

UUW84

Costs (Wholesale) Wastewater - Table Commentary

October 2023

Data Table Commentaries

This document provides a commentary and supporting information for the Costs (Wholesale) Wastewater PR24 data tables.

Executive Summary

Our plan for Wastewater Network plus is ambitious as we accelerate the transformation of the drainage system that serves the North West. This transformation will be happening at the same time as maintaining and improving performance across the wastewater network and at wastewater treatment works. We will deliver one of the largest programmes in the industry whilst striving for 4* in the Environment Agency's Environmental Performance Assessment (EPA). We have achieved the top 4* rating in the EPA in five of the last eight years.

The purpose of these tables is to capture the operating and capital expenditure and the outcomes as set out in-line definitions and the RAG guidance. Wastewater cost data tables reflect the investment required to achieve these targets within AMP8 to ensure we meet the expectations of customers and stakeholders today, as well as effectively planning for the future. The Wastewater Network plus totex for AMP8 is £8.2bn, for details on the approach taken to the build of totex, please refer to our wastewater plans is available in *UUW56 - Wastewater Business Plan* and supplementary document *UUW58 - Bioresources Business Plan* supplementary document

We have challenged costs throughout the programme to develop an ambitious and efficient plan. With new legislative requirements to meet new standards across the wastewater system these tables reflect a plan we are proud of and one that will support the transformation of the service provided from Wastewater Network plus.

The price base for financial cost information is 2022-23 prices indexed using the financial year average Consumer Price Index (including housing costs) Tables CWW4 and CWW6 concern costs associated with our asset base. These tables show that we propose to maintain our asset base, without significant numbers of new assets being added unless associated with enhancement. This is in-line with our commitment to efficient operation, whereby the maintenance and operation of existing assets represents best value / least cost for customers, unless those assets are required to be enhanced for new legislation, for example new legislation for overflow spills and Phosphorus removal at wastewater treatment works.

CWW3 includes our costs associated to overflows and spill reduction and CWW20 reflects our activities to deliver the benefits. We understand and share concerns about the use of storm overflows and we are under no illusion about the urgency of the task. Our plan, included in these tables, demonstrates our action and ambition that we are committed to. The North West has more rainfall and more combined sewers than elsewhere in the country, as well as a very large network. Therefore, achieving the new requirements set out in new legislation is going to take sustained effort and investment over time. These tables represent our plan to reduce storm overflow spill that is our pathway to the long-term target of less than 10 spills per overflow.

CWW1 includes the base case costs and CWW4 includes the enhancement costs that support our plan to continue to drive a step change in flooding performance. The North West is served by a large proportion of combined sewers that are more prone to hydraulic capacity risk in times of heavy rainfall, which is also an environmental factor of the North West. Our plan includes interventions to add targeted capacity where it is most needed, improved monitoring to enhance situational awareness and also nature based solutions that manage rainfall close to where it falls. Climate change forecasts indicate that we will experience more rainfall in the future. We are taking steps now to improve resilience of the system for customers today and those of the future. Our interventions in AMP8 are those on the least regrets pathway as we monitor the trajectory of the climate whilst seeking to keep bills as low as possible.

Table CWW3 includes the costs to deliver improvements described in the WINEP, including phosphorus removal schemes. The levels of phosphorus in the environment is a challenge, and we are aware of our contribution to solving the issue. We have made great improvements in the levels that wastewater treatment techniques can achieve over the last few investment periods. In AMP8 we embark on the next stage of phosphorus removal as we seek to meet the new Environment Act targets for phosphorus by 2037. Our AMP8 plan includes interventions that are least regrets within our adaptive plan for meeting these 2037 targets.

Tables CWW12 and CWW20a include the transitional investment and table CWW17 include the accelerated programme investment required to ensure we can deliver enhancements as soon as we are able and the

Advanced WINEP in table CWW3 to remove surface water ahead of AMP9. Additional detail on the AMP8 wastewater enhancement expenditure can be found in the enhancement supplementary documents.

These data tables outline the efficient costs and stretching outputs required to operate and enhance the wastewater business in AMP8 that will meet regulatory standards and customer expectations.

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1. CWW1 – Totex analysis – wastewater network + and bioresources (post frontier shift and real price effects)

1.1 Whole table

Cost changes over the period

- 1.1.1 The table has been prepared taking into account the guidance on improving cost allocation between the sewage treatment and bioresources units in relation to sludge liquors, energy generation and overheads.

1.2 Operating expenditure

CWW1.1 Base operating expenditure

- 1.2.1 Commentary completed for CWW2 is also relevant for CWW1.1
- 1.2.2 Base operating expenditure includes sludge liquors, which have previously only been shadow reported.

Principal use recharges

- 1.2.3 Where possible, fixed assets and associated depreciation are directly attributed to a single price control unit. Where this is not possible, the asset is assigned to the price control of principal use with recharges made to other price controls reflecting the proportion of the asset used by the other price controls.
- 1.2.4 Each commissioned asset in the SAP register is assigned to a business unit code, which determines the price control unit that the asset/depreciation is allocated using the 'principal use' method. Assets that are used across more than one price control are assigned a management & general (M&G) business unit code. These codes determine the allocation percentages across the price controls. This is consistent with the approach taken in the APR. Using 2022/23 APR data, circa 11% of historic cost depreciation and amortisation relates to assets used by more than one price control (all M&G assets).
- 1.2.5 The resultant annual recharges, as reported in APR 23 (in current year prices) derived from historic cost depreciation, are detailed below in Table 1.

Table 1: Recharges

Price control	Water Resources £m	Water Network+ £m	Wastewater Network+ £m	Bioresources £m	Residential Retail £m	Total £m
Recharge from other segments	(0.1)	(13.8)	(2.8)	(3.1)	(3.1)	(22.9)
Recharge to other segments	0.0	3.6	18.7	0.1	0.5	22.9
Net recharge	(0.1)	(10.2)	15.9	(3.0)	(2.6)	-

1.2.6 The nature and extent of the most material principal use recharges are detailed below in Table 2.

Table 2: Material principal use recharges

Assets allocated over Price Control	Key assets	Drivers	Principal Use Price Control	Value of recharge (£m)
IT assets used by all employees	Microsoft, printer, internet, video conferencing	FTE allocation	Wastewater Network Plus	5.6
Mobile Asset & Resource Scheduling System	Systems	Number of assets in each price control	Wastewater Network Plus	3.1
Corporate systems	SAP system/Workforce Management systems	Number and type of licence/users	Wastewater Network Plus	3.0
Head office	Head office buildings	Floor space occupation	Wastewater Network Plus	2.3
Geographic Information System (GIS)	Systems	Analysis of data layers and usage	Wastewater Network Plus	1.1
Total				15.2

1.2.7 The principal use recharges are forecast to increase in 2024/25 as a project to replace desktop and laptop computers across UUW is commissioned in that year.

Equity issuance costs

1.2.8 Equity issuance costs of £20m have been included in AMP8, with £18m allocated to Wastewater Network Plus and £2m allocated to Bioresources as shown in RR2.15 and RR2.16.

CWW1.2 Enhancement operating expenditure

1.2.9 Commentary completed for CWW3 is also relevant for CWW1.2.

1.2.10 The enhancement operating expenditure varies year on year depending on the profiling and completion of schemes. The phosphorous removal schemes in AMP7 will result in lower permit levels, which significantly increase the base operating expenditure in AMP8 so this is being addressed via a Cost Adjustment Claim.

CWW1.5 Third party services

1.2.11 Commentary completed for CWW11 is also relevant for CWW1.5.

1.2.12 Third party services cost movements are predominantly due to client driven diversions, with increased activity expected in the remaining years of the AMP7. Third party service costs include volume increases in bulk supplies (which are in-line with revenue assumptions) and from 2023/24 these include highway drainage costs. Diversions expenditure in AMP8 is expected to increase further again, predominantly due to the impact of HS2 diversions.

1.3 Developer services revenue

CWW1.7 Developer Services Revenue Operating Expenditure

1.3.1 The impact of the increased diversions activity is leading to increased grants and contributions (operating expenditure) due to the majority of these costs being recoverable.

1.4 Capital Expenditure

CWW1.8 Base capital expenditure

- 1.4.1 Base capital expenditure reduces in the last two years of AMP7, this is a result of forecast efficiencies and reduced activity as the period ends. This reduction is partially offset by increased investment in Bioresources to complete the IED programme.
- 1.4.2 The AMP8 base capital expenditure profile is front end loaded, this is primarily related to two areas of expenditure. Both the cost adjustment claim for Bioresources and maintenance associated to delivering our WINEP requirements in Wastewater Network Plus require investment to be made earlier in the period. The impact of these is significantly lower in the final two years, hence the lower forecasted expenditure.

CWW1.9 Enhancement capital expenditure

- 1.4.3 Enhancement capital expenditure in the Wastewater Network Plus price control reduces in the last two years of AMP7, this is a result of forecasted efficiencies and reduced activity as the period ends.
- 1.4.4 AMP8 enhancement capital expenditure varies throughout the period as a result of the profiling of statutory commitments and delivery plan. The requirements of the WINEP have the largest impact on this profile.

CWW1.10 Developer services capital expenditure

- 1.4.5 Developer services capital expenditure movements in AMP7 predominantly relate to increased network reinforcement spend, which is expected to address the current surplus position in table 2K (Infrastructure charges reconciliation). In AMP8 there will be further increased reinforcement expenditure required, due to the increased demand on the network based on current local authority development plans.

CWW1.14 Grants and contributions capital

- 1.4.6 Grants and contributions capital expenditure in AMP7 remains fairly static with no significant changes required to our current infrastructure charges. Increased income in AMP8 mainly relates to us recovering the increased reinforcement expenditure in AMP, as well as full cost recovery of site specific costs.

1.5 Atypical expenditure

CWW1.24 Atypical expenditure

- 1.5.1 We have not categorised any costs as atypical for the purpose of this table.

2. CWW1a – Totex analysis – wastewater network + and bioresources

2.1 Whole table

CWW1a.1-24

- 2.1.1 This table mirrors CWW1 but excludes the impact of the frontier shift and real price effects assumptions included in table SUP11.
- 2.1.2 Commentary completed for CWW1 is also relevant for CWW1a.

3. CWW2 – Base expenditure analysis – wastewater network + and bioresources

3.1 Whole table

CWW2.1 - 18

- 3.1.1 This table is compiled on the same basis as Table 4K in-line with RAG 4.11 guidelines, except where otherwise stated.

3.2 Operating expenditure

CWW2.1 Power

- 3.2.1 Power expenditure profile is due to the assumption that purchased power consumption is relatively flat between 2022/23 and 2024/25, however an increased unit cost in 2023/24 and reduction in 2024/25 cause the year on year movement in power cost. There is growth in consumption at the beginning of AMP8 as a result of delivering the AMP7 WINEP. Power prices assumed in 2023/24 and 2024/25 are reflective of our hedged position. AMP8 power prices are assumed to follow June 2023 Cornwall 'central' scenario price assumptions, including the cost of Renewable Energy Guarantee of Origin (REGO) certificates. Given that *UUW* is hedged below the Cornwall forecast for 2023/24 and 2024/25, there is an assumed unit cost increase into 2025/26, which is contrary to the Cornwall forecast year on year movement.
- 3.2.2 The sector, through Water UK, jointly commissioned Cornwall Insight to provide delivered electricity cost forecasts (i.e. import prices) for the period to 2031/32 in order to support our business plan submission to Ofwat. Cornwall Insight is a third party consultancy considered expert in its field that provides price forecasting services to many businesses. Due to the nature of the electricity grid, the economic regulation of the network operators, and the diverse nature of each company's portfolio of assets, a separate forecast for each company which takes into account the specific nature of its portfolio was requested. Underlying macro-economic assumptions remain consistent across each of the forecasts, however company specific variations are accounted for as far as possible. Cornwall Insight provided two forecasts to each company, the first in October 2022 and the final in June 2023 forming the basis of the forecast used for electricity import costs in our business plan submission. We have used the most recent June 2023 forecast and the 'central' scenario as the basis for the price assumptions implicit in our business plan submission.

CWW2.2 Income treated as negative expenditure

- 3.2.3 The income treated as negative expenditure reduces from 2027/28 due to Renewable Obligation Certificates being phased out from 31st March 2027.

CWW2.4 Renewals expensed in year (infrastructure)

- 3.2.4 Renewals expensed in year reduces in the remaining two years of AMP7 due to efficiency within the reactive repairs process. The programme for AMP8 is broadly flat.

CWW2.5 Renewals expensed in the year (non-infrastructure)

- 3.2.5 Renewals expensed in the year (non-infrastructure) is nil. The purpose of this line is to capture any renewal expenditure against non-infrastructure that is not capitalised, however *UUW*'s accounting policy is to treat any renewals expenditure on non-infrastructure as capex and write off any replaced / refurbished asset where applicable and as a result this line is zero.

CWW2.6 Other operating expenditure

- 3.2.6 Other operating expenditure reduces as a result of chemical price reductions between 2022/23, and other efficiencies from 2023/24 into AMP8 through innovation and optimisation of solutions, robust cost challenge and effective use of markets.

Equity issuance costs

- 3.2.7 Equity issuance costs of £20m have been included in AMP8, with £18m allocated to Wastewater Network Plus and £2m allocated to Bioresources.
- 3.2.8 In sewage collection there is an increase in maintenance operating expenditure between AMP7 and AMP8 reflecting the reclassification of expenditure from enhancement to base for activities related to our current Dynamic Network Management programme and ensuring we maintain spills and network performance in AMP8. We have seen cost increases on a number of key network maintenance contracts, which we are addressing through intelligent risk based prioritisation and our systems thinking capability. Removing the impact of profiling for planned IRE works, renewals expensed in the year (infrastructure) remains in largely in-line with AMP7 average expenditure.
- 3.2.9 In sewage treatment there is an increase in chemical and maintenance base operating expenditure between AMP7 and AMP8 following the delivery of the AMP7 WINEP, particularly from the phosphorous removal schemes.
- 3.2.10 In sludge treatment, there is a reduction between AMP7 and AMP8 that relates to the cost adjustment claim for the Industrial Emissions Directive (IED) and the compliance requirements to deliver enhanced environmental protection. The increase in 2024-25 mainly relates to new capacity.

CWW2.7 Local authority and Cumulo rates

- 3.2.11 The vast majority of the wastewater business rates liabilities are based on the replacement cost of the operational wastewater assets established by the Valuation Office Agency (VOA). These assessments are periodically adjusted by the VOA at what is called a revaluation date. There has recently been a revaluation at April 2023 and there are two further revaluations anticipated at April 2026 and April 2029. At the April 2023 revaluation the replacement costs assigned to asset types by the VOA increased significantly to reflect increases in construction costs since the previous revaluation date. As we expect construction costs to continue to increase we are forecasting further increases to the replacement costs and the associated business rates liabilities at the forthcoming revaluation dates. In addition as we continue to invest in our wastewater asset base the overall replacement cost of our total wastewater asset base will continue to grow, contributing to an increase in our wastewater business rates liabilities as we progress through AMP8.

3.3 Location specific costs & obligations**CWW2.11 Costs associated with the traffic management act**

- 3.3.1 Costs are directly related to permit schemes incurred on our base expenditure excluding fines in-line with our APR submission methodology.

CWW2.12 Costs associated with lane rental schemes

- 3.3.2 Following the introduction of such schemes across the UK, from 2025-26 we have also included costs associated with lane rental schemes. Our assumptions include an introduction of lane rental costs for the three largest authorities in our region and are based on permitted job volumes included in the base operating expenditure.
- 3.3.3 The costs for permits within the Wastewater price control are wholly allocated to Sewage Collection as most permits relate to jobs undertaken on the Wastewater network. This does not include costs related to developer services.

3.4 Capital expenditure**CWW2.17 Total base capital expenditure**

- 3.4.1 The AMP8 base capital expenditure profile is front end loaded, this is primarily related to two areas of expenditure. Both the cost adjustment claim for Bioresources and maintenance associated to delivering of WINEP requirements in Wastewater Network Plus require investment to be made earlier in the

period. The impact of these is significantly lower in the final two years, hence the lower forecasted expenditure.

Business Rates

- 3.4.2 Business rates included within this table excludes the impact of asset growth. This growth has been included in CWW3.

4. CWW3 – Enhancement expenditure – wastewater network + and bioresources

4.1 Whole table

CWW3.1 - 195

- 4.1.1 This table is compiled on the same basis as Table 4M in-line with RAG 4.11 guidelines, except where otherwise stated.
- 4.1.2 Further detail to proportional allocations of costs between expenditure categories in table CWW3 or between enhancement and base expenditure is found in UUW117 Project allocations-CW3 and CWW3.

4.2 EA/NRW environmental programme Wastewater (WINEP/NEP)

CWW3.1 - 130

- 4.2.1 EA/NRW environmental programme Wastewater (WINEP/NEP) is populated with expenditure programmes driven by statutory obligations agreed with the EA and included in the National Environment Programme. Expenditure is incurred in-line with the specific output delivery dates. The overall profile of expenditure is a result of the range of required delivery dates within the WINEP, with most of the significant construction activity in years 2 – 4 of the period. The approval of the Accelerated Programme has also impacted the profile of investment, bringing forward expenditure and allowing for more construction activity in year 1 of the period than would normally be undertaken. As we move into the new price review period, the incremental operating expenditure from the AMP7 enhancement schemes is presented in the base operating expenditure of AMP8 in line with the guidance.

4.3 EA/NRW environmental programme bioresources (WINEP/NEP)

CWW3.130 - 152

- 4.3.1 EA/NRW environmental programme bioresources (WINEP/NEP) is populated with expenditure programmes driven by statutory obligations agreed with the EA and included in the National Environment Programme. Expenditure is incurred in-line with the specific output delivery dates.

4.4 Other enhancement

CWW3.153 - 155 Growth at sewage treatment works (excluding sludge treatment)

- 4.4.1 The profile of growth at sewage treatment works (excluding sludge treatment) expenditure reflects the delivery dates required for each scheme to meet the growth forecasts at the individual sewage treatment works affected.

CWW3.156 - 158 Reduce flooding risk for properties

- 4.4.2 Reduce flooding risk for properties expenditure relates to ongoing activity to improve flooding performance for customers.

CWW3.159 - 161 First Time Sewerage

- 4.4.3 First Time Sewerage expenditure relates to new and additional sewage treatment and sewerage assets for first time sewerage schemes.

CWW3.168 - 170 Wastewater Resilience

- 4.4.4 The profile of Wastewater Resilience expenditure reflects the delivery plan for providing resilience to wastewater assets against coastal erosion and power outage risks.

CWW3.177 - 179 Net zero expenditure

- 4.4.5 Net zero expenditure relates to various projects to deliver a reduction in our CO₂ emissions, expenditure is profiled in-line with expected delivery plan. Further detail of the projects can be found in CWW22.

4.5 Other enhancement (Freeform lines - by exception)

CWW3.181 – 182 Additional Line 1

4.5.1 In the period 2023 – 2025 expenditure on Additional Line 1 is for AMP7 programmes recorded in table 4M which do not fit into the specified lines in CWW3. This is:

- 4M.3 Conservation drivers.

4.5.2 In the period 2026-2030 expenditure in this line relates to enhanced sludge screening and alternative outlet adaptive planning. Further details can be found in enhancement cases *UUW66 – Bioresources Enhancement Claims*

CWW3.183 – 184 Additional Line 2

4.5.3 Expenditure on this line is to complete the Green Recovery programme, further details can be found in enhancement case *UUW65 – Wastewater Quality Additional Requirements Enhancement Claims - Green Recovery*.

CWW3.185 – 186 Additional Line 3

4.5.4 Expenditure on this line relates to the Wastewater Reservoirs programme, further details can be found in enhancement case *UUW65 – Wastewater Quality Additional Requirements Enhancement Claims – Wastewater Reservoirs*.

CWW3.187 – 188 Additional Line 4

4.5.5 Expenditure on this line relates to the Rainwater management programme, further details can be found in enhancement case *UUW65 – Wastewater Quality Additional Requirements Enhancement Claims - Rainwater Management Enhancement*.

CWW3.189 - 190 Additional Line 5

4.5.6 In the period 2023 – 2025 expenditure on Additional Line 5 are for AMP7 programmes recorded in table 4M which do not fit into the specified lines in CWW3. These are:

- 4M.43 UV disinfection (or similar);
- 4M.59 Sludge enhancement (quality);
- 4M.75 and 76 NEP - Discharge Relocation;
- 4M.77 and 78 NEP requirement for bathing water shellfish driver delivered through long sea outfall or increased FTFT; and
- 4M.79 and 80 Innovation Competition.

Table 3 below sets out Ofwat's response to query 331.

Table 3: Ofwat query 331

ID	W&SC query text	W&SC query table	Ofwat response
331	<p>How should we capture AMP7 WINEP enhancement spend that carries over into AMP8? As illustrated through our Table 7F submission and subsequent queries (in this case relating to AMP6 carryover), there can often be ongoing spend beyond the regulatory completion date, which could be 31st March 2025. Similarly, through the WINEP alteration process we have agreed with the EA for some AMP7 completion dates to be extended beyond Mar 2025. In both cases we will not be asking for this money again through our PR24 business plan.</p>	CWW3	<p>Thankyou for the query. Any expenditure forecast in AMP8 should be included in your PR24 Business Plan. As you state you will not receive new funding in PR24, however, we need to be aware of any delayed expenditure to enable full reconcillation of AMP7 allowed expenditure. We would also expect that you have confirmed and agreed any delay on WINEP schemes with the Environment Agency.</p> <p>If it is expenditure on a wastewater WINEP scheme please detail the forecast expenditure in CWW3.182 -192, and include detail in your business plan table commentary that the expenditure is for carryover from AMP7. In your commentary you should include specific details on the WINEP actions it is for and the solutions implemented, so we can reconcile the expenditure. If it is water WINEP spend please follow the same approach using one or more of the additional lines CW3.127-136 and include details in your business plan commentary.</p> <p>In addition please ensure you include all expenditure in your APR under the appropriate year.</p>

5. CWW4 –Wastewater network + - Functional expenditure

5.1 Whole table

CWW4.1-14

- 5.1.1 This table is compiled on the same basis as Table 7A in-line with RAG 4.11 guidelines, except where otherwise stated.
- 5.1.2 The allocation of costs are based on the Wastewater Explanatory Factors (WEF) model so the number of large works is assumed to change over time. This moves costs between band 1-5 sewage treatment works (CWW4.7) and band 6 (CWW4.13) sewage treatment works.
- 5.1.3 The number of works in 2022-23 increases from 63 to 67 by 2029-30 and this is detailed in Table 4 below.

Table 4: WwTWs changes

Year	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30
Tot Band 6	63	63	65	65	66	66	66	67
Works		+Tyldsley -Wilmslow	+Kidsgrove +Stretford	No change	+Wilmslow	No change	No change	+Formby

- 5.1.4 The reduction in costs between 2023/24 and 2024/25 is mainly due to power prices. The increase in other direct costs from 2025/26 is mainly due to the delivery of enhancement projects from AMP7, particularly phosphorous removal, increasing operating costs in AMP8.

6. CWW5 – Wastewater network + - Large sewage treatment works

6.1 Whole table

Data quality confidence grade

6.1.1 We have graded this table data as B2

6.2 Sewage treatment works - Explanatory variables

CWW5.1 Works name

6.2.1 Over the reporting period we have an increase of 4 sites moving into the large treatment works category. In 2025 Kidsgrove and Stretford, in 2027 Wilmslow and in 2030 Formby is the 4th site to move into the large works table. This is detailed below in Table 5.

Table 5: Additional large works reconciliation

Year	2023	2024	2025	2026	2027	2028	2029	2030
Number	63	63	65	65	66	66	66	67
Additions	-	-	Kidsgrove	Kidsgrove	Kidsgrove	Kidsgrove	Kidsgrove	Kidsgrove
Additions	-	-	Stretford	Stretford	Stretford	Stretford	Stretford	Stretford
Additions	-	-	-	-	Wilmslow	Wilmslow	Wilmslow	Wilmslow
Additions	-	-	-	-	-	-	-	Formby

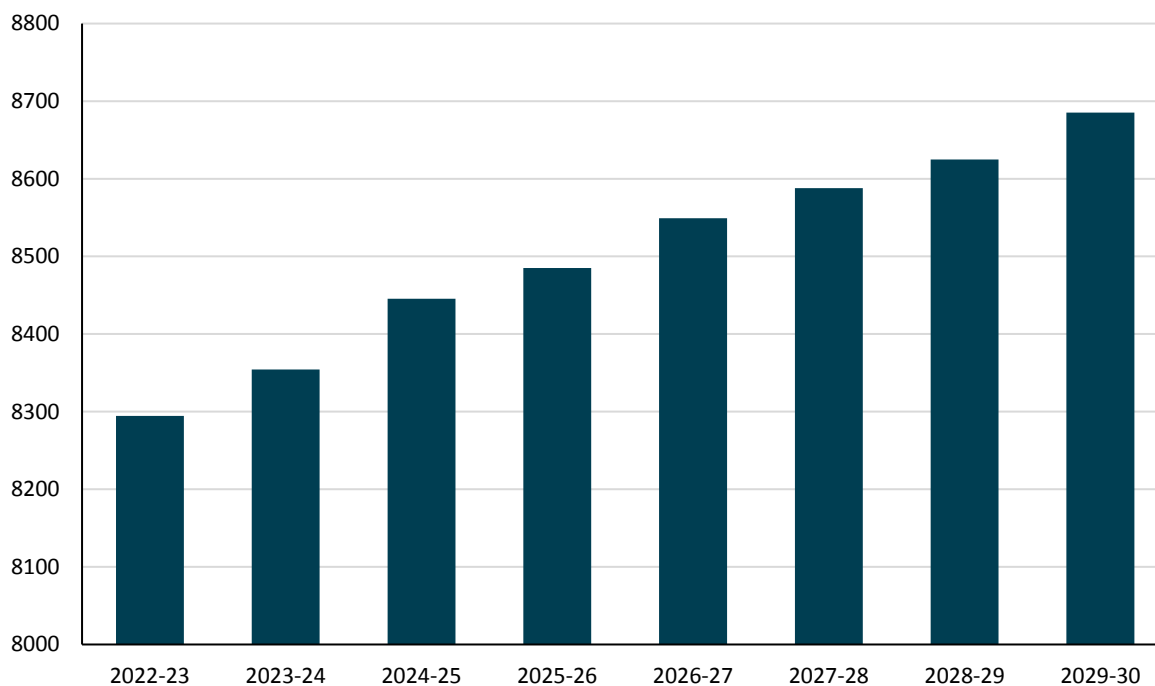
CWW5.2 - Classification of treatment works

6.2.2 There are no changes in classification of treatment works aside from the new sites entering the large treatment works as detailed in Table 5. Classifications are detailed below:

- Kidsgrove – TA2;
- Stretford – SB;
- Wilmslow – TB2; and
- Formby – TB2.

CWW5.3 - Population equivalent of total load received

6.2.3 There is an increase in 4.71% in the population equivalent of total load received across the reporting period. This is detailed in Figure 1 below.

Figure 1: Sum of PE of total load**CWW5.4 - 8**

6.2.4 Please see Table 6 below regarding the changes in consents across the reporting period.

Table 6 Change in consents

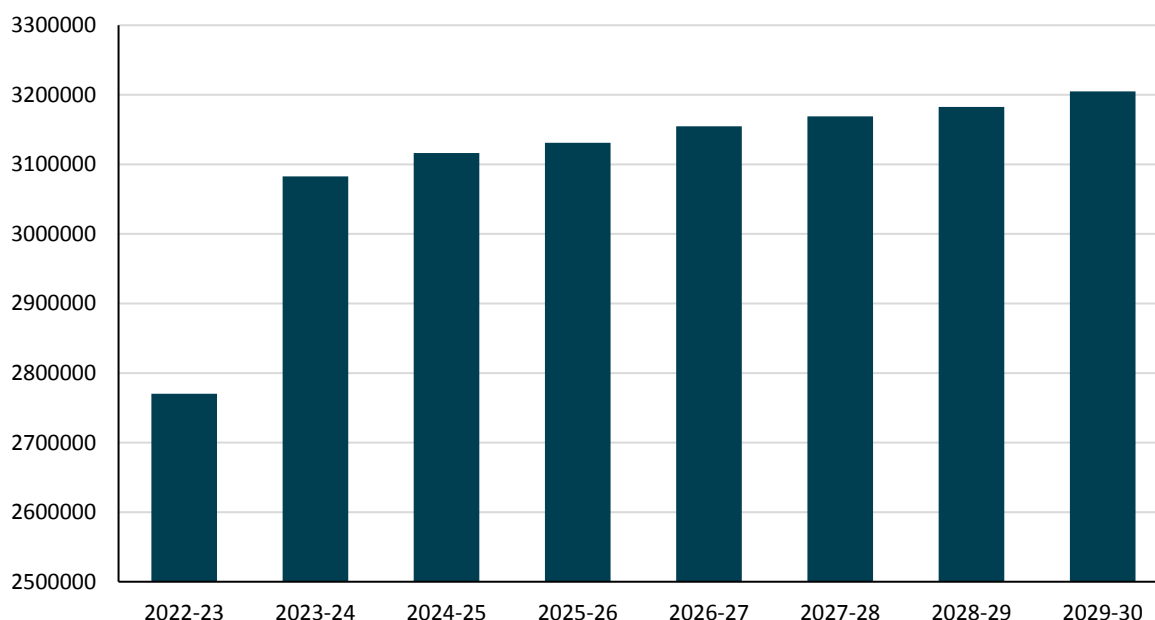
Year	Consent change	Number of sites
2025	sites with Phos limit tightened as per WINEP	11
2025	sites with new Phos limit as per WINEP	5
2025	sites with BOD limit tightened as per WINEP	3
2025	sites with Ammo limit tightened as per WINEP	3
2026	sites with Phos limit tightened as per WINEP	1
2026	sites with BOD limit tightened as per WINEP	1
2027	sites with new Phos limit as per WINEP	2
2027	sites with BOD limit tightened as per WINEP	3
2028	sites with Phos limit tightened as per WINEP	1
2029	sites with Phos limit tightened as per WINEP	1
2029	sites with BOD limit tightened as per WINEP	1
2029	sites with new Ammo limit as per WINEP	1
2030	sites with Phos limit tightened as per WINEP	7
2030	sites with new Phos limit as per WINEP	2
2030	sites with BOD limit tightened as per WINEP	2
2030	sites with Ammo limit tightened as per WINEP	5

CWW5.10 Consents

6.2.5 There is a steady increase in flows passed to full treatment from 2023-24 – 2029-30.

6.2.6 In APR23 we saw a reduction in flows due to a dry period from March 2022 to October 2022 across the entire asset base, this means the first year of the reporting period is atypically low. Our forecast trend includes consideration of flow trend prior to 2022-23 accordingly what appears as a step change in 2023-24 is just continuation of the overall long-term trend (increase in flows as population grows over time). We also anticipate flow passed to full treatment to increase as a result of our increased flow passed forward solutions as part of our overflow reduction programme.

Figure 2: Sum of flow passed to full treatment



6.3 Sewage treatment works - Functional expenditure

CWW5.11 - 16

- 6.3.1 This table is compiled on the same basis as Table 7B in line with RAG 4.11 guidelines, except where otherwise stated.
- 6.3.2 The allocation of costs are based on the Wastewater Explanatory Factors (WEF) model so the number of large works is assumed to change over time. This moves costs between band 1-5 sewage treatment works (CWW4.7) and band 6 (CWW4.13) sewage treatment works.
- 6.3.3 The number of works in 2022/23 increases from 63 to 67 by 2029/30 and this is detailed in the Table 7 below.

Table 7: WwTWs number within size band 6

Year	2022/23	2023/24	2024/25	2025/26	2026/27	2027/28	2028/29	2029/30
Total Band 6	63	63	65	65	66	66	66	67
WwTWs		+Tyldsley -Wilmslow	+Kidsgrove +Stretford	No change	+Wilmslow	No change	No change	+Formby

- 6.3.4 The reduction in costs between 2023/24 and 2024/25 is mainly due to power prices. The increase in other direct costs from 2025/26 is mainly due to the delivery of enhancement projects from AMP7, particularly phosphorous removal, increasing operating costs in AMP8.

6.4 Sewage treatment works - Functional expenditure

CWW5.17 Population equivalent of total load received (resident population and trade effluent)

- 6.4.1 There is a 3.97% increase across the reporting period in population equivalent of total load received in the large works table.
- 6.4.2 To note there is a decrease in Wigan WwTW of 1.08%. This is due to a decrease in the trade effluent entering the sewage system.

7. CWW6 – Wastewater network + - Sewer and volume data

7.1 Whole table

Data quality confidence grade

7.1.1 We have graded this table data as between B2 and B4.

7.2 Wastewater network

CWW6.1 - 2 Connectable properties served by s101A schemes completed in the report year and Number of s101A schemes completed in the report year

7.2.1 The forecast for the period of 2025-2030 for lines 1 and 2 is based on the current number of live applications that have reached the technical assessment stage of the S101A process. There are currently four live applications, an additional two at appeal with the EA and one scheme with duty accepted for delivery in AMP8.

7.2.2 The unpredictability of application received and the need to meet the specific criteria means that it is challenging to forecast projects that will be completed year on year. The size and scale of a scheme can be variable and therefore there is a risk of what can be expected to deliver versus the funding allocated for delivery.

CWW6.3 - 4 Total Pumping Station Capacity & Number of Network Pumping Stations

7.2.3 It is expected that the number of pumping stations and capacity will continue to grow for the remainder of AMP7 and throughout AMP8, as pumping stations are adopted each year and additional private transfer pumping stations are identified. No new pumping station sites are expected to be built through the WINEP and no associated pump capacity is forecast to affect current projections for these reporting lines. Current projections do not include pumping station numbers or associated capacity that may be required from HS2 diversion activities. Any change is expected to be negligible to total figures.

CWW6.5 Total Number of Sewer Blockages

7.2.4 Over the course of AMP8, *UUW*'s reportable blockage numbers are assumed to follow a stretching trajectory from our end of AMP7 forecast performance to an 2029/30 position of 15,272 blockages; equivalent to an 11.5% reduction. Such a reduction is consistent with our AMP7 PCL, which also targets an 11.5% reduction. On a normalised basis, *UUW* is the industry leader in blockage performance and therefore sustaining such a rate of improvement is highly ambitious. For the remainder of AMP7 and into AMP8 we will continue to build upon and mature successful operational interventions driven through base expenditure, including:

- Expansion and maturation of our industry-leading Dynamic Network Management (DNM) initiative. To date, DNM has involved the installation of over 17,500 intelligent sensors across 160 drainage areas. By improving the monitoring capabilities in our network and applying predictive analytics and machine learning to spot deviations from 'normal' flow signatures, we have been able to identify and clear blockages before customers are even aware of the problem. The proactive alerts generated by this network of sensors have detected over 2,500 sewer blockages and over 100 CSO blockages since August 2021. In this way, we have been able to increase the detection of non-reportable proactive blockages;
- Continuation of our robust blockage resolution model, including: conducting CCTV post blockage clearance to better understand root cause and raise further works accordingly; a targeted planned cleaning programme in areas identified as susceptible to repeat blockages; and proactive walkovers of assets susceptible to blockage formation;

- Working with Food Service Establishments (FSEs) to provide education and advice regarding grease removal equipment and kitchen best practice. Since Oct 2019, through our partnership with Environmental Compliance Experts, ECAS, we have conducted over 8,500 site visits to high-priority FSEs and prevented an estimated 1,242 tonnes of FOG from entering UUW's sewer network; and
- Implementing customer awareness campaigns to raise awareness regarding 'What not to Flush' and how to 'Stop the Block'. UUW's most recent awareness campaign in 2022–23 resulted in an overall 64 per cent awareness of 'What not to flush', compared to a 2019–20 baseline of 25 per cent. We want to stretch this achievement, maintaining and improving enhanced awareness levels among customers, empowering customers to help improve network use and supporting embedded behaviour changes through to 2030.

7.2.5 The quality of historical data reported for this metric is high, with a confidence grade of A3, and the methodology has been subject to third party assurance. Forecasting future performance comes with inherent uncertainty, however, we believe a further 11.5% reduction in the number of blockages over the course of AMP8 to be stretching but achievable.

CWW6.6 Total Number of Gravity Sewer Collapses

7.2.6 The total number of sewer collapses is presented in OUT5.79. We propose to offset deterioration and drive a reduction in the number of gravity sewer collapses through a proactive inspection and rehabilitation programme for those sewers known to be at risk of collapse and/or of high consequence if failure should occur (see CWW6.14). Further, we will continue to mature the machine learning capabilities of DNM to improve our ability to detect changes in levels that may be indicative of defects within the network and take appropriate action to prevent a collapse.

7.2.7 The quality of historical data reported for this metric is high, with a confidence grade of A3, and the methodology has been subject to third party assurance. Forecasting future performance comes with inherent uncertainty, however, we consider our forecasts for collapse performance to be stretching and we outline the evidence to support our proposals in *UUW30 - Performance commitments technical document - Sewer Collapses*.

CWW6.7 Total Number of Sewer Rising Main Bursts

7.2.8 A key part of our base programme will be focused on transforming the way in which we manage our rising mains. This includes installing pressure transient monitoring in our highest risk mains to detect burst pre-cursors, improving the way in which we inspect and maintain air valves and replacing failing mains that are beyond their asset lives. Therefore, we are aiming to observe a 26% decrease in the number of rising main bursts over the course of AMP8.

7.2.9 The quality of historical data reported for this metric is high, with a confidence grade of A3, and the methodology has been subject to third party assurance. Forecasting future performance comes with inherent uncertainty, however, we consider our forecasts for collapse performance to be stretching and we outline the evidence to support our proposals in *UUW30 - Performance commitments technical document - Sewer Collapses*.

CWW6.8 Number of combined sewer overflows

7.2.10 The figures reported in the 2022/23 annual regulatory return include all current permitted overflows included on the corporate permit system iComply plus the overflows United Utilities is aware of (Known unpermitted overflows) recorded on the Unpermitted List that are predicted to spill up to 1 in 30 year storm events. There is no significant change forecast to these figures other than within year fluctuation.

7.2.11 2,004 permitted storm overflows have been included in 2023 annual reporting based on those recorded on the corporate iComply system. It has been assumed that the records in the system are accurate. Although there are processes in place to audit the data entries there is a risk of errors within iComply as it relies on human input. A confidence rating of B2 has been applied to reflect the level of uncertainty associated with this.

- 7.2.12 85 unpermitted storm overflows are being included in 2023 annual reporting based on the below assumptions.
- 7.2.13 20 Storm overflows at WwTW that should treat all flow have been included on the basis they meet the line definition.
- 7.2.14 3 storm overflows to be abandoned as part of current AMP schemes have been included on the basis they exist until abandoned
- 7.2.15 1 storm overflow has been newly added and current status is that it is a live overflow that spills in 1/30 year storm event so requires a permit and will need EDM.
- 7.2.16 58 of 59 reported in EDM data return have been included as current status for these is that they are live overflows that spill in 1/30 year storm event so require permits and will need EDM. LAN0124 has since been permitted so has been removed from unpermitted number.
- 7.2.17 1 was omitted from the EDM data return in error ([✂]) and current status is that it is a live overflow that spills in 1/30 year storm event so requires a permit and will need EDM.
- 7.2.18 2 were included in EDM return as permitted (HAL0126, HAL0127)
- 7.2.19 12 Storm overflows where current modelling forecasts no spill up to the 1/30 year storm event have been discounted. There is a risk that upon completion of model verification these may spill in storm events up to 1/30 year event and will need to be permitted and counted.
- 7.2.20 2 storm overflows that have been identified not to be CSOs so have been excluded. There is a risk that these may be confirmed as overflows following survey so will need to be permitted and counted.
- 7.2.21 There is a project currently on-going that includes surveys, impact assessments, flow surveys, model verification and estimating to further understand the performance of these 85 overflows and what is required to meet the relevant legislative obligations and apply for Environmental Permits. The forecast completion date for this project is 30/06/2024. Some of these overflows may be modelled not to spill in storm conditions and will subsequently be removed. A confidence rating of B2 has been applied to reflect the level of uncertainty associated with this.
- 7.2.22 We continue to investigate and map the existing wastewater network as part of our Integrated Drainage Area Strategy (IDAS). Investigations include asset surveys and modelling a 1/30 year rainfall event to understand the existence and operation of any additional legacy assets. The same methodology used in the 2022-23 annual regulatory reporting is expected to be followed for future forecast year so any changes to our asset records will be updated accordingly.
- 7.2.23 Corporate systems including GIS, SAP, Airline and iComply have been used to identify overflows that are unpermitted along with feedback from operational staff however, there is a risk that some may have been missed or there are overflows that exist which the business is unaware of. A process is in place to manage these as and when they are identified.
- 7.2.24 A confidence rating of B2 has been applied to reflect the level of uncertainty associated with unpermitted overflows and the iComply data entry.

CWW6.9 Number of emergency overflows

- 7.2.25 The figures reported in the 2022-23 annual regulatory return include all current permitted overflows included on the corporate permit system iComply plus the overflows United Utilities is aware of (Known unpermitted overflows) recorded on the Unpermitted List. There is no change forecast to these figures other than within year fluctuation
- 7.2.26 612 permitted storm overflows have been included based on those recorded on the corporate iComply system. It has been assumed that the records in the system are accurate. Although there are processes in place to audit the data entries there is a risk of errors within iComply as it relies on human input. A confidence rating of B2 has been applied to reflect the level of uncertainty associated with this.

- 7.2.27 33 unpermitted emergency overflows are being included assuming they only spill in emergency situations and do not operate in storm conditions. There is a project currently on-going that includes surveys, impact assessments, flow surveys, model verification and estimating to further understand the performance of these 33 overflows and what is required to meet the relevant legislative obligations and apply for Environmental Permits. The forecast completion date for this project is 30/06/2024. Some of these overflows may be modelled to spill in storm conditions and will subsequently be included in-line 8 but will be discounted from line 9 in accordance with the definition. A confidence rating of B2 has been applied to reflect the level of uncertainty associated with this.
- 7.2.28 Corporate systems including GIS, SAP, Airline and iComply have been used to identify overflows that are unpermitted along with feedback from operational staff however, there is a risk that some may have been missed. A process is in place to manage these as and when they are identified.
- 7.2.29 A confidence rating of B2 has been applied to reflect the level of uncertainty associated with unpermitted overflows and the iComply data entry.

CWW6.10 Total number of settled storm overflows

- 7.2.30 The number reported against this line is the sum of permitted and currently known unpermitted settled storm overflows.
- 7.2.31 The definition of line CWW6.10 is *'The total number of storm tank overflows - a storm overflow with significant settlement at a STW'*. The following sites were converted from a WwTW to either Pumping Station (PS) or CSO (Billinge PS, Lower Eccleshill Road CSO, Mickle Trafford PS and Royton SSO). The settled storm storage has been retained and utilised as part of the solution and as such the SSO discharge activity is retained in the permit. These sites have been reported as SSO's at PR24. This is consistent with the approach taken for regulatory reporting.
- 7.2.32 Currently known unpermitted overflows at WwTW are reported against line CWW6.8 *'Total number of CSO'* until they are confirmed, through further investigation, to be settled storm overflows.
- 7.2.33 Future forecast numbers for SSO are expected to remain stable for the remainder of AMP7 and extending across AMP8. An increase or decrease in SSO's would be as a result of constructing a new WwTW or decommissioning an existing WwTW and transferring flows to another WwTW for treatment. Based on the best available information at the time of this submission there are no plans to build new WwTW with storm storage tanks.
- 7.2.34 Package treatment plants being costed up to replace existing Septic Tanks to meet the AMP8 U_IMP7 driver will not impact on SSO number reported. Plans to decommission nine WwTW during the remainder of AMP7 and AMP8 is expected to have no impact on the total of SSO reported as these WwTW do not currently have a settled storm overflow. Therefore these sites are excluded from the SSO numbers and will continue to be excluded from the SSO numbers.
- 7.2.35 It is assumed that any AMP8 spill reduction drivers at WwTW will be met through either adding to existing storm storage or by providing a detention tank and therefore will not impact on the total number of SSO.

CWW6.12 Volume of trade effluent

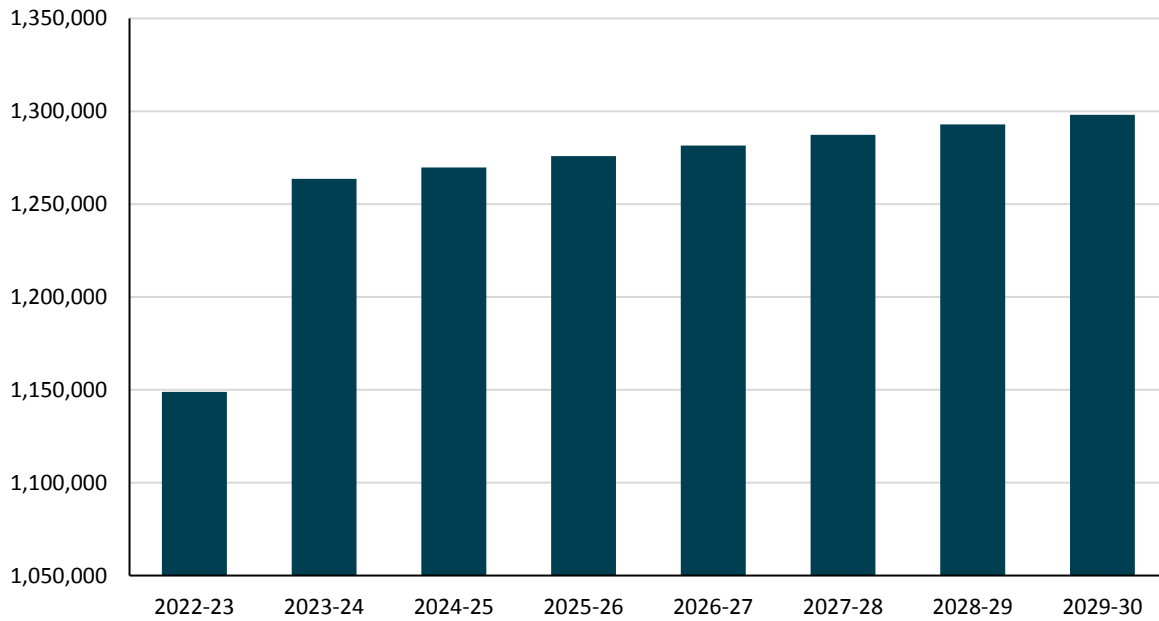
- 7.2.36 To forecast the volume of trade effluent for CWW6.12 we have extrapolated historic regulatory return data based on the application of a series of influencing, external factors. The outputs of this don't suggest there will be any atypical changes in the volume discharged for AMP8 when compared to the historic trend.

CWW6.13 Volume of wastewater receiving treatment at sewage treatment works

- 7.2.37 In APR23 we saw a reduction in flows due to a dry period from March 2022 to October 2022 across the entire asset base, this means the first year of the reporting period is atypically low. Our forecast trend includes consideration of flow trend prior to 2022-23 accordingly what appears as a step change in 2023/24 is just continuation of the overall long-term trend

7.2.38 There is then a steady increase annually of between 0.40% and 0.48% over the reporting period. There is a 2.73% total increase in volume of wastewater receiving treatment from 2023-24 to 2029-30 at sewage treatment works. This is demonstrated graphically in Figure 3 below.

Figure 3: Volume of wastewater receiving treatment



CWW6.14 Length of Gravity Sewers Rehabilitated

7.2.39 Across the remainder of AMP7, rehabilitation rates were assumed to remain stable at the AMP7 average to date i.e. 28.03 km. This was deemed to be a reasonable assumption as *UUW* is not proposing any major rehabilitation programme for the remainder of AMP7.

7.2.40 However, in AMP8 we are proposing to make a step change in the length of gravity sewers rehabilitated through the implementation of a large-scale proactive sewer inspection and rehabilitation programme to enable us to better understand the asset health of our gravity network and prioritise repair appropriately. This programme will be largely enabled by our partnership with VAPAR, a company specialising in automation of condition assessments from CCTV footage using artificial intelligence. Through our work with VAPAR to date, we have estimated that over the course of the AMP8 we should expect to rehabilitate c.104 km of our gravity sewer network. This 104 km has therefore been distributed equally across AMP8 and added to the base rate of rehabilitation of 28.03 km.

7.2.41 The historical data for this measure has been assigned a confidence grade of B2 and the methodology has been subject to third party assurance. Forecasting future performance comes with inherent uncertainty, however, the length of sewers to be rehabilitated in AMP8 has been agreed through multi-disciplinary programme build sessions and has therefore been subject to an appropriate level of scrutiny by senior leaders across *UUW*. It should be noted that this programme will pass through our robust risk prioritisation framework continuously throughout AMP8 and is therefore subject to change.

CWW6.15 Length of Rising Mains Replaced or Structurally Rehabilitated

7.2.42 Across the remainder of AMP7, rehabilitation rates were assumed to remain stable at the AMP7 average to date i.e. 0.20 km. This was deemed to be a reasonable assumption as *UUW* is not proposing any major rehabilitation programme for the remainder of AMP7.

7.2.43 However, our current AMP8 programme identifies c.16.6 km of high priority rising mains that require replacement. We are therefore seeking to increase our rising main replacement rates in AMP8. This 16.6 km has therefore been distributed equally across AMP8 and added to the base rate of rehabilitation of 0.2 km.

7.2.44 The historical data for this measure has been assigned a confidence grade of B2 and the methodology has been subject to third party assurance. Forecasting future performance comes with inherent uncertainty, however, the length of rising mains to be replaced or structurally refurbished in AMP8 has been agreed through multi-disciplinary programme build sessions and has therefore been subject to an appropriate level of scrutiny by senior leaders across *UUW*. It should be noted that this programme will pass through our robust risk prioritisation framework continuously throughout AMP8 and is therefore subject to change

7.2.45 CWW6.16 – 22 Sewer data

7.2.46 As with other water companies, there is a large sum of sewer length that remains unmapped across the region. Sewers will continue to be mapped and added to our systems upon onsite operational investigations, with figures expected to fluctuate year on year. Because of this, the breakdown of additional sewer length is forecast as an average length based on the last six years of change from 2018 to 2023. We forecast a total increase in public sewer length at a constant rate of 116 km per year. We have used a shortened historic data set for this calculation, because we wanted consistent operating practices to reflect the general increase in sewer length over recent times, such as current relining practice and GIS system improvements. Operating procedures regarding relining activities are a required activity when our teams are onsite investigating sewer blockages and other operational issues; however, it is not cost effective to proactively carry out this task across areas of network with no known issues.

7.2.47 *UUW* continues to use a static value for the length of formerly private sewers and lateral drains (s105A sewers), as per the agreement with Ofwat regarding reported transfer sewer length, which is reflected across the industry.

8. CWW6a - Transition and accelerated programme - Wastewater network+ - Sewer and volume data

8.1 Wastewater network

CWW6a.1 - 22

- 8.1.1 Our accelerated/transitional investment does not impact these lines and therefore the table has been left blank in-line with the data table guidance.

9. CWW7a – Wastewater network + - Sewage treatment works; size and consents

9.1 Whole Table

Data Quality confidence grade

9.1.1 We have graded this table data as B2

9.2 Load received at sewage treatment works

CWW7a.1 - 7 Load received by size band

9.2.1 Please see Table 8 below.

Table 8: Consent information

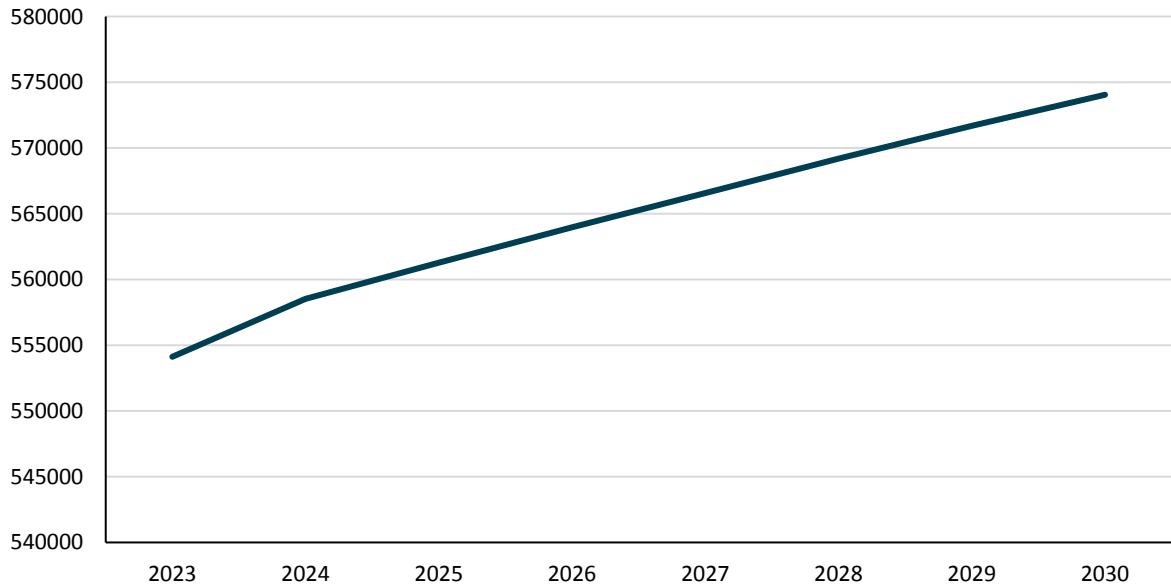
Year	Consent change	Number of sites
2024	sites with new Phos limit as per WINEP	3
2025	sites with new Phos limit as per WINEP	27
2025	sites with Phos limit tightened as per WINEP	19
2025	sites with a BOD limit tightened as per WINEP	6
2025	sites with a Ammo limit tightened as per WINEP	4
2026	sites with Phos limit tightened as per WINEP	1
2026	sites with a BOD limit tightened as per WINEP	1
2027	sites with new Phos limit as per WINEP	4
2027	sites with Phos limit tightened as per WINEP	3
2027	sites with a BOD limit tightened as per WINEP	10
2028	sites with new Phos limit as per WINEP	11
2028	sites with Phos limit tightened as per WINEP	1
2028	sites with new BOD limit as per WINEP	28
2028	sites with new Suspended Solids as per WINEP	28
2028	sites with new Ammo limit as per WINEP	1
2029	sites with new Phos limit as per WINEP	8
2029	sites with Phos limit tightened as per WINEP	2
2029	sites with new BOD limit as per WINEP	1
2029	sites with new Suspended Solids as per WINEP	1
2029	sites with a BOD limit tightened as per WINEP	2
2029	sites with new Ammo limit as per WINEP	3
2029	sites with a Ammo limit tightened as per WINEP	1
2030	sites with new Phos limit as per WINEP	23
2030	sites with Phos limit tightened as per WINEP	12
2030	sites with a BOD limit tightened as per WINEP	2
2030	sites with new Ammo limit as per WINEP	8

9.2.2 Alpraham WWTW is to receive limits for Biochemical Oxygen Demand, Suspended Solids, Ammonia, Phosphorous. Limits remain TBC in WINEP due to a need to remodel and the solution being unknown at this point. EA national have agreed to mark as proceed and drivers and limits will be confirmed as soon as possible prior to 2025. We therefore omit any permit limit changes for this site within Table 7A and 7C.

CWW7a.7 – Total Load Received

9.2.3 This is an auto-populated line, however, this line demonstrates that there has been an increase in 3.60% over the reporting period of the average daily pollution loads received by sewage treatment works of all sizes this is calculated as the sum of Lines CWW7a.1 to 6, as demonstrated in Figure 4 below.

Figure 4: Total load received



9.3 Number of sewage treatment works

CWW7a.9-15 – Size Bands

9.3.1 Table 9 below details the size band changes. Three sites closed in 2028 as per WINEP AMP8 forecast which is why the total has reduced by 3 to 581.

Table 9: WwTW size band changes

Reporting year	2024	2025	2026	2027	2028	2029	2030	Variance
Size band 1	318	316	316	315	310	310	307	-11
Size band 2	62	64	64	64	66	65	68	6
Size band 3	63	63	63	63	62	63	63	0
Size band 4	47	47	47	48	49	48	48	1
Size band 5	31	29	29	28	28	29	28	-3
Size band 6	63	65	65	66	66	66	67	4
Total	584	584	584	584	581	581	581	-3

10. CWW7b – Wastewater network + - Sewage treatment works data: UV permits

10.1 Whole table

Data quality confidence grade

10.1.1 We have graded this table data as B2

10.2 Average number of days that UV permit applies per year

CWW7b.1-6 Weighted average number of days that UV permit applies per year for STWs by size band

10.2.1 There is no significant year on year variance apart from 2029/30 when Settle and Barnoldswick are anticipated to get UV treatment. (Conditional based on bathing water designation)

10.2.2 We have assumed the consent of 20mJ/cm² for Settle and Barnoldswick based on similar sized works with UV.

10.2.3 We have also assumed continuous operation of 365 days per year in line with our other assets.

10.2.4 Please note that the totals in the tables are not formulated correctly, the total for each line should be 365. The issue with the tables has been raised.

11. CWW7c – Wastewater network + - Sewage treatment works data: treatment type

11.1 Whole table

Data quality confidence grade

11.1.1 We have graded this table data as B2 CWW7c.1 - 7 Treatment Type

11.2 Load received at sewage treatment works

11.2.1 A treatment type class change arises when new treatment stages are added to a wastewater treatment works. Please see Table 10 below, this shows us the changes in treatment type classification across the reporting period.

11.2.2 Within the dataset we observe a significant shift from Primary treatment (category P) to Secondary treatment (category SB). This arises from septic tank replacement projects where there is an environmental driver to upgrade to Secondary treatment standard. This can also be seen in the consent table (CWW7a) as an increase in BOD consents in the >20ml category. The majority of these changes deliver in 2027/28 as shown in Table 10: Summary of treatment type classification changes

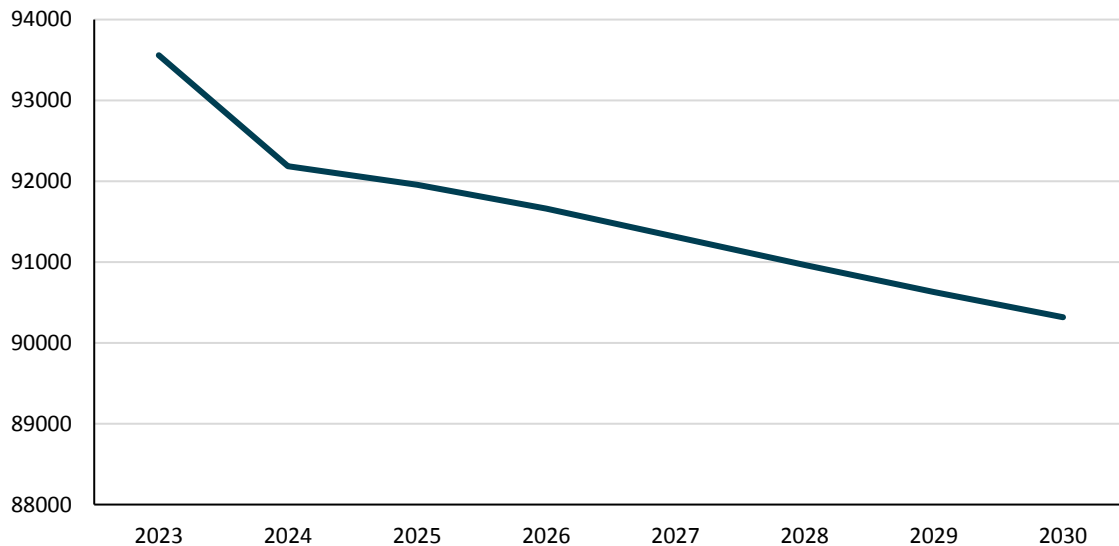
11.2.3 Increase tertiary treatment classifications TA and TB arising from tertiary solids removal at WwTW gaining Phosphorus limits at or below 1mg/l.

Table 10: Summary of treatment type classification changes

Year	Number	Reason for change
2028		Changes in classifications of treatment works
	3	Consent removed as treatment works closed due to transfer of flows as per the WINEP AMP8 forecasts. Treatment works were previously classified as 'P' Primary treatment as these were septic tanks. Under the driver to improve septic tanks to secondary treatment the propose solution is flow diversion, resulting in a reduction of three to category P in the transfer year and subsequent years. Corresponding reduction of three is also observed in total number of treatment works.

CWW7c.8 Load received from trade effluent customers at treatment works

11.2.4 We have seen a decrease in trade effluent as demonstrated in Figure 5. Even though the volume of trade effluent has increased the concentration has decreased and as such our BOD. We have used third party forecasts to complete the load received from Trade Effluent customers, within the dataset we observe an overall increase in volume with a reduction in COD concentration. This results in a declining BOD load and associated reduction in PE equivalent derived from Trade Effluent contribution. The majority of the trade effluent data has stayed static.

Figure 5: Load received from trade effluent customers at treatment works

11.3 Number of sewage treatment works

CWW7c.9 - 15 Size bands

11.3.1 Table 11 demonstrates number of WwTW within each size band. The number of wastewater treatment works in each category is driven by closures and transfers, which is observed in the overall reduction of 3 in the total. The general expected trend is caused by regional growth, which moves some works up into higher size bands over time.

Table 11: Changes in number of WwTWs per size band

Reporting year	2024	2025	2026	2027	2028	2029	2030	Variance
Size band 1	318	316	316	315	310	310	307	-11
Size band 2	62	64	64	64	66	65	68	6
Size band 3	63	63	63	63	62	63	63	0
Size band 4	47	47	47	48	49	48	48	1
Size band 5	31	29	29	28	28	29	28	-3
Size band 6	63	65	65	66	66	66	67	4
Total	584	584	584	584	581	581	581	-3

12. CWW8 – Wastewater network + - Energy consumption and other data

12.1 Whole table

Data quality confidence grade

- 12.1.1 We have graded this table data as between A1 and A3. The exception to this is line CWW8.1, which we have assessed as B5.

12.2 Other

CWW8.1 Total Sewerage Catchment Area

- 12.2.1 Since the last AMP we have continued to make improvements to our Geographical Information System (GIS), which has enabled better mapping of our drainage areas. Since these improvements began, there has been an overall reduction in drainage area, as locations such as motorway intersections, water bodies and wide railway lines are not drained by our assets, so have been correctly de-classified as part of the drainage area. Improvements will continue to be completed over the next AMP, and it is assumed that the drainage area will continue to reduce at a constant rate until these improvements are completed. This reduction will be counteracted throughout AMP8 by drainage area additions, as a result of growth in the North West as specified in the National Land Use Change statistics.
- 12.2.2 Since PR19, there has been a change in the methodology in which additional green spaces have been included creating a small uplift in the total sewerage catchment reporting figure. In addition to the total sewerage catchment reporting figures, *UUW* continues to own a number of surface water sewers and overflows that lie outside the existing drainage area boundaries, but deemed not to be impacting the overall area and therefore not reported in the total figures.

CWW8.2 Designated coastal bathing waters

- 12.2.3 The number of coastal bathing waters is not something that is decided by *UUW*, applications are submitted by interested parties to Defra. We do not expect there to be any new applications.

CWW8.3 Designated Inland bathing waters

- 12.2.4 The number of inland bathing waters is not something that is decided by *UUW*, applications are submitted by interested parties to Defra. A number of applications were submitted in 2022 and they were all rejected. We expect some or all applications maybe re-submitted however we do not know when and whether they will be successful and therefore we have not forecast any changes the number of inland bathing waters

12.2.5 CWW8.4 Number of intermittent discharge event duration monitors

- 12.2.6 The number of intermittent discharge monitors installed during the reporting year will align to the delivery profile set out in the WINEP. Sites with a U_MON3 driver in AMP7 and a U_MON3b driver in AMP8 have been included within this line.
- 12.2.7 This line does not include event duration monitors that have been installed outside of the WINEP commitment or sites that have a U_MON3a driver in AMP8. We assume that every site requires only one monitor to meet the U_MON3 requirement.

CWW8.5 – Number of monitors for flow monitoring at STWs

- 12.2.8 The number of flow monitors installed at wastewater treatment works or last in-line pumping stations during the reporting year will align to the delivery profile set out in the WINEP. Sites with a U_MON4 driver in AMP7 and a U_MON4c, U_MON4d or U_MON4e driver in AMP8 have been included within this line. Sites with a U_MON4a or U_MON4b driver in AMP8 are excluded to avoid double counting.
- 12.2.9 In AMP7, *UUW* undertook 82 site investigations to identify whether the existing flow monitor(s) could be used to accurately measure pass forward flow compliance. Where the investigation concluded that,

with minor modifications, a site was able to use the existing flow monitor then the U_MON4 permit conditions will be accepted in AMP7. These sites have not been included within this line. Where the investigation identified that a new monitor was required sites have been included within the AMP8 WINEP with a U_MON4 driver.

12.2.10 We assume that every site requires only one monitor to meet the U_MON4 requirement.

CWW8.6 Number of odour related complaints

12.2.11 The long term trend of odour complaints is forecast to continue to decline. This is in consideration of the continued benefits from the blockage reduction programme and dynamic network management allowing proactive maintenance of network assets, for which the majority of complaints are raised. A linear forecast has been used, however there is an established correlation between high ambient temperature and dry weather and increased odour complaints. The forecast does not attempt to model future weather impact due to high annual variability. The forecast is based on historically reported data from a corporate system with processes for data capture and governance and therefore represents the best available source. Historical values prior to AMP6 have been excluded as these are outliers when compared to recent trends.

12.3 Energy consumption

CWW8.7 Energy consumption – sewage collection

12.3.1 Energy consumption remains static, with a minor increase in the forecast in-line with population growth, applied to electricity consumption.

CWW8.8 Energy consumption – sewage treatment

12.3.2 An increase in consumption of electricity as a result of AMP7 WINEP projects yet to come live (as of 2023) result in an increase base consumption from 2023/24 onwards.

An increase is seen in electricity across AMP8 from wastewater WINEP, however the full impact doesn't occur until 2032/33, which is beyond the timeline of the data table.

There is also an increase in the forecast in-line with population growth, applied to electricity consumption.

An increase in stationary fuel is seen from the Power Resilience standard enhancement, installing diesel generators from 2027/28 to full delivery by 2030/31.

CWW8.9 Energy consumption – Wastewater Network+

12.3.3 This is the sum of CWW8.7 and CWW8.8. The commentaries above apply for these lines.

13. CWW8a - Transition and accelerated programme - Wastewater network+ - Energy consumption and other data

13.1 Other & Energy consumption

CWW8a.1 - 9

- 13.1.1 Our accelerated/transitional investment does not impact these lines and therefore the table has been left blank in-line with the data table guidance. The power associated with lines populated in CWW20a has been considered and would be negligible.

14. CWW9 – Enhancement expenditure (cumulative) – wastewater network + and bioresources

14.1 Whole table

CWW9.1 - 195

- 14.1.1 This table reflects cumulative expenditure on schemes completed in the year. The profiling of costs throughout AMP8 is reflective of work performed and length of time for schemes to complete, generally with an increasing completion year on year. More detail on schemes included is give with commentary for table CWW3.

15. CWW10 – Wholesale wastewater local authority rates

15.1 Whole table

Composition of wastewater liabilities

- 15.1.1 The business rates of *UUW*'s operational wastewater assets are assessed on a site by site basis which results in *UUW* getting individual rateable values (RV's) and final rates liabilities for each of their 431 operational wastewater sites.
- 15.1.2 The onus to identify and maintain business rates assessments sits with the Valuation Office Agency (VOA). Hence there is often a delay from assessable assets being brought into use by *UUW* and being captured in the VOA's assessments. Hence the value of these unassessed rates liabilities has been quantified and factored into the forecast.
- 15.1.3 *UUW* also incurs rates costs on offices and depots of which a large proportion is allocated to Wholesale price controls. A proportion of this is then capitalised where these cost contribute to various capital schemes. The remaining net liability is then allocated to wastewater using the relevant FTE drivers.

Calculation of wastewater liabilities

- 15.1.4 All operational wastewater rates liabilities are calculated on the contractors' basis, which means liabilities are ultimately driven by the replacement cost of the assessable assets. The VOA uses internal cost guides to establish the adjusted replacement cost of the assessable assets and determine the RV. The RV is then multiplied by a Business Rates Multiplier (BRM) to calculate an initial rates liability for the year. A final adjustment is then made for transitional relief which reduces the liability with the objective of phasing in any increases in liabilities since the previous revaluation period.
- 15.1.5 For all offices and depots the rates liabilities are calculated as above. However instead of RV's being based on replacement cost of assets they are based on the rental value/hypothetical rental value of the property in question.
- 15.1.6 The vast majority of wastewater liabilities in the table are based on actual current assessments maintained by the VOA.
- 15.1.7 For all existing assets that have not been assessed or are currently under assessed by the VOA the additional business rates liabilities have been forecast by quantifying the replacement cost of these unassessed assets by referencing the capital expenditure values of these capital schemes.
- 15.1.8 In addition to the existing assets there will also be newly created assets that will attract business rates liabilities that will come into use from 2023/24 onwards. Similar to the existing assets that are under assessed the additional business rates liabilities have been forecast by quantifying the replacement cost of these unassessed assets by referencing the capital expenditure values of these capital schemes.

Rateable Values

- 15.1.9 The vast majority of the rateable values included in-line one are company forecast valuations.
- 15.1.10 For rateable values in 2023/24 to 2025/26 the vast majority are based on actual valuations. However we have reduced these to reflect the fact that we are expecting the VOA to apply under working allowance to many of our valuations in the near future. In addition there is also a company forecast of rateable values for all existing assets that are either currently not assessed/under assessed or are expected to be newly created during the period. There is an expectation a proportion of all existing and newly created assets will be captured in assessment from 2023/24 onwards following governments intention to introduce duty to notify and annual confirmations in the 2023 revaluation period. Then from 2026/27 when we expect these regulations are fully implemented all unassessed assets will effectively be captured into assessment.
- 15.1.11 For all rateable values from 2026/27 onwards these will be based on company forecasts as these liabilities will be adjusted by the VOA following the 2026 revaluation. For all assets that are either

currently assessed or unassessed the relevant RV has been inflated by the increase in the BCIS tender Price Index between the relevant Antecedent Valuation Dates (AVD) to forecast the new RV.

- 15.1.12 The figures quoted in CWW10.1 are nominal prices and not 2022/23 CPIH deflated values per query response #312.

Transitional Relief

- 15.1.13 The transitional relief has been estimated on a site by site basis for each year in the current revaluation period. This has been calculated in accordance with the caps provided by government and has been reviewed by *UUW*'s external rates adviser.

- 15.1.14 The assumption has been made that transitional relief will no longer be available from the April 2026 revaluation. This is on the basis that moving to triennial revaluations will reduce the need for transitional relief as set out by government's fundamental review of business rates.

Impact of Revaluation Dates

- 15.1.15 As set out in the assumptions below further revaluations are expected at April 2026 and April 2029 in addition to the revaluation that has recently taken place at April 2023.
- 15.1.16 At the 2023 revaluation *UUW* saw a significant increase in RV's. In addition to this business rates are expected to increase further at the 2026 and 2029 revaluations. The reason being the VOA uses cost guides to estimate the replacement cost of assessable assets to calculate the RV's and associated liabilities. It is understood that the VOA has previously used the BCIS Tender price index to inflate such cost guides. Hence the projected growth in this index between the appropriate AVD's has been used to estimate the increases expected in these cost guides and hence the associated increases in RV's and liabilities.
- 15.1.17 Also at the revaluation dates we are expecting the introduction of the new requirements around duty to notify and annual confirmations to be phased in.

Change of Asset Stock

- 15.1.18 This includes the increase in liabilities for newly created assets that attract business rates liabilities as they come into use.

Adjustments to BRMs rate being different to CPIH

- 15.1.19 It is assumed that in-line with previous increases the Business Rates Multipliers (BRMs) will rise by the September CPI figure prior to the year of assessment. However at the revaluation dates we expect a downwards adjustment to the BRMs. This takes into account the overall growth in RV's across UKPLC and is based on historical trends in government's setting of BRMs over the last 20 years.
- 15.1.20 When analysing the total movement in annual liabilities between years the element that relates to the movement in the BRMs rates being different to CPIH has been quantified.

Assumptions

- 15.1.21 The following assumptions have been utilised to develop CWW10:
- The Business Rates Multipliers (BRMs) will be increased by CPI each year. With a downwards adjustment to the BRM at the revaluation date to take account of growth in overall RV's across UKPLC. This is based on historical trends seen in governments setting of the BRMs over the last 20 years;
 - Business Rates revaluations will take place triennially in-line with government's current stated intentions, with the next revaluations at April 2026 and April 2029;
 - Transitional Relief will no longer be available from April 2026. This is on the basis that moving to triennial revaluations will reduce the need for transitional relief;
 - Decapitalisation rate which underpins the valuation will remain unchanged at future revaluations at 4.4%;

- The Antecedent Valuation Date (AVD) will continue to be two years before the revaluation date;
- The cost guides used by the VOA to assess the sites will not be subject to major changes going forward. It has been assumed the values in the cost guide will increase with the BCIS Tender Price Index as it is understood that the VOA has previously used this index to inflate their cost guides;
- All other allowances built into future revaluations will be based on the 2023 revaluations;
- Government will continue with their intention to implement the system of duty to notify and annual confirmations to cover changes made at hereditaments. This will effectively bring all assets either not assessed or under assessed into assessment; and
- Under Working Allowances will be reinstated across our portfolio on a flow basis.

16. CWW11 – Third party costs by business unit for the wholesale wastewater service

16.1 Whole table

Price control

- 16.1.1 Third party damage costs are inherently unpredictable and can vary significantly year on year. There is a slight increase in the projected costs for 2023/24 onwards due to a more robust and thorough claims process implemented in 2022/23, which is predicted to improve the visibility and accuracy of damages incurred by third parties.
- 16.1.2 Diversions cost movements are predominantly due to client driven activity, with increased activity expected in the remaining years of the AMP7. In AMP8 we have used historic averages to understand NRSWA diversions activity, and assumed a flat profile over the five year period. However there is a large increase in other non-s185 diversions, predominantly due to the impact of HS2 activity within our region.
- 16.1.3 Bulk supplies (wastewater) operating expenditure for sewerage services are based on volumes. Bulk supply volumes align to revenues and costs are based on the bulk supply price excluding profit and the current cost of depreciation. From 2023/24 onwards the costs also include standing charges.

Non-price control

- 16.1.4 Diversions cost movements are predominantly due to client driven activity, with increased activity expected in the remaining years of the AMP7. In AMP8 we have used historic averages to understand s185 diversions activity, and assumed a flat profile over the five year period.

17. CWW12 – Transitional expenditure – wastewater network + and bioresources

17.1 Whole table

CWW12.1 - 195

- 17.1.1 Transitional expenditure within EA/NRW environmental programme (WINEP/NEP) relates to a mixture of investments required to complete:
- schemes with March 2026 regulatory dates which will take longer than 12 months to deliver;
 - schemes with 2028 and 2030 regulatory dates that are of sufficient size and complexity that they cannot be delivered on time without early investment; and
 - WINEP Investigations required to deliver earlier than the regulatory date so that the outputs can better inform the next phase of DWMP development.
- 17.1.2 As part of our approach to building our Totex plan we have developed robust cost estimates for each scheme requiring transitional investment. We have used project norms, which is a collation of historical delivery data that is used to produce a set of averages, to determine when projects need to start to achieve their regulatory dates.
- 17.1.3 It is assumed that any incremental operating expenditure from this programme will be incurred in AMP8.

18. CWW13 – Best value analysis (enhancement expenditure) – wastewater network + and bioresources

18.1 Whole table

CWW13.1 - 268

18.1.1 The present value calculations in CWW13 use the following assumptions:

- An appraisal period of 30 years has been used;
- The capex and opex used for the present value calculations are based on the post frontier shift efficiency and real price effects using the data from CWW13;
- The present value calculations have been calculated for projects starting in AMP8 including any carryover into AMP9 until project completion;
- Opex is assumed to continue at the same value as Financial Year 2035 unless not expected to continue;
- Capex is allocated across asset life categories (Very Short, Short, Medium, Medium/Long, Long, Infrastructure and Land), see Table 12 below;
- The present value of capex is calculated by annualising the cost over the lives of the asset including an allowed return on capital using the PR24 Wholesale WACC;
- Third party contributions and DPC capex have been excluded from the present value calculation as required by paragraphs 20.13 and 20.14 of the PR24 business plan table guidance section 3;
- The average asset lives used are consistent with those used in the UUW financial model (see table below) unless more specific lives are appropriate;
- The WACC rate of 3.23% was obtained from the PR24 Final Methodology Appendix 11¹; and
- Present values are calculated using the Social Time Preference Rate of 3.5% from the HM Treasury Green Book².

Table 12: Average asset life

Category	Very short	Short	Medium	Medium Long	Long	Infrastruc ture	Land
Average asset life (years)	5	14	24	40	63	145	Infinite

¹ https://www.ofwat.gov.uk/wp-content/uploads/2022/12/PR24_final_methodology_Appendix_11_Allowed_return.pdf

² https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1063330/Green_Book_2022.pdf

19. CWW14 – Best value analysis of alternative option (enhancement expenditure) – wastewater network + and bioresources

19.1 Whole table

CWW14.1 - 268

19.1.1 The present value calculations in CWW14 use the following assumptions:

- An appraisal period of 30 years has been used;
- The capex and opex used for the present value calculations are based on the post frontier shift efficiency and real price effects using the data from CWW14;
- The present value calculations have been calculated for projects starting in AMP8 including any carryover into AMP9 until project completion;
- Opex is assumed to continue at the same value as Financial Year 2035 unless not expected to continue;
- Capex is allocated across asset life categories (Very Short, Short, Medium, Medium/Long, Long, Infrastructure and Land). This is detailed in Table 13;
- The present value of capex is calculated by annualising the cost over the lives of the asset including an allowed return on capital using the PR24 Wholesale WACC;
- Third party contributions and DPC capex have been excluded from the present value calculation as required by paragraphs 21.13 and 21.14 of the PR24 business plan table guidance section 3;
- The average asset lives used are consistent with those used in the UUW financial model (see table below) unless more specific lives are appropriate;
- The WACC rate of 3.23% was obtained from the PR24 Final Methodology Appendix 11³; and
- Present values are calculated using the Social Time Preference Rate of 3.5% from the HM Treasury Green Book⁴.

Table 13: Average asset lives

Category	Very short	Short	Medium	Medium Long	Long	Infrastru cture	Land
Average asset life (years)	5	14	24	40	63	145	Infinite

³ https://www.ofwat.gov.uk/wp-content/uploads/2022/12/PR24_final_methodology_Appendix_11_Allowed_return.pdf

⁴ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1063330/Green_Book_2022.pdf

20. CWW15 – Best value analysis; benefits – wastewater network + and bioresources

20.1 Whole table

CWW15.1 - 697

- 20.1.1 The enhancement benefits forecast in CWW15 represent the best value plan, which is *UUW's* preferred plan. This plan has been built using the data used to populate this table to inform decisions being made on schemes and enhancement cases.
- 20.1.2 Benefits assessments that we have carried out are more likely to understate the benefits of programmes as we have taken a prudent approach to benefits and value assessment, including removing the risk of double counting by omitting benefits where double counting risk exists, using uncertainty weightings and using mid-range values where available.
- 20.1.3 To ensure alignment with OUT3, we have included absolute figures, as cumulative values are calculated in OUT3. The Present Value benefits assumes cumulative benefits.
- 20.1.4 The benefit types included in this table are summarised below:
- Performance Commitment benefit, aligning with OUT3, benefit values derived from Ofwat's incentive rates
 - WEO benefit, benefit values derived from the EA's Wider Environmental Outcomes guidance
 - Other benefit, risk based measures from *UUW's* value framework, largely monetised avoided risk values
- 20.1.5 All NPV calculations use a 30-year time horizon and are discounted using the social time preference rate as set out in the Governments 'The Green Book'.
- 20.1.6 All carbon benefit/dis-benefit in this table has been calculated using the PC method, with the exception of the WEO for Carbon Sequestration which is calculated in-line with the EA's WEO methodology.
- 20.1.7 We will profile 'Other' and 'WEO' benefits on the assumption that 100% of the benefit would be achieved one year post the PIU date. PC benefits are profiled to align with Performance Commitment targets and expected performance.
- 20.1.8 Benefits assessments were not completed for investigation and monitoring schemes. Benefits have been assessed against the value framework detailed in Table 14 below.

Table 14: Benefit types

Measure category	Measure	Units	Dp	Confidence level
Performance Commitment	Leakage	% reduction in MI/d for a three year average from 2019-20	1	High
Performance Commitment	Per capita consumption	% reduction in litres/person/day for a three year average from 2019-20	1	High
Performance Commitment	Operational greenhouse gas emissions (water)	Tonnes CO ₂ e	2	High
Performance Commitment	Business demand	% reduction in MI/d for a three year average from 2019-20	1	High
Performance Commitment	Compliance risk index (CRI)	Numerical score	2	High
Performance Commitment	Water supply interruptions	Hours:minutes:seconds (HH:MM:SS) per property per year	0	High
Performance Commitment	Customer contacts about water quality	Customer contacts per 1,000 population	2	High
Performance Commitment	Biodiversity	Biodiversity units per 100km ² for which the company provides monopoly services	2	High
Performance Commitment	Serious pollution incidents	Number	0	High

Measure category	Measure	Units	Dp	Confidence level
Performance Commitment	Mains repairs	Number per 1,000 kilometres of mains	1	High
Performance Commitment	Unplanned outage	%	2	High
Other - WEO	Natural Environment – Air Quality	£m	3	High
Other - WEO	Natural Environment - Food - shellfish	£m	3	High
Other - WEO	Natural Environment - Water quality	£m	3	High
Other - WEO	Catchment Resilience - Hazard regulation - flood	£m	3	High
Other - WEO	Catchment Resilience - Water purification by habitats	£m	3	High
Other - WEO	Catchment Resilience - Water supply	£m	3	High
Other - WEO	Amenity, access, and engagement - Recreation	£m	3	High
Other - WEO	Amenity, access, and engagement - Angling	£m	3	High
Other - WEO	Amenity, access, and engagement - Volunteering	£m	3	High
Other - WEO	Amenity, access, and engagement - Education	£m	3	High
Other - Other	Trust & Reputation – Customers	£m	3	Low
Other - Other	Trust & Reputation – Regulators	£m	3	Low
Other - Other	Trust & Reputation – Shareholders	£m	3	Low
Other - Other	Finance – Avoided CAPEX	£m	3	High
Other - Other	Finance – Avoided OPEX	£m	3	High
Other - Other	Finance – Avoided Fines	£m	3	High
Other - Other	Service – Avoided Customer Contacts for Availability	£m	3	High
Other - Other	Service – Avoided Customer Contacts for Nuisance	£m	3	High
Other - Other	Service – Avoided Water Availability – Low Pressure	£m	3	High
Other - Other	Service – Avoided Extra Treatment Costs (Bioresources)	£m	3	Low
Other - Other	Service – Avoided Sludge Disposal (Bioresources)	£m	3	Low
Other - Other	Health & Safety – Avoided Accidents	£m	3	Medium
Other - Other	Health & Safety – Avoided Societal Risk	£m	3	Medium

20.1.9 Value measure confidence assessment are defined below in Table 15 below.

Table 15: Value measure confidence assessment

Confidence level	Definition
High	Valuation is sourced from a reputable source such as Central Government or Regulators.
Medium	Valuation is sourced from a reputable source such as Central Government or Regulators. However, some information may be inferred where there are gaps in the literature.

Confidence level	Definition
Low	Valuations classified as low have been constructed based on defined assumptions and interpretations.

20.1.10 *UUW45 – Our approach to best value totex* details our approach that supports the benefits presented in this table. The Data Table commentary for Costs - Wastewater includes:

- How consistency of benefit assessment and valuation has been driven through the assured PR24 value tool;
- How the benefits assessed create or erode value across the six capitals (benefits impact); and
- How decisions have been supported with information benefit and value assessment.

20.2 CWW15 Greenhouse gas reduction (net zero) benefits

General

20.2.1 As per data table guidance for CWW15, the impact of our proposed net zero enhancement projects on GHG emissions takes into account both the generation and savings of operational GHG emissions that result from the enhancement project.

20.2.2 The net operational GHG emission benefits in CWW15 have been calculated in-line with the common performance commitment methodology which is set out in Ofwat’s PR24 operational greenhouse gas emissions performance commitment definition documents, unless stated otherwise. For additional information see data table outcome commentary for GHG operational emissions common PC wastewater.

20.3 Net zero enhancement programme

CWW16.630 - 640

20.3.1 Ofwat has requested that companies put forward interventions with a primary driver of greenhouse gas (GHG) emissions reduction as net zero enhancements. Appendix 9, page 92 in the Final Methodology states “Ofwat has created a net zero enhancement challenge where companies that are stretching themselves and have efficient proposals will be priorities for additional enhancement funding to tackle operational GHG emissions.”

20.3.2 This programme includes a suite of projects that all have a primary driver of emissions reduction, some of which we have put forward into Ofwat’s net zero challenge. Through our assessments and optimisation we have included only the best possible projects in this programme and ensured multiple benefits and low regrets in securing the required levels of emissions reductions in AMP8 and essential enablers for our long term adaptive plan.

20.3.3 The 11 projects selected (see Table 16 below) as part of our net zero enhancement programme have been split into net zero enhancement cases and those for inclusion in Ofwat’s net zero challenge. The net zero enhancement projects allocated to the water price control can be found in the PR24 data table CWW22 and the anticipated long term GHG emissions reductions expected from these projects have been captured in this data table CWW15. The eight cases classified as ‘selected’ in the table below have been submitted as net zero enhancement projects, outside of the challenge. A further three cases have been identified as ‘feasible’ for inclusion in the net zero enhancement challenge.

20.3.4 6 of our 11 projects are reportable against the common GHG PC methodology and as such can reduce the associated performance commitment level (PCL) by a total of 70,916 tCO₂e across all price controls. This goes beyond our base and standard enhancement programmes. These have been reported against the operational GHG PC benefit type in the CWW15 data table. The remaining 5 projects that will not directly impact the PCL have been reported as other benefit type in the CWW15 data table.

Table 16: Net zero enhancement programme

Project reference	Net Zero Enhancement Cases	Net zero Enhancement or Net zero Challenge fund	CW21 / CWW22 data table dropdown used	Price control deliverable (PCD) applied	Quoted tCO2e to reduce PCL directly	Water/ Wastewater allocation
E00001337	Stationary fossil fuel reductions	Net zero enhancement	Selected	Yes	Yes	Wastewater
E00001340	Transport fossil fuel reductions – green fleet LCVs phase 1	Net zero enhancement	Selected	Yes	Yes	Water & Wastewater
E00001341	Transport fossil fuel reductions – green fleet LCVs phase 2	Net zero enhancement	Selected	Yes	Yes	Water & Wastewater
E00001342	Transport fossil fuel reductions - Green fleet Biomethane HGVs	Net zero enhancement	Selected	Yes	Yes	Wastewater
E00001346	Property emissions reductions	Net zero enhancement	Selected	Yes	Yes	Water & Wastewater
E00001425	Net zero catchment strategy	Net zero enhancement	Selected	Yes	Yes	Wastewater
E00001344	Peatland restoration	Net zero enhancement	Selected	Yes	No	Water
E00001345	Woodland creation	Net zero enhancement	Selected	Yes	No	Water
E00001338	Process emissions (Bioresources)	Net zero challenge fund	Feasible	No	No	Wastewater
E00001339	Process emissions (Wastewater)	Net zero challenge fund	Feasible	No	No	Wastewater
E00001425	Phase 2 – Further low regrets emissions reductions in AMP8	Net zero challenge fund	Feasible	No	No	Water & Wastewater

20.3.5 The emissions reduction benefits presented in-line CW15.631 are associated with the net zero enhancement expenditure for those projects that will not directly impact the common PCL and therefore are not represented in OUT3 for methodological reasons and due to their uncertainty of approval within the challenge fund. For further technical detail please see *UUW67 – Cross Price Control Enhancement Claim: Net Zero Enhancement*.

- 20.3.6 The emissions reduction benefits presented in-line CWW15.632 are associated with the net zero enhancement expenditure presented in OUT3 (overall performance from enhancements) for those projects that will directly impact the PCL for the operational GHG emissions common PC. .
- 20.3.7 Both the above lines CWW15.631 and CWW15.632 equal the total net zero enhancement expenditure presented in CW3 as per Ofwat's PR24 data table guidance issued in August 2023.
- 20.3.8 As per PR24 final methodology data table guidance, the net operational emissions benefits from the net zero enhancement programme are presented as annual operational (tCO₂e) from AMP8 to 2055 and the benefits are stated as negative values. Benefits have calculated in-line with the common performance commitment which aligns to Ofwat's methodology provided in the PR24 operational greenhouse gas emissions performance commitment definition documents for wastewater with the exception n of the process emissions projects. For further technical detail please see *UUW67 - Cross Price Control Enhancement Claim: Net Zero Enhancement*.
- 20.3.9 Increased emissions have been given a positive value and decreased emissions a negative value as per PR24 data table guidance for CWW22 released by Ofwat in August 2023.
- 20.3.10 All net zero enhancements have been third party assured.
- 20.3.11 The total benefit value generated by projects starting in AMP8 has been calculated using our proposed ODI rate for the PR24 operational greenhouse gas emissions performance commitment for wastewater.

20.4 Standard enhancement benefits

General

- 20.4.1 Outside of our net zero enhancement programme we have assessed the GHG emission impacts of the other enhancement projects and those with a material impact have been provided within CWW15, as per Table 17 below. In-line with the PR24 data table guidance for CWW15, the impact of these proposed enhancement projects on GHG emissions takes into account both the generation and savings of GHG emissions which result from the enhancement project.

Table 17: CWW15 standard enhancements with GHG emission generation and savings

Data table enhancement name	Benefit type	Data table line reference
Sludge treatment - Thickening and/or dewatering	Operational greenhouse gas emissions (wastewater)	CWW15.508
Sludge Enhancement Cases	Operational greenhouse gas emissions (wastewater)	CWW15.641
Resilience	Operational greenhouse gas emissions (wastewater)	CWW15.597
Greenhouse gas reduction (net zero) Wastewater WINEP AMP8 enhancement	Operational greenhouse gas emissions (wastewater)	CWW15.630

- 20.4.2 The net operational GHG emission benefits in CWW15 have been calculated in-line with the common performance commitment which aligns to Ofwat's methodology provided in the PR24 operational greenhouse gas emissions performance commitment definition documents. For additional information see data table outcome commentary for GHG emissions common PC wastewater.
- 20.4.3 Emissions are presented as annual tCO₂e presented as a positive value for increased emissions and a negative value for decreased emissions as per PR24 data table guidance for CWW22 released by Ofwat in August 2023.

21. CWW16 – Best value analysis of alternative option benefits – wastewater network + and bioresources

21.1 Whole table

CWW16.2 - 697

21.1.1 We have aligned the least cost plan in CWW16 to the least cost plan presented to customers during acceptability testing. In optioneering, we considered some alternative least cost options that aren't presented in this table as this would create misalignment with acceptability testing.

21.1.2 In this scenario we submitted a plan which differed from the best value plan due to:

- Different suite of WINEP options, often without a hybrid solution; and
- Omitted Net Zero Enhancement programme.

21.1.3 The methodology supporting the data in this table is in-line with CWW15.

21.2 Total enhancement

CWW16.697

21.2.1 This line is auto calculated from the sub-totals from the above lines.

21.3 CWW16 Greenhouse gas reduction (net zero) benefits

General

21.3.1 CWW16 includes the greenhouse gas (GHG) emission benefits from the following enhancements provided in Table 18 below.

Table 18: CWW16 enhancement benefits (GHG emissions)

Enhancement	Benefit type	Details	Benefit value
WINEP Wastewater enhancement (tCO ₂ e)	Operational greenhouse gas emissions (wastewater)	Generation of GHG emissions as a result of the WINEP wastewater enhancement programme. Emissions presented are the net annual operational emissions, calculated in-line with the common performance commitment (PC) which aligns to Ofwat's methodology provided in the PR24 operational greenhouse gas emissions performance commitment definition document for wastewater.	£130/tCO ₂ e
Standard enhancements (tCO ₂ e)	Operational greenhouse gas emissions (wastewater)	Generation of GHG emissions as a result of standard enhancement programmes, such as wastewater resilience. Emissions presented are the net annual operational emissions, calculated in-line with the common performance commitment (PC) which aligns to Ofwat's methodology provided in the PR24 operational greenhouse gas emissions performance commitment definition document for wastewater.	£130/tCO ₂ e

Enhancement	Benefit type	Details	Benefit value
Standard enhancements (tCO ₂ e)	Operational greenhouse gas emissions (wastewater)	Savings of GHG emissions as a result of standard enhancement programmes, such as sludge treatment. Emissions presented are the net annual operational emissions, calculated in-line with the common performance commitment (PC) which aligns to Ofwat's methodology provided in the PR24 operational greenhouse gas emissions performance commitment definition document for wastewater.	£130/tCO ₂ e

- 21.3.2 As per data table guidance for CWW16, the impact of our proposed net zero enhancement projects on GHG emissions takes into account both the generation and savings of operational GHG emissions which result from the enhancement project.
- 21.3.3 The net operational GHG emission benefits in CWW16 have been calculated in-line with the common performance commitment which aligns to Ofwat's methodology provided in the PR24 operational greenhouse gas emissions performance commitment definition documents, unless stated otherwise. For additional information see data table outcome commentary for GHG operational emissions common PC wastewater.
- 21.3.4 There are no GHG emission benefits from our net zero enhancement programme (aligned to PR24 data tables CWW22) as this enhancement programme does not form part of our least cost plan.

21.4 Standard enhancement benefits

General

- 21.4.1 We have assessed the GHG operational emission impacts of all enhancement projects included within our least cost plan and those with a material impact have been provided within CWW16 as per Table 19 below. In-line with the PR24 data table guidance for CWW16, the impact of these proposed enhancement projects on GHG emissions takes into account both the generation and savings of GHG emissions which result from the enhancement project.

Table 19: CWW16 standard enhancements with GHG emission generation and savings

Data table enhancement name	Benefit type	Data table line reference
Sludge treatment - Thickening and/or dewatering	Operational greenhouse gas emissions (wastewater)	CWW16.508
Resilience	Operational greenhouse gas emissions (wastewater)	CWW16.597
Greenhouse gas reduction (net zero) Wastewater WINEP AMP8 enhancement	Operational greenhouse gas emissions (wastewater)	CWW16.630
Sludge Enhancement Cases	Operational greenhouse gas emissions (wastewater)	CWW16.641

- 21.4.2 The net operational GHG emission benefits in CWW16 have been calculated in-line with the common performance commitment which aligns to Ofwat's methodology provided in the PR24 operational greenhouse gas emissions performance commitment definition documents. For additional information see data table outcome commentary for GHG emissions common PC wastewater.
- 21.4.3 Emissions are presented as annual tCO₂e, a positive value represents an increase in emissions and a negative value for decreased emissions as per PR24 data table CWW15.

22. CWW17 – Accelerated programme expenditure – wastewater network + and bioresources

22.1 Whole table

CWW17.1-195

- 22.1.1 There are four programmes of work in relation to our regulatory obligations that we intend to start ahead of the commencement of AMP8. These are:
- ENV2- Accelerating habitats improvements in the Eden catchment;
 - ENV3 - Accelerating storm overflow improvements to reduce discharges;
 - ENV4 - Reducing the frequency of storm overflow discharges in Lake Windermere catchment; and
 - ENV10 - Reducing the frequency of storm overflow discharges into bathing waters.
- 22.1.2 The purpose of this table is for companies to identify wastewater capital and operating expenditure for approved accelerated schemes in both, the final two years of the current price control (2023/24 and 2024/25) and 2025-30 (AMP8).
- 22.1.3 In June 2023, Ofwat announced its final decision for a number of infrastructure projects to be brought forward, with work commencing in AMP7, to ensure spill reduction and habitat improvements are made more quickly than the statutory required dates. This included £1.5 billion of investment for UUW to deliver the four programmes to improve river water quality and reduce discharges from storm overflows, including those into Lake Windermere.
- 22.1.4 These programmes continue to mature with the overall expenditure for ENV3, ENV4 and ENV10 now forecast to be £1.2 billion. This reduction is a result of identified efficiencies within the individual project estimates primarily relating to the cost of providing storage. In the case of the ENV2 programme a review of the requirements of the Penrith scheme, plus other delivery efficiencies has allowed for further reductions resulting in the programme estimate reducing from £118m to £60m.
- 22.1.5 £197 million of this will be spent in the remainder of AMP7, helping to deliver these important improvements to rivers and other watercourses across the North West as early as possible, as well as mobilising the supply chain early and smoothing the demands on capacity. This level of expenditure in the 2023-25 period is consistent with the June determination, with the exception of the ENV2 programme which is forecasting to now only accelerate £6m compared to the £18m determination. This reduction is a result of two factors, the overall value of the programme and the delay in the passing of the Levelling-up and Regeneration Bill.

23. CWW18 – Cost adjustment claims – base expenditure: wastewater network and bioresources

23.1 Cost adjustment claim 1

CCW18.1 – 10

- 23.1.1 A cost adjustment claim to reflect the additional costs of operating and maintaining a drainage system in an area in which multiple exogenous factors interact to increase drainage costs, including 40% higher than average urban rainfall and the highest proportion of combined sewers in the industry.
- 23.1.2 This claim is conditional and not required should our proposed PCL for internal sewer flooding be accepted.
- 23.1.3 Refer to document *UUW_CAC_002* for full details

23.2 Cost adjustment claim 2

CCW18.11 – 20

- 23.2.1 A cost adjustment claim to efficiently operate phosphorus removal at wastewater treatment works to maintain compliance with environmental enhancement phosphorus permits with limits of 0.5mg/l phosphorus and below. These AMP7 WINEP driven schemes will incur operating costs, above those modelled in base, in the AMP8 period.
- 23.2.2 Refer to document *UUW_CAC_003* for full details

23.3 Cost adjustment claim 3

CCW18.21 - 30

- 23.3.1 A cost adjustment claim to reflect higher than historical costs, arising from changes in regulatory requirements across the industry at anaerobic digestion sites, to operate under the Industrial Emissions Directive and comply with Appropriate Measures guidance.
- 23.3.2 Refer to document *UUW_CAC_004* for full details

24. CWW19 – Wastewater network + - WINEP phosphorus removal scheme costs and cost drivers

24.1 Whole table

CWW19.1-802

- 24.1.1 This table is reflective of projects within the AMP8 WINEP with a phosphorus driver.
- 24.1.2 The population equivalent uses the 2050 design population equivalent which is based on the best information available during options development. Historic data highlights annual variability in trade concentrations within different catchment, this variability makes trade inputs difficult to forecast and in some cases the AMP8 forecast PE may exceed the design PE. Detailed options development will revisit the design population to ensure that they are appropriate best on the best available data.
- 24.1.3 Where a site has multiple phosphorus drivers (for example an Urban Waste Directive and Water Framework Directive driver), the design population has been counted twice to represent the two separate requirements. The historical and enhanced permit limits have been taken from the AMP8 WINEP.
- 24.1.4 Nine projects have been identified for a catchment based solution to offset the permit limit at the wastewater treatment works, all catchment solutions are subject to appropriate agreements with land owners and the Environment Agency.
- 24.1.5 No data has been included against 'Burnley WwTW - 08UU101390a' as this scheme has an AMP9 regulatory date and the AMP8 driver of 1mg/l is less onerous than AMP7 WINEP driver to achieve 0.25mg/l phosphorus and therefore there is no additional benefit.
- 24.1.6 Davyhulme WwTW solution type has been identified as other as the solution is for phosphorus recovery rather than traditional treatment methods. The cost of this scheme has been allocated to chemical phosphorus removal in table CWW3.
- 24.1.7 The Environment Agency included a last minute change to the WINEP programme for Wigan WwTW and Skelmersdale WwTW where the AMP9 driver for a tighter phosphorus limit of 0.25 mg/l was introduced. To achieve the technically achievable limit for phosphorus at these sites would require significant capital intervention, UUW does not believe this is deliverable in one AMP and has put forward an adaptive plan for these catchments. The adaptive plan takes a phased approach to phosphorus remove and included a catchment investigation to identify the most appropriate solution for these catchment taking into account all environmental driver. Whist an adaptive plan is our preferred approach, the Environment Agency has included the requirement for 0.25 mg/l of P in the WINEP for AMP8 and therefore the full cost of the low phosphorus solution has been included. Discussion with the Environment agency will continue and if an adaptive approach is agreed, expenditure will be returned via the PCD mechanism.

25. CWW20 – Wastewater network + - Sewage treatment works population capacity and network data

25.1 Whole table

Data quality confidence grade

25.1.1 We have graded this table A1 where it relates to known projects and B2/B3 for lines that require calculation/modelling. The exceptions are CWW.27, CWW.28 and CWW.47 which have a lower grade for the reasons described below.

25.2 Sewage treatment data

25.2.1 We have included costs in AMP8 for the three overflows associated with Eccles WwTW that was scheduled in our WINEP to be in AMP10. [✂]

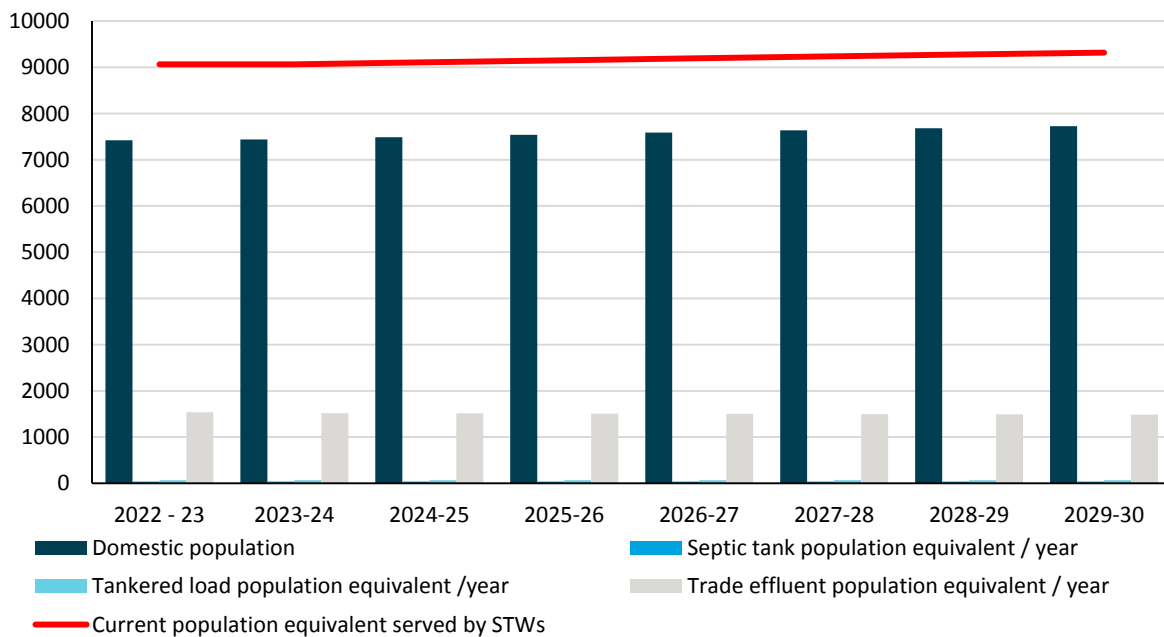
]

CWW20.1 Current population equivalent served by STWs

25.2.2 We have forecasted there to be a 2.82% growth in the population equivalent served by STWs from 2023-24 and 2029-30. Population equivalent is calculated using the sum of the total value of domestic population, septic tank population equivalent / year, tankered load population equivalent / year and trade effluent population equivalent / year.

25.2.3 We have forecasted there to be a 3.86% increase in domestic population from 2023-24 and 2029-30. The septic tank and tankered loads has remained static and trade effluent has declined by 2.05% from 2023/-24 and 2029-30 resulting in the 2.82% increase over the period. This is presented graphically in Figure 6.

Figure 6 Current population equivalent served by STWs



CWW20.2 Current population equivalent served by STWs with tightened/new P permits

25.2.4 71 Schemes in plan with new or tightened P requirements in AMP8. 71 Schemes across 70 WwTW. 50 New limits, 21 tightened limits.

- 25.2.5 Burnley U_IMP2 limit is being met by the AMP7 Project PE not included in this line.
- 25.2.6 Wigan is included twice once under chemical (08UU101386) U_IMP2 and once under biological (09UU100060) included in this line.
- 25.2.7 Skelmersdale is included twice once under chemical (08UU102404) U_IMP2 and once under biological (09UU100060) included in this line.
- 25.2.8 Davyhulme (08UU100878) date revised to 31/03/2030.
- 25.2.9 9 Sites with new limits met via catchment management schemes, are included here and also included in CWW20.66
- 25.2.10 PE allocation in 2027-28 includes PE from 2 AMP7 schemes Hazel Grove and St Helens. Discrete in year PE used which aligns with the data generated for CWW20.1 and does not include holiday / tourist population.

CWW20.3 Current population equivalent served by STWs with tightened/new N permits

- 25.2.11 No N schemes or new / tightened permits.

CWW20.4 Current population equivalent served by STWs with tightened/new sanitary parameter permits

- 25.2.12 Schemes included in DPC are not captured within this line. Discrete in year PE used which aligns with the data generated for CWW20.1 and does not include holiday / tourist population.

CWW20.5 Current population equivalent served by STWs with tightened/new microbiological standards

- 25.2.13 All schemes are conditional on bathing water designation. Discrete in year PE used which aligns with the data generated for CWW20.1 and does not include holiday / tourist population. This is significant for Coniston, as this site has a large contribution from tourism (PE including tourism is 69% greater).

CWW20.6 Population equivalent served by STWs with enhanced treatment capacity

- 25.2.14 Supply and demand enhancement case. Discrete in year PE used which aligns with the data generated for CWW20.1 and does not include holiday / tourist population.

CWW20.7 Current population equivalent served by STWs with tightened/new permits for chemicals / hazardous substances

- 25.2.15 Discrete in year PE used which aligns with the data generated for CWW20.1 and does not include holiday / tourist population.

CWW20.8 Current population equivalent served by septic tank replacement projects

- 25.2.16 75 Septic tank replacement projects. Portion of AMP8 requirements phased into AMP9. 47 of 75 U_IMP7 requirements phased to AMP9, sites with HD_IMP / WFD drivers prioritised for AMP8. 3 sites are proposed transfer solutions in AMP8 – [✂]. Discrete in year PE used which aligns with the data generated for CWW20.1 and does not include holiday / tourist population.

CWW20.9 Number of new wetland treatment solutions for tightened sanitary or nutrient (N or P) permits

- 25.2.17 Wetland solutions are for P scheme requirements, No wetlands for N schemes or new / tightened permits or Sanitary requirements. Reed beds have been included as wetland.

CWW20.10 Total area of new wetlands for tightened sanitary or nutrient (N or P) permits

- 25.2.18 See CWW20.9 commentary

CWW20.11 Total number of septic tank replacement projects

- 25.2.19 See CWW20.7 commentary

CWW20.12 Total number of STW outfall screens

- 25.2.20 No screens to prevent fish entrainment on WwTW outfalls.

CWW20.13 Cumulative shortfall in FFT addressed by WINEP / NEP schemes to increase STW capacity

25.2.21 No AMP 8 drivers for FFT increase.

CWW20.14 Additional storm tank capacity provided at STWs - grey infrastructure

25.2.22 Includes the grey component of hybrid schemes (grey / green mix)

CWW20.15 Additional volume of effective storm storage at STWs - nature based/green solution

25.2.23 Includes the green component of hybrid schemes (grey / green mix)

CWW20.16 Total number of STW sites where additional storage has been delivered

Included in STW count of Overflows with Storage as has more than one overflow, costs are allocated against CSO storage. See Table 20 below.

Table 20: Projects which deliver storage or equivalent storage at multiple overflows.

Reference	Project name
E00000579	EnvAct IMP2 - GREAT BROUGHTON WwTW SO
E00000469	EnvAct IMP2 - KIRKBY STEPHEN WwTW SO
E00000944	D00001387_017270008SO
E00000836	SALE WwTW (BOD)
E00000817	No Det - Strines WwTW

CWW20.17 Number of STW sites where additional storage has been delivered with pumping

25.2.24 Two sites Embleton and Brough have been identified without requirement for pumping as part of the storage solution.

CWW20.18 Number of STW sites benefitting from green infrastructure replacing the need for storm tank storage

25.2.25 This line includes all STW Overflow reduction schemes for which the solution includes green infrastructure including those which also have an element of Grey solutions.

CWW20.19 Total number of schemes with tightened / new P permits (met by biological treatment)

25.2.26 AMP8 3 new and tightened P limits met by Biological P removal schemes Ashton Under Lyne (08UU102357), Dukinfield (08UU102360) and Partington (08UU100953), Wigan & Skelmersdale

CWW20.20 Total number of schemes with tightened / new P permits (met by chemical treatment)

25.2.27 AMP8 new and tightened P limits met by Chemical P removal schemes

CWW20.21 Total number of schemes with tightened / new N permits (met by biological treatment)

25.2.28 No N schemes or new / tightened permits.

CWW20.22 Total number of schemes with tightened / new N permits (met by chemical treatment)

25.2.29 No N schemes or new / tightened permits.

CWW20.23 Total number of schemes with tightened/new sanitary parameter permits

25.2.30 N/a.

CWW20.24 Total number of schemes with tightened/new microbiological standards (UV, ozone etc)

25.2.31 N/a.

CWW20.25 Total number of STWs with microbiological treatment - new and existing (UV, ozone etc.)

25.2.32 N/a.

CWW20.26 Total number of schemes with tightened/new chemicals/hazardous substances permits

25.2.33 N/a.

CWW20.27 Total number of schemes with new chemical dosing installations

25.2.34 Aligns with CWW20.20.

CWW20.28 Volume of chemical dosing storage installed (m3)

25.2.35 Chemical dosing volumes are for single or multipoint coagulant dosing and pH / alkalinity correction for phosphorus removal.

25.2.36 No volume for total N removal, no volume to achieve sanitary parameters.

25.2.37 AMP8 volumes are based on notional solution designs.

CWW20.29 Total number of schemes with new tertiary solids removal

25.2.38 TSR at sites to achieve low P limits.

CWW20.30 Volume to water treated through tertiary solids removal (m3/day)

25.2.39 Calculation from site permitted flow to full treatment or if not available from filter maximum flow rate.

CWW20.31 Total number of N-TAL trials

25.2.40 Total number of N-TAL trials

25.2.41 *UUW* is not undertaking any Nitrogen technically achievable limit trials in AMP7 or AMP8 but is completing four investigations with WFD_INV_N-TAL drivers which include a trial of treatment options and for which costs are include in CWW3. These are:

- 08UU100311 payment to UKWIR for N-TAL Investigation on data management
- 08UU100312 Proposing Trickling Filters Trial at FORMBY WwTW to develop and test nitrogen treatment options
- 08UU100313 Proposing Nereda Trial at MORECAMBE WwTW to develop and test nitrogen treatment options
- 08UU100314 Proposing MOB Trial at WORSLEY WwTW to develop and test nitrogen treatment options

25.2.42 These investigations will be included within the N-TAL Trial line and removed from the investigation lines CWW20.61-64.

CWW20.32 Number of STW flow monitors installed

25.2.43 Same as CWW8.5.

25.2.44 The number of flow monitors installed at wastewater treatment works or last in-line pumping stations during the reporting year will align to the delivery profile set out in the WINEP. Sites with a U_MON4 driver in AMP7 and a U_MON4c, U_MON4d or U_MON4e driver in AMP8 have been included within this line. Sites with a U_MON4a or U_MON4b driver in AMP8 are excluded to avoid double counting.

25.2.45 In AMP7 *UUW* undertook 82 site investigations to identify whether the existing flow monitor(s) could be used to accurately measure pass forward flow compliance. Where the investigation concluded that, with minor modifications, a site was able to use the existing flow monitor then the U_MON4 permit conditions will be accepted in AMP7. These sites have not been included within this line. Where the investigation identified that a new monitor was required sites have been included within the AMP8 WINEP with a U_MON4 driver.

25.2.46 We assume that every site requires only one monitor to meet the U_MON4 requirement.

CWW20.33 Number of STW flow monitoring schemes requiring permit changes only

25.2.47 AMP8 0 / 94 permit changes only

CWW20.34 Number of STW flow monitoring schemes requiring simple meter installations

25.2.48 AMP8 74/94 simple meter installations

CWW20.35 Number of STW flow monitoring schemes requiring complex civils installations

25.2.49 AMP8 20/94 Complex civils installations

25.3 Network / Storm overflow data**CWW20.36 Additional volume of network storage at CSOs etc to reduce spill frequency - grey infrastructure**

25.3.1 Grey schemes and includes the grey component of schemes with a grey / green mix

CWW20.37 Additional volume of effective network storage to reduce CSO spill frequency - nature based/green solution

25.3.2 Green schemes and includes the green component of schemes with a grey / green mix

CWW20.38 Number of individual sites delivering additional network storage - grey infrastructure

25.3.3 Count includes grey with a green component to the solution. Five grey storage sites with transitional investment in 2024/25 details in table CWW20a. Projects bundle sites for efficiency of delivery.

CWW20.39 Number of individual sites delivering additional network storage - grey infrastructure - which include pumping

25.3.4 All network storage tanks will have an element of pumping. Mirrors CWW20.38

CWW20.40 Number of individual sites delivering additional network storage through green infrastructure

25.3.5 Count includes hybrid schemes (grey / green mix) 150 total schemes/projects 3 total overflows. Projects bundle sites for efficiency of delivery.

CWW20.41 Surface water separation drainage area removed

25.3.6 No schemes AMP8

CWW20.42 Total number of surface water separation schemes to reduce storm overflows

25.3.7 No schemes AMP8

CWW20.43 Sustainable drainage / attenuation schemes (green) area removed / attenuated

25.3.8 This includes the hectares removed from Storm overflow and storm tanks.

CWW20.44 Total number of sustainable drainage / attenuation schemes

25.3.9 Two fewer Sustainable drainage schemes in 2029/30 due to two green schemes allocated as Storage to reduce spill frequency at CSOs etc - green solution.

CWW20.45 Flow rate diverted to reduce storm overflow spills

25.3.10 No schemes

CWW20.46 Total number of sewer flow management / control schemes to reduce storm overflow spills

25.3.11 No schemes

CWW20.47 Total storm overflow spill volume avoided

25.3.12 We have completed this line with the best available data however we have concerns that these values are not accurate or robust. Our design is for 2050 but based on the previous CC model (CP18 not available at the time). We have calculated from modelled annual spill volume and the modelled annual

spills to work out an average volume per spill, then using 2050 design horizon for spill reduction, multiplied spills by average to give a volume overall. This is therefore very theoretical.

- 25.3.13 As we develop solution we will check and upgrade the spills to the new rainfall model but it would supersede any calculation we did today.

CWW20.48 Total number of new storm overflow screens installed

- 25.3.14 Number of screens anticipated to be delivered aligns to WINEP requirement and our delivery plan within AMP8.

CWW20.49 Number of continuous water quality monitor installations

- 25.3.15 Guidance Defra requires 25% of programme to be delivered in AMP8, delivery profile reflects capex profile due to limited guidance from Defra. Profile equally distributed over AMP8.

CWW20.50 Number of new MCERTs event duration monitors installed at SPS emergency overflows

- 25.3.16 Guidance from Defra requires 25% of programme to be delivered in AMP8, Delivery profile reflects regulatory date in WINEP

CWW20.51 Number of new MCERTs flow monitors (PFF) installed at SPSs with combined emergency and storm overflows.

- 25.3.17 Guidance from Defra requires 25% of programme to be delivered in AMP8, Delivery profile reflects regulatory date in WINEP, subset of CWW20.50

CWW20.52 Number of event duration monitors installed (to include at STWs and in network)

- 25.3.18 Profile aligned to regulatory date.

CWW20.53 Number of event duration monitoring schemes requiring permit changes only (at STWs and in network)

- 25.3.19 Profile aligned to regulatory date 0 / 273 requiring permit changes only

CWW20.54 Number of event duration monitoring schemes requiring simple meter installations (at STWs and in network)

- 25.3.20 Profile aligned to regulatory date 219 / 273 requiring simple meter installations

CWW20.55 Number of event duration monitoring schemes requiring complex civils installations (at STWs and in network)

- 25.3.21 Profile aligned to regulatory date 54 / 273 requiring complex civils installations

CWW20.56 Total number of storm overflow discharge relocation schemes

- 25.3.22 No schemes

CWW20.57 Total number of schemes to increase combined or trunk sewer capacity to reduce storm overflow spills

- 25.3.23 No schemes

CWW20.58 Total number of infiltration management schemes to reduce storm overflow spills

- 25.3.24 No schemes

CWW20.59 Length of new rising main installed to reduce storm overflow spills (km)

- 25.3.25 Aligns to storm overflow profile, subset of CWW20.60

CWW20.60 Total length of sewer installed to reduce storm overflow spills (km)

- 25.3.26 Aligns to storm overflow profile, total of CWW20.59 and estimated gravity feed sewer length requirements.

25.4 Other Data

CWW20.61 Number of WINEP/NEP investigations - desk-based studies only

25.4.1 SOAF investigations counted as simple.

25.4.2 We have 300+ sites within our AMP7 Green Recovery plan – these have not been included within this line.

25.4.3 Line definition is for number of investigations, WINEP entries for ancillary costs have been excluded from this line (08UU100277a, 08UU100311a).

CWW20.62 Number of WINEP/NEP investigations - survey, monitoring or simple modelling

25.4.4 None.

CWW20.63 Number of WINEP/NEP investigations - multiple surveys and/or monitoring locations, and/or complex modelling

25.4.5 9 – EnvAct_INV4s identified as complex – see enhancement document

CWW20.64 Total number of WINEP/NEP investigations

25.4.6 None.

CWW20.65 Total number of catchment management chemical source control schemes

25.4.7 None.

CWW20.66 Total number of catchment management nutrient balancing schemes

25.4.8 AMP8 - 9 Schemes:

- CALDBECK WwTW (08UU100915);
- DUBWATH WwTW (08UU100921);
- GRANGE IN BORROWDALE WwTW (08UU100924);
- GREAT ASBY WwTW (08UU100926);
- LONG MARTON EAST WwTW (08UU100932);
- LORTON WwTW (08UU100934);
- TEMPLE SOWERBY WwTW (08UU100943);
- THRELKELD WwTW (08UU100945); and
- WARCOP WwTW (08UU100946).

CWW20.67 Total number of catchment management catchment permitting schemes

25.4.9 There are three catchment permitting schemes in AMP7 and zero in AMP8.

CWW20.68 Total number of catchment management habitat restoration schemes

25.4.10 There are zero catchment management habitat restoration schemes in AMP7 and AMP8.

CWW20.69 Number of river connectivity schemes (fish passes etc.)

25.4.11 3 schemes

CWW20.70 Number of marine conservation zones (new and existing)

25.4.12 None

CWW20.71 Total number of contribution to 3rd party WINEP/NEP schemes

25.4.13 None

CWW20.72 Total number of 25 yr Environment Plan schemes

25.4.14 None

CWW20.73 Additional line 1; wastewater network+ cost driver

- 25.4.15 The line has been used to quantify the number of Sludge Enhancement cases. Details of associated benefits are provided within the Enhancement cases and associated lines in table BIO5.

CWW20.74 Additional line 2; wastewater network+ cost driver

- 25.4.16 This line has been used to quantify number of schemes with delivery for AMP7 Green Recovery within AMP8. There are two projects delivering in 2025/26, 7UU200793 - Bury WwTW Storm Tanks and 7UU200802 - Nuttall Hall Road CSO (BRY0002).

CWW20.75 Additional line 3; wastewater network+ cost driver

- 25.4.17 This line has been used to quantify number of sites with need for intervention to improve Wastewater Reservoirs as outlined the in Enhancement Case.

26. CWW20a - Transition and accelerated programme - Wastewater network+ - Sewage treatment works population, capacity and network data

26.1 Whole table

CWW20a.1 - 77

- 26.1.1 There are five overflows agreed as part of the accelerated programme for AMP8. All of these overflows are network assets and therefore the remainder of the table is reported as zero.

27. CWW21 – Wastewater sewers; asset condition

27.1 Whole table

CWW21 An explanation of any material variations between current and previous percentages of assets in each condition grade (e.g. PR09 data where available).

27.1.1 Not applicable

An explanation of any changes in reporting methods / assumptions that have led to a material change in reported figures.

27.1.2 The clarification of collapse reporting for AMP7 achieved through the cross industry working group prior to AMP7 has led to significant changes in collapse reporting. Since the collapse rate/condition boundaries may have been derived from data prior to the guidance clarification it is likely that the condition boundaries are not reflective of network condition.

An indication of the quality of data provided.

27.1.3 The data is comprehensive for gravity sewers, with less certainty on last in-line (broadly equivalent to terminal pumping station) rising mains where repairs may be carried out using a broad range of delivery routes. In-line with APR confidence grading guidance, we have graded this data as B3.

Coverage of company asset surveys.

27.1.4 Approximately 20,000 fast pass surveys are carried out across the sewer network each year. These are predominantly in smaller sewers in the size range of 100-150mm, most subject to blockage and hence service disruption. We are currently trialling using machine learning techniques to automatically encode these sewer surveys to provide industry standard structural and serviceability conditions. It should be noted that the existing CCTV data represents a biased sample.

The procedures, including any statistical techniques adopted by the company to extrapolate the results of individual surveys to larger groups of assets;

27.1.5 We do not extrapolate the condition data across the asset base, preferring to rely upon blockage and collapse incident data.

CWW21 An explanation of any material variations between current and previous percentages of assets in each condition grade (e.g. PR09 data where available).

27.1.6 The data has been prepared in-line with the guidance as far as practically possible. The two major non-compliances are:

27.1.7 We only have 3 years of appropriate data, not the requested 5 years. Rather than blend the old data from our previous work management system (SAP) we have used the 3 years of AMP7 data from Salesforce. This is also because Ofwat significantly updated the definitions and provided additional clarification that makes the old SAP data much less comparable and the mapping of repairs to individual pipes of older SAP data is a lot more suspect than from Salesforce.

27.1.8 We have returned data based upon cohorts that meet Ofwat's requirements as well as we can manage. Many cohorts will be too small, a few will be too large. This is required to be compliant with another Ofwat requirement to present cohorts that conform to the primary risk categories.

27.2 Cohort tables

27.2.1 For table CWW21 as per Ofwat PR24 Final Methodology submission table guidance – section 4: Costs (wholesale) – wastewater v5 Page 106 section 29.11 UUW has provided a supporting .xls files which includes a full breakdown of cohorts and relative burst rate information. This can be found in UUW12 – CWW21 – cohort analysis.

28. CWW22 – Wastewater – net zero enhancement schemes

28.1 Whole table

CW22 all lines

- 28.1.1 Ofwat has requested that companies put forward interventions with a primary driver of greenhouse gas (GHG) emissions reduction as net zero enhancements. Appendix 9, page 92 in the Final Methodology states “Ofwat has created a net zero enhancement challenge where companies that are stretching themselves and have efficient proposals will be priorities for additional enhancement funding to tackle operational GHG emissions.”
- 28.1.2 Working towards net zero is a priority to us and our customers as the affordability and resilience of our operations and services fundamentally rely on a stable climate and a healthy natural environment. We have produced an ambitious plan to reach net zero in scopes 1, 2 and 3 greenhouse gas (GHG) emissions by 2050, supporting the national legal requirements in the Climate Act 2008. Our net zero enhancement programme is central to our plan and crucial in AMP8 to achieve further GHG emissions reduction and work towards a science-based trajectory as part of our adaptive plan to net zero by 2050.
- 28.1.3 With support from Ofwat, our net zero enhancement programme will see £196.3 million invested to deliver benefits across all aspects of our operational emissions plus essential enablers to future action and longer-term emissions benefits. The programme is summarised in the table below targeting a total emissions benefit of over 2 million tCO₂e by 2055. All cases provided in CWW22 meet the criteria set out in Appendix 9 and noted above, with the primary enhancement driver to reduce operational GHG emissions.
- 28.1.4 Our justification for the selected vs feasible dropdown box within CWW22 is aligned to the PR24 data table guidance accompanying the net zero enhancement data tables CW21 and CWW22. This guidance states “selected schemes should make up the company level net zero enhancement programme (as presented in CW3 and CWW3) and those schemes not part of the company level programme but are suitable for consideration in the net zero challenge should be given the Feasible dropdown option.”

The 11 projects (see Table 21 below) selected as part of our net zero enhancement programme have been split into net zero enhancement cases and those for inclusion in Ofwat’s net zero challenge.

- 28.1.5 The 8 cases classified as ‘selected’ in the table below have been submitted as net zero enhancement projects, outside of the challenge. These consist of project types which are more developed and relatively more readily deployable forms of innovation that require additional funding in AMP8 beyond base expenditure to cover new activities or an uplift in cost compared to traditional alternatives.
- 28.1.6 A further 3 cases have been identified as ‘feasible’ for inclusion in the net zero enhancement challenge. These cases consist of cutting edge innovation to help tackle systemic long term challenges to our and the sectors route to net zero 2050.
- 28.1.7 For further details see *UUW67 – Cross Price Control Enhancement Claim: Net Zero Enhancement*.

Table 21: Net zero enhancement projects

Project reference	Net Zero Enhancement Cases	Net zero Enhancement or Net zero Challenge fund	CW21 / CWW22 data table dropdown used	Price control deliverable (PCD) applied	Quoted tCO ₂ e to reduce PCL directly
E00001337	Stationary fossil fuel reductions	Net zero enhancement	Selected	Yes	Yes
E00001340	Transport fossil fuel reductions – green fleet LCVs phase 1	Net zero enhancement	Selected	Yes	Yes
E00001341	Transport fossil fuel reductions – green fleet LCVs phase 2	Net zero enhancement	Selected	Yes	Yes
E00001342	Transport fossil fuel reductions - Green fleet Biomethane HGVs	Net zero enhancement	Selected	Yes	Yes
E00001346	Property emissions reductions	Net zero enhancement	Selected	Yes	Yes
E00001425	Net zero catchment strategy	Net zero enhancement	Selected	Yes	Yes
E00001344	Peatland restoration	Net zero enhancement	Selected	Yes	No
E00001345	Woodland creation	Net zero enhancement	Selected	Yes	No
E00001338	Process emissions (Bioresources)	Net zero challenge fund	Feasible	No	No
E00001339	Process emissions (Wastewater)	Net zero challenge fund	Feasible	No	No
E00001425	Phase 2 – Further low regrets emissions reductions in AMP8	Net zero challenge fund	Feasible	No	No

28.1.8 As per PR24 final methodology data table guidance the net operational GHG emission benefits for the enhancement cases presented in CWW22 are stated in tonnes equivalent of CO₂e as a cumulative impact annually from 2025 to 2030.

28.1.9 Increased emissions have been given a positive value and decreased emissions a negative value as per PR24 data table guidance for CWW22 released by Ofwat in May 2023.

28.1.10 The operational greenhouse gas (GHG) emissions for these cases have been calculated in-line with the common performance commitment which aligns to Ofwat's methodology provided in the PR24 operational greenhouse gas emissions performance commitment definition documents for wastewater with the exception of the following enhancement cases; process emissions (Bioresources), process emissions (Wastewater) which use other industry standards and Phase 2 – innovation in AMP8 that has been calculated as an average of the proposed phase 1 enhancement cases to take account of the different project types that this could potentially deliver.

- 28.1.11 For all cases presented below the impacts of each case on *UUWs* operational greenhouse gas (GHG) emissions are presented in columns 21 to 25 in PR24 data tables CWW22 table. Column 26 then provides the overall scheme impact on *UUWs* net total greenhouse gas emissions by 2029-30 including both operational and embodied (cradle-to-build) emissions as per PR24 data table guidance.
- 28.1.12 The embodied emissions have been calculated in-line with our PR24 carbon assessment framework. This takes a best practice emissions approach using expert third party support from our technical partners. Our approach uses bottom up data where available and the creation of benchmarks where it is not. For further detail see *UUW37 - Our strategy to net zero 2050*.
- 28.1.13 All net zero enhancements have been assured by a third party.

E00001337 Stationary fossil fuel reductions

- 28.1.14 **Headline:** Halving the use of fossil fuels at priority operational sites by switching to alternative fuels, saving over 35,000 tonnes of GHG emissions in AMP8 and over 300,000 tonnes by 2055.
- 28.1.15 This net zero enhancement case delivers a step change in reducing fossil fuel use in our treatment operations. Swapping to low/zero GHG emissions energy sources will deliver a reduction of over 35,000 tCO₂e over the course of AMP8, and more over the long-term. To minimise the cost we are proposing a series of retrofit actions at a number of sites, as opposed to replacing with brand new assets.
- 28.1.16 The capex and opex for the switch to alternative fuels is based on initial site assessments undertaken by a third party contractor.
- 28.1.17 The annual operational GHG emission scheme benefits presented as the cumulative impact on tCO₂e within columns 21 to 25 include all operational Scope 1, Scope 2 and Scope 3 emissions for fuel switching from fossil fuels to alternative lower carbon options in-line with common performance commitment definition.
- 28.1.18 Reduction in fossil fuel (natural gas and kerosene, dependant on site) is -59,139 tCO₂e and increase in electricity is 23,862 tCO₂e, so our total net emissions are -35,277 tCO₂e to be delivered in AMP8.
- 28.1.19 For further details see *UUW67 – Cross Price Control Enhancement Claim: Net Zero Enhancement*.

E00001338 Process emissions (Bioresources)

- 28.1.20 **Headline:** Introduce innovative technologies to monitor and reduce the release of methane (CH₄) from sludge management processes
- 28.1.21 This net zero enhancement relates to process emissions associated with Bioresources and provides a major reduction in fugitive methane releases. It goes beyond business as usual as it is providing a further benefit to the current lowest carbon emissions digestion process (as defined in the carbon accounting workbook), which is thermal hydrolysis (THP) with Anaerobic Digestion (AD). The proposal is to use new technology to extract more biogas from the sludge which would have otherwise be lost to atmosphere. The biogas is recovered and used for energy production. The benefit of the energy generation is captured in the proposed costs, i.e. netted out.
- 28.1.22 This project will focus on a reduction in CH₄, and is a separate enhancement case from E00001339 wastewater process emissions case below, which focuses on a reduction in nitrous oxide (N₂O).
- 28.1.23 The costs are based on an AMP7 pilot at an existing WwTW using initial site assessment and monitoring data alongside supplier quotations. The capex for this enhancement case is required in the first two years of AMP8 so construction and commissioning of new equipment can take place. This means that the carbon reduction over AMP8 is also phased and benefits won't be realised until year 3 (2027-28) onwards.
- 28.1.24 The current approach for the common PC is to calculate methane emissions from sludge treatment based on the raw dry tonnes of sludge processed by specific digestion technologies multiplied by an emissions factor. This enhancement case requires installation of a technology within an existing sludge processing technology. Therefore, for PC reporting the proposed accounting methodology will not capture the carbon benefit from the capturing of methane.

28.1.25 For further details see *UUW67 – Cross Price Control Enhancement Claim: Net Zero Enhancement*.

E00001339 Process Emissions (Wastewater)

- 28.1.26 **Headline:** Introduce innovative technologies to monitor and reduce the release of nitrous oxide from wastewater processes
- 28.1.27 This case focuses on wastewater process emissions. We are proposing an ambitious and sector leading nitrous oxide (N₂O) emissions reduction programme that is innovative and focused on driving a low cost for delivery (£/tCO₂e). The solution goes well beyond any current international programme of N₂O reduction.
- 28.1.28 This enhancement case will focus on N₂O, and is a separate enhancement case from E00001338 above which focuses on a reduction in methane (CH₄). It focuses on reducing N₂O emissions from *UUW*'s existing assets/operations. For planned investment we are building into our solution development (optioneering) how we develop low N₂O emission solutions. Based on a site screening exercise, we propose to monitor and mitigate N₂O emissions from 17 WwTW sites.
- 28.1.29 The costs are based on an AMP7 pilot at existing WwTW using, initial site assessment and monitoring data alongside supplier quotations.
- 28.1.30 The annual operational GHG emission scheme benefits are presented as the cumulative impact on tCO₂e within columns 21 to 25 include all operational Scope 1 emissions relating to process emissions. The carbon reduction over AMP8 is phased as the first two years will require time for construction and commissioning.
- 28.1.31 Based on the scope and proposed methodology for reporting carbon emissions for the common performance commitment (PC), we estimate N₂O emissions represent 12% of our forecast carbon emissions for AMP8. The current sector reporting methodology used for the PC is widely acknowledged to under report the carbon impact of process emissions. Using the Intergovernmental Panel for Climate Change (IPCC) methodology the carbon impact of our N₂O process emissions could be circa 270,000 tCO₂e per year. Using the IPCC methodology N₂O it increases our operational carbon emissions by circa 230,000 tCO₂e per year and becomes the single largest emissions source.
- 28.1.32 The current approach for the common PC is to calculate N₂O emissions from wastewater treatment based on the total population multiplied by an emissions factor. This approach will therefore not allow any changes to actual N₂O emissions to be reported in the common PC.
- 28.1.33 For further details see *UUW67 – Cross Price Control Enhancement Claim: Net Zero Enhancement*.

Transport fossil fuel reductions - Green fleet LCVs

- 28.1.34 **Headline:** Saving around 30,000 tonnes of GHG emission in AMP8 and over 250,000 tonnes by 2055 by transitioning all the cars and vans in our fleet to electric or other low carbon options, and enabling 20% of our HGVs to use clean energy from our biogas.

E00001340 Transport fossil fuel reductions - Green fleet LCVs phase 1

- 28.1.35 This enhancement case will provide GHG emissions reduction benefits in *UUW*'s Scope 1 emissions associated with transport (company owned or leased vehicles), progressing towards the Science-Based Target Scope 1 and 2 reduction by 2030. This involves a transition to a green fleet by procuring zero emission (Electric Vehicle, EV) cars & vans.
- 28.1.36 This enhancement case does not overlap with any activities delivered through base. The capex entered is based on manufacturer quotes provided for the low carbon vehicles we have already purchased in AMP7 and a standard uplift applied to reflect 2022/23 pricing. The opex has been entered as a negative value as this enhancement case is forecast to deliver an operational cost saving as it's more beneficial in the long term to operate and maintain an EV fleet compared to its diesel alternative
- 28.1.37 The annual GHG emission scheme benefits, presented as the cumulative impact on tCO₂e within columns 21 to 25 include all Scope 1, Scope 2 and Scope 3 emissions for upgrading our Light Commercial

Vehicle (LCV) fleet from diesel to electric in-line with the common performance commitment definition on GHG emissions reduction (water and wastewater).

- 28.1.38 The net operational GHG emissions impact for this enhancement case are stated in tonnes equivalent of CO₂e as a cumulative impact annually from 2025 to 2030. Increased emissions have been given a positive value and decreased emissions a negative value as per PR24 data table guidance for CWW22 released by Ofwat in August 2023.
- 28.1.39 As this enhancement case is applicable to both water and wastewater the cost and total emissions calculated above have then been apportioned between both data tables CW21 and CWW22 in-line with the price control allocation spilt below.
- 28.1.40 For further details see *UUW67 – Cross Price Control Enhancement Claim: Net Zero Enhancement*.

Table 22: E00001340 price control allocation split

Project reference	Enhancement case name	Water Resources	Water Network+	Wastewater Network+	Bioresources
E00001340	Green Fleet – phase 1	4%	32%	32%	33%

E00001341 Transport fossil fuel reductions - Green fleet LCVs phase 2

- 28.1.41 This enhancement cases will provide GHG emissions reduction benefits in *UUW*'s Scope 1 emissions associated with transport (company owned or leased vehicles), progressing towards the Science-Based Target Scope 1 and 2 reduction by 2030. This involves a transition to a green fleet by procuring zero emission (Electric Vehicle, EV) cars & vans.
- 28.1.42 This enhancement case is in addition to E00001340 above to deliver 100% LCV green fleet by 2030 and does not overlap with any activities delivered through base. The capex entered is based on manufacturer quotes provided for the 33 low carbon vehicles we have already purchased in AMP7 and a standard uplift applied to reflect 2022/23 pricing. The opex has been entered as a negative value as this enhancement case is forecast to deliver an operational cost saving as it's more beneficial in the long term to operate and maintain an EV fleet compared to its diesel alternative.
- 28.1.43 Due to increasing costs of EVs within the market, our stretch proposal in particular does not present a particularly favourable cost per unit of operational GHG emissions (£ per tCO₂e) specifically within AMP8 when compared to our other net zero enhancements cases presented within the net zero challenge fund, however, greening our fleet is imperative to our long term delivery strategy and net zero ambitions.
- 28.1.44 The annual GHG emission scheme benefits, presented as the cumulative impact on tCO₂e within columns 21 to 25 include all Scope 1, Scope 2 and Scope 3 emissions for upgrading our Light Commercial Vehicle (LCV) fleet from diesel to electric in-line with the common performance commitment definition on GHG emissions reduction (water and wastewater).
- 28.1.45 The net operational GHG emissions impact for this enhancement case are stated in tonnes equivalent of CO₂e as a cumulative impact annually from 2025 to 2030. Increased emissions have been given a positive value and decreased emissions a negative value as per PR24 data table guidance for CWW22 released by Ofwat in August 2023.
- 28.1.46 As this enhancement case is applicable to both water and wastewater the cost and total emissions calculated above have then been apportioned between both data tables CW21 and CWW22 in-line with the price control allocation spilt below in Table 23.
- 28.1.47 For further details see *UUW67 – Cross Price Control Enhancement Claim: Net Zero Enhancement*.

Table 23: E00001341 Price control allocation split

Project reference	Enhancement case name	Water Resources	Water Network+	Wastewater Network+	Bioresources
E00001341	Green Fleet – phase 2	4%	32%	32%	33%

E00001342 Transport fossil fuel reductions - Green fleet Biomethane HGVs

- 28.1.48 This enhancement case will replace 21 Bioresources diesel HGV with biomethane and therefore 100% of the cost has been allocated to the Bioresources price control.
- 28.1.49 The capex is based on cost information provided by a manufacturer in 2022 and a 10% uplift applied to reflect any recent changes to reflect the current financial year. The opex has been entered as a negative value as this enhancement case is forecast to deliver an operational cost saving as it's more beneficial in the long term to operate and maintain low emission alternative HGV's compared to its diesel alternative, due to the fuel saving identified.
- 28.1.50 The annual GHG emission scheme benefits, presented as the cumulative impact on tCO₂e within columns 21 to 25 include all Scope 1 emissions for upgrading 21 HGVs from diesel to biomethane in-line with the common performance commitment definition on GHG emissions reduction (waste and wastewater).
- 28.1.51 Forecast decrease in diesel is -7,743 tCO₂e and increase in biomethane is 3,877 tCO₂e, so our total net emissions are -3,866 tCO₂e.
- 28.1.52 Due to the current market cost of HGVs, this enhancement case does not present a particularly favourable cost per unit of operational GHG emissions (£ per tCO₂e) specifically within AMP8 when compared to our other net zero enhancements cases presented in CW21 and CWW22, however, it provides longer term GHG emission benefits which is imperative to our long term delivery strategy and net zero ambitions. For additional technical detail see *UUW37 – Our strategy to net zero 2050* and *UUW67 – Cross Price Control Enhancement Claims*.

E0001346 Property emissions reductions

- 28.1.53 **Headline:** Saving over 6,000 tonnes of GHG emissions in AMP8, and over 35,000 tonnes by 2055, by switching energy sources needed for heating to reduce use of fossil fuels in key buildings
- 28.1.54 This enhancement case is focused on decarbonising heat within our UUW owned property portfolio, in particular the large office site at Lingley Mere. Through alternative heating systems and efficient boiler replacements this enhancement case is estimated to save 6,123 tCO₂e for a cost of £3.59m.
- 28.1.55 The costs have been estimated utilising existing consumption data to estimate building heat demands and appropriately size the heat pump system required to power our head office at Lingley Mere. Supplier visits and boiler replacement estimates have been used, based on an average system size and cost model, however further on site investigations will be undertaken to ensure feasibility and firm up costs prior to 2025.
- 28.1.56 Operational GHG emissions benefits for this enhancement case include; Scope 1 emissions from fossil fuel use, Scope 2 emissions from purchased electricity and Scope 3 emissions from purchased electricity Transmission & Distribution.
- 28.1.57 As this enhancement case is applicable to both water and wastewater the cost and total emissions calculated above have then been apportioned between both data tables CW21 and CWW22 in-line with the price control allocation split below in Table 24.
- 28.1.58 For further details see *UUW67 – Cross Price Control Enhancement Claim: Net Zero Enhancement*.

Table 24: E0001346 Price control allocation split

Project reference	Enhancement case name	Water Resources	Water Network+	Wastewater Network+	Bioresources
E0001346	Property emissions reductions	0%	33%	33%	33%

E00001425 Net zero catchment strategy

- 28.1.59 **Headline:** Working with partners to develop a sustainability masterplan and test innovative approaches for low carbon water and wastewater priorities in the major new development of St Cuthbert's Garden Village
- 28.1.60 This enhancement case will aid in the development of a net zero catchment strategy for St Cuthbert's garden village development to support the new WwTW in Carlisle, facilitating the expected population growth. It will allow us to take a leading role in working with Cumberland Council and the St Cuthbert's Garden Village developers in developing an exemplar vision and masterplan for a net zero community, and delivering on the Council's masterplan framework and sustainability strategy for the community. A key component of this would be in relation to Integrated Water Management and efficient water use, but the ambition is to deliver a vision that supports net zero holistically across all aspects of community master planning. £1m capex has been allocated for an investigation, required to enable successful completion of the first phase of our proposed programme of work, allowing UUW to take a leading role in working with Cumberland Council and the St Cuthbert's Garden Village developers.
- 28.1.61 At this stage it is not possible to fully quantify the potential GHG emissions reductions benefits associated with this enhancement case, as they will be dependent not least on the phasing of the St Cuthbert's Garden Village development build out. As it will take time to develop the masterplan vision and associated policies, we do not anticipate that the enhancement case will deliver any specific reduction benefits during AMP8, however this investigation is an important part of our wider net zero strategy looking at emissions reductions beyond AMP8 to 2050.
- 28.1.62 The total cost and emissions for this enhancement has been entered into the PR24 data table CWW22 in-line with the price control allocation split below in Table 25.
- 28.1.63 For further details see UUW67 – *Cross Price Control Enhancement Claim: Net Zero Enhancement*.

Table 25: E00001425 Price control allocation split

Project reference	Enhancement case name	Water Resources	Water Network+	Wastewater Network+	Bioresources
E00001425	Net Zero Catchment Strategy	0%	0%	100%	0%

E00001426 Phase 2 – Further low regrets emissions reductions in AMP8 Phase 2 – Innovation in AMP8

- 28.1.64 **Headline:** As part of our net zero enhancement programme we have proposed a 'Phase 2 – AMP8 Innovation' project which will have GHG emissions reduction as the primary driver. Due to the uncertainty and rapid evolution within the market the potential cases within our proposed phase 2 require further investigation and will be defined within AMP8.
- 28.1.65 We have proposed an enhancement expenditure of £81.6 million within our submission to Ofwat's net zero challenge to support this. We estimate this will deliver circa 55,000 tCO₂e reduction, which will be confirmed with Ofwat upon final technical review. These values have been calculated based on averages from other projects within our programme and therefore shouldn't be used to amend the PCL of the common performance commitment for operational GHG emissions.
- 28.1.66 As this enhancement case is applicable to both water and wastewater the cost and total emissions calculated above have then been apportioned between both data tables CW21 and CWW22 in-line with the price control allocation split below in Table 26.

28.1.67 As this enhancement case is applicable to both water and wastewater the cost and total emissions calculated above have then been apportioned between both data tables CW21 and CWW22 in-line with the price control allocation spilt below.

Table 26: E00001426 Price control allocation split

Project reference	Enhancement case name	Water Resources	Water Network+	Wastewater Network+	Bioresources
E00001426	Phase 2	1%	27%	32%	41%

28.1.68 For additional technical detail see *UUW37 – Our Strategy to net zero 2050*.

Appendix A Compliance with reporting requirements

A.1 General

A.1.1 *UUW* has endeavoured to fully comply with all of the reporting requirements. In a small number of instances where this is not the case, we have fully explained this within the table commentaries with appropriate justification.

A.2 Ofwat query response ID-533

A.2.1 *UUW*, in response to query ID-533, has not trimmed our data to match Ofwat's defined number of decimal place requirements. For display purposes data will, however, always conform to the formatting rules as set within the Ofwat PR24 tables. We believe this to be fully aligned to the table requirements.

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