United Utilities Water

Annual Performance Report 2022/23
Additional regulatory information commentaries for tables 3 to 11

July 2023

United Utilities

Water for the North West

Executive Summary

This document is designed to support and provide commentary on tables 3A to 11A within UUW's 2022/23 Annual Performance Report (APR).

Tables 3A to 11A of the APR contain information on performance and the allocation of expenditure to different investment categories. They also contains information on the drivers of expenditure, such as population served or asset capacities.

Assurance

As set out in the Final Assurance Plan that is published at:

https://www.unitedutilities.com/globalassets/documents/pdf/final-assurance-plan-2022-23.pdf/download

We have applied a three lines of assurance review and governance approach.

Data has been subject to data owner, responsible, accountable and executive manager sign-off as appropriately identified through risk assessment. In addition to this independent audit / peer review of supporting information and audit trails has also taken place.

The regulatory reporting process, including the cost assessment data, was reviewed by United Utilities Corporate Audit. The audit covered the following areas, with no issues being noted:

- The validity consistency of the data reported in Sections 3 and 4 of the Annual Performance Report. This included sample testing to agree data back to underlying UU records and systems;
- Consistency of the commentary with the underlying data within the APR;
- Compliance of the reported data in the APR with key aspects of Regulatory Guideline 3.14 "Guideline for the format and disclosures for the annual performance report";
- Overall governance arrangements in place to ensure the regulatory data is complete and accurate and reported in line with the required timescales;
- Confirmation that assurance activities detailed in UU's published Final Assurance Plan have been completed in line with the plan; and
- Review the proposed Assurance Report (to be published along with the Annual Performance Report 2022/23) to ensure it is a fair reflection of the associated assurance activities and results thereof.

The data within this submission was also added to the scope of the assurance review undertaken by our technical auditor James Luger from Jacobs Limited. Jacobs undertook an agreed upon procedures review and concluded that *"*On the basis of our audit work and with exceptions as noted in Appendix A, we are satisfied that the information within and which supports RR23 has been assembled using appropriate data and methodologies and provides a reliable representation of Company performance. There is also good evidence of senior management engagement, governance and programme management*".*

The results and findings from the review and assurance processes were presented to and discussed with the UUW Board, as part of its review and approval of the Annual Performance Report in June 2023.

The findings of the Jacobs review and the findings of the second line review undertaken by UU Corporate Audit are included within Appendix 1 of our APR, which is published on our website.

unitedutilities.com/globalassets/documents/pdf/united-utilities-annual-performance-report-2022-23

Contents

Table 3A Outcome Performance – Water Performance Commitments (financial)

Section 1.1 of the main APR document contains further details on our Water performance commitments with financial incentives. This section outlines how we have performed this year and the number of performance commitments that have been achieved.

unitedutilities.com/globalassets/documents/pdf/united-utilities-annual-performance-report-2022-23

In Appendix 1 of our main APR document we set our approach to assurance. This also includes details of how we regularly share information about our performance with our YourVoice panel.

Appendix 3 of our APR also outlines which performance commitments require a non-standard calculation. One measure is included in Table 3A. 'Abstraction Incentive Mechanism (AIM)'.

Line 3A.15 - Thirlmere transfer into West Cumbria (AMP7)

We have now completed the West Cumbria project and the performance commitment is 100 per cent complete. We have noticed that when performance is entered as 100 in the model, the cell shows the performance as one and not 100 due to embedded formatting.

Table 3B Outcome Performance – Wastewater Performance Commitments (financial)

Section 1.1 of the main APR document contains further details on our wastewater performance commitments with financial incentives. This section outlines how we have performed this year and the number of performance commitments that have been achieved.

unitedutilities.com/globalassets/documents/pdf/united-utilities-annual-performance-report-2022-23

Appendix 3 of our APR also outlines which Performance Commitments require a non-standard calculation. One measure is included in Table 3B. 'Better Air Quality'.

The Environment Agency (EA) confirm that schemes have been satisfactorily completed in the AMP7 WINEP. We consider this position as definitive and then fully align our two corresponding performance commitments ('Improving the water environment' and 'Improving river water quality') to this reported position.

The WINEP is saved on Defra's SharePoint site:

https://defra.sharepoint.com/teams/Team843/WINEP/Forms/AllItems.aspx

Table 3C Customer Measure of Experience (C-MeX) table

Section 1.1 of the main APR document contains further details on our Customer Measure of Experience (C-MeX) performance commitment. This section outlines how we have performed this year and contains details on our customer satisfaction surveys and results.

unitedutilities.com/globalassets/documents/pdf/united-utilities-annual-performance-report-2022-23

Table 3D Developer Measure of Experience (D-MeX) table

Table 3D

Line 3D.1 – Qualitative Component Annual Results, Line 3D.2 – Quantitative Component Annual Results, Line 3D.3 – D-MeX Score, Line 3D.4 – Developer Services Revenue (Water) and Line 3D.5 – Developer Services (Wastewater)

We have no comments for these lines.

Table 3D

Line 3D.W1 – W1.1 – Pre-development enquiry – reports issued within target – 21 days (Non-statutory), Line 3D.W2 – S3.1 Sewer requisition design – offers issued within target

We have no comments for these lines.

Line 3D.W3 – S4.1 Sewer requisition – constructed and commissioned within agreed extension, Line 3D.W4 – S7.1 Adoption legal agreement – draft agreements issued within target.

We did not have any transactions for this measure in the reporting period.

Line 3D.W5 – SAM - 3/1 Execute Adoption Agreement (Stage 3) – Sewerage Company – SAM – 3/1 – Update draft Agreement, Line 3D.W6 – SAM - 4/1 Customer notifies of construction start date and requests inspections (Stage 4) – Sewerage Company – SAM – 4/1 Inspections & construction period, Line 3D.W7 – SLPM - 2/2b Design Self-Laid Main (Stage 2) – Water Company – SLPM - S2/2b – Water Company to Provide design acceptance and Line 3D.W8 – SLPM – S1/2 POC (Stage 1C) – Water Company – SLPM – S1/2 – Review PoC proposal.

We have no comments for these lines.

Line 3D.W9 – SLPM - S2/2a Design Self-Laid Main (Stage 2) – Water Company – SLPM - S2/2a – Provide design

We did not have any transactions for this measure in the reporting period.

Line 3D.W10 - SLPM – S3 Execute Water Adoption Agreement (Stage 3) – Water Company – SLPM – S3 – Review / revise Water Adoption Agreement, Line 3D.W11 - SLPM – S4/1 Delivery Date (Stage 3 / 4) – Water Company – SLPM – S4/1 – Source of Water Delivery Date, Line 3D.W12 - SLPM – S5/1a Connect Self-Laid Main – (Stage 5) – Water Company – SLPM – S5/1a – Review request and carry out Final Connection, Line 3D.W13 - SLPM – S7/1 Make Service Connections (Stage 7 – Part 2) – Water Company – SLPM – S7/1 – Validate notification and provide consent to progress with connection, Line 3D.W14 - SN2.2 % Bulk discharge offer letters issued to the applicant within target period,

We have no comments for these lines.

Line 3D.W15 - SN4.1 % of main laying schemes constructed and commissioned within the target period

We did not have any transactions for this measure in the reporting period.

Line 3D.W16 - W1.1 Pre-development enquiry – reports issued within target, Line 3D.W17 - W17.1 Mains diversions (without constraints) - quotations within target, Line 3D.W18 - W17.2 Mains diversions (with constraints) - quotations within target, Line 3D.W19 - W18.1 Mains diversions - construction/commissioning within target, Line 3D.W20 - W20.1 Self-lay Point of Connection report < 500 plots etc - reports issued within target

We have no comments for these lines.

Line 3D.W21 - W21.1 Self-lay Point of Connection reports >500 plots etc - reports issued within target,

We did not have any transactions for this measure in the reporting period.

Line 3D.W22 - W23.1 Self-lay design and terms request <500 plots etc - quotations within target

We have no comments for these lines.

Line 3D.W23 - W24.1 Self-lay design and terms request >500 plots etc - quotations within target,

We did not have any transactions for this measure in the reporting period.

Line 3D.W24 - W26.1 Self-lay water for pressure/bacteriological testing - provided within target, Line 3D.W25 - W27.1 Self-lay permanent water supply - provided within target, Line 3D.W26 - W3.1 s45 quotations - within target, Line 3D.W27 - W30.1 Self-lay plot references and costing details - issued within target, Line 3D.W28 - W4.1 s45 service pipe connections - within target, Line 3D.W29 - W6.1 Mains design <500 plots - quotations within target

We have no comments for these lines.

Line 3D.W30 - W7.1 Mains design >500 plots - quotations within target

We did not have any transactions for this measure in the reporting period.

Line 3D.W31 - W8.1 Mains construction within target, Line 3D.W32 - WN1.1 % of confirmations issued to the applicant within target period, Line 3D.W33 - WN2.2 % Bulk supply offer letters issued to the applicant within target period

Line 3D.W34 - WN4.1 % of main laying schemes constructed and commissioned within the target period

UUW did not have any transactions for this measure in the reporting period.

Line 3D.W35 - WN4.2 % of testing supplies provided within target period

We have no comment for this line.

Line 3D.W36 - WN4.3 % of permanent supplies made available within the target period

We did not have any transactions for this measure in the reporting period.

Table 3E Outcome Performance – Non-Financial Performance Commitments

Section 1.1 of the main APR document contains further details on our non-financial performance commitments and our overall performance in terms of the number that have been achieved this year.

unitedutilities.com/globalassets/documents/pdf/united-utilities-annual-performance-report-2022-23

Table 3F Underlying Calculations for Common Performance Commitments – Water and Retail

See section 1.1 of the main APR document for further details on outcome performance:

unitedutilities.com/globalassets/documents/pdf/united-utilities-annual-performance-report-2022-23

Performance Commitments set in Standardised Units - Water

Line 3F.1 – Mains Repairs – Reactive, Line 3F.2 – Mains Repairs – Proactive and Line 3F.3 – Mains Repairs

We are following the revised methodology.

Line 3F.4 – Per Capita Consumption (PCC)

We have no comment for this line.

Performance Commitments Measured against a Calculated Baseline

Line 3F.5 – Leakage

Our baseline performance can be found in United Utilities' 2019-20 APR.

Line 3F.6 – Per Capita Consumption (PCC)

Our baseline performance can be found in United Utilities' 2019-20 APR.

Water Supply Interruptions

Line 3F.7 – Water Supply Interruptions

We have no comment for this line.

Unplanned Outage

Line 3F.8 – Unplanned Outage

We have no comment for this line.

Priority Services for Customers in Vulnerable Circumstances

Line 3F.9 – Priority Services for Customers in Vulnerable Circumstances

Data in Column 23 from Table 4R.19 plus properties using only wastewater services (84,391).

Table 3G Underlying Calculations for Common Performance Commitments – Wastewater

Line 3G.1 – Internal Sewer Flooding – Customer Proactively Reported, Line 3G.2 – Internal Sewer Flooding – Company Reactively Identified (i.e. neighbouring properties) and Line 3G.3 – Internal Sewer Flooding

This year, 10.1 per cent of all internal sewer flooding incidents were found through company reactive identification. This is a reduction compared to the previous year and is a result of there being fewer severe and hydraulic sewer flooding incidents, which are more likely to lead to the flooding of multiple neighbouring properties. The overall weather conditions have also been drier this year.

We also consider an element of the decrease to be attributable to a combination of our improved ability to proactively identify blockages, as a result of the deployment of our industry-leading Dynamic Network

Management (DNM) initiative, and resultant improved incident response times. Through these improvements we are able to clear blockages faster and thereby constrain the extent of flooding to a single property.

Line 3G.4 – Pollution Incidents

Data in Column 4 is sewer length reported in Water & Sewerage Company Environmental Performance Assessment (EPA) Methodology (version 9), Table 2.

Line 3G.5 – Sewer Collapses

We have no comments for this line.

Table 3H Summary information on Outcome Delivery Incentive Payments

Initial Calculation of in-period Revenue Adjustment by Price Control

This is a calculated table.

Table 3I Supplementary Outcomes Information

Unplanned or planned Outage

Line 3I.1 – Planned Outage

We have no comments for this line.

Risk of Severe Restrictions in Drought

Line 3I.2 – Risk of Severe Restrictions in Drought

In column 8 for 'total population supplied', the value is 7,270,439.

Risk of Sewer Flooding in a Storm

Line 3I.3 – Risk of Sewer Flooding in a Storm

We have no comment for this line.

Sewer collapses

Line 3I.4 – Number of patch repairs or relining undertaken on sewer and not included in reported sewer collapses

As we describe in Section 1.1 of the main APR document, we continue to develop and implement a wide variety of schemes and initiatives to improve our sewer collapse performance. These include the promotion of less disruptive 'no-dig' techniques for repairing sewers.

Table 4A Water bulk supply information

Bulk supply exports

Line 4A.1 – 4A.26 Bulk supply export volumes

The volume of raw water exported from Heronbridge has again decreased in the reporting year reflecting lower demand from Dwr Cymru. There has again been an increase in the number of exports this year associated with New Appointments and Variations (NAVs) and new developments which we expect to continue for the remainder of the AMP.

Sitch Lane and Llanforda have nil values due to them being emergency supply sites which are rarely used.

Bulk supply imports

Line 4A.27 – 4A.52 Bulk supply import volumes

Import volumes are slightly increased on the previous reporting year.
Note that there are supplies that have been recorded on the Bulk Supply Register for which no services have yet been provided in this year or in the prior year. For supplies where no operating costs have been incurred, they have been excluded from table 4A.

Table 4F Major project expenditure for wholesale water by purpose for the 12 months ended 31 March 2023

Major project capital expenditure by purpose

In accordance with RAG 4.11 Section 16.1, there are four projects which meet the definition of a major project. This includes:

- **Manchester & Pennine Resilience direct procurement for customers (DPC) project** (Line 4F.1)
- **Strategic water resource projects**, comprising of Water Trading - Joint Transfer (line 4F.2), Water Trading - UU Sources (line 4F.3) and Water Trading - Vyrnwy Aqueduct (line 4F.4)

Line 4F.11 – Total major project capital expenditure
Total major project capital expenditure for Wholesale Water is £3.666m lower in 2022/23 compared to 2021/22, reflecting progression of the projects. Water Resources has seen an increased level of expenditure of £1.233m attributed to water trading, which is offset by a lower level of expenditure on the Manchester & Pennine Resilience DPC project within Treated Water Distribution of £4.899m.

No major projects include a green recovery element.

Major project operating expenditure by purpose

There is no operating expenditure associated with major projects for Wholesale Water in 2022/23.

Table 4G Major project expenditure for wholesale wastewater by purpose for the 12 months ended 31 March 2023

Major project capital expenditure by purpose – Capital and operating expenditure

There are no projects in Wholesale Wastewater which meet the definition of a major project as per RAG 4.11 Section 16.1.

Table 4L Enhancement expenditure for the 12 months ended 31 March 2023 - water resources and water network+ -

The operating costs within this table reflect the spend profile associated with each enhancement scheme or water efficiency programme. For meeting lead standards, operating expenditure is in line with grants to customers for the replacements of their own private side lead pipes, whilst innovation competition operating

expenditure relates to spend incurred on projects funded through Ofwat's Innovation Competition ring-fenced pot.

All totex lines contained within this table are calculated values.

EA/NRW environmental programme (WINEP/NEP)

Line 4L.1 Ecological improvements at abstractions (capex)

This line has been populated with capital expenditure linked to programmes that are driven by statutory obligations agreed with the Environment Agency and included in the National Environment Programme.

The reduced levels of expenditure in the period 2022/23 is primarily due to the completion of the AMP6 Eels and Elvers - Windermere project and lower levels of spend on the Water Framework Directive (WFD) no-deterioration investigation.

Line 4L.2 Ecological improvements at abstractions (opex)

This line has been populated with expenditure linked to programmes that are driven by statutory obligations agreed with the Environment Agency and included in the National Environment Programme.

The increased levels of expenditure in the period 2022/23 are in relation to infrastructure removal schemes, and the spend profile associated with these schemes.

Line 4L.4 Eels Regulations (measures at intakes) (capex)

The reduced levels of expenditure in the period 2022/23 is primarily due to the completion of the AMP6 Eels and Elvers - Windermere project.

Line 4L.7 Invasive Non Native Species (capex)

There is a small amount of expenditure in this line relating to an Invasive Non Native species investigation project.

Line 4L.10 Drinking Water Protected Areas (schemes) (capex)

There is no expenditure associated with Drinking Water Protected Areas.

Line 4L.11 Drinking Water Protected Areas (schemes) (opex)

There is a small increase in year reflecting the spend profile of these schemes.

Line 4L.13 Water Framework Directive measure (capex)

There is no expenditure associated with Water Framework Directive.

Line 4L.16 Investigations (capex)

There is no expenditure associated with Investigations.

Line 4L.17 Investigations (opex)

The costs in relation to investigations has reduced year on year a result of the annual spend profile, and two schemes completing in year.

Supply-demand balance

Line 4L.22 Supply-side improvements delivering benefits in 2020-2025 (totex)

Expenditure is largely attributable to the new Williamsgate water treatment works, in relation to the West Cumbria Future Strategy project. This programme is now largely complete reflected by the lower level of activity in the reporting year. There is no allowance as this was included in the AMP6 allowance.

Line 4L.23 Demand-side improvements delivering benefits in 2020-2025 (excl leakage and metering) (capex)

The lower level of expenditure in the year is due to reduced spend on West Cumbria Future Strategy and Southport Demand Management Zone (DMZ) projects as nearing project completion.

Line 4L.24 Demand-side improvements delivering benefits in 2020-2025 (excl leakage and metering) (opex)

Slight decreased level of spend in the period attributable to the West Cumbria Future Strategy.

Line 4L.25 Demand-side improvements delivering benefits in 2020-2025 (excl leakage and metering) (totex)

The reported cumulative expenditure is primarily associated with the continued delivery of the West Cumbria Future Strategy project and the Alston and Spade Mill transfer pipeline. The West Cumbria Future Strategy project is reported as demand-side enhancement as it is a major capital project to resolve the forecast critical period and dry run year supply demand deficit in West Cumbria. In AMP7, the remaining work is associated with the treated water distribution network, which involves laying new network and slip-lining our existing distribution network across the West Cumbria region. The Alston and Spade Mill transfer pipeline is also designed to support demand management within the network. This programme is now largely complete reflected by the lower level of activity in the reporting year. There is no allowance as this was included in the AMP6 allowance.

Line 4L.26 Leakage improvements delivering benefits in 2020-2025 (capex)

The expenditure reported in Line 4L.26 relates to the completion of our leakage loggers investment.

In accordance with the 'Consultation on regulatory reporting for 2022-23 – response document', where a company has undertaken discretionary expenditure outside of their PR19 allowance this can be reported as enhancement provided that the expenditure delivered a step change in performance and is beyond that expected to be delivered through base expenditure.

- This investment is expected to achieve at least a 15% improvement on PR14 levels, demonstrating a step change in leakage performance across AMP7, which meets the definition of enhancement expenditure in RAG 4.11.
- This expenditure does not meet the definition of base expenditure which refers to 'maintaining the current level of service'. At PR19, we also claimed that meeting stretching leakage targets in AMP7 would require enhancement expenditure – the fact that Ofwat did not allow UUW to recover those costs as (additional) enhancement expenditure does not lessen the validity of these costs being enhancement expenditure. Our approach is also consistent with CMA's position on leakage enhancement expenditure.

Line 4L.29 Internal interconnectors delivering benefits in 2020-2025 (capex)

The increased level of expenditure in this line is wholly attributable to increased levels of activity on the West East Link Main (WELM) 150 Project.

Line 4L.31 Internal interconnectors delivering benefits in 2020-2025 (totex)

The increased level of expenditure in this line is largely attributable to increased levels of activity on the West East Link Main (WELM) 150 Project.

Line 4L.32 Supply demand balance improvements delivering benefits starting from 2026 (capex)

There is no expenditure associated with supply demand balance improvements starting from 2026.

Line 4L.37 Strategic regional water resources (totex)

The expenditure in this line relates to the three regional water resource projects:

- Joint transfer
- UU sources
- Vyrnwy Aqueduct

The strategic project expenditure on these three named Water Resources schemes has been reported line 4L.35 and listed individually in Table 4F. The expenditure on each of these schemes reflects the activity in the last financial year.

Expenditure is lower than the cumulative allowance due to delays caused by dry weather events.

Metering

Line 4L.39 New meters requested by existing customers (optants) (capex)

There has been a minor increase in Free Meter Options (FMO) reported activity in the year which is consistent with continued activity post the COVID-19 pandemic.

Line 4L.42 New meters introduced by companies for existing customers (capex)

There has been a cost allocation to this line in the 2022/23 period associated with new meters introduced by companies for existing customers and consistency of reporting with Table 6D.

Line 4L.45 New meters for existing customers – business (capex)

There has been a cost allocation to this line in the 2022/23 period associated with new meters for existing customers – business.

Line 4L.63 Total metering expenditure

Cumulative expenditure to date is lower than the allowed expenditure reflecting the lower levels of FMO activity in the early years of the AMP as a consequence of COVID 19 and lower uptake of FMO during this time.

Other enhancement

Line 4L.66 Improvements to taste, odour and colour (totex)

The adverse variance compared to the allowed expenditure is the consequence of the increased levels of activity on our Taste and Odour projects. These include Granulated Activated Carbon (GAC) projects at Castle Carrock and Mitchells. This line is also capturing additional expenditure relating to further reducing Taste, Smell and Appearance issues for our customers, this includes the early stages of the relining project at Vyrnwy and a programme of cast iron mains replacement. These are additional enhancement programmes that were not part of our PR19 submission.

Line 4L.67 Addressing raw water deterioration (grey solutions) (capex)

The lower level of expenditure in the 2022/23 period is wholly attributable to the completion of the Oswestry WTW AMP6 Water Quality Improvements project.

Line 4L.72 Addressing raw water deterioration (green solutions) (totex)

This is a new expenditure reporting line in the 2022/23 period and covers the Catchment Peatland Restoration project reported in table 4S.

Line 4L.78 Improvements to river flow (totex)

There is no expenditure associated with "Improvements to river flows."

Line 4L.79 Enhancing resilience to low probability high consequence events (capex)

The reduced spend in this reporting line in the 2022/23 period is wholly associated with the Alston Spade Mill Transfer Pipeline project.

Line 4L.84 Conditioning water to reduce plumbosolvency (totex)

There is no expenditure associated with "Conditioning water to reduce plumbosolvency".

Line 4L.85 Lead communication pipes replaced or relined for water quality (capex)

The increased expenditure in the 2022/23 period reflects the increased levels of activity in the year on the lead and/or common supply pipe replacement scheme (LCSP) and a proportional reallocation of capex costs from IRE.

Line 4L.89 Other lead reduction related activity (opex)

There is no expenditure associated with other lead reduction related activity**.**

Line 4L.93 Meeting lead standard (totex)

Our cumulative expenditure exceeds our cumulative allowed expenditure due to higher activity volumes in relation to our lead communication pipe replacement ODI scheme. Under the ODI for lead communication pipe replacement, we were granted an incentive rate of £1,120 (17/18 prices) which is equivalent to a replacement cost of £2,240 (17/18 prices) or £2,683 in real terms (22/23 prices).

Our actual unit cost for the work completed in AMP7 to date is £2,634 (22/23 prices) and below the real allowed unit cost.

Line 4L.94 Security – SEMD (capex)

This line includes expenditure required to comply with security enhancement obligations under the Security and Emergency Measures Direction (SEMD). The lower levels of spend in the year reflects the completion of the AMP6 programme of works.

Line 4L.97/4L.98 Security - Non-SEMD (capex)

There is no expenditure associated with Security – Non – SEMD.

Line 4L.100 Innovation Competition (capex)

Expenditure incurred on projects awarded as part of the innovation competition fund, for 2022/23 these include Industrial Symbiosis, Alternative Phosphorus (Natural Coagulants) and Catchment Systems Thinking Cooperative projects.

Line 4L.101 Innovation Competition (opex)

Expenditure incurred on projects awarded as part of the innovation competition fund, for 2022/23 this related to "Industrial Symbiosis".

Line 4L.102 Concessionary Supplies (capex)

The expenditure relates to a DWI regulatory commitment to improve the water supply at a number of Concessionary supply sites. This meets the definition of enhancement as it increases the current level of service being provided to these sites. This is consistent with AMP6 reporting, where investment in Concessionary Supplies has been classified as enhancement.

Table 4M Enhancement expenditure for the 12 months ended 31st March 2023 - wastewater network+ and Bioresources

The incremental operating costs from the capital schemes, whether positive or negative, have been included against the relevant programme.

All totex lines contained within this table are calculated values.

EA/NRW environmental programme (WINEP/NEP)

Line 4M.1 Conservation drivers (capex)

There is a small amount of expenditure on this line associated with projects with a Conservation driver.

Line 4M.4 Event Duration Monitoring (EDM) at intermittent discharges (capex)

The higher levels of expenditure above the cumulative allowed expenditure to the reporting year reflects the revised profiling of the EDM portfolio in the earlier years of the AMP.

Line 4M.7 Flow monitoring at sewage treatment works (capex)

The increased spend in the 2022/23 period is primarily due to increased levels of activity on the Flow Programme.

Line 4M.10 Schemes to increase flow to full treatment (capex)

The increased spend in the in the 2022/23 period is wholly attributable to the Burnley project.

Line 4M.13 Schemes to increase storm tank capacity (capex)

The higher levels of expenditure above the cumulative allowed expenditure to the reporting year end reflects the accelerated levels of activity in the programme on a number of high value schemes.

Line 4M.14 Schemes to increase storm tank capacity (opex)

Expenditure in this line is higher in the 2022/23 period reflecting the full year impact of projects completed in the previous year plus Worsley coming into use in December 2022.

Line 4M.16/4M.17 Schemes to provide additional effective storage at sewage treatment works through green infrastructure.

There is no expenditure associated with Schemes to provide additional effective storage at sewage treatment works through green infrastructure.

Line 4M.19 Storage schemes to reduce spill frequency at CSOs, storm tanks, etc (capex)

Expenditure in this line is higher than in the 2022/23 period due to increased activity on three high value schemes.

Line 4M.22 Effective storage in the network to reduce spill frequency at CSOs etc (green solutions) (capex)

Costs are wholly attributable to the Sustainable Drainage Solutions project which is reported in Table 4T.

Line 4M.25 Total for storage schemes in the network to reduce spill frequency at CSOs etc (grey + green) (totex)

The higher levels of expenditure above the cumulative allowed expenditure to the reporting year reflects the increased levels of activity in the programme on a number of high value schemes. This line also includes expenditure related to the Green Recovery CSO scheme (BRY0002) and some expenditure to complete AMP6 schemes which was not included in the allowances.

Line 4M.26 Chemical removals schemes (capex)

There is no expenditure associated with Chemical removals schemes.

Line 4M.29 Chemicals monitoring/ investigations/ options appraisals (capex)

Expenditure in this line is higher than in the 2022/23 period due to increased activity on the CIP3 Quality Investigations programme.

Line 4M.32 Nitrogen removal (capex)

There is no expenditure associated with Nitrogen removal schemes.

Line 4M.35 Phosphorus removal (capex)

Expenditure in this line is higher than in the 2022/23 period reflecting the higher levels of activity in the delivery of the AMP7 regulatory projects.

Line 4M.36 Phosphorus removal (opex)

Expenditure in this line is higher in the 2022/23 period reflecting the full year impact of projects completed in the previous year plus Alsager, Chorley, Cotebrook, Gawesworth, Glazebury, Horwich, Leigh, Tyldesley and Worsley coming into use during 2022/23.

Line 4M.37 Phosphorus removal (totex)

The higher levels of expenditure above the cumulative allowed expenditure to the reporting year end reflects the higher levels of activity in the delivery of the AMP7 regulatory projects together with the impact of costs incurred to complete AMP6 projects as shown in table 7F.

Line 4M.38 Reduction of sanitary parameters (capex)

The higher levels of expenditure above the cumulative allowed expenditure to the reporting year end reflects the increased levels of activity in the programme on a number of high value schemes.

Line 4M.39 Reduction of sanitary parameters (opex)

The reduction in this line is lower in the 2022/23 period reflecting the full year impact of projects completed in the previous year plus Alsager and Worsley coming into use during 2022/23.

Line 4M.41 UV disinfection (or similar) (capex)

The adverse variance compared to the allowance on the UV disinfection (or similar) programme is due to increased costs to complete the Carlisle scheme.

Line 4M.42 UV disinfection (or similar) (opex)

Expenditure in this line is higher in the 2022/23 period due to inflation.

Line 4M.44 Investigations (capex)

Expenditure in this line lower than the 2021/22 period reflecting the reallocation of schemes from investigations to specific regulatory drivers.

Other enhancement

Line 4M.48 Growth at sewage treatment works (excluding sludge treatment) (capex)

Expenditure in this line is higher in the 2022/23 period as a consequence of additional investment on the Leyland project.

Line 4M.51 Reduce flooding risk for properties (capex)

This line includes all expenditure incurred by the company to minimise the risk of flooding within the region.

Line 4M.54 First time sewerage (capex)

Expenditure in this line is lower in the 2022/23 period due to less expenditure on a project which completed in the previous year.

Line 4M.57 Sludge enhancement (quality) (capex)

Expenditure in this line is below the 2021/22 period reflecting the completion of previously high value schemes in earlier years consistent with their regulatory output requirements.

Line 4M.60 Sludge enhancement (growth) (capex)

There is no expenditure associated with Sludge enhancement (growth) schemes.

Line 4M.63 Odour (capex)

There is no expenditure associated with Odour schemes.

Line 4M.66 Enhancing resilience to low probability high consequence events (capex)

There is no expenditure associated with enhancing resilience to low probability high consequence events.

Line 4M.69 Security – SEMD (capex)

There is no expenditure associated with Security – SEMD schemes.

Line 4M.72 Security - Non-SEMD (capex)

There is no expenditure associated with Security - Non-SEMD schemes.

Line 4M.75 NEP Discharge Relocation (capex)

There is a small amount of expenditure on this line associated with Discharge Relocation.

Line 4M.77 NEP requirement for bathing water shellfish driver delivered through long sea outfall or increased FTFT (capex)

The higher levels of expenditure above the cumulative allowed expenditure to the reporting year end reflects the increased levels of activity in the programme and is wholly attributable to the completion of the AMP6 Blackburn & Darwen project.

Line 4M.78 NEP requirement for bathing water shellfish driver delivered through long sea outfall or increased FTFT (opex)

Expenditure in this line is higher in the 2022/23 period reflecting the full year impact of the Blackburn and Darwen project completed in the previous year.

Line 4M.79 Innovation Competition (capex)

Expenditure incurred on projects awarded as part of the innovation competition, for FY23 these are made up of “Industrial Symbiosis”, “Sewer AI (WRC)” and “Alternative P (Natural Coagulants)”.

Line 4M.80 Innovation Competition (opex)

Expenditure incurred on projects awarded as part of the innovation competition, for 2022/23 this related to “Industrial Symbiosis”.

Line 4M.81 NEP phase 5 WFD schemes - treatment increased storage or investigations (capex)

There is no expenditure associated with NEP phase 5 WFD schemes - treatment increased storage or investigations.

Line 4M.83 WINEP / NEP - Eels Regulations (measures at outfalls) (capex)

There is no expenditure associated with WINEP / NEP - Eels Regulations (measures at outfalls) schemes.

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

Connections volume data

Line 4Q.1 New connections (residential – excluding NAVs), Line 4Q.2 New connections (business – excluding NAVs)

The number of new residential connections is circa 16,500 which is circa 10,000 lower than business plan anticipated volumes. We believe overall demand for new properties has declined due to cost of living pressures. Higher cost of living means lower disposable income and potentially lower number of buyers. High inflation rates mean higher mortgage rates, which may put people off buying.

For wastewater connections we do not explicitly track or record new connections to the sewer network. All new connections are carried out by developer or their agents, not us, and we are not notified of all new connections to sewers. Connection can be made direct to the sewer, an existing drain or adoptable network. On the basis that each new property with a water connection will usually need separate drainage for foul and surface water, we have allowed two connections per property. We have then applied a small reduction factor for water only connections e.g. (existing properties) and foul only connections (e.g. water to soakaway).

Line 4Q.3 Total new connections served by incumbent

This is a calculated line.

Line 4Q.4 New connections – SLPs

The majority of new connections are undertaken by SLP's

Properties volume data

Line 4Q.5 New properties (residential - excluding NAVs), Line 4Q.6 New properties (business - excluding NAVs)

The number of new properties at circa 23,000 is lower than the previous year.

Line 4Q.7 Total new properties served by incumbent

This is a calculated line.

Line 4Q.8 9 New residential properties served by NAVs, Line 4Q.9, New business properties served by NAVs, Line 4Q.10 Total new properties served by NAVs

These are new lines for AMP7. We have reported the numbers available to us but recognise that as we are reporting on customers connected to another company's network we are reliant on NAV's providing accurate information. As more NAV sites are granted, the assumptions being made will potentially reduce confidence in the data being reported.

Line 4Q.11 Total new properties

This is a calculated line.

Line 4Q.12 New properties – SLP connections

We have no comments for this line.

New water mains data

Line 4Q.13 Length of new mains (km) – requisitions
Line 4Q.14 Length of new mains (km) – SLPs

We have over 155km of new mains – the majority, 140km, are laid by SLP's.

Table 4R Connected properties, customers and population

Customer numbers - average during the year

Line 4R.1 Residential water only customers, Line 4R.2 Residential wastewater only customers, Line 4R.3 Residential water and wastewater customers

There has been an overall increase of circa 26,000 customers. This is largely attributable to the number of new connections and the ongoing work as part of the Voids performance commitment. See section 1.1 of the main APR for further details:

unitedutilities.com/globalassets/documents/pdf/united-utilities-annual-performance-report-2022-23

Line 4R.4 Total residential customers

This is a calculated line.

Line 4R.5 Business water only customers, Line 4R.6 Business wastewater only customers, Line 4R.7 Business water & wastewater customers, Line 4R.8 Total business customers

There has been a small increase of circa 2,000 business customers.

Line 4R.9 Total customers

This is a calculated line.

Property numbers - average during the year

Residential properties

Line 4R.10 – Residential properties billed

The average number of households billed for water has increased by circa 24,000 which is due to the number of new properties and our continued targeted work towards the voids performance commitment. See section 1.1 of the main APR for further details.

Line 4R.11 - Residential void properties

The average number of void properties is broadly similar the previous year.

Line 4R.12 Total connected residential properties

This is a calculated line.

Business Properties
Line 4R.13 Business properties billed

The average number of business properties billed for water is broadly similar to 2021/22.

Line 4R.14 Business void properties

The average number of void business properties billed for water has decreased by circa 5,000. This is due to the performance of the Gap Sites and Vacancy incentive performance commitments.

Line 4R.15 Total connected business properties

This is a calculated line

Line 4R.16 Total connected properties

This is a calculated line

Property and meter numbers - at end of year (31st March)

Line 4R.17 Total new residential properties connected in year, Line 4R.18 Total new business properties connected in year

There are no new unmeasured properties – all new properties will be measured.

Line 4R.19 Residential properties billed at year end

We have reported the number properties billed for water. This includes properties billed for water and wastewater and properties billed for water only.

Line 4R.20 Residential properties unbilled at year end

We do not have any unbilled accounts at year end. All active accounts in our billing system are liable to be charged and a bill issued to the customer.

Line 4R.21 Residential void properties at year end

We have seen a further significant reduction on void property numbers which is largely due to the performance within the voids performance commitment.

Line 4R.22 Total connected residential properties at year end

This is a calculated line.

Line 4R.23 Business properties billed at year end

There has been a small reduction from 2021/22.

Line 4R.24 Business properties unbilled at year end

We identify eligible business premises in line with the Ofwat eligibility guidance. All premises deemed eligible will be registered in the non-household market and wholesale charges will be raised accordingly. If the criteria is not met, a premises would not be registered in the market and therefore we do not have any unbilled non-household premises. Exceptions to this rule would be gap sites, which by their very nature means we are unaware of them and therefore do not bill.

Line 4R.25 Business void properties at year end

The number of void properties at year end has decreased by circa 5,000 reflecting the work done on business voids and gap sites.

Line 4R.26 Total connected business properties at year end

This is a calculated line.

Line 4R.27 Total connected properties at year end

This is a calculated line. There has been an overall increase of circa 9,000.

Population data

Our population continues to grow steadily year on year. This growth is a combination of expected regional growth and an improvement in data quality as a result of improvements to the accuracy of the area mapping data used to assign population.

Line 4R.28 Resident population

The resident population has increased by circa 32,000 an increase of circa 0.4 per cent over the previous reporting period.

There was a small increase in resident population from last year to this year. A population increase is expected each year, therefore this is in line with expectation. It is an increase of 0.44% which is in line with historic range. There has been a deviation between the ONS and Edge Analytics estimate, this is due to the 2021 census which will have started to impact the data. We saw a similar jump in difference in 2012.

Line 4R.29 Non-Resident population

The number of non-residents continues to grow steadily. This data has a lower confidence grade as it is an extrapolation from a small data set.

Line 4R.30 Household population
Line 4R.31 Measured household population
Line 4R.32 Unmeasured household population

Overall household population as increased by 0.72% or circa 51,000. Measured population has increased by circa 100,000 and unmeasured has decreased by circa 50,000.

Non-resident population is not used in the calculation and is reported as zero.

Table 4S Green recovery expenditure for the 12 months ended 31 March 2023 - water resources and water network+ - Finance

A detailed overview of our Green recovery activity and expenditure for 2022/23 can be found in our Green recovery progress report at:

unitedutilities.com/globalassets/documents/pdf/green-recovery-2023

Table 4T Green recovery expenditure for the 12 months ended 31 March 2023 - wastewater network+ and bioresources Finance

A detailed overview of our Green recovery activity and expenditure for 2022/23 can be found in our Green recovery progress report at:

unitedutilities.com/globalassets/documents/pdf/green-recovery-2023

Table 4U Impact of Green recovery on RCV

Line 4U.1 Approved bid

The Green recovery allowance for 2022/23 as issued by Ofwat on 7 June 2022 within document 'UUW Enh by year (revised)_07.06.22'.

Line 4U.2 Actual totex

Calculated as the sum of lines 4S.15 and 4T.15.

Line 4U.3 – 4U.5 Variance

In 2022/23, Green recovery spend of £5.3 million is below the planned profile of £8.3 million. The majority of spend incurred to date relates to the 'define phase' to progress the development of solutions and negotiation of new commercial agreements, which has taken longer than originally anticipated. Contracts are now in place or commercial discussions are progressing and we do not anticipate this to have an impact on overall project delivery, with the exception of WINEP investments at Bury, as completion of the project may be delayed until 2025/26. We continue to look for opportunities to recover the position and bring spend back into the current AMP.

Underspend is classified as timing, as we expect equivalent increases in green recovery spend later in this AMP (and 2025/26 for WINEP investments at Bury).

A detailed overview of our Green recovery activity and expenditure for 2022/23 and future can be found at: unitedutilities.com/globalassets/documents/pdf/green-recovery-2023

Line 4U.6 – 4U.11 Customer cost sharing rate

As per the 'Green economic recovery: Final decisions' document published by Ofwat. Given the uncertainty over the true costs of the innovative schemes, underspend will be subject to a 90 (customer share):10 (company share) sharing rate, to ensure underspend variances are weighted heavily in customers' favour, while still providing companies with an incentive to act efficiently. Overspend is subject to an equal 50/50 share between customers and the company**.**

Line 4U.13

In-period funding does not apply to our Green recovery programme.

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

Water resources

Line 5A.1 – Water from impounding reservoirs

This number is consistent with last year

Line 5A.2 – Water from pumped storage reservoirs

We do not have any pumped storage reservoirs

Line 5A.3 – Water from river abstractions

This number is consistent with last year

Line 5A.4 – Water from groundwater works, excluding managed aquifer recharge (MAR) water supply schemes

This number is consistent with last year

Line 5A.5 – Water from artificial recharge (AR) water supply schemes, Line 5A.6 – Water from aquifer storage and recovery (ASR) water supply, Line 5A.7 – Water from saline abstractions and Line 5A.8 – Water from water reuse schemes

We do not currently have any of these schemes therefore the number is zero.

Line 5A.9 – Number of impounding reservoirs

The number of impounding reservoir sources varies from year to year depending on weather, demand and asset outages. The number reported has increased to 53 this year from 48 in 2021/22.

As per the Ofwat guidance for 5A.17: -

- A source is defined as an independent raw water supply that directly supplies a treatment works.
- Standby or mothballed sources from which no water has been obtained in the year should not be included.

Line 5A.10 – Number of pumped stored reservoirs

We have not currently classed any of our reservoirs as pumped storage reservoirs therefore the number is zero.

Line 5A.11 – Number of river abstractions

The number of sources varies from year to year depending on weather, demand and asset outages. We have reported 24 river abstractions in this year compared to 25 in 2021/22.

Line 5A.12 – Number of groundwater works excluding managed aquifer recharge (MAR) water supply schemes

The number of sources varies from year to year depending on weather, demand and asset outages. This year we used 69 sources compared to 71 in the previous year.

Line 5A.13 – Number of artificial recharge (AR) water supply schemes
Line 5A.14 – Number of aquifer storage and recovery (ASR) water supply schemes
Line 5A.15 – Number of saline abstraction schemes
Line 5A.16 – Number of reuse schemes

We do not currently have any of these schemes therefore the number is zero.

Line 5A.17 – Total number of sources

The number of sources varies from year to year depending on weather, demand and asset outages. The overall number reported is broadly similar to the previous year although the assets operated differ.

Line 5A.18 –Total number of water reservoirs

This year we are reporting a total number of 162 water reservoirs due to the exclusion of three balancing reservoirs.

Line 5A.19 – Total volumetric capacity of water reservoirs

The number compared with last year has decreased slightly due to the exclusion of three balancing reservoirs.

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

There has been no change to the number of intake and source pumping stations.

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

The slight increase in capacity is due to updates to corporate data.

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

There has been a decrease in the length of raw water abstraction mains and other conveyors. This is due to updated GIS information following a data cleanse.

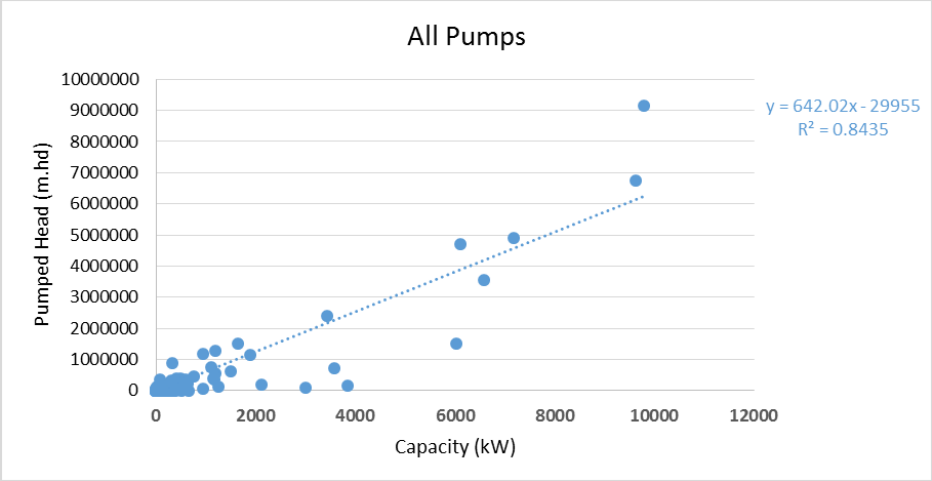
Line 5A.23 – Average pumping head – raw water abstraction

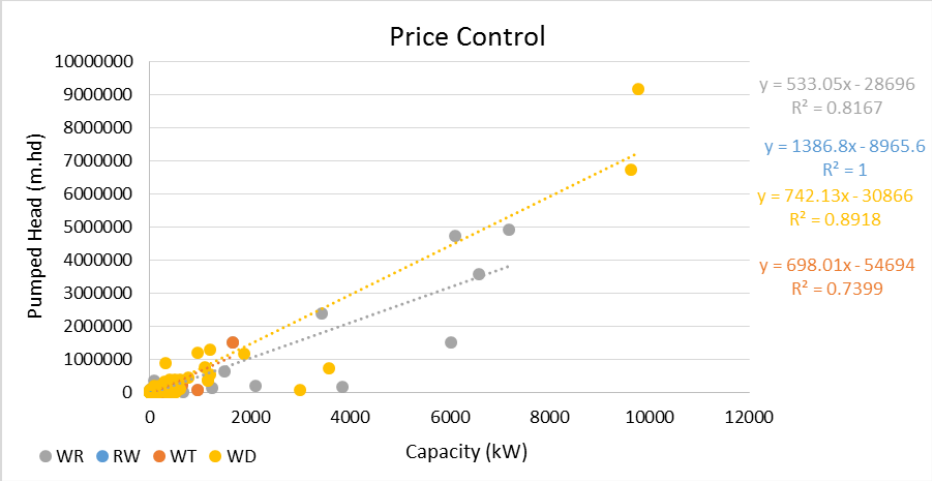
In response to the Turner and Townsend and WRc 'Average Pumping Head: data quality improvement' report in March 2022, a review of the Average Pumping Head (APH) methodology was carried out for this reporting year. In previous reporting years a number of sites (up to 63 per cent) were being excluded due to the nature of the calculation and estimation methods. This means that the value for APH for all four price controls (raw water abstraction, raw water distribution, water treatment and treated water distribution) was being under reported, to a significant degree in some cases. APH is not used internally to make operational decisions, but following the Turner and Townsend report and recommendations we have taken the opportunity to review our methodology in line with the rest of the industry.

This year, in order to infer data for the remaining assets in line with the recommendations, an additional estimation was applied based on typical values of similar assets. This has helped to provide a more representative view of the APH for each price control, proportional to the volumes of water distributed.

The inference of data was based on the kW capacity of the asset, in line with the hierarchy set out in the Turner and Townsend report. Before carrying out the analysis, the strength of the relationship between capacity and pumped head was tested using a scatter plot (excluding assets with 'Missing' data). There was a strong correlation between the two variables with the R^2 value being 0.84 for all assets, and at least 0.73 when split by price control (as there is limited data for raw water transport due to a small number of pumping stations, this gives an R^2 value of 1.00). Therefore, it was reasonable to assume that the remaining pumps with missing data

could be inferred using this relationship between capacity and pumped head, using typical values of similar assets.





The inclusion of the additional pumps has increased the reported value for APH in 2022/23 (see chart below)

Price Control	2021/2022 APH reported values	2022/23 APH reported values
Raw Water Abstraction	8.96 m.hd	10.76 m.hd
Raw Water Transport	18.11 m.hd	21.90 m.hd
Water Treatment	4.20 m.hd	12.75 m.hd
Treated Water Distribution	53.82 m.hd	71.95 m.hd

The change in methodology has materially impacted the reported APH values for Water Treatment and Treated Water Distribution Price because more pumps are now included in the calculation. Across all price controls, 95.8 per cent of pumps are being included in the calculation, which is an increase of 32.8 per cent compared to the previous 63 per cent of assets. In line with our published assurance framework this approach has been assured by our Technical Auditor, Jacobs.

As noted in the Turner and Townsend report, the calculation of APH relies heavily on estimation and extrapolation of data. It is assumed that pumps with no data will have similar activity as pumps with data that are of a similar size.

Before the next reporting year, a further validation of the estimation method will be undertaken. This will include additional checks of sites, reviewing and updating asset details (e.g. height, destination and meter reference information) to the corporate data system and the APH calculation model and carry out any necessary site or telemetry improvements. As more assets have their data updated, the APH will change without there necessarily being any change in the operation of sites.

Following our additional checks we will look to review and restate previous year's data.

The additional estimation has impacted the percentage of APH that is derived from measured data:

For the Raw Water Abstraction price control:

- 0 per cent of sites have measured data for lift **and** volume. These sites contribute 0 per cent of the APH for the price control.
- 63 per cent of sites have measured data for lift **or** volume. These sites contribute 86 per cent of the APH for the price control.
- Where measured data is not available, estimations are used. Static ground level measurements and the standard hydraulic formula are used to estimate lift and network demand data is used to estimate volume. Where these estimation methods are not available, typical values are used based on similar assets.

Variance between 2021/22 and 2022/23

As well as the increase in APH due to the revised methodology, there has been changes in the value of APH for raw water abstraction due to operational changes such as the increased use of Franklaw to support the Thirlmere transfer and the commissioning of the new assets as part of the West Cumbria supplies project.

Variance between 2022/23 and FBP forecast

The 2022/23 APH is higher than the business plan forecast. This is due to changes to our methodology since we submitted our business plan forecasts. Also our water network is a dynamic system and operation of sources and pumps differs depending on a number of variables such as changes in demand, weather, how much we abstract from different sources and operational changes to assets to ensure we meet demand in the most efficient way.

Line 5A.24 – Energy consumption - raw water abstraction, Line 6A.7 Energy consumption - raw water transport, Line 6A.32 Energy consumption - water treatment and Line 6B.23 Energy consumption – treated water distribution

In 2020/21 the reporting lines were changed, splitting water into abstraction, transport, treatment and distribution. Reported volumes prior to this year therefore cannot be compared.

This year we have seen that Water Wholesale (which includes abstraction, transport, treatment and distribution) has seen an increase of 4.5% from 2021/22 to 2022/23. Overall energy consumption in 2021/22 was 349,164 MWh and in 2022/23 it was 364,910 MWh.

The main contributor of this energy increase was an increase electricity usage of 17,664 MWh. Water Resources and Raw Water Transport combined saw an increase in electricity usage year on year of 14% and this was largely due to a dry weather event which required increased water resource pumping.

Stationary and transport fuel use declined slightly (circa 2 GWh); in 2021/22 consumption combined was 23,826 MWh and in 2022/23 consumption combined was 21,938 MWh.

Line 5A.25 – Total number of raw water abstraction imports,
Line 5A.26 – Water imported from 3rd parties' raw water abstraction systems

We do not currently have any raw water abstraction imports.

Line 5A.27 – Total number of raw water abstraction exports and
Line 5A.28 – Water exported to 3rd parties' from raw water abstraction systems

We have one raw water abstraction export at Heronbridge. The volume of raw water exported from Heronbridge has again decreased in the reporting year reflecting lower demand from Dwr Cymru.

Line 5A.29 – Water resources capacity (measured using water resources yield)

The total capacity company forecast is based on the summation of the individual capacities for each of the UU water resource zones. This is consistent with last years reported figure.

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

This is a new reporting line for 2022/23. There are 25 WINEP investigations that have been completed so far in 2021/22 and 2022/23. The number of completed WINEP investigations will not change going forward, as all the investigations that were agreed to be delivered in AMP7 have now been completed.

Table 5B Water resources operating cost analysis for the 12 months ended 31 March 2023

Line 5B.1 – Power

All energy costs, including the climate change levy and the carbon reduction commitment.

Where possible costs are allocated down to supply point level and therefore the associated asset class within the Water Resources price control. In comparison to 2021/22 power costs have increased which is mainly attributable to an increase in power price and increased river abstraction and use of boreholes.

Line 5B.2 – Income treated as negative expenditure

Income received from Renewable Obligation Certificates, Gas Exports and Electricity Exports. There is minimal value allocated to Water Resources.

Line 5B.3 – Abstraction charges/ discharge consents

Total cost of abstraction charges and service charges from the Environment Agency (EA), Canal & River Trust and Severn Trent (service charge for use of Vyrnwy). For EA abstraction charges the costs are individually listed by each licence and therefore the associated Water Resource asset types, using this information, a percentage of total cost for each water resource category is calculated. In 2022/23 there has been an increase in charges from the EA due to implementation of a new charging scheme.

Line 5B.4 – Bulk supply

In line with the updated guidance in the RAGs, bulk supply import costs are allocated across upstream services in proportion to total cost of the supplying company (previously all bulk supply costs were reported in Treated Water Distribution). For 2022/23 the cost has been allocated to the asset category of the supplying company which drives the water resource allocation as opposed to the water supply source.

Line 5B.5 – Renewals expensed in year (Infrastructure)

Increased cost have been incurred in the Impounding Reservoir IRE programme compared to last year reflecting the project specific construction activity.

Line 5B.6 – Renewals expensed in year (Non-Infrastructure)

We have not included any expenditure within this line.

Line 5B.7 – Other operating expenditure excluding renewals

Sum of all costs in the Water Resources price control. The costs have increased when compared to 2021/22 due to dry weather incident costs and other provisions. Provisions have been allocated to the asset they directly relate to where applicable.

Line 5B.8 – Local authority and Cumulo rates

The cost of local Cumulo rates are allocated based on the total of the Central List (Cumulo) Rates payments which are then allocated to upstream services and water resource asset type on a proportionate basis to GMEAV of all Water Assets (both Infrastructure and Non-Infrastructure). Costs are consistent year on year.

Line 5B.9 – Total operating expenditure (excluding 3rd party)

This is a calculated line.

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

Raw water transport and storage
Line 6A.1 - Total number of balancing reservoirs

There has been no change in the number compared with last year.

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

There has been no change in the number compared with last year.

Line 6A.3 Total number of raw water transport stations

There has been no change in the number compared with last year.

Line 6A.4 Total installed power capacity of raw water transport pumping stations

There has been a slight increase due to updated corporate data.

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

There has been an increase in the length of raw water transport mains and other conveyors. This is due to the addition of over 50km of main as part of the West Cumbria supplies scheme.

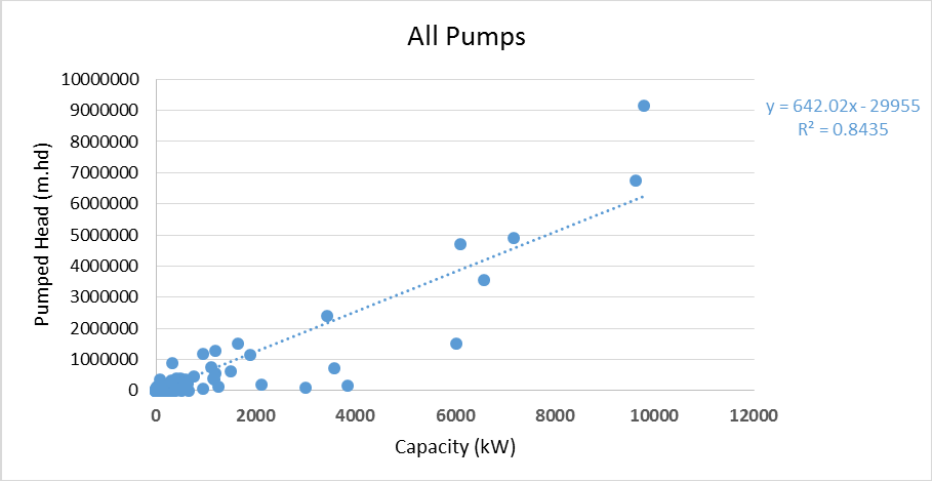
Line 6A.6 Average pumping head - raw water transport

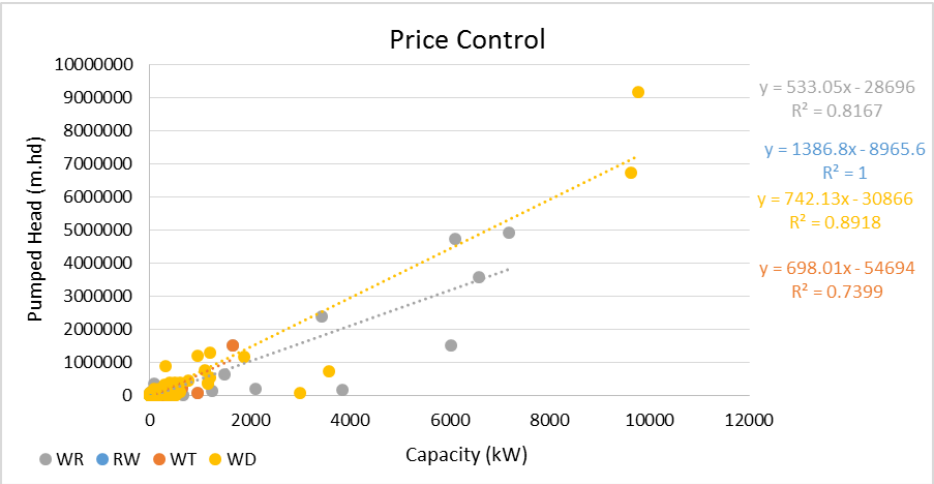
In response to the Turner and Townsend and WRc 'Average Pumping Head: data quality improvement' report in March 2022, a review of the Average Pumping Head (APH) methodology was carried out for this reporting year. In previous reporting years a number of sites (up to 63 per cent) were being excluded due to the nature of the

calculation and estimation methods. This means that the value for APH for all four price controls (raw water abstraction, raw water distribution, water treatment and treated water distribution) were being under reported, to a significant degree in some cases. APH is not used internally to make operational decisions, but following the Turner and Townsend report and recommendations we have taken the opportunity to review our methodology in line with the rest of the industry.

This year, in order to infer data for the remaining assets in line with the recommendations, an additional estimation was applied based on typical values of similar assets. This has helped to provide a more representative view of the APH for each price control, proportional to the volumes of water distributed.

The inference of data was based on the kW capacity of the asset, in line with the hierarchy set out in the Turner and Townsend report. Before carrying out the analysis, the strength of the relationship between capacity and pumped head was tested using a scatter plot (excluding assets with 'Missing' data). There was a strong correlation between the two variables with the R^2 value being 0.84 for all assets, and at least 0.73 when split by price control (as there is limited data for raw water transport due to a small number of pumping stations, this gives an R^2 value of 1.00). Therefore, it was reasonable to assume that the remaining pumps with missing data could be inferred using this relationship between capacity and pumped head, using typical values of similar assets.





The inclusion of the additional pumps has increased the reported value for APH in 2022/23 (see chart below)

Price Control	2021/2022 APH reported values	2022/23 APH reported values
Raw Water Abstraction	8.96 m.hd	10.76 m.hd
Raw Water Transport	18.11 m.hd	21.90 m.hd
Water Treatment	4.20 m.hd	12.75 m.hd
Treated Water Distribution	53.82 m.hd	71.95 m.hd

The change in methodology has materially impacted the reported APH values for Water Treatment and Treated Water Distribution Price because more pumps are now included in the calculation. Across all price controls, 95.8 per cent of pumps are being included in the calculation, which is an increase of 32.8 per cent compared to the previous 63 per cent of assets. In line with our published assurance framework this approach has been assured by our Technical Auditor, Jacobs.

As noted in the Turner and Townsend report, the calculation of APH relies heavily on estimation and extrapolation of data. It is assumed that pumps with no data will have similar activity as pumps with data that are of a similar size.

Before the next reporting year, a further validation of the estimation will be undertaken. This will include additional checks of sites, reviewing and updating asset details (e.g. height, destination and meter reference information) to the corporate data system and the APH calculation model and carry out any necessary site or telemetry improvements. As more assets have their data updated, then the APH will change without there necessarily being any change in the operation of sites.

Following our additional checks we will look to review and restate previous year's data.

The additional estimation has impacted the percentage of APH that is derived from measured data:

For the Raw Water Transport price control:

- 2 per cent of sites have measured data for lift **and** volume. These sites contribute 0 per cent of the APH for the price control.
- 77 per cent of sites have measured data for lift **or** volume. These sites contribute 99 per cent of the APH for the price control.
- Where measured data is not available, estimations are used where possible. Static ground level measurements and the standard hydraulic formula are used to estimate Head and network demand data is used to estimate Flow. Where these estimation methods are not available, typical values are used based on similar assets.

Variance between 2021/22 and 2022/23

There has been an increase in raw water transport pumping head in the reporting year. As well as the increase in APH due to the revised methodology, there has been changes in the value of APH for raw water transport due to operational changes such as the increased use of the Windermere intake pumps and Caton intake pumps to support the Thirlmere transfer and the commissioning of the new assets as part of the West Cumbria Supplies Project.

Variance between 2022/23 and FBP forecast

The 2022/23 APH is higher than the business plan forecast. This is due to changes to our methodology since we submitted our business plan forecasts. Also our water network is a dynamic system and operation of sources and pumps differs depending on a number of variables such as changes in demand, weather, how much we abstract from different sources and operational changes to assets to ensure we meet demand in the most efficient way.

Line 6A.7 Energy consumption - raw water transport

See commentary for Line 5A.24

Line 6A.8 Total number of raw water transport imports, Line 6A.9 Water imported from 3rd parties' raw water transport systems, Line 6A.10 Total number of raw water transport exports, Line 6A.10 Total number of raw water transport exports and Line 6A.11 Water exported to 3rd parties raw water transport systems

We do not have any imports/exports to/from 3rd parties' raw water transport systems.

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

There has been a slight decrease compared with the previous year. One raw water customer has been deregistered from the market and the associated length of mains removed from this category.

Water treatment - treatment type analysis

We are required to report water treatment works that have not been used in the year but have not been decommissioned. The water treatment works in the table below have not been used in the year because they were not required to meet demand.

Site	Treatment type	Site	Treatment Type
Bickerstaffe WTW	GW2	Netherley WTW	GW2
Blundell House WTW	GW2	Springfield WTW	GW2
Buttermere WTW	SW4	Tosside WTW	GW1
Daresbury WTW	GSD	Walton WTW	GSD
Mill Brow WTW	GW3	Water Lane WTW	GSD
Mow Cop WTW	GSD	Heaton Park WTW	SW1

Line 6A.13 All simple disinfection works

We have no surface water simple disinfection works. The volume of water treated at ground water simple disinfection works was slightly above the previous year.

Line 6A.14 W1 works

None of our WTWs fall into the ground or surface water W1 category.

Line 6A.15 W2 works

There has been an increase in water treated at surface water sites (+95.93Ml), which is primarily driven by increased flows from Woodgate Hill WTW. There has also been a slight increase in groundwater production (+5.74Ml).

Line 6A.16 W3 works

This year we have seen an increase in production volumes at surface water sites (+47.07Ml), primarily at Watchgate and Lostock.

Line 6A.17 W4 works

Incremental decrease at Surface water sites

Line 6A.18 W5 works

Decrease in production at W5 sites. This is partly attributable to recommissioning of Quarry Hill as Quarry Hill - Scales (a change from W5 to W4). Slight increase in production levels from ground water W5 works.

Line 6A.19 W6 works

None of our WTWs fall into the ground or surface water W6 works category.

Water treatment – works size

Line 6A.20 - 27 WTWs in size band 1 - 8

We have categorised WTW size bands based on peak week production capacity in line with the guidance in RAG 4.11.

During the 2022/23, production from three WTWs was discontinued, Cornhow, Ennerdale and Quarry Hill. A data review identified Bickerstaffe was mistakenly recorded as active last year. This site was closed in quarter one 2021. Reporting has been updated to reflect this change. Additionally, during this period two new WTWs were commissioned, Williamsgate and Quarry Hill - Scales. This has resulted in a net decrease of two WTWs.

Line 6A.28 Peak week production capacity (PWPC)

PWPC has slightly increased from the previous year.

Line 6A.29 Total peak week production capacity (PWPC) having enhancement expenditure for grey solution improvements to address raw water quality deterioration

In the report year total PWPC has not had any benefit from having enhancement expenditure for grey solution improvements to address raw water quality deterioration.

Line 6A.30 Total peak week production capacity (PWPC) having enhancement expenditure for green solutions improvements to address raw water quality deterioration

606.64 Ml/d PWPC has benefitted from having enhancement expenditure for green solution improvements to address raw water quality deterioration, on a WTW's basis. This has been delivered by a number of schemes across the region.

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

A significant volume of treated water from Watchgate WTWs is re-treated at three separate aqueduct take off points, Martholme WTWs, Townsend Fold WTW and Woodgate Hill WTWs. The increase in water treated at more than one site is primarily due to increased production volumes at Woodgate Hill WTWs.

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

We have undertaken remedial action at Rivington WTW to address Taste and Odour.

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

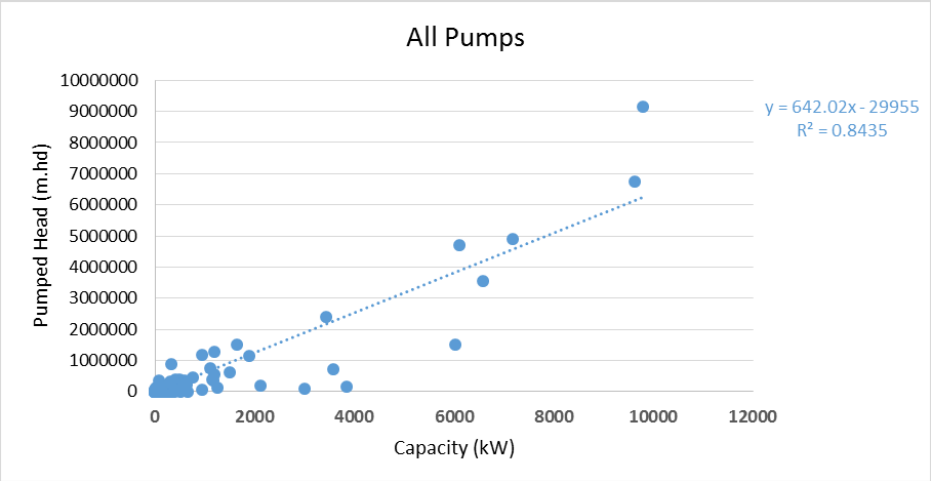
There has been no real change in the area of coverage with phosphate dose in 2021/22. The increase in reported population receiving orthophosphate is down to a change in the source population figures. This has been calculated using 2023 Mid-year population projections.

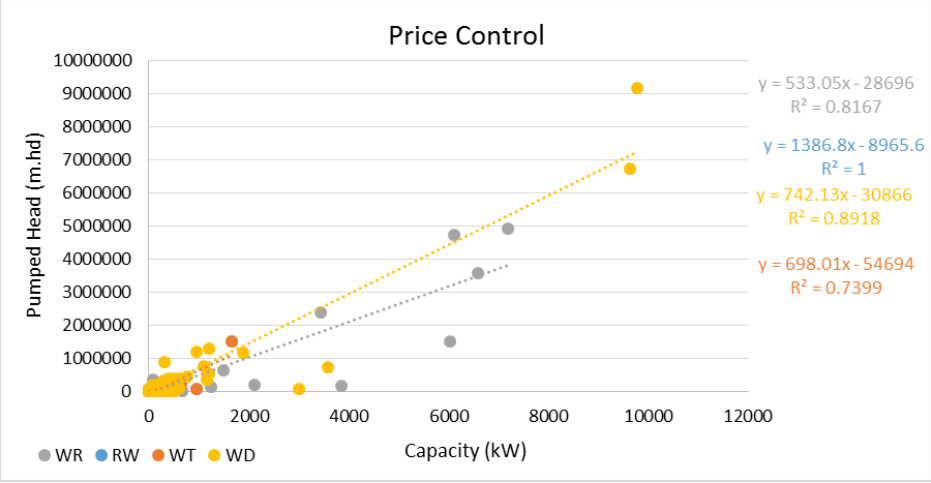
Line 6A.34 Average pumping head – water treatment

In response to the Turner and Townsend and WRc 'Average Pumping Head: data quality improvement' report in March 2022, a review of the Average Pumping Head (APH) methodology was carried out for this reporting year. In previous reporting years a number of sites (up to 63 per cent) were being excluded due to the nature of the calculation and estimation methods. This means that the value for APH for all four price controls (raw water abstraction, raw water distribution, water treatment and treated water distribution) was being under reported, to a significant degree in some cases. APH is not used internally to make operational decisions, but following the Turner and Townsend report and recommendations we have taken the opportunity to review our methodology in line with the rest of the industry.

This year, in order to infer data for the remaining assets in line with the recommendations, an additional estimation was applied based on typical values of similar assets. This has helped to provide a more representative view of the APH for each price control, proportional to the volumes of water distributed.

The inference of data was based on the kW capacity of the asset, in line with the hierarchy set out in the Turner and Townsend report. Before carrying out the analysis, the strength of the relationship between capacity and pumped head was tested using a scatter plot (excluding assets with 'missing' data). There was a strong correlation between the two variables with the R^2 value being 0.84 for all assets, and at least 0.73 when split by price control (as there is limited data for raw water transport due to a small number of pumping stations, this gives an R^2 value of 1.00). Therefore, it was reasonable to assume that the remaining pumps with missing data could be inferred using this relationship between capacity and pumped head, using typical values of similar assets.





The inclusion of the additional pumps has increased the reported value for APH in 2022/23 (see chart below)

Price Control	2021/2022 APH reported values	2022/23 APH reported values
Raw Water Abstraction	8.96 m.hd	10.76 m.hd
Raw Water Transport	18.11 m.hd	21.90 m.hd
Water Treatment	4.20 m.hd	12.75 m.hd
Treated Water Distribution	53.82 m.hd	71.95 m.hd

The change in methodology has materially impacted the reported APH values for Water Treatment and Treated Water Distribution Price because more pumps are now included in the calculation. Across all price controls, 95.8 per cent of pumps are being included in the calculation, which is an increase of 32.8 per cent compared to the previous 63 per cent of assets. In line with our published assurance framework this approach has been assured by our Technical Auditor, Jacobs.

As noted in the Turner and Townsend report, the calculation of APH relies heavily on estimation and extrapolation of data. It is assumed that pumps with no data will have similar activity as pumps with data that are of a similar size.

Before the next reporting year, a further validation of the estimation will be undertaken. This will include additional checks of sites, reviewing and updating asset details (e.g. height, destination and meter reference information) to the corporate data system and the APH calculation model and carry out any necessary site or telemetry improvements. As more assets have their data updated, then the APH will change without there necessarily being any change in the operation of sites.

Following our additional checks we will look to review and restate previous year's data.

The additional estimation has impacted the percentage of APH that is derived from measured data:

For the Water Treatment price control:

- 0 per cent of sites have measured data for lift **and** volume. These sites contribute 0 per cent of the APH for the price control.
- 3 per cent of sites have measured data for lift **or** volume. These sites contribute 4 per cent of the APH total for the Water Treatment Price Control.
- Where measured data is not available, estimations are used where possible. Static ground level measurements and the standard hydraulic formula are used to estimate Head and network demand data is used to estimate Flow. Where these estimation methods are not available, typical values are used based on similar assets.

Variance between 2021/22 and 2022/23

There has been an increase in water treatment pumping head in the reporting year. The increase in APH is due to the revised methodology.

Variance between 2022/23 and FBP forecast

The 2022/23 APH is higher than the business plan forecast. This is due to changes to our methodology since we submitted our business plan forecasts. Also our water network is a dynamic system and operation of sources and pumps differs depending on a number of variables such as changes in demand, weather, how much we abstract from different sources and operational changes to assets to ensure we meet demand in the most efficient way.

Line 6A.35 Energy consumption - water treatment

See commentary for Line 5A.24

Line 6A.36 Total number of water treatment imports, Line 6A.37 Water imported from 3rd parties' water treatment works, Line 6A.38 Total number of water treatment exports and Line 6A.39 Water exported to 3rd parties' water treatment works

We do not currently import from or export to 3rd parties' water treatment works.

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

Water treatment – Assets and operations

Line 6B.1 Total installed power capacity of potable water pumping stations

There has been an increase in potable water pumping station capacity. The change in capacity is due to the addition and removal of pumps and updates to corporate data.

Removed	Added
Clatterbridge	Crosshill BP2
Oswestry Booster	Sandwith
	Harrot Hill
	High Leys
	Pex Hill BP2
	Moota Hill

Line 6B.2 Total volumetric capacity of service reservoirs

There has been a net increase in the number and capacity of service reservoirs. We have decommissioned four small reservoirs, commissioned two new reservoirs and reclassified four balancing tanks as SRs.

Removed	Added
Holcombe Moor SR	Buttermere SR
Hollins Hill 1 SR	Cloughbottom SR
Pex Hill No.2 SR	High Leys SR
Runcorn No.2 SR	Mitchells SR
	Moota Hill SR
	Summergrove BPT SR

Line 6B.3 Total volumetric capacity of water towers

There has been a decrease to the number and capacity of water towers due to one water tower being decommissioned in 2022/23.

Line 6B.4 Water delivered (non-potable)

There has been a decrease in the water delivered (non-potable) over the reporting period.

Line 6B.5 Water delivered (potable)

There has been a slight increase in potable water delivered.

Line 6B.6 Water delivered (billed measured residential)

The trend in household water delivered has decreased from 2021/22 and appears to be returning to 'normal' after the recent increase due to COVID-19 related water usage behaviours.

Line 6B.7 Water delivered (billed measured business)

There has been an increase in billed measured non-household water delivered, primarily due to more businesses opening back up and employees returning to work post COVID-19 restrictions.

Line 6B.8 Proportion of distribution input derived from impounding reservoirs

We have applied the following guidance from RAG 4.11 when calculating the distribution input proportions. 'If multiple sources feed a works (for example a river and a number of boreholes) and the flow from these sources is combined prior to treatment, then all of the flow entering the works can be categorised as the more difficult to treat water. (In this example, all of the water would be categorised as river water.)'

The number reported is consistent with last year.

Line 6B.9 Proportion of distribution input derived from pumped storage reservoirs

We have not currently classed any of our reservoirs as pumped storage reservoirs therefore the number is zero.

Line 6B.10 Proportion of distribution input derived from river abstractions

The number reported is consistent with last year.

Line 6B.11 Proportion of distribution input derived from groundwater works, excluding managed aquifer recharge (MAR) water supply schemes

The number reported is consistent with last year.

Line 6B.12 Proportion of distribution input derived from artificial recharge (AR) water supply schemes, Line 6B.13 Proportion of distribution input derived from aquifer storage and recovery (ASR) water supply schemes, Line 6B.14 Proportion of distribution input derived from saline abstractions and Line 6B.15 Proportion of distribution input derived from water reuse schemes

We do not currently have any of these schemes therefore the number is zero.

Line 6B.16 Total number of potable water pumping stations that pump into and within the treated water distribution system

The number of potable water pumping stations has increased from last year. Two pumping stations have been decommissioned and there are also six new pumping stations reported this year.

Removed	Added
Clatterbridge	Crosshill BP2
Oswestry Booster	Sandwith
	Harrot Hill
	High Leys
	Pex Hill BP2
	Moota Hill

Line 6B.17 Number of potable water pumping stations delivering treated groundwater into the treated water distribution system, Line 6B.18 Total number of potable water pumping stations that pump into and within the treated water distribution system

No change in the reporting year.

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

There has been an increase in the number of potable water pumping stations that re-pump water already within the treated water system. Two pumping stations have been removed (decommissioned) and six pumping stations added (new assets).

Removed	Added
Clatterbridge	Crosshill BP2
Oswestry Booster	Sandwith
	Harrot Hill
	High Leys
	Pex Hill BP2
	Moota Hill

Line 6B.20 Number of potable water pumping stations that pump water imported from a 3rd party supply into the treated water distribution system

No pumping stations fall into this category; no change from previous reporting year.

Line 6B.21 Total number of service reservoirs

This year we have seen a net increase of two service reservoirs, going from 348 in 2021/22 to 350 in 2022/23.

The net increase is due to four service reservoirs being removed, whilst six service reservoirs have been added.

Removed	Added
Holcombe Moor SR	Buttermere SR
Hollins Hill 1 SR	Cloughbottom SR
Pex Hill No.2 SR	High Leys SR
Runcorn No.2 SR	Mitchells SR
	Moota Hill SR
	Summergrove BPT SR

Line 6B.22 Number of water towers

The number of water towers has decreased by one this year due to the closure of Gorsehill Tower (South Mersey).

Line 6B.23 Energy consumption – treated water distribution

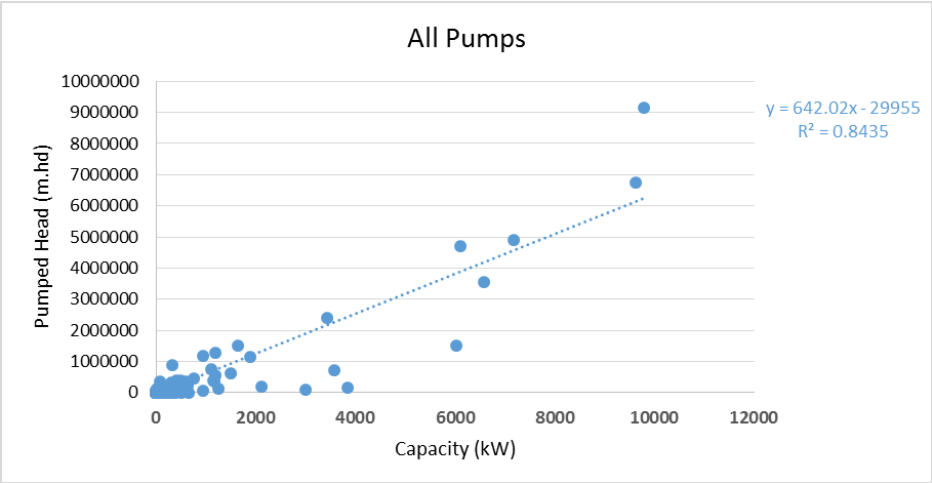
See commentary for Line 5A.24

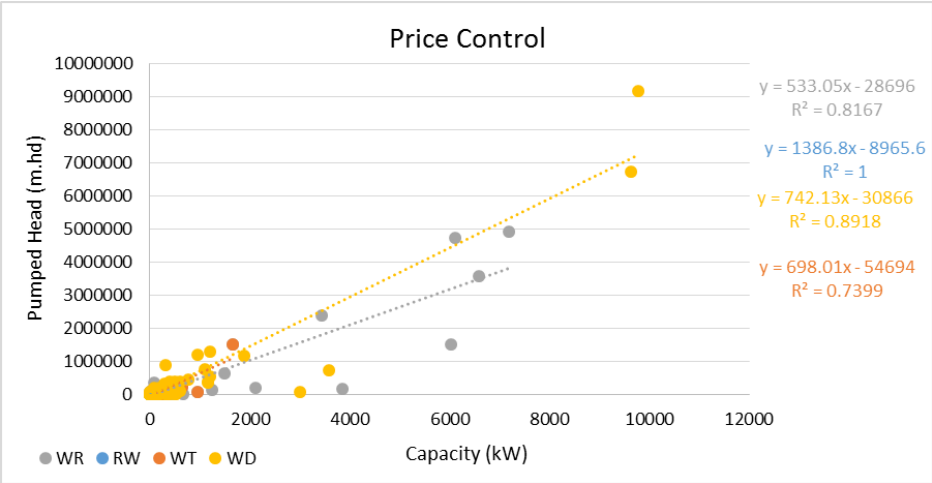
Line 6B.24 Average pumping head – treated water distribution

In response to the Turner and Townsend and WRc 'Average Pumping Head: data quality improvement' report in March 2022, a review of the Average Pumping Head (APH) methodology was carried out for this reporting year. In previous reporting years a number of sites (up to 63 per cent) were being excluded due to the nature of the calculation and estimation methods. This means that the value for APH for all four price controls (raw water abstraction, raw water distribution, water treatment and treated water distribution) was being under reported, to a significant degree in some cases. APH is not used internally to make operational decisions, but following the Turner and Townsend report and recommendations we have taken the opportunity to review our methodology in line with the rest of the industry.

This year, in order to infer data for the remaining assets in line with the recommendations, an additional estimation was applied based on typical values of similar assets. This has helped to provide a more representative view of the APH for each price control, proportional to the volumes of water distributed.

The inference of data was based on the kW capacity of the asset, in line with the hierarchy set out in the Turner and Townsend report. Before carrying out the analysis, the strength of the relationship between capacity and pumped head was tested using a scatter plot (excluding assets with 'Missing' data). There was a strong correlation between the two variables with the R^2 value being 0.84 for all assets, and at least 0.73 when split by price control (as there is limited data for raw water transport due to a small number of pumping stations, this gives an R^2 value of 1.00). Therefore, it was reasonable to assume that the remaining pumps with missing data could be inferred using this relationship between capacity and pumped head, using typical values of similar assets.





The inclusion of the additional pumps has increased the reported value for APH in 2022/23 (see chart below)

Price Control	2021/2022 APH reported values	2022/23 APH reported values
Raw Water Abstraction	8.96 m.hd	10.76 m.hd
Raw Water Transport	18.11 m.hd	21.90 m.hd
Water Treatment	4.20 m.hd	12.75 m.hd
Treated Water Distribution	53.82 m.hd	71.95 m.hd

The change in methodology has materially impacted the reported APH values for Water Treatment and Treated Water Distribution Price because more pumps are now included in the calculation. Across all price controls, 95.8 per cent of pumps are being included in the calculation, which is an increase of 32.8 per cent compared to the previous 63 per cent of assets. In line with our published assurance framework this approach has been assured by our Technical Auditor, Jacobs.

As noted in the Turner and Townsend report, the calculation of APH relies heavily on estimation and extrapolation of data. It is assumed that pumps with no data will have similar activity as pumps with data that are of a similar size.

Before the next reporting year, a further validation of the estimation will be undertaken. This will include additional checks of sites, reviewing and updating asset details (e.g. height, destination and meter reference information) to the corporate data system and the APH calculation model and carry out any necessary site or

telemetry improvements. As more assets have their data updated, the APH will change without there necessarily being any change in the operation of sites.

Following our additional checks we will look to review and restate previous year's data.

The additional estimation has impacted the percentage of APH that is derived from measured data:

For the Treated Water Distribution price control:

- 4 per cent of sites have measured data for lift **and** volume. These sites contribute 4 per cent of the APH for the price control.
- 42 per cent of sites have measured data for lift **or** volume. These sites contribute at least 36 per cent of the APH for the price control.
- Where measured data is not available, estimations are used where possible. Static ground level measurements and the standard hydraulic formula are used to estimate Head and network demand data is used to estimate Flow. Where these estimation methods are not available, typical values are used based on similar assets.

Variance between 2021/22 and 2022/23

There has been an increase in average pumping head for treated water distribution this year. The increase in APH is due to the revised methodology and variations in operations (e.g. what sources and water treatment works are used) from year to year and the addition and removal of treated water distribution pumping stations.

Variance between 2022/23 and FBP forecast

The 2022/23 APH is higher than the business plan forecast. This is due to changes to our methodology since we submitted our business plan forecasts. Also our water network is a dynamic system and operation of sources and pumps differs depending on a number of variables such as changes in demand, weather, how much we abstract from different sources and operational changes to assets to ensure we meet demand in the most efficient way.

Line 6B.25 Total number of treated water distribution imports

There has been no change to the total number of treated distribution imports.

Line 6B.26 Water imported from 3rd parties treated water distribution systems

This is has increased slightly in the current reporting year.

Line 6B.27 Total number of treated water distribution exports

This has increased in the reporting year with the increased number of NAVs.

Line 6B.28 Water exported to 3rd parties' treated water distribution systems

This has increased in the reporting year with the increased number of NAVs.

Line 6B.29 Peak 7 day rolling average distribution input
Line 6B.30 Peak 7 day rolling average distribution input/annual average distribution input

The period with the highest peak 7 day rolling average distribution input during 2022/23 was the week commencing 19th December 2022 (19/12/2022 – 25/12/2022). This was 114.46% of the annual average distribution input. The reason for the high demand was a significant freeze-thaw event that led to increases to customer and distribution-side losses.

Water Balance

Line 6B.31 Measured household consumption (excluding supply pipe leakage)
Line 6B.32 Unmeasured household consumption (excluding supply pipe leakage)
Line 6B.33 Measured non-household consumption (excluding supply pipe leakage)
Line 6B.34 Unmeasured non-household consumption (excluding supply pipe leakage)

We continue to see changes in consumption between household and non-household as we return to a new normal post COVID-19**.**

Line 6B.35 Total annual leakage

We have derived this figure from the same leakage data that is used in both leakage performance reporting (as an input to the three-year average calculation) and annual water resources management plan reporting.
The table below shows total annual leakage reported for the 2021/22 and 2022/23 reporting years and the forecast performance from the PR19 final business plan (FBP).

	2021/22 APR	2022/23 APR	2022/23 FBP
Total Annual Leakage (Ml/d)	413.9	423.0	426.2

Variance between 2021/22 and 2022/23

The summer of 2022 was warm and dry and we saw an increase in leakage. This was followed by a very severe freeze-thaw event in December 2022. This event impacted distribution-side (company) and customer-side (private) leakage levels which was particularly prevalent during this event.

Variance between 2022/23 and FBP forecast

We continue to outperform our PR19 business plan forecast and are on track to deliver the forecast 15% improvement over AMP7 and we are working towards our longer term WRMP target.

Line 6B.36 Distribution system operational use

Consistent with previous year.

Line 6B.37 Water taken unbilled

Consistent with previous year.

Line 6B.38 Distribution input
Line 6B.39 Distribution input (pre-MLE)

We have seen an increase of 10.7 Ml/d in the distribution input, compared with the value reported for 2021/22. This has primarily been the result of the warm dry summer and the December 2022 freeze-thaw event that resulted in and increase to leakage. The water balance reconciliation gap has improved to -0.1%.

Components of total leakage (post MLE) – Company level

Line 6B.58 Leakage upstream of DMA

We have seen a reduction in leakage upstream of DMA. This reduction is as a result of our continued focus on reducing upstream leakage and improved targeting of leak detection activity.

Line 6B.59 Distribution main losses

Distribution mains losses have increased as a result of the dry summer and the significant freeze-thaw event in December 2022 that led to increases to both customer and distribution side losses.

Line 6B.60 Customer supply pipe losses – measured households excluding void propeties
Line 6B.61 Customer supply pipe losses – unmeasured households excluding void propeties
Line 6B.62 Customer supply pipe losses – measured non-households excluding void propeties
Line 6B.63 Customer supply pipe losses – unmeasured non-households excluding void propeties
Line 6B.64 Customer supply pipe losses – void measured households
Line 6B.65 Customer supply pipe losses – void unmeasured households
Line 6B.66 Customer supply pipe losses – void measured non-households
Line 6B.67 Customer supply pipe losses – void unmeasured non-households

Our customer supply pipe losses estimates are from an industry best practice study, which provide per property supply pipe losses estimates, based on monitoring a sample of measured/metered and unmeasured/unmetered properties.

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

Treated water distribution – mains analysis

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

There are small movements in the km of mains reported each year as new mains are installed and other mains are abandoned. This year has seen a slight increase (0.003%) overall in the length of main.

Line 6C.2 Total length of potable mains relined
We have not relined any of our water mains.

Line 6C.3 Total length of potable mains renewed

The 2022/23 report year number is higher than the previous year, mainly as a result of work initiated to address drivers dealing with taste, smell and appearance, known as the ‘Cast Iron Mains Replacement Programme. As part of this programme of work, a total of 29.3km of slip-lining and open-cut replacement has been delivered by this programme in the report year.

We have reviewed our methodology and mains replaced under the mains diversion programme are now included within the numbers stated here. A total of 5.3km of minor diversion works was delivered in the report year.

We are also now reporting mains replaced as part of the reactive leakage reduction programme. These are generally piece through sections required to be replaced to restore the structural health of a leaking section of a main. A total of 4.7km of piece through reactive replacements was recorded during the report year.

We have applied the updated methodology to the previous years in AMP7 and this has resulted in an increase in renewed mains length for each year, please see table below for restated numbers.

Table 6C.3 Line description	2020-21	2021-22	2022-23
Length of potable mains renewed - Sliplining	7.4	12.4	24.1
Length of potable mains renewed - Opencut	0.0	1.0	5.2
Length of potable mains renewed - Diversions	4.7	5.5	5.3
Length of potable mains renewed - Reactive	4.0	4.3	4.7
Total length of potable mains renewed (restated RR21,RR22)	**16.2**	**23.2**	**39.2**
Total length of potable mains renewed (APR previously reported)	**7.4**	**12.4**	**39.2**

Line 6C.4 Total length of new potable mains

The length of new potable mains is higher than last year as the recovery of house building/construction continues following the impact of COVID-19 lockdowns that affected the previous two years.

Line 6C.5 Total length of potable water mains (< ≤320mm), Line 6C.6 Total length of potable water mains >320mm and ≤ 450mm, Line 6C.7 Total length of potable water mains >450mm and ≤610mm and Line 6C.8 Total length of potable water mains > 610mm

There are small movements in length of different sizes of mains reported each year as new mains are installed and other mains are abandoned.

Treated water distribution - mains age profile
Line 6C.9 Total length of potable mains laid or structurally refurbished pre-1880
Line 6C.10 Total length of potable mains laid or structurally refurbished between 1881 and 1900
Line 6C.11 Total length of potable mains laid or structurally refurbished between 1901 and 1920
Line 6C.12 Total length of potable mains laid or structurally refurbished between 1921 and 1940
Line 6C.13 Total length of potable mains laid or structurally refurbished between 1941 and 1960
Line 6C.14 Total length of potable mains laid or structurally refurbished between 1961 and 1980
Line 6C.15 Total length of potable mains laid or structurally refurbished between 1981 and 2000
Line 6C.16 Total length of potable mains laid or structurally refurbished between 2001 and 2020
Line 6C.17 Total length of potable mains laid or structurally refurbished during and after 2021

The mains length in each category is relatively stable with only slight variation. There have been decreases in the number of mains laid before 1961. This is to be expected due to replacement activity.

Other year on year changes are due to updated GIS data; for example, mains with previously unverified characteristics (i.e. laid date and diameters) have now become verified.

There has been an increase in the number of mains laid between 2001 and 2020. This is mainly attributed to the West Cumbria Supplies Project; the laying of new mains and mains renewal have been taking place since spring of 2017, but the mains were only made ‘live’ in 2022 which is when they are captured by this methodology.

Communication pipes

Line 6C.18 Number of lead communication pipes

There has been a reduction in the number of lead communications pipes in-line with the number replaced and reported in 6C.21.

Line 6C.19 Number of galvanised iron communication pipes

There has been a small change in the number of galvanised iron communication pipes due to updated data.

Line 6C.20 Number of other communication pipes

The small increase compared to last year is in-line with anticipated connection growth and movement of lead pipes to the other materials.

Line 6C.21 Number of lead communication pipes replaced or relined for water quality

We have no comment to make on this line

Other

Line 6C.22 Company area

The company reported company area is the same as last year.

Line 6C.23 Compliance Risk Index

The CRI score is forecast to be 3.67 we are waiting for confirmation of the final score from the DWI. In 2022 we have continued to see a high number of iron, aluminium and manganese infringements in zones with existing Notices or Undertakings. There has also been an increase in the number of taste and odour infringements in comparison to 2021. Detailed investigations and remedial work ongoing to minimise risk of future infringements in this area.

Line 6C.24 Event Risk Index

The ERI score reported is a provisional score we are waiting for confirmation of the final score from the DWI. The UU Drinking Water Regulation team estimates the ERI score for each event. The current estimated score for calendar year 2022 is 111 this is higher than the confirmed ERI score of 52.26 for 2021.
In 2022, we reported 28 water quality events compared with 33 events in 2021. The score is dependent on the type of incident that occurs, the location, number of properties impacted and the duration the event occurs. Although we have had fewer events the nature of the events and the number of properties impacted has resulted in a higher score.

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

This number has reduced in the reporting year.

Table 6D Demand management - Metering and leakage activities for the 12 months ended 31 March 2023

Smart metering

We continue to fit one type of smart AMR-enabled meter read in different ways.

- The first is by our meter readers who carry a receiver to pick up the reads. The benefit of this is that we can read internal meters without entering properties and therefore gives us a much higher read success rate.
- The second method is reading via the local authority refuse collection wagons where some local authorities have allowed us to fit receivers. This method offers many more benefits as we get weekly reads for many customers to help identify leaks providing improved customer service and promoting water efficiency.

As we continue to develop our proposals for an ambitious smart metering programme in AMP8 (2025–30) we are progressing well with a targeted trial of 3,000 smart meters in AMP7 (2020–25). This will help us inform elements such as our new system requirements, procurement approach, meter and communications technology choice, operating model and deployment and customer engagement approach. It will also help us explore how to efficiently realise the benefits we know smart metering is capable of delivering.

We have done a lot of work during the year reviewing the evidence for our proposed smart metering investment programme with the help of expert third parties to ensure our business case is robust. We have also taken the opportunity to conduct some market testing for smart metering technologies engaging with many meter suppliers and communications network providers. This has helped us get ready for the procurement activity of our enduring solution to be rolled out next AMP.

Metering activities - Totex expenditure

Line 6D.1 New optant meter installation

Expenditure has increased from 2021/22 in line with the increased take up of meters.

Line 6D.2 New selective meter installation

We have fitted over 24,000 selective meters as part of our full rollout of installing Selective Meter fits from August 2022. The costs incurred are reflective of these increase installations.

Line 6D.4 Residential meters renewed and Line 6D.5 Business meters renewed

Expenditure is broadly consistent with the previous year.

Metering activities – Explanatory variables

Line 6D.6 New optant meters installed

We installed 24,866 meters an increase of circa 3,500 from 2021/22 but circa 11,000 lower than FBP.

	2021/22 APR	2021/22 APR	2022/23 FBP
New optant meters	21,301	24,866	36,051

Through a combination of selective and optant meters we aim to fit circa 65,000 household meters each year for remainder of the AMP.

Our Lowest Bill Guarantee (LBG) introduced in 2020 will mean that customers who have a free meter fitted will pay on their cheapest tariff for each billing period within the two year reversion timescale. If the customers measured charges are higher than their rateable value charges, we will bill them on their rateable value charges. The offer has been designed to reduce the potential 'loss aversion' that customers tell us is preventing them from moving to a meter, whilst still offering a potential financial saving to reduce water use, along with the use information that a meter provides.

Line 6D.7 New selective meters installed

We have fitted over 24,000 selective meters. This brings the total number of meters (selective and optant) fitted in the year to over 49,000. We continue to promote free meter options and our Lowest Bill Guarantee (LBG) scheme by targeting customers who we believe will make a saving based on their current charges and send letters, texts and emails and we will included flyers inside second half yearly unmeasured bills.

Line 6D.8 New business meters installed

A small number of business meters have been installed.

Line 6D.9 Residential meters renewed

We have renewed just over 10,000 residential meters which is c900 fewer than the prior year and c700 more than planned.

Line 6D.10 Business meters renewed

The number of non-household meter exchanges has increase due our continued work investigating meters which have been registering zero consumption and exchanging these meters where required.

Line 6D.11 Replacement of basic meters with smart meters for residential customers - Mick

This is a new line for 2022/23. We have replaced 6,239 basic meters with AMR meters.

Line 6D.12 Replacement of AMR meter with AMI meters for residential customers

We currently do not install AMI meters.

Line 6D.13 Replacement of basic meters with smart meters for business customers

There have been a small number of basic meters replaced with AMR meters.

Line 6D.14 Replacement of AMR meter with AMI meters for business customers

We currently do not install AMI meters

Line 6D.15 New residential meters installation – supply-demand balance benefit

We have reported 1.54 Ml/d based on the number of new smart meters installed.

Line 6D.16 New business meters installation – supply-demand balance benefit, Line 6D.13 Residential meters renewed - supply-demand balance benefit and Line 6D.14 Business meters renewed - supply-demand balance benefit

We have reported zero in these lines and have no further comments.

Line 6D.21Residential properties - meter penetration

Meter penetration is slightly increased from last year at 48.3%

Leakage activities

Line 6D.22 Total leakage activity – totex expenditure

Our networks are dynamic systems and multiple leakage activities are often carried out in district metered areas therefore leakage totex and the associated leakage savings are based on a number of assumptions. These assumptions may differ from company to company meaning data is not comparable. The comparison of costs and benefits is further complicated by the delay between incurring the expenditure and delivering the benefit. For example acoustic logger enhancement costs incurred in a specific year will not deliver benefits instantaneously,

however they will deliver benefits in future years for the whole of their useful economic life. Likewise, investment in historic years will have delivered leakage benefits in the current year.

2022/23 has been a challenging year for our leakage reduction programme due to extreme weather incidents in December 2022. However we implemented an extensive recovery strategy ensuring leakage levels were returned to pre-incident levels as quickly as possible. This is reflected in the increase in totex expenditure incurred in maintaining leakage in Table 6D.

Despite the above performance challenges, we have continued to allocate expenditure to the reduce leakage category on the basis that we have delivered interventions that we believe to deliver a step-change in performance such as acoustic logger installation albeit this benefit will be masked by external factors. Acoustic logger enhancement expenditure has been included in Table 4L in line with discretionary enhancement expenditure however we have also included an element of our cast iron mains replacement/rehabilitation expenditure in reduce leakage expenditure in Table 6D in 2022/23 in line with prior years.

To identify leakage totex costs we have combined a bottom up and top down approach. IRE and Capex spend has been analysed on a project by project basis to identify those contributing to leakage performance. Costs incurred in relation to specific projects associated with leakage loggers, active leak control, pressure management and mains replacement/rehabilitation have been included. Where the project delivers multiple drivers we have allocated costs to leakage/non leakage dependent on the type of activity with Opex costs following the same activity methodology used for IRE and Capex

The following direct costs associated with leakage detection and repair activities have been reported in totex including:

- customer enquiries;
- work scheduling;
- internal resource and associated spend for investigation;
- external partner costs for the repairs;
- health & safety;
- street works (including permit costs;)
- commercial support costs

With an allowance for indirect corporate overheads.

A bottom up review of all leakage costs is then undertaken to allocate totex to one of the following categories;

- 100% maintaining leakage
- 100% reducing leakage
- Costs associated with both maintaining and reducing leakage allocated based on management estimate
- Repair & maintenance contract partner spend driver allocated based on natural rate of rise

It is not feasible to identify if repair and maintenance contract partner costs contribute to maintaining or reducing leakage from a bottom up approach due to the high volume of relatively low value work (c31,000 leak repairs carried out per annum). We have therefore used the natural rate of rise to allocate spend which has allocated all expenditure to maintain leakage in 2022/23.

As with all cost allocations, we continue to review and refine our methodology for the allocation of leakage Totex to improve the accuracy of expenditure reported. We have specifically refined the allocation of supporting operating expenditure in 2022/23 using a more detailed and robust approach. As both the RAG guidance for Table 6D and any additional prevent/aware/locate/mend (PALM) analysis develops over time we expect cost allocation methodologies to change and improve across all companies.

Line 6D.23 Leakage improvements delivering benefits in 2020-25

The incremental leakage enhancement delivered during the reporting year to the supply-demand balance has been calculated by subtracting last year's total annual leakage from this years reported total annual leakage.

413.89 – 423.01 = -9.12 Ml/d. This increase in leakage follows a dry summer and a severe freeze-thaw event in December 2022.

Per capita consumption (excluding supply pipe leakage)

Line 6D.24 Per capita consumption (measured customers)
Line 6D.25 Per capita consumption (unmeasured customers)

Consumption for measured customers has reduced (customers have used less water) from the 2021/22 levels. For unmeasured customers a number of customers have moved to measured charges as result of our free meter option (FMO) optant programme and our enhanced metering programme. Consumption for unmeasured customers is consistent with the previous year.

See section 1.1 of the main APR.

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

These are projects which are either detailed in our Water Resources Management Plan 2019 (WRMP19), or will provide a benefit to future plans and once delivered will be detailed in our annual Water Resource Management Plan (annual WRMP).

Projects which are already in the baseline of the WRMP, and therefore no extra benefit has been detailed in table 6F are;

- West Cumbria future Strategy project
- Southport DMZ project

There are several investigations where the intention was to bring in a new source or add a connection, however off the back of the investigation they will not be progressed any further;

- Springfield Bickerstaffe AMP7 works
- Scales BH project
- Woodford BH to Hazel Grove Resilience
- Eccleston Hill BH project

The South Egremont groundwater project was enacted in 2019/20 and therefore the benefit is already in place prior to this table.

The Williamsgate WTW – Sludge treatment will not bring any deployable output benefit.

The two schemes which will benefit future plans (not accounted for in the WRMP19 baseline) and have a benefit assigned to them are;

The West East Link Main (WELM) 150 internal interconnector project, which will increase the amount of water which can be transferred across our network from South area sources to Manchester.

The Alston and Spade Mill transfer pipeline which has been connected into an existing WTW to improve resilience.

We have continued with our water efficiency campaign in the West Cumbria area and the derived benefits are 0.10 Ml/d in 2022/23. We have updated the profile of benefits across AMP7 in line with WRMP19 half-life approach to education water efficiency benefits. This gives the profile in the chart below.

	2020/21	2021/22	2022/23	2023/24	2024/25
Benefits delivered in the report year (Ml/d)	0.49	0.14	0.10	0.00	0.00
Cumulative savings – education half-life (Ml/d)	0.49	0.51	0.48	0.37	0.28

The expenditure and cost allocations relating to these projects are consistent with table 4L for each of the different classifications (appropriate lines are 4L.22, 4L.25 and 4L.31). Forecasted years expenditure represents our current best view of the projects but may vary as the projects deliver.

Table 7A Wastewater network+ - Functional expenditure for the 12 months ended 31 March 2023

Costs of STWs in size bands 1 to 5

Line 7A.1 Direct costs of STWs in size band 1, Line 7A.2 Direct costs of STWs in size band 2, Line 7A.3 Direct costs of STWs in size band 3, Line 7A.4 Direct costs of STWs in size band 4 and Line 7A.5 Direct costs of STWs in size band 5

This year we have seen increases in power price costs, chemical price costs, employment costs and materials.

For all of the works in size bands one to five we have continued to allocate the expenditure based on the numbers of full time equivalent operational staff for each treatment works.

These lines are directly influenced by the movement in size bands of our treatment works, most notably between bands 5 and 6. However, this year the number of size band six works has remained as the same 63 works.

Details of these movements are described in the commentary for lines 7D.9 to 7D.14 below.

Line 7A.6 General & support costs of STWs in size bands 1 to 5

This year we have experienced a reduction in the principle use recharge primarily due to assets out of life/disposed of that were previously recharging out of Wastewater Network+.

Line 7A.7 Functional expenditure of STWs in size bands 1 to 5

This is a calculated line.

Costs of STWs in size band 6

As described in line 7D.14, the number of size band six work has stayed the same at 63.

Line 7A.8 Service charges for STWs in size band 6

The majority of the costs in this line are associated with our Environment Agency Permits. We continue to review our consent charges with the Environment Agency to ensure that we pay the correct amount for our discharges.

Line 7A.9 Estimated terminal pumping costs size band 6 works

These are estimated costs, based on power and a proportional allocation of maintenance costs. We routinely review our terminal pumping station assets and these estimated costs are largely in line with those reported in the previous period but taking into account the increases in electricity prices.

Line 7A.10 Other direct costs of STWs in size band 6

This line includes power, employment costs, hired and contracted services, materials and consumables and other direct costs. Income from generation is treated as negative expenditure. Sludge liquors recharges have been reflected in direct costs (which was previously only shadow reported) and the revised RAG 2.09 allocation of other business activities (regulation costs). This is in line with updated RAG 4.11 guidance which states that functional expenditure should take into account improved cost allocations between the sewage treatment and bioresources units in relation to sludge liquors, energy generation and overheads, which is new for 2022/23.

We have seen increases in power price costs, chemical price costs, employment costs and materials. These have been offset party by the inclusion of the sludge liquors recharge.

Line 7A.11 Direct costs of STWs in size band 6

This is a calculated line.

Line 7A.12 General & support costs of STWs in size band 6

This year we have experienced a reduction in the principle use recharge primarily due to assets out of life/disposed of that were previously recharging out of WWN+

Line 7A.13 Functional expenditure of STWs in size band 6

This is a calculated line.

Line 7A.14 Total Functional expenditure for Sewage treatment

This is a calculated line.

Table 7B Wastewater network+ - Large sewage treatment works for the 12 months ended 31 March 2022

Sewage treatment works - Explanatory variables

Line 7B.1 Works name

This is standard information linking the works to the Environment Agency consent. The number of large sewage works has stayed the same as the previous period, with 63 being reported. Two works have been removed from the list and two added, as shown below

WwTW name	Annual change	Reason for change
Darwen WWTW	Removed	Site closed
Tyldesley WWTW	Removed	Site no longer in large works category
Clitheroe WWTW	Added	New to large works category
Wilmslow WWTW	Added	New to large works category

Line 7B.2 Classification of treatment works

The treatment works classifications remain consistent with those reported in the previous period.

Line 7B.3 Population equivalent of total load received

The table below highlights the significant changes in population equivalent of total load received.

WwTW name	Annual change	Reason for change
Blackburn WWTW	Increase	16% increase in load contribution from Trade Effluent (TE)
Bolton WWTW	Increase	22% increase in load contribution from TE
Burnley WWTW	Increase	66% increase in load contribution from TE
Chorley WWTW	Increase	25% increase in load contribution from TE
Crewe WWTW	Increase	43% increase in load contribution from TE
Fazakerley (Liverpool North) WWTW	Increase	52% increase in load contribution from TE
Lancaster (Stodday) WWTW	Increase	More accurate sample data available with an increased sampling frequency
Northwich WWTW	Increase	32% increase in load contribution from TE
Whaley Bridge WWTW	Increase	20% increase in load contribution from TE
Birkenhead WWTW	Reduction	49% reduction in load contribution from TE
Burscough WWTW	Reduction	55% reduction in load contribution from TE
Darwen WWTW	Reduction	Site closed
Kendal WWTW	Reduction	17% reduction in load contribution from TE
Skelmersdale WWTW	Reduction	24% reduction in load contribution from TE
Tyldesley WWTW	Reduction	Site no longer in large works category
Walton-le-dale WWTW	Reduction	30% reduction in load contribution from TE
Warrington North WWTW	Reduction	34% reduction in load contribution from TE
Whitehaven WWTW	Reduction	52% reduction in load contribution from TE
Widnes WWTW	Reduction	37% reduction in load contribution from TE

Line 7B.4 Suspended solids consent, Line 7B.5 BOD_5 consent, Line 7B.6 Ammonia consent, and Line 7B.7 Phosphorus consent

There are no notable changes to the consent levels in this financial year, with the exception of the two ammonia limit changes shown in the table below. As described in the commentary to 7B.1 two works have been removed from the list and two added. Their associated permit levels have therefore been updated accordingly in the table.

WwTW name	Annual change	Previous	New	Reason for change
Ashton-under-lyne WWTW	Permit change	1.5	3	PERMIT VARIATION - Ammo limited relaxed - 01/08/2022
Dukinfield WWTW	Permit change	4	3	PERMIT VARIATION - Ammo limited tightened - 01/08/2022

Line 7B.8 UV Consent

There have been two notable changes to the stated UV consents this year.

WwTW name	Annual change	Previous	New	Reason for change
Carlisle WWTW	Increase	0	20	Validated Dose UV now effective - permit still in draft stage with EA.
Morecambe WWTW	Increase	35	50.2	New ammonia limit

Line 7B.9 Load received by STW

This is a calculated line.

Line 7B.10 Flow passed to full treatment

During the last financial year we experienced a general trend of approximately a 9% decrease compared to the last financial year. Lower flows were experienced on many sites in the March to October timeframe, possibly due to the impact of dryer weather conditions.

Sewage treatment works – Functional expenditure

Line 7B.11 Service charges

The majority of the costs in this line are associated with our Environment Agency Permits. We continue to review our consent charges with the Environment Agency to ensure that we pay the correct charges for our discharges.

Line 7B.12 Estimated terminal pumping expenditure

These are estimated costs, based on power and a proportional allocation of maintenance costs. We routinely review our terminal pumping station assets and these estimated costs are largely in line with those reported in the previous period but taking into account the increases in electricity prices.

Line 7B.13 Other direct expenditure

This line includes power, employment costs, hired and contracted services, materials and consumables and other direct costs. Income from generation is treated as negative expenditure. Sludge liquors recharges have been reflected in direct costs (which was previously only shadow reported) and the revised RAG 2.09 allocation of other business activities (regulation costs), in accordance with the updated RAG 4.11 definition of functional expenditure.

7A.10 above, we have seen increases in power price costs, chemical price costs, employment costs and materials. These have been offset party by the inclusion of the sludge liquors recharge.

Line 7B.14 Total direct expenditure

This is a calculated line.

Line 7B.15 General and support expenditure

This year we have experienced a reduction in the principle use recharge primarily due to assets out of life/disposed of that were previously recharging out of Wastewater Network+

Line 7B.16 Functional expenditure

This is a calculated line.

Table 7C Wastewater network+ - Sewer and volume data for the 12 months ended 31 March 2023

Line 7C.1 Connectable properties served by s101A schemes completed in the report year and Line 7C.2 Number of s101A schemes completed in the report year

The number of first time sewerage schemes can vary depending on the number of applications that are received from customers. As such, no schemes have been completed this financial year.

The first time sewerage expenditure in line 4M.54 is associated with the AMP6 Mains Lane project.

Line 7C.3 Total pumping station capacity and Line 7C.4 Number of network pumping stations

We extract pumping station numbers and capacity from our corporate management system. Pumping station data is checked and verified as part of our data improvement checks by operational and asset management teams.

Increases in the number of pumping stations is predominantly as a result of:

- New stations adopted through the s104 adoption process,
- The continuing identification of private pumping stations that have now transferred in to our ownership through s105A,
- Capital improvement works such as WwTW transfer and flow transfer, and
- Improvements to the quality of our asset data.

However, these increases can be offset by sites being decommissioned (i.e. s105A sites where flows have been altered to gravity). The net position this year is an increase of 10 pumping stations from the number reported in the previous period. The associated pump capacity has decreased by 2,223kW. The net decrease in capacity is a result of a combination of the increase in pumping station sites, and the decommissioning and replacement of large pumps at Anchorsholme pumping station. We continue to review our process at existing sites to provide the most accurate, up-to-date and reliable data possible.

Line 7C.5 Total number of sewer blockages

Our blockages performance of 20,203 incidents is an improvement on our 2021/22 performance. Whilst blockages from our existing assets have reduced over the long term, the proportion of blockages from transferred assets has continued to remain stable. Historically United Utilities' pre-existing assets benefited from a programme of maintenance that has kept them in better condition, whilst transferred assets were in varying degrees of asset condition when transferred to us from private ownership in 2011. Transferred assets are typically smaller in diameter than existing assets, meaning that they tend to be more prone to blockages, particularly during times of stress due to increased load or demand. They are also typically subject to a higher percentage of blockage incidents due to customer misuse.

We continue to develop and implement a wide variety of schemes and initiatives to improve our performance. These include the implementation of a regional blockage plan focussing on increased customer engagement. We have continued to use the impactful 'Stop the Block!' identifier to badge our communications campaign activities in raising awareness of 'what not to flush/pour'. We are continuing to work with food service establishments to reduce fats, oils and grease discharges at source.

We are also seeing benefits of investment in our Dynamic Network Management (DNM) model, with our in-sewer monitors telling us when blockages are forming, allowing our dedicated blockage teams to proactively attend site to resolve the issue before a customer experiences a service interruption and needs to contact us. Further details on blockage performance can be found in the Outcomes section 1.1 of the main APR document.

Line 7C.6 Total number of gravity sewer collapses

The number of 1,040 gravity sewer collapse incidents is slightly higher than last year. It is anticipated that there will be future improvements in this reported number as we continue to roll out our dynamic network management (DNM) programme.

Over recent years we have also enhanced the use of CCTV surveys and fully utilised our programme to identify structural defects and sewer deformations. We have also trialled and are rolling out innovative artificial intelligence sewer CCTV technology (VAPAR). This technology allows us to quickly and consistently review CCTV data to support and prioritise our investment decisions.

Line 7C.7 Total number of sewer rising main bursts

The 77 rising main burst incidents in this reporting period are slightly higher than the previous numbers of incidents.

Line 7C.8 Number of combined sewer overflows

Our profile of overflows changes over time. Increases in the number of overflows can be as a result of the adoption of previously private assets or the discovery and permitting of previously unknown/unpermitted assets. Decreases occur when assets are closed and also from the discovery that some assets do not exist (the permits for these assets are then surrendered). We are continuously reviewing our assets against our data records.

The total number of combined sewer overflows (CSOs) in this reporting period has increased from 2050 to 2089. This is an overall net increase of 39 largely due to the addition of unpermitted storm overflows that have been confirmed through investigations.

Line 7C.9 Number of emergency overflows

Our profile of overflows changes over time. Increases in the number of overflows can be as a result of the adoption of previously owned private assets or the discovery and permitting of previously unknown/unpermitted assets. Decreases occur when assets are closed and from the discovery that some assets no longer exist (the permits for these assets are then surrendered).

The total number of emergency overflows (EOs) in this reporting period has increased from 611 to 645. This is an overall net increase of 34. The increase in permitted emergency overflows (27) is largely due to reporting improvements to discount the EOs already counted in SO line. The increase in unpermitted emergency overflows (7) is largely due to sites confirmed as EOs rather than SOs which were previously under investigation.

Line 7C.10 Number of settled storm overflows

Our profile of overflows changes over time. Increases in the number of overflows can be as a result of the adoption of previously private assets or the discovery and permitting of previously unknown/unpermitted assets. Decreases occur when assets are closed and also from the discovery that some assets do not exist (the permits for these assets are then surrendered).

The number of settled storm overflows (SSOs) reported in this financial year is 191 compared to 197 in the previous period. Following a review of assets against data records, six SSOs have been reclassified as SOs, one SSO permit has been surrendered and one SO has been reclassified as an SSO. This has resulted in a net decrease of six.

Line 7C.11 Sewer age profile (constructed post 2001)

The length of sewer laid or structurally refurbished post 2001 has had a net decrease this year of 390 km. This is due to a combination of sewer growth and a correction to our GIS system that reversed an increase that occurred in 2021/22.

Line 7C.12 Volume of trade effluent

There has been an overall increase of 0.9 % in the trade effluent flow discharged to the sewerage system recorded this year.

This variance can be attributed to a recovery of trade in the North West after the impact of COVID-19 on the regions industry, the change in the way trade effluent volumes have been captured since the Retail market opened in 2017, and the steps that have been taken since then to improve the accuracy of the data in the market.

Line 7C.13 Volume of wastewater receiving treatment at sewage treatment works

The total volume reported is the sum of foul, surface water and highway drainage, so is the sum of all flows received at the treatment works, not just domestic flows. This has decreased by 9.3% this year.

The quality of the data provided for this table has increased over the past few years as we have continued to install more flow recording devices at our WwTWs. Where a site is not MCERT'd we have estimated the flow based on the information we have available in relation to population equivalent and flow. This estimation is reflected in the confidence grade.

Line 7C.14 Length of gravity sewers rehabilitated

The length of gravity sewer rehabilitated can vary across a five year period. This is to be expected as our work prioritisation can flex to accommodate emerging customer priorities. However, the lengths of gravity of sewer rehabilitated for this reporting year is consistent with the previous year.

Line 7C.15 Length of rising mains replaced or structurally refurbished

We have only seen a small 0.22km length of rising main refurbished this year. Like last year, this is primarily due to no observed major capital projects (MCP) including this asset type, and a reduction in numbers of reactive bursts captured. However, when reported to 0 decimal places, this length will be displayed as zero.

When a reactive rising main burst occurs, our operations teams input all the reactive incident data into our corporate system. An output report is produced, containing information on the type of repairs made, length and depth of rising main, pipe material and photographs, which is all taken from the corporate system and validated by the local operational teams and thereafter our strategic teams. In this instance we therefore interpret 'structurally refurbished' as any pipeline rehabilitation technique which results in a repair to a burst rising main, that by its action improves the structural integrity of the pipe.

Line 7C.16 Length of foul (only) public sewers, Line 7C.17 Length of surface water (only) public sewers, Line 7C.18 Length of combined public sewers, Line 7C.19 Length of rising mains, Line 7C.20 Length of other wastewater network pipework, Line 7C.21 Total length of "legacy" public sewers as at 31 March and Line 7C.22 Length of formerly private sewers and lateral drains (s105A sewers)

We have continued with our sewer length data improvement checks this financial year. These checks have focused on improving the quality of our sewer records, and saw a small growth in the mapped network as a result of replacing records that were previously inferred. This has led to a small increase in our existing asset length, whilst transferred assets have remained the same.

Table 7D Wastewater network+ - Sewage treatment works data for the 12 months ended 31 March 2023

Load received at sewage treatment works

Line 7D.1 Load received by STWs in size band 1, Line 7D.2 Load received by STWs in size band 2, Line 7D.3 Load received by STWs in size band 3, Line 7D.4 Load received by STWs in size band 4, Line 7D.5 Load received by STWs in size band 5 and Line 7D.6 Load received by STWs above size band 5

The total number of wastewater treatment works has increased from 566 to 584 this year, which is a net increase of 18 works. Details of the sites that have been added or removed and the movements between size bands categories is described in the commentary for line 7D.9 below.

Changes in the size band of treatment works have affected the distribution of loads across treatment works and also the distribution of the numbers of treatment works.

Load distribution has also been influenced by tightening of existing consent limits and introduction of new limits at WwTW. Due to various quality improvement drivers there is a developing general trend of tighter phosphorus limits at treatment works.

Line 7D.7 Total load received

This is a calculated line

Line 7D.8 Load received from trade effluent customers at treatment works

The overall load received from trade effluent customers at treatment works has increased this year. Some of the key factors influencing this change are detailed in the commentary for lines 7B.3 and line 7C.12 above.

Number of sewage treatment works

The number of sewage treatment works can be used as a basic indicator of the size of a water company. However, for it to be used as an effective comparator, it must be used in conjunction with consent, load and WwTW classification information.

Line 7D.9 STWs in size band 1, Line 7D.10 STWs in size band 2, Line 7D.11 STWs in size band 3, Line 7D.12 STWs in size band 4, Line 7D.13 STWs in size band 5 and Line 7D.14 STWs above size band 5

The total number of works has increased 18 from the previous reporting period, from 566 up to 584. A summary of the movements between the numbers of works in each size band is shown below.

	Size bands		
Works Name	2021/22	2022/23	Change
Askham	1	2	Increase in banding
Bulkeley	1	2	Increase in banding
Crowton	1	2	Increase in banding
Dolphinholme	1	2	Increase in banding
Plumpton North	1	2	Increase in banding
Aglionby	2	1	Decrease in banding
Gilcrux	2	1	Decrease in banding
Langdale	2	1	Decrease in banding
Whittington	2	1	Decrease in banding
Arlecdon	2	3	Increase in banding
Prospect & Oughterside	2	3	Increase in banding
Melling	3	4	Increase in banding
Newbiggin	3	4	Increase in banding
Grange-Over-Sands	4	5	Increase in banding
Settle	4	5	Increase in banding
Clitheroe	5	6	Increase in banding
Wilmslow	5	6	Increase in banding
Tyldesley	6	5	Decrease in banding
Darwen	6	-	Site closed
Binn Green WwTW 1	-	1	New site for FY23
Binn Green WwTW 2	-	1	New site for FY23
Coldwell WTW	-	1	New site for FY23
Crank Road WwTW	-	1	New site for FY23
Cumwhinton WTW	-	1	New site for FY23
Forest Farm Cottage STP	-	1	New site for FY23
Foxhill WTW	-	1	New site for FY23
Hodder WTW	-	1	New site for FY23
Holcroft Lane WwTW	-	1	New site for FY23
Houghton Green WwTW	-	1	New site for FY23
Hyde Bank Farm Septic Tank	-	1	New site for FY23
Mill Brow Septic Tank	-	1	New site for FY23
Paddy End Water	-	1	New site for FY23
Pasture Lane WwTW	-	1	New site for FY23
Pexhill BH WwTW	-	1	New site for FY23
Poaka Beck WTW Septic Tank	-	1	New site for FY23
STP serving Hurleston WTW	-	1	New site for FY23
Ulpha WTW Septic Tank	-	1	New site for FY23
Walton BH WwTW	-	1	New site for FY23

Size band	In	Out	Net
1	23	5	**19**
2	5	7	**-2**
3	2	2	**0**
4	2	2	**0**
5	3	2	**1**
6	2	2	**0**
			18

Number of works (2021/22)	Number of works (2022/23)	Net
299	318	**19**
65	63	**-2**
60	60	**0**
47	47	**0**
32	33	**1**
63	63	**0**
566	**584**	**18**

The Phosphorus, BOD and Ammonia permit condition bandings associated with these 584 works are also displayed in lines 7D.9 to 7D.14

Line 7D.15 Total number of works

This is a calculated line.

Population equivalent

Line 7D.16 Current population equivalent served by STWs

The population equivalent (PE) served by WwTWs has increased by 26,610, which is an increase of 0.29% over the previous reporting period.

The primary contributor to population equivalent is domestic population, with the latest UK census now being incorporated into the population figures. There has also been a 0.74 % increase in Trade Effluent (TE) load which is equivalent to an additional 11,000 PE increase across all works.

The non-resident population figures are sourced from the 2021 dataset, where tourism figures were still recovering from the impacts of COVID-19.

Line 7D.17 Current population equivalent served by filter bed or activated sludge STWs with tightened/new P consents

The relevant schemes claimed in the WINEP this year are detailed below, along with the associated tightened P limit. The total population equivalent served by these schemes is 32,439.

The projects were delivered by capex solution. In any instance where this is not the case, the population equivalent benefitting from the primarily opex solutions would be shown.

WINEP Reference	Works Name	Delivery	Driver	Tightened P Limit	Population equivalent (000s)
7UU200514	Alderley Edge WwTW	31/12/2022	U_IMP2	2	15.69
7UU200717	Alderley Edge WwTW	31/12/2022	WFD_IMPg	0.3	15.69
7UU100069	Gawsworth WwTW	04/07/2022	WFD_IMPg	2	0.77
7UU100068	Little Budworth South WwTW	10/03/2023	WFD_IMPg	2.5	0.28
					32.44

Line 7D.18 Current population equivalent served by STWs with tightened/new N consents

We have no new/tightened N consents in this reporting period, so the population equivalent is reported as zero.

Line 7D.19 Current population equivalent served by STWs with tightened/new sanitary parameter consents

The relevant scheme claimed in the WINEP this year is detailed below, along with the associated tightened sanitary parameter. The total population equivalent served by this scheme is 14,867.

Typically projects are delivered by capex solution. In any instance where this is not the case, the population equivalent benefitting from the primarily opex solutions would be shown.

WINEP Reference	Works Name	Delivery	Driver	Tightened sanitary parameter	Population equivalent (000s)
7UU100060	Alsager WwTW	07/12/2022	WFD_IMPg	Ammonia, DO	14.87
					14.87

Line 7D.20 Current population equivalent served by STWs with tightened/new UV consents

The relevant scheme claimed this year is detailed below. The total population equivalent served by this scheme is 109,271.

Typically projects are delivered by capex solution. In any instance where this is not the case, the population equivalent benefitting from the primarily opex solutions would be shown.

WINEP Reference	Works Name	Delivery	Driver	Population equivalent (000s)
7UU200395	Carlisle WwTW secondary treated sewage effluent	22/10/2022	SW_ND UV	109.27
				109.27

Line 7D.21 Population equivalent treatment capacity enhancement

This year we have delivered two projects; one at Alsager WwTW and one at Little Budworth South WwTW. The total additional population accommodated through these schemes is 6,885.

Line 7D.22 Current population equivalent served by STW with tightened / new consents for chemicals

This year we have delivered four projects. The total additional population served through these schemes is 212,000.

WINEP Reference	Works Name	Delivery	Driver	Chemical of interest	Population equivalent (000s)
CHM00328	Failsworth WwTW (CIP2 T2)	22/12/2022	WFD_NDLS_CHEM1	Mercury (total)	22.13
GMC00073	Kidsgrove WwTW (CIP1)	22/12/2022	WFD_NDLS_Chem2	Zinc (dissolved)	24.47
GMC00075	St Helens WwTW (CIP2 T1)	22/12/2022	WFD_NDLS_Chem2	Zinc (dissolved)	144.22
CHM00352	Worsley WwTW (CIP2 T2)	22/12/2022	WFD_NDLS_CHEM2	Zinc (dissolved)	21.18
					212.00

Table 7E Wastewater network+ - Energy consumption and other data for the 12 months ended 31 March 2023

Other

Line 7E.1 Total sewerage catchment area

Our number is consistent with last year's, there is a minor change of 0.41 per cent due to updates in our corporate GIS system.

Line 7E.2 Designated coastal bathing waters

We currently have 29 designated bathing waters in our region. 25 of these are coastal bathing waters and four are inland bathing waters at Windermere. As per the reporting guidance, we are now only reporting the 25 coastal bathing waters on this line.

There is the potential for additional designation of bathing waters, particularly where open water swimming becomes more popular in inland waterways and lakes. We will treat newly designated bathing waters in the same manner as existing ones; promoting improvements where appropriate and supported by customers, to ensure our assets are not preventing bathing waters achieving excellent status by 2040.

Line 7E.3 Number of intermittent discharge sites with event duration monitoring

This year, 31 event duration monitoring (EDM) installations have been completed. The number of installations varies year on year, but as we near the end of the AMP and conclude our programme, the number will naturally be smaller than reported in previous years.

Line 7E.4 Number of monitors for flow monitoring at STW's

In 2022/23, 26 monitors were delivered within the reporting period. This is a decrease from the number delivered in the previous year.

The number of schemes delivered each year aligns to the regulatory dates agreed with the Environment Agency and published in the WINEP. As a consequence we expect to see fluctuations within the annually reported figures.

Line 7E.5 Number of odour related complaints

The number of odour related complaints has decreased again this year, down to 1,304 from 1,783 in the previous period, which is our lowest ever total.

We continue to employ our odour plans at the relevant operational sites and the reduction in overall numbers is in line with our predicted trend.

Energy consumption

Line 7E.6 Energy consumption – sewage collection, Line 7E.7 Energy consumption – sewage treatment and Line 7E.8 Energy consumption – wastewater network +

From 2020/21 the wastewater business consumption was split between collection and treatment. This has remained the same for 2022/23 reporting

At a combined level for wastewater collection and treatment, consumption in 2021/22 was 474,028 MWh versus 475,380 MWh in 2022/23. This represents an increase of circa 0.3 per cent.

In terms of variance, we saw electricity consumption decrease by 2,153 MWh and stationary fuel use increase by 6,268 MWh. The reduction in electricity is a result of lower rainfall and less sewerage collection pumping. The stationary fuel variance is due to increased demand at Ellesmere Port WwTW and Carlisle WwTW, which are both met utilising diesel generators instead of grid import which is constrained both areas as we await a local network upgrade by the Distribution Network Operator.

Scheme delivery

Line 7E.9 Cumulative shortfall in FFT addressed by WINEP / NEP schemes to increase STW capacity and Line 7E.10 Number of sites with an increase in sewage treatment works capacity delivered to address a shortfall in FFT

We have delivered no WINEP schemes to address FFT shortfall in this reporting period, so the equivalent flow is reported as zero.

Line 7E.11 Additional storm tank capacity provided at STWs (grey infrastructure), Line 7E.12 Additional effective storm storage capacity at sewage treatment work (delivered through green infrastructure), Line 7E.15 Total number of sewage treatment works sites where additional storage has been delivered (grey infrastructure), Line 7E.16 Number of sewage treatment works sites where additional storage has been delivered with pumping (grey infrastructure) and Line 7E.17 Number of sewage treatment works benefitting from green infrastructure replacing the need for storm tank storage

There has been no additional storage tank capacity delivered this year.

Line 7E.13 Additional volume of network storage at CSOs etc. to reduce spill frequency (grey infrastructure), Line 7E.14 Additional effective storage in the network delivered through green infrastructure Line 7E.18 Number of sites delivering additional network storage (grey infrastructure), Line 7E.19 Number of sites delivering additional network storage including pumping (grey infrastructure) and Line 7E.20 Number of sites delivering additional network storage through green infrastructure

The three additional network storage schemes delivered through grey infrastructure are shown in the table below. There were no green infrastructure schemes delivered.

WINEP Reference	Works Name	Delivery	Driver	Volume (m3)
7UU200396	Carlisle WwTW Inlet CSO (Silloth Solway)	22/10/2022	SW_ND	3,500
7UU300109 and 7UU300110	Horwich WwTW Low level inlet and Horwich WwTW Storm tanks	07/10/2022	WFD_IMPm	4,700
7UU100071b	Pumping station No.4 off King Street (CON0012)	07/12/2022	WFD_IMPg	665
				8,865

Line 7E.21 Surface water separation drainage area removed

This year we have delivered two projects; the first at Ursuline Catholic primary school removed 7,137 m^2 and the second at Farnborough Infant and Junior school removed 1,818 m^2.

Line 7E.22 Number of schemes delivered to meet tightened or new sanitary consents

As described in line 7D.19, there is only one scheme delivered this year to meet tightened or new sanitary consents.

Line 7E.23 Number of installations requiring civils for flow monitoring at sewage treatment works

All of our installations are placed into one of the three following categories:

1. **Permit update only** – Where no additional kit is used and no additional work required.
2. **Simple install** – Installation of kit e.g. level sensors, controller for data feed and connection of telemetry.
3. **Complex/Civils install** – in addition to the simple install there was civil work required, for example digging a new duct route or adding a new access panel.

This year, there have been seven installations requiring civils.

Works Name	Driver	Delivery	Type
Alsager WwTW	U_MON4	07/12/2022	Complex/Civils
King Street PS (CON0012)	U_MON4	31/03/2023	Complex/Civils
Threlkeld Quarry PS	U_MON4	31/03/2023	Complex/Civils
Newchurch in Pendle WwTW	U_MON5	31/03/2023	Complex/Civils
Rimington WwTW	U_MON5	31/03/2023	Complex/Civils
Calthwaite PS	U_MON4	31/03/2023	Complex/Civils
Hest bank PS	U_MON4	31/03/2023	Complex/Civils

Line 7E.24 Number of installations requiring civils for event duration monitoring at intermittent discharges

Using the same definition as described above in line 7E.23, there have been 11 EDM installations requiring civils this year.

WINEP Reference	Works Name	Driver	Delivery	Type	No. of installs
7UU200555	Alsager WwTW	U_MON3	07/12/2022	Complex/Civils	1
7UU200348	Aspatria WwTW	U_MON3	31/03/2023	Complex/Civils	2
7UU200157	Carlisle WwTW	U_MON3	22/10/2022	Complex/Civils	3
7UU300166a	King Street PS (CON0012)	U_MON3	31/03/2023	Complex/Civils	1
7UU200245	Kirkbride WwTW	U_MON3	31/03/2023	Complex/Civils	1
7UU300262	Liverpool WwTW (Sandon Dock)	U_MON3	31/03/2023	Complex/Civils	1
7UU200683	Urmston WwTW	U_MON3	31/03/2023	Complex/Civils	1
7UU200689	Weaverham WwTW	U_MON3	31/03/2023	Complex/Civils	1
					11

Line 7E.25 Number of storm overflows where improvements have been made to reduce harm or reduce spill frequencies

This year there have been five storm overflows where improvements have been made to reduce harm or spill frequencies.

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

In column 'Historical consent for phosphorus' where we do not have a consent we have entered n/a.

Table 7F was a new table for 2021/22 and revised in 2022/23. The list of phosphorus schemes has been populated from the WINEP (as per position in April 2023). This includes all schemes with a phosphorus driver regardless of delivery status. Any changes to the List of WINEP schemes will be updated as appropriate in future APR submissions.

To date the following changes have been made to table 7F:

- Davyhulme WwTW has been swapped for P removal at Oldham WwTW and Eccles WwTW. This provides the same water quality benefit however the population equivalent (PE) will be significantly reduced as Davyhulme has a higher PE than Oldham WwTW and Eccles WwTW combined.
- The Chipping project has been divided into two requirements, one at the WwTW and one within the catchment. Only the catchment solution will deliver a phosphorus reduction and so Chipping WwTW has been removed from Table 7F.
- Six nutrient neutrality schemes have been identified from AMP8 for early investment, these schemes have been added to table 7F. The schemes are Appleby WwTW, Brampton WwTW (Carlisle), Kirkby Stephen WwTW, Warwick Bridge WwTW, Carlisle WwTW and Penrith WwTW.

The PE has been populated using the current design forecast as required in RAG 4.11. For schemes still in the design phase this forecast may change as the final solution is developed. Where the design population forecast is not available the current PE has been used within the site PE column. PE will be updated as appropriate in future APR submissions. Where phosphorus removal is being delivered via a catchment or wetland solution. The PE for the WwTW listed in the WINEP has been given.

The historic and enhanced consent has been populated from the WINEP. Where there is a backstop permit and stretch limit, both have been populated in the enhanced consent column. Similarly, where phosphorus removal is delivered via a wetland or catchment solution this also populated in the enhanced content column. Petteril catchment solution will result in the removal of 98kg/annum in phosphorus across three different WINEP drivers: 7UU100007b Greystoke, 7UU100012b Motherby WwTW and 7UU200449b Southwaite WwTW. Within Table 7F 'catchment solution' has been identified within the Enhanced consent column without a value to prevent double counting.

Where a site has multiple phosphorus drivers, requiring different phosphorus limits, both WINEP references have been included under a single project line, the PE has been counted twice to reflect the two requirements.

Expenditure in this table is consistent with line 4M.37 Phosphorous Removal. This includes all expenditure relating to the listed AMP7 WINEP phosphorus removal schemes, plus expenditure of £2.817m in line 7F.80 for the completion and closedown of some AMP6 schemes.

Future forecasted expenditure represents our current best view of project costs and profiling through to completion. Some schemes have multiple drivers, in these instances costs have been proportionally allocated based on the driver and solution.

Further to Ofwat confirming the Accelerated Programme in April 2023, the table now includes six ENV2 schemes on lines 7F.81-7F.86.

Table 8A Bioresources sludge data for the 12 months ended 31 March 2023

We use our Regional Sludge Operational Management (RSOM) system as the primary source of measuring sludge production.

Line 8A.1 Total sewage sludge produced, treated by incumbents

This financial year we have seen another increase in the volume of raw sludge that we have produced. This is a result of population growth, an increase in the trade effluent loads that we have received and tighter consents on effluent discharges.

The 2022/23 figure is derived from measured data for digester feed using our RSOM system. When measured data has not been available we have applied a back calculation. We have added to this figure a raw sludge production number for the sludge that we lime. Both figures exclude any inbound sludge trading and is constrained to the sludge produced within our region. It excludes the volume of lime addition, grit and screenings from sewage treatment and excludes grit and screenings arising from sludge treatment.

It excludes our sludge that is treated using lime by a 3rd party contractor. That volume is detailed in line 8A.2. As such, none of our sludge is double-counted, it is classified as subject to either incumbent or third party treatment, never both.

Line 8A.2 Total sludge produced, treated by 3rd party sludge service provider

This figure is a raw sludge production number and excludes any inbound sludge trading and is constrained to the sludge produced within our region. It excludes the volume of lime addition, grit and screenings from sewage treatment and excludes grit and screenings arising from sludge treatment.

Compared to 2021/22 there has been a substantial increase in the amount of sludge sent to reclamation untreated due to operational issues in-year. Therefore there has been less sludge metered through digestion and a larger portion of the stated volume has been calculated from tipper volumes to reclamation

Line 8A.3 Total sewage sludge produced

This is a calculated line.

Line 8A.4 Total sewage sludge produced from non-appointed liquid waste treatment

To calculate this figure we have interpreted “non-appointed liquid waste treatment” as septic tank and bioprocessing treatment. To estimate the figure, we firstly gather information on liquid sludge thickness from some of our representative sites that receive septic tank waste. Then we apply the average percentage dry solids value (% DS) from a spot sample of tanker deliveries. Using the flow and concentration, we are then able to calculate the suspended solids of the septic sludge treated. Settled COD was converted into settled BOD using a ratio of 2:1 as advised from testing undertaken by our Bioprocessing team. Using an asset standard primary tank solids removal of 50%, the primary sludge from non-appointed activities was calculated.

We predominantly utilises activated sludge (ASP) sites, therefore we assumed a sludge yield ratio for ASP sites is an appropriate estimate to express the secondary sludge make (0.8kg SS/kg settled BOD). Adding the primary sludge and secondary sludge for both septic tanks and bioprocessing waste therefore gives a total sludge produced from non-appointed liquid waste treatment.

There has been a reduction in both septic tank flow and bioprocessing flow in 2022/23 compared with 2021/22 with a corresponding reduction in solids. Septic tank volume is down 7.6%, whilst bioprocessing load is also lower, driven by a 13% COD load decrease at Davyhulme.

Line 8A.5 Percentage of sludge produced and treated at a site of STW and STC co-location

We have interpreted the line to include all co-located indigenous sludge production and indigenous sludge from physically separate sites connected by pipeline where any sludge treatment activity takes place and where that site has the appropriate Biosolids Approval Scheme (BAS) accreditation.

The small increase in percentage in this reporting period is within the variability range we would expect in indigenous sludge calculation due to %DS assumptions at dewatering sites.

Line 8A.6 Total sewage sludge disposed by incumbents and Line 8A.7 Total sewage sludge disposed by 3rd party sludge service provider

There was a decrease of 24.5 ttds treated sludge disposed compared to 2021/22. This is due to an increase in raw sludge being taken to restoration and a reduction in treated sludge produced. In addition, cropping plans on the back of high fertiliser prices meant there was a greater demand for spring applications, then the wet weather experienced in the region in March postponed these applications into April 2023.

The total volume of sewage sludge disposed by 3rd party providers has increased in 2022/23 by 9.9 ttds compared to 2021/22. This is due the major incident at Liverpool (Sandon dock) and several other sites experiencing processing issues. This lead to a higher volume of raw sludge requiring disposal by other routes.

Line 8A.8 Total sewage sludge disposed

This is a calculated line.

Line 8A.9 Total measure of intersiting 'work' done by pipeline

The work done by pipeline has been calculated using the total tonnes dry solids moved from each start site to end location. The total volume was then multiplied by the distance in one direction to give the total work done.

We have interpreted the line to include all intersiting 'work' done by pipeline that transports both raw and treated sludge, one way only.

The reported 2022/23 figure is higher than 2021/22 reported value. This is primarily due to an increase in volume down the Pennine leg of the Mersey Valley Sludge Pipeline, following an issue at Halewood in 2021/22.

Line 8A.10 Total measure of intersiting 'work' done by tanker

We have interpreted the line to include all treated and untreated liquid sludge intersiting 'work' done as a liquid sludge, one way only.

The total work done via tanker has been calculated by:

- Calculating the total tTDS for each route
- Calculating the distance travelled in one direction (as opposed to estimating)
- The total distance for each route is then multiplied by the total tTDS
- The regional total is a sum of all of the routes

There has been a decrease in tankering in 2022/23 compared to 2021/22. This is due to a number of factors including:

- A reduction in digested sludge movements due to the resolution of the issue at Halewood on the MVSP.
- In 2021/22 there was a long outage at the Bury sludge treatment centre, resulting in a large amount of tanker exports.

- In 2021/22 there were exports out of Eccles WwTW due to an issue on the raw sludge pipeline to Davyhulme.
- In 2021/22 operational issues at Southport resulting in liquid export from site and diverted imports

Line 8A.11 Total measure of intersiting 'work' done by truck

We have interpreted this line to be sludge as a solid (cake), with intersiting 'work' done one way only. All of this work is raw sludge cake movements.

The total work done via truck has been calculated by:

- Calculating the total ttds for each route.
- Calculating the distance travelled in one direction.
- The total distance for each route is then multiplied by the total ttds.
- The regional total is a sum of all of the routes.

In 2022/23 there has been a large increase in the volume of cake transported. This is due to:

- The use of temporary dewatering at Liverpool due to digester outage.
- An increase in dewatering activity at Hyndburn.
- An increase in dewatering activity at Wigan.
- The use of temporary dewatering at Ellesmere Port.

We have also increased the volume of sludge to restoration this year. This activity has increased the utilisation of our temporary cake pad at Blackburn, which then had an impact on the distances travelled.

Line 8A.12 Total measure of intersiting 'work' done (all forms of transportation)

This is a calculated line.

Line 8A.13 Total measure of intersiting 'work' done by tanker (by volume transported)

The figure that we have reported is lower than the last financial year. As described in line 8A.10, many of the issues experienced in 2021/22 have now been resolved.

Line 8A.14 Total measure of 'work' done in sludge disposal operations by pipeline

United Utilities do not dispose of any sludge by pipeline.

Line 8A.15 Total measure of 'work' done in sludge disposal operations by tanker

This year we have not disposed of any sludge by tanker.

Line 8A.16 Total measure of 'work' done in sludge disposal operations by truck

From 2016/17 onwards our vehicles have been able to record distances on board to automatically calculate distances travelled.

This year there has been a 1,359 ttds*km/year (12.9%) increase from the previous reporting period. This is primarily due to the distance travelled to Scottish restoration sites and a lack of suitable restoration availability closer to our export sites. Some of this distance travelled has been offset by reduced travel distance for exports to agriculture, which fell by 871 ttds*km/year compared to 2021/22 in comparison to raw sludge exports which rose by 2,189ttds*km/year in the same period.

Line 8A.17 Total measure of 'work' done in sludge disposal operations (all forms of transportation)

This is a calculated line.

Line 8A.18 Total measure of 'work' done by tanker in sludge disposal operations (by volume transported)

As described in line 8A.15, we have not disposed of any sludge by tanker this year.

Line 8A.19 Chemical P sludge as % of sludge produced at STWs

There was no change to the chemical P sites in 2022/23 compared with 2021/22. Therefore the minor increase in the reported percentage in this reporting period is due to localised population increases at the existing chemical P removal facilities.

Table 8B Bioresources operating expenditure analysis for the 12 months ended 31 March 2023

Sludge transport method

Sludge transport Lines 8B.1 to 8B.10

In line with guidance, costs include the updated RAG 2.09 overhead allocations. All other allocations are in line with the prior year.

Sludge treatment type

Sludge treatment Lines 8B.11 to 8B.20

We have reviewed the allocation this financial year to allocate costs from ‘other’ according to the final treatment route of the sludge.

Our main sludge pipeline, the Mersey Valley Sludge Pipeline (MVSP) transports treated sludge and so we have included costs associated with this pipeline in the sludge treatment ‘other’ column.

Sludge liquors recharges have been reflected in costs (which was previously only shadow reported) and the revised RAG 2.09 allocation of other business activities (regulation costs), in accordance with the updated RAG 4.11 definition of functional expenditure.

Sludge disposal route

Sludge Disposal Lines 8B.21 to 8B.30

In line with guidance, costs include the updated RAG 2.09 overhead allocations. All other allocations are in line with the prior year.

Lines 8B.1, 8B.11 and 8B.21 – Power

Sludge treatment power costs have reduced due to an increase in the power price for generation sold to WWN+.

Lines 8B.2, 8B.12 and 8B.22 – Income treated as negative expenditure

Income is generated using sludge assets, so is allocated 100% to Sludge Treatment. Income treated as negative expenditure has increased due to the impact of significant price increases in the wholesale energy markets.

Lines 8B.3, 8B.13 and 8B.23 – Discharge consents

We continue to review the charges that we pay for our Pollution Prevention and Control (PPC) permits and Waste Management Licenses with the Environment Agency to ensure that we pay the correct charges.

Lines 8B.4, 8B.14 and 8B.24 – Bulk discharge

No costs within Bioresources.

Lines 8B.5, 8B.15 and 8B.25 – Renewals expensed in year (infrastructure)

Infrastructure renewals expenditure on our raw sludge pipelines has been allocated to sludge transport and expenditure on our treated sludge pipeline (MVSP) has been allocated to sludge treatment. This year we have experienced operating issues on the raw sludge pipeline from Eccles WwTW to MBC which has resulted in increased tankering costs. There has also been an issue on the MVSP between Liverpool WwTW and Shell Green all year, which required digesate to be temporarily tankered out of Liverpool.

Lines 8B.6, 8B.16 and 8B.26 – Renewals expensed in year (non-infrastructure)

We have not included any expenditure within this line.

Lines 8B.7, 8B.17 and 8B.27 – Other operating expenditure excluding renewals

Sludge liquors recharges have been reflected in other operating expenditure (which was previously only shadow reported) and the revised RAG 2.09 allocation of other business activities (regulation costs), in accordance with the updated RAG 4.11 definition of functional expenditure. This is new for 2022/23, and Table 8B no longer reconciles to table 4E due to the differing definition.

Other operating expenditure in sludge transport has increased mainly due to additional sludge volumes, increased distances from incidents/site closures and higher fuel prices.

Farming Rules for Water (FRfW) has impacted both treatment and disposal operating expenditure due to increasing our enhanced cake production at MBC by installing additional centrifuges to increase production. This allowed us to go to more grass land bank across the North West and reduce the nitrogen impact in line with FRfW requirements.

In addition to FRfW, other operating expenditure in sludge treatment has increased mainly due to regional incidents on the pipelines mentioned in the infrastructure renewals section above and also due to the inclusion of sludge liquors that were previously shadow reported.

Other operating expenditure in sludge disposal has increased mainly due to FRfW and also increases in restoration costs at a higher price, and also higher volumes with a lower proportion of sludge processed going to land.

Lines 8B.8, 8B.18 and 8B.28 – Total functional expenditure

This is a calculated line.

Lines 8B.9, 8B.19 and 8B.29 – Local authority and Cumulo rates

For sludge treatment (excluding MVSP and Shell Green) the Wastewater local list business rates costs cover the operational assets (excluding Network) which are allocated to Wastewater upstream services on a proportionate basis to GMEAV of non-infrastructure assets at each site.
The MVSP (Mersey Valley Sludge Pipeline) is allocated directly to sludge treatment as the pipeline transports treated sludge.

Shell Green is split between sludge treatment and sludge disposal based on GMEAV of the dewatering and incineration assets.

Lines 8B.10, 8B.20 8B.30 – Total operating costs (excluding 3rd party)

This is a calculated line.

Table 8C Bioresources energy and liquors analysis for the 12 months ended 31 March 2023

Energy

Line 8C.1 Energy consumption – Bioresources

This is the gross energy consumption across Bioresources. This has increased this year mainly due to increases in the market price of electricity, diesel and fuel oil.

Line 8C.2 Energy generated by and used in Bioresources control [Electricity]

This is electricity generated by undertaking activities within the Bioresources price control and which is subsequently used within the Bioresources control.

The total amount of electricity produced by Bioresources has decreased this year. This is due to the digestion process at Liverpool being offline for a large portion of the year and digestion activities ceasing at St. Helens. There has also been an increase in the market price of electricity which has impacted the equivalent monetary value. The market price reflects our hedged price of electricity.

Line 8C.2 Energy generated by and used in Bioresources control [Heat]

This is heat generated by undertaking activities within the Bioresources price control and which is subsequently used within the Bioresources control.

The total amount of heat produced has decreased this year. This is due to the digestion process at Liverpool being offline for a large portion of the year and digestion activities ceasing at St. Helens. Furthermore, there has been a reduction in heat (steam) demand at the Manchester Bioresources centre, with the Thermal Hydrolysis plant consuming less steam per tDS throughput. There has also been an increase in the market price of natural gas and fuel oil which has impacted the equivalent monetary value.

Line 8C.3 Energy generated by Bioresources and used in network plus control [Electricity]

This is electricity generated by undertaking activities within the Bioresources price control and which is subsequently used within the wastewater network plus price controls.

The total amount of electricity produced has decreased this year. As a result, Wastewater Network+ has been supplied with a smaller volume than the previous year. This is due to the digestion process at Liverpool being offline for a large portion of the year and digestion activities ceasing at St. Helens. As a consequence, there has also been a reduction in the amount of electricity exported to Network plus.

The increase in monetary value has been impacted by the increase in the market price of electricity. The market price reflects our hedged price of electricity.

Line 8C.4 Energy generated by Bioresources and exported to the grid or third party [Electricity]

This is the electricity generated by undertaking activities within the Bioresources price control and which is subsequently exported to the national grid or a third party (including non-appointee businesses).

The total amount of electricity produced has decreased this year and as such there has been a decrease in electricity exported to the grid as sites will export to grid when the engines are operating at full load. This is due to the digestion process at Liverpool being offline for a large portion of the year and digestion activities ceasing at St. Helens.

The increase in monetary value has also been impacted by the significant increase in the market price of electricity.

Line 8C.4 Energy generated by Bioresources and exported to the grid or third party [Biomethane]

This is the Biomethane generated by undertaking activities within the Bioresources price control and which is subsequently exported to the national grid or a third party (including non-appointee businesses).

The overall amount of Biomethane produced by Bioresources has decreased. Although the volume produced has reduced, there is an increase the market price of Biomethane.

Line 8C.5 Energy generated by Bioresources that is unused [Heat]

This is heat generated by undertaking activities within the Bioresources price control and which is subsequently unused by the incumbent, third parties or the national grid.

A decrease in the amount of heat unused is due to a decrease in the total amount of heat generated.

Line 8C.6 Energy bought from grid or third party and used in Bioresources control [Electricity]

This is electricity that is purchased from the national grid or another third party and subsequently used within the Bioresources price control.

A small reduction in electricity purchased from grid has been seen due to lower consumption. Although the volume purchased has reduced, there is an increase in cost due to increase in market price of electricity purchased. The market price is the hedged price.

Line 8C.6 Energy bought from grid or third party and used in Bioresources control [Heat]

This is the heat that is purchased from the national grid or another third party and subsequently used within the Bioresources price control.

This year there has been a reduction in the amount of fuel purchased to provide heat to Bioresources processes. This is due to heat (steam) demand efficiency at Manchester Bioresources Centre and the closure of St.Helens. Some additional biogas has been used in boilers to displace stationary fuels. There has also been an increase in the market price of natural gas and fuel oil which has impacted the equivalent monetary value.

Line 8C.6 Energy bought from grid or third party and used in bioresources control [Biomethane]

This corresponds to the amount of Propane that has been purchased to enrich the Biomethane to meet grid entry requirements.

There has been a reduction in the total amount of Biomethane injected to grid compared to 2021/22. However we have added more propane per MWh than the previous year due to a request from the gas company Cadent for higher calorific value. There has been also been an increase in the market price.

Income from renewable energy subsidies

Line 8C.7 Income claimed from Renewable Energy Certificates

This is the ROC income that applies to bioresources assets. This has decreased this year mainly due to lower sludge volumes processed through the system.

Line 8C.8 Income claimed from Renewable Heat Incentives

This is the total income received from Renewable Heat Incentives that apply to bioresources assets. This has decreased by switching to Renewable Transport Fuel Obligation (see 8C.10) in the final quarter.

Line 8C.9-11 Income claimed from other renewable energy subsidies

The total income received from renewable energy subsidies that are not Renewable Energy Certificates and Renewable Heat Incentives that apply to bioresources assets. This relates to RGGO's and RTFO's. RGGO has increased this year mainly due to a renegotiated rates. RTFO was a new subsidy in the final quarter, instead of RHI.

Line 8C.12 Total income claimed from renewable energy subsidies

This is a calculated line.

Line 8C.13 % of total number of renewable energy subsidies due to expire in the next 2 financial years

This is percentage of the total number of renewable energy subsidies claimed by the company that are due to expire within the next two financial years. There remains no renewable subsidies which are due to expire in the next two years.

Line 8C.14 This year's value of renewable energy subsidies due to expire in the next 2 financial years

This is the total value of the number of renewable energy subsidies claimed by the company that are due to expire within the next two financial years. There remains no renewable subsidies which are due to expire in the next two years

Bioresources liquors treated by network plus [AMP7 shadow reported values]

Line 8C.15 BOD load of liquor or partially treated liquor returned from bioresources to network plus

This is the biochemical oxygen demand load of sludge liquor or partially treated liquor (ie 'settled BOD') returned from bioresources to network plus in units of kilogram per day (kg BOD5/d).

BOD load has increased by 3,598kg/d (17.5%).

8C.16 Ammonia load of liquor or partially treated liquor returned from bioresources to network plus

This is the ammonia load of sludge liquor or partially treated liquor returned from bioresources to network plus in units of kilogram ammonia nitrogen per day (kg NH4-N/d).

Ammonia load has increased by 1,538kg/d (17.5%), largely driven by increased sludge throughput, particularly at Davyhulme which is an ammonia rich liquor due to thermal hydrolysis pre-treatment. Improvement to sampling

results has reduced reliance on generic liquor data. An operational incident at Liverpool resulted in the temporary use of a centrifuge for raw sludge which was not present in the previous year.

Line 8C.17 Recharge to Bioresources by network plus for costs of handling and treating bioresources liquors

The sludge liquor cost for 2022/23 is £11.246m compared to a reported figure in 2021/22 of £7.255m. The increase is due to the electricity and chemical price increases.

Table 8D Bioresources sludge treatment and disposal data for the 12 months ended 31 March 2023

Sludge treatment process

This table has been populated on the basis of the sludge treatment centre (STC) capability not the product that is produced.

Line 8D.1 % Sludge – untreated

The volume of sludge untreated by incumbent (e.g. sent to reclamation) has increased two-fold. This is due to operational incidents in-year which have restricted digester throughput. As a consequence, the overall percentage has increased to 8.6%.

Line 8D.2 % Sludge treatment process - raw sludge liming

The volume of raw sludge liming in 2021/22 has decreased to 2.0% from 2.9% in 2021/22. This is due to only a small additional volume of cake from the feeder sites to our Manchester Bioresources Centre (MBC) being diverted for lime treatment at Carlisle.

Line 8D.3 % Sludge treatment process - conventional AD and Line 8D.4 % Sludge treatment process - advanced AD

Sludge treatment by conventional AD has decreased from 27.8% to 26.6% and treatment by advanced AD has decreased from 65.9% to 62.7% compared to the previous reporting year.

The reduction in conventional AD is due to St. Helens ceasing digestion in 2022/23, and operational issues at Liverpool resulting in exporting raw sludge cake, eventually to restoration.

Reductions in throughput at Blackburn, Ellesmere Port and Lancaster have resulted in a decrease in advanced AD.

Line 8D.5 % Sludge treatment process - incineration of raw sludge

We do not utilise this treatment process.

Line 8D.6 % Sludge treatment process - other (specify)

We do not utilise any other treatment processes in addition to the ones described in lines 8D.1 to 8D.4.

Line 8D.7 % Sludge treatment process – Total

This is a calculated line.

(Un-incinerated) sludge disposal and recycling route

Line 8D.8 % Sludge disposal route - landfill, raw and Line 8D.9 % Sludge disposal route - landfill, partly treated

We do not currently use landfill as a disposal route.

Line 8D.10 % Sludge disposal route - land restoration/ reclamation

We have interpreted the line to be calculated from a treated sludge figure. The total volume of sewage sludge disposed by 3rd party providers to restoration has decreased again this year to 6.3%. This is due to increased visibility and management of the sludge system within United Utilities and ensuring all available sludge recycled to farmland capacity is being utilised where appropriate.

The total volume of sewage sludge disposed by 3rd party providers in 2022/23 has increased by 11.3% when compared to 2021/22. This is due to a major incident at Liverpool (Sandon Dock) and temporary treatment process capacity issues within the system to deal with raw sludge at a number of export sites

Line 8D.11 % Sludge disposal route - sludge recycled to farmland

We have interpreted the line to be calculated from a treated sludge figure (regardless of origin i.e. sludge traded in has been included in scope). We have interpreted this line to include the volume of lime addition, where relevant, as this is the physical volume of material actually disposed.

The figure for sludge disposed to farmland by incumbents in 2022/23 has decreased by 11.3% compared to 2021/22. This is due to an increase in raw sludge to restoration, and a carryover of treated sludge in temporary stockpiles into 2023/24 due to weather conditions in March 2023.

Line 8D.12 % Sludge disposal route - other (specify)

We do not utilise any other disposal routes in addition to the ones described in lines 8D.10 to 8D.11.

Line 8D.13 % Sludge disposal route – Total

This is a calculated line.

Table 9A Innovation Competition

Line 9A.1 Allocated innovation competition fund price control revenue

The allowed amount of revenue to be collected from customers in relation to the innovation fund in 2022/23 as per the PR19 Final determination, inflated to nominal prices for the year using Actual November CPIH.

Lines 9A.2 Innovation fund income from customers

The revenue collected from customers in 2022/23, which aligns to the allowance reported in line 9A.1

Lines 9A.3 – Income from customers to fund innovation projects the company is leading on

No income received in 2022/23.

Line 9A.4 – Income from customers as part of the inflation top-up mechanism

No income received in 2022/23.

Line 9A.5 – Income from other water companies to fund innovation projects the company is leading on

No income received in 2022/23.

Line 9A.6 Income from customers that is transferred to other companies as part of the innovation fund

As per the payment schedule that is issued from Nesta and Ofwat following the announcement of the winners of each round. £8.7m paid into the innovation fund in 2022/23

Line 9A.8 Administration charge for innovation partner

As per the annual invoice issued to us by Ofwat for the running of the fund, which has been paid in 2022/23.

Lines 9A.9 – 9A.23 Project detail

Expenditure breakdown on our 4 successful bids in securing for lead projects, including the first Innovation in Water Challenge (IWC) and the first Water Breakthrough Challenge (WBC). No spend has been incurred in relation to our lead WBC projects.

A total of £5.4m spend on innovation projects in 2022/23 (excluding 10% partnership contribution).

Note that the table does not include the contributions to other water companies for their lead bids.

Line 9A.24 Total

This is a calculated line.

Table 10A Green recovery data capture additional items for the 12 months ended 31 March 2023

Our activities for Green recovery do not have an impact on the activities listed in lines 10A.1 to 10A.21.Therefore the reported values for these lines are stated as 'N/A'.

Our Green recovery activities do potentially impact on lines 10A.22 and 10A.25. However, as detailed below in our commentary for table 10E, there have been no outputs completed under Green recovery this year.

Table 10B Green recovery data capture outcome performance for the 12 months ended 31 March 2023

Our activities for green recovery do not have an impact on the activities listed Table 10B. Therefore the reported values for these lines are stated as 'N/A'.

Table 10C Green recovery data capture outcome performance for the 12 months ended 31 March 2023

Performance commitments set in standardised units

Line 10C.1 Internal sewer flooding - customer proactively reported, Line 10C.2 Internal sewer flooding - company reactively identified (i.e. neighbouring properties), Line 10C.3 Internal sewer flooding, Line 10C.4 Pollution incidents, Line 10C.5 Risk of sewer flooding in a storm and Line 10C.6 Risk of sewer flooding in a storm

As detailed below in our commentary for table 10D, our Green recovery activities only potentially impact on three of our performance commitments. This potential impact excludes all of the common performance commitments outlined in table 10C, therefore the reported values are stated as N/A.

Table 10D Green recovery data capture outcome performance for the 12 months ended 31 March 2023

Bespoke performance commitments relevant to green recovery reporting

Line 10D.1 Enhancing natural capital for customers, Line 10D.2 Hydraulic internal flood risk resilience and Line 10D.3 Hydraulic external flood risk resilience

There is the potential for some of our 'sustainable drainage and natural flood management' Green recovery activities to provide additional benefit under both our 'hydraulic internal flood risk resilience' and 'hydraulic external flood risk resilience' performance commitments. However in 2022/23, none of our activities delivered any benefit in this area.

Likewise, there is the potential for some of our 'catchment phosphorus' Green recovery activities to provide additional benefit under our 'enhancing natural capital for customers' performance commitment. Again, none of our activities delivered any benefit in this area in 2022/23.

Table 10E Green recovery data capture reconciliation model input for the 12 months ended 31 March 2023

A detailed overview of our Green recovery activity for 2022/23 and future milestones can be found at:

unitedutilities.com/globalassets/documents/pdf/green-recovery-2023

Please note that for rows 10E.57 and 10.60 we have reported the allowance spend performance in £m to three decimal places, as opposed to reporting this as a percentage. The percentage completion that corresponds to this performance is then available in the blue coloured adjoining cells in the table.

Table 11A Operational greenhouse gas emissions reporting for the 12 months ended 31 March 2023

This table has been populated where possible directly from the 'Ofwat Annual Performance Reporting' lines on the 'Summary' worksheet of the Carbon Accounting Workbook (CAW) v17 with data for the 12 months ending 31 March 2023. Some values which are not in a suitable format in the summary worksheet were obtained from other worksheets within the same CAW v17 as detailed below. Remaining values were obtained from United Utilities Group scope 3 reporting, as detailed below.

Line 11A.1 Burning of fossil fuels (location-based) and Line 11A.2 Burning of fossil fuels (market-based)

The GHG Protocol states that location / market-based methodologies only apply to scope 2 emissions. Ofwat have recognised this in the June 2nd update of the 'Greenhouse gas emissions data request 2023' template.

In this table both lines are populated from the CAW line entitled 'Direct emissions from burning of fossil fuels (including CHP generated onsite)' to enable lines 11A.6 and 11A.7 to auto calculate.

Line 11A.3 Process and fugitive emissions and Line 11A.4 Vehicle transport

Populated directly from relevant 'Ofwat Annual Performance Reporting' lines in CAW v17 'Summary' worksheet.

Line 11A.5 Emissions from land

All emissions associated with biosolids recycling are captured in scope 3.

Line 11A.6 Total scope one emissions (location-based) and Line 11A.7 Total scope one emissions (market-based)

These are automatically calculated lines.

Line 11A.8 Scope one emissions; GHG type CO2, Line 11A.9 Scope one emissions; GHG type CH4 and Line 11A.10 Scope one emissions; GHG type N2O

Populated directly from relevant 'Ofwat Annual Performance Reporting' lines in CAW v17 'Summary' worksheet.

Line 11A.11 Scope one emissions: GHG other types

Populated directly with values from table '4.2 Refrigerants' of CAW v17 '4.Transprt, Refrig & Off Waste' page.

Line 11A.12 Purchased electricity (location-based), Line 11A.13 Purchased electricity (market-based), Line 11A.14 Purchased heat and Line 11A.15 Electric vehicles

Populated directly from relevant lines of 'Ofwat Annual Performance Reporting' in CAW v17 'Summary' worksheet.

Line 11A.16 Removal of electricity to charge electric vehicles at site

This line is zero as we do not have sub-meters for onsite charging points. All electricity purchased for charging vehicles is included in line 11A.12 or 11A.15. The records of distance are for travel in private vehicles and therefore contribute to Line11A.23.

Line 11A.17 Total scope two emissions (location-based) and Line 11A.18 Total scope two emissions (market-based)

These are automatically calculated lines.

Line 11A.19 Scope two emissions; GHG type CO2, Line 11A.20 Scope two emissions; GHG type CH4 and Line 11A.21 Scope two emissions; GHG type N2O

Populated directly from relevant 'Ofwat Annual Performance Reporting' lines in CAW v17 'Summary' worksheet.

Line 11A.22 Scope two emissions: GHG other types

There is no breakdown of emission factors by other GHGs for the scope 2 emissions sources in the UK government conversion factors for company reporting of GHG emissions, therefore the emissions of other GHG types is assumed to be zero.

Line 11A.23 Business travel and Line 11A.24 Outsourced activities

We outsource a small portion of our sludge transport. The emissions are calculated using the tonne kilometres transported and emission factor below from the UK government conversion factors for company reporting of GHG emissions:

https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2022.

- DEFRA 2022: Freighting goods, HGV (all diesel), All HGVs, Average laden

Line 11A.25 Purchased electricity; extraction, production, transmission and distribution (location-based) and Line 11A.26 Purchased electricity; extraction, production, transmission and distribution (market-based)

We are experienced at complete reporting of scope 3 category 3 fuel and energy-related emissions having done so since 2019/20 in our UU Group accounts. This line is populated with the scope 3 emissions using the following three emissions factors from the UK government conversion factors for company reporting of GHG emissions https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2022.

- DEFRA 2022: Transmission and distribution, T&D- UK electricity
- DEFRA 2022: WTT- UK electricity, WTT- UK electricity (generation)
- DEFRA 2022: WTT- UK electricity, WTT- UK electricity (T&D)

The GHG Protocol states that location / market-based methodologies only apply to scope 2 emissions. However, both lines are populated as described above to enable lines 11A.31 and 11A.32 to auto calculate.

Line 11A.27 Purchased heat; extraction, production, transmission and distribution

We do not purchase any heat.

Line 11A.28 Purchased fuels; extraction, production, transmission and distribution

We are experienced at complete reporting of scope 3 category 3 fuel and energy-related emissions having done so since 2019/20 in our UU Group accounts. This line is populated with the scope 3 emissions using the following five emissions factors from the UK government conversion factors for company reporting of GHG emissions https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2022.

- DEFRA 2022: WTT - fuels, Liquid Fuels, Gas Oil, litres
- DEFRA 2022: WTT - fuels, Liquid Fuels, Burning oil, litres
- DEFRA 2022: WTT - fuels, Liquid Fuels, Diesel (100% mineral diesel), litres
- DEFRA 2022: WTT - bioenergy, WTT-biofuel, Biodiesel HVO, litres
- DEFRA 2022: WTT - fuels, Gaseous Fuels, Natural Gas, kWh (Net CV)

Line 11A.29 Chemicals

This line is populated with our estimate for emissions from chemicals and gases based on an analysis of our annual spend using an extended-environmental input output (EEIO) model called CEDA Global 2022. This aligns with our UU Group reporting methodology. We are actively working with suppliers to improve the availability and accuracy of data such as emissions factors, which is currently relatively immature in the chemicals sector. For PR24 data tables and performance commitment reporting we will use CAW v17.

Line 11A.30 Disposal of waste

Populated directly with scope 3 emission values from table '5.2 Water & wastewater treatment' and '5.3 Sludge treatment' of CAW v17 '5.Treatment and Waste' page. This line does not include any water sludge emissions data as confirmed by Ofwat on 2nd June 2023.

Line 11A.31 Total scope three emissions (location-based) and Line 11A.32 Total scope three emissions (market-based)

These are automatically calculated lines.

Line 11A.33 Scope three emissions; GHG type CO2, Line 11A.34 Scope three emissions; GHG type CH4, Line 11A.35 Scope three emissions; GHG type N2O and Line 11A.36 Scope three emissions: GHG other types

There are no breakdowns of emission factors by different GHGs and therefore line 11A.33 has been populated with the CO_2 equivalent value. Note Ofwat have recognised this in the June 2nd update of the 'Greenhouse gas emissions data request 2023' template.

Line 11A.37 Gross operational emissions (location-based) and Line 11A.38 Gross operational emissions (market-based

These are automatically calculated lines.

Line 11A.39 Exported renewables and Line 11A.40 Exported biomethane

Populated directly with location-based values from relevant lines of CAW v17 'Results by accounts' page.

Line 11A.41 Insets

We are not yet claiming any emissions benefit from our peatland restoration and woodland planting schemes. We have registered schemes with the relevant codes to enable this option in the future, when carbon units are issued.

Line 11A.42 Other emissions reductions

Populated directly with values relating to location-based emissions reductions from 100% green electricity purchase to enable line 11A.43 to auto calculate.

Line 11A.43 Total emissions reductions and Line 11A.44 Net annual emissions (location-based)

These are automatically calculated lines.

Line 11A.45 Net annual emissions (market-based)

This is an auto calculated line, however, the formula in the proforma incorrectly gave the same value as the line 11A.38 (Gross operational emissions (market-based)). We have populated this line consistently with our UU Group reporting using the value derived from the following calculation.

Net annual emissions (market-based)	=	Gross annual emissions (market-based)	-	Emissions reduction from exported renewables (line 11A.39) using the UK Grid emission factor.	-	Emissions reduction from exported biomethane (line 11A.40) where RGGO certificates are retained.

Line 11A.46 Emissions per Ml of treated water and Line 11A.47 Emissions per Ml of sewage treated

Populated directly from relevant lines of 'Ofwat Annual Performance Reporting' in CAW v17 'Summary' worksheet.

Line 11A.48 Green tariff electricity

Populated directly with values relating to location-based emissions reductions from 100% green electricity purchase as line 11A.42.

Line 11A.49 Capital projects (cradle-to-gate)

This line is left intentionally blank as the contracts with our capital delivery partners are to design and build solutions to our requirements. As emissions are estimated using an EEIO model, it is not possible to differentiate between design, materials and build, therefore the estimate is entered on line 11A.50 only.

Line 11A.50 Capital projects (cradle-to-build)

This line is populated with our estimate for capital project emissions based on the annual spend on our capital projects with our construction services partners, using an EEIO model called CEDA Global 2022. The partners' contracts are to design and build solutions therefore the estimate is entered on line 11A.50 rather than line 11A.49.

Line 11A.51 Purchased goods and services

This line is populated with our estimate for purchased goods and services (excluding the emissions from spend on chemicals and gases) based on the annual spend using an EEIO model called CEDA Global 2022. We have populated this line consistently with our UU Group reporting.

United Utilities Water Limited
Haweswater House
Lingley Mere Business Park
Lingley Green Avenue
Great Sankey
Warrington
WA5 3LP

unitedutilities.com

United Utilities

Water for the North West