PR24 Data Table Commentary
Section 9. Long-term strategies

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2. Introduction

In these tables, the data details our forecast long-term outcomes and enhancement expenditure for 2025-50.

This data underpins our long-term delivery strategy at PR24. Our long term delivery strategies form a key part of the evidence to justify the scale and timing of need for enhancement expenditure in 2025-30 and provide early sight of future investments.

3. LS1 and LS2 - Forecast outcomes and Forecast outcomes from base expenditure.

LS1.1 & LS2.1 - Water Supply interruptions

The Board have agreed we will achieve 00:01:20 water supply interruptions by 2050. This is an aspiration that reflects our commitment to improve ways of working, including carrying out large scale mains renewals programme (e.g. replace cast iron mains), ensuring failures at our water pumping stations are kept to a minimum and improving supply restoration techniques. A liner glidepath has been created based on 12 seconds improvement per year/1 minute per AMP. The improvement for this is PC is assumed to be 100% from Base Expenditure.

LS1.2 & LS2.2 – Compliance Risk Index (CRI)

The Board have agreed we will achieve 1.00 CRI by 2050. We estimate that this position has an underlying level of unexpected or forecast failures that we have modelled and will be achievable with the continued level of funding. It is assumed the Cost Adjustment Claim for Non-infrastructure or other mechanism to increase base funding will be continued from 2025 through to 2050 for the improvement to be achieved. A linear glidepath is assumed. The improvement for this PC is assumed to be 65% from Base Expenditure.

LS1.3 & LS2.3 - Customer Contacts about Water Quality

The Board have agreed we will achieve 0.44 by 2050. This is an aspirational forecast based on a reduction of 0.01/1000 contacts per year/0.05 over the AMP. This will be achieved through continuation of the large-scale mains renewals programme (removal of cast iron and asbestos cement mains), enhanced DMA flushing programme and trunk mains conditioning . The improvement for this PC is assumed to be 70% from Base Expenditure.

LS1.4 & LS2.4 – Internal Sewer Flooding.

The Board have agreed that we will aspire for zero internal sewer flooding (ISF) incidents by 2050. This is an aspiration that reflects the likely technology and innovation advances we will see in the future that will enable this. We will continue to develop the strategy for achieving the target and the costs associated with it. A linear glide path has been created through AMP10, 11 and 12 to get to the zero target. Our customers support this aspiration and ISF is one of their highest priorities. We forecast that long term ISF improvements will be partially funded from base therefore there are different values in LS2 to LS1. Our LS2 profile matches the DWMP for AMP11 and 12. We will review this in the future.

LS1.5 & LS2.5 – External Sewer Flooding.

The Board have agreed a target of 2295 annual external sewer flooding incidents by 2050. Our priority will be internal sewer flooding over the next 25 years and we will seek to invest to bring dual benefit to both ISF and ESF wherever we can. However, ESF is less of a priority than ISF as it is generally less impactful and therefore we do not believe achieving zero on this measure should be a prime priority. A linear glide has been created through AMP10,11 and 12 which reflects the same rate of improvement as ISF getting to the agreed 2050 target. We forecast that long term ISF improvements will be fully funded from base therefore OUT2 and is aligned with OUT5. We will review this in the future.

LS1.6 & LS2.6 Biodiversity.

The Board have agreed a target to achieve 8.35 biodiversity units by 2050. We will continue to develop the Biodiversity plan through a mix of continued Enhancement and new Base funding. Enhancement funding is driven by WINEP

commitments relating to SSSI management, chalk streams and wetland habitat creation, all likely to require multiple AMP cycles for completion. During future AMP cycles, it is expected there will be a contribution to this commitment from our corporate commitment to Nature Based Solution which will deliver outcomes for biodiversity habitat as well as operational benefits. There is an expectation that base funding will contribute to this commitment in future AMP cycles, via managing elements of our land for conservation outcomes.

LS1.7, 1.8 & 2.7, 2.8 - Water and Wastewater Operational Greenhouse Gases.

The Board have agreed a target to achieve 40% reduction in GHG emissions from water, and a 34% increase in GHG emissions in wastewater by 2050. These are a progression of the forecast emissions in OUT4.24 and OUT5.27 and are forecast using the same fixed location-based emission factors (2022) to enable comparison with baseline. Actual emissions will be substantially lower, using annual location-based emission factors and market-based adjustments. It should be further noted that the LS1 and LS2 tables for GHG emissions are aligned to the operational GHG emissions boundary (per AMP8), and that additional investment has been allocated in Tables LS3 and LS4 to address wider scope 3 emissions associated with purchased goods and services and capital goods.

These investments will be critical for our net zero glide path but cannot for consistency reasons be included in the LS1 and LS2 tables as they are outside of the boundary of the earlier AMP8 performance commitments.

Our ambition is to deliver a 90% reduction in emissions (all scopes science-aligned) with Base and Enhancement investment and to offset the remaining 10% through a combination of self-generated carbon insets (woodland and peatland based) and purchase of third party carbon offsets, to deliver net zero by 2050. Table lines LS1.7 and LS1.8 show the trajectory with Enhancement investment, and Table lines LS2.7 and LS2.8 show the impact of Base reductions only. Increases in emissions in both cases for wastewater reflect the scale of the future capital programmes and increased emissions that we need to address via Enhancement funding. We will achieve the water emission reduction by on-going investment in self-generation of energy out to 2040, and measures to reduce chemical use, but must also address wider purchased and capital goods not included in LS1.7 or LS2.7. The wastewater emission increase will be staved off through similar investments plus on-going investments in process emission reduction. We have allocated investment at a level to address uplift in the emission factor for nitrous

oxide. The greatest uncertainty in emissions in the future rests with the scale and nature of future WINEP programmes, and the overall pace of decarbonisation in the UK, both factors outside of management control.

LS1.9 & LS2.9- Leakage

The Board have agreed to halve leakage rates by 2050, compared to 2019/20 levels on a 3 year rolling average metric (2017/18-2019/20). This is aligned to the Water Resources Management Plan. The glidepath has been created based on various leakage interventions, such as active leakage control, pressure management and the mains renewal programme. This programme has been optimised to create a plan of investment for every year to 2050. Continuous review of the cost benefit assumptions will be undertaken and inform the requirement to deviate or re-optimise the plan. The improvement for this PC is assumed an average of 44% from Base expenditure. Subject to change following final Water Resources Management Plan (WRMP).

LS1.10 & LS2.10 - Per Capita Consumption

The Board have agreed to reduce PCC to an average 110 litres of water per person per day by 2050 as per the industry policy and this aligns to the Water Resources Management Plan. The glidepath has been created based on water efficiency interventions in the Water Resources Management Plan. The improvement for this PC is 0% from Base expenditure. The LS2 table has been populated incorrectly with zero for all timesteps due to misinterpretation of the guidance. The correct PC value in all timesteps is the roll forward of AMP7 outturn, **2.57%.**

Subject to change following final Water Resources Management Plan (WRMP).

LS1.11 & LS2.11 - Business Demand

The Board have agreed to a 15% reduction from the baseline by 2050. This is aligned to the Water Resources Management Plan. The improvement for this PC is 0% from Base expenditure. The LS2 table has been populated incorrectly with zero for all timesteps due to misinterpretation of the guidance. The correct PC value in all timesteps is the roll forward of AMP7 outturn, **0.55%.**

Subject to change following final Water Resources Management Plan.

LS1.12, 1,13 & 2.12,2.13 Pollution and Serious Pollution.

The Board have agreed a target to reduce pollution to zero incidents by 2050. They have committed to having zero serious pollution incidents from 2025. Pollution is a high priority to our customers and therefore we are committed to achieving a high level of service, close to upper quartile throughout AMP8 and AMP9 on our journey to zero incidents. Zero pollution is a stretching aspirational target that will be achieved through a combination of operational excellence, maximised visibility of our assets and creating and managing strategic and local stakeholder relationships in partnership. A linear glide path to zero has been created from AMP9 through to AMP12. The assumption is that pollution improvement will be fully funded from Base, therefore the numbers in OUT2 are a replica of OUT5.

LS1.14 & LS2.14 Discharge Permit Compliance.

The Board have agreed that we will target 100% discharge permit compliance from 2025. This is a particularly stretching target given the wide variety in failure modes and reasons for failure that can occur at permitted treatment sites, particularly with regard to operational failures. However we are committed to improving our processes to ensure that we achieve maximum compliance every year. We do not anticipate any Enhancement funding requirement for Discharge Permit Compliance therefore OUT2 aligns with OUT5.

LS1.15 & 2.15 Bathing Water Compliance

The Board have agreed a long term outcome of 69% compliance at 2050. Our long-term ambition is to continually improve bathing water quality at our existing designations as well as supporting new bathing water designations. This aligns to our company vision of a thriving Yorkshire, right for customers, right for the environment; as well as the objective of the Yorkshire Bathing Water Partnership, which is to achieve excellent bathing water status at all of Yorkshire's designated bathing waters.

From our engagement with stakeholder groups across Yorkshire, we know there is an interest in applying for future bathing water designations. We also know from our customer engagement survey, 'Exploring customer views on Designated

Bathing Water sites', that our customers want to see us to go beyond the statutory requirements at bathing waters.

In our Long-Term Delivery Strategy, we have accounted for 3 successful bathing water applications per AMP, which will require improvements to our wastewater assets. Based on our current understanding within Yorkshire and across the industry of monitoring of inland recreational locations for bathing water quality, we have assumed that these future designations will be classified as Poor, requiring both improvements across our asset base and in collaboration with our stakeholders to manage diffuse bathing water sources.

Please refer to Section 3.1.2 for our wastewater Long-Term Delivery Strategy for further detail including the complete wastewater WINEP core pathway summary tables.

We do not anticipate any of these long-term improvements to be made through base hence the values of zero in LS2.

LS1.16 & 2.16 River Water Quality

The Board have agreed a long-term outcome of 88.5% phosphorous removal from a 2020 baseline by 2050. This will be achieved by removing phosphorous before it gets into the river. We will deploy our Totex hierarchy to achieve this, looking for 'no build' options such as working with landowners in catchments to remove the nutrients at source. Where we have to directly intervene we will deploy nature based solutions such as the wetland at Clifton to remove nutrients in a low carbon sustainable way. Only when there are limited options will we reply on traditional chemical removal solutions. We will ensure that we comply with the requirements of the Environment Act making our contribution to the national requirement for P removal in river catchments. No river water quality improvements are made through Base hence the values of zero in LS2.

LS1.17 and 2.17 Storm Overflows

The Board have agreed a long-term outcome of 9.02 regional average spills in 2050. This will ensure we outperform the requirements of the Environment Act target of ten regional spills by 2050. We will deliver our largest programmes of environment work ever over 25 years to ensure we reduce spills and harm to the

environment. Over the period our strategy is to reduce the reliance on grey infrastructure and move to blue-green solutions including surface water separation, surface water attenuation and work to reduce infiltration on the network, spending over £7bn on such measures from AMP9. We would also note that our high climate change scenario in alternative pathway 4e could see us spending considerably more to manage flood risks.

We are forecasting some benefit from base up to the end of AMP9 which includes expenditure to increase uptime, screens and operational improvements. This is expected to plateau from AMP10.

LS1.18 & LS2.18 - Mains Repair

The Board have agreed a forecast of 149.9 mains repair per 1000km by 2050. Based on a continuation of the 0.66% per annum mains renewals programme (replacement of cast iron and asbestos cement mains). Partially offset by leakage reduction. The improvement for this PC is assumed 100% from Base Expenditure.

LS1.19 & LS2.19- Unplanned Outage

The Board agreed target is to achieve 1% by 2050. This level has been deemed the achievable and acceptable level for a water supply system the size of Yorkshire Water. Our aim is to have an asset base with only 1% unplanned outage based on asset health. In order to achieve these improvements in asset health and thus UPO performance, additional funding, above the current Base allocation is required, either in the form of Cost Adjustment Claims, or other vehicles such as DPC. Our Water Supply System strategy will allow for even unplanned outage to a low percentage without impacting the ability for us to continuously provide customers with clean water. This will be achieved by ensuring customers can be provided water from multiple Water Treatment Works and where they are reliant on only one asset, the maintenance plans will be extensive. The improvement for this PC is assumed to be 72% from Base Expenditure.

LS1.20 & 2.20 Sewer Collapses

The Board have agreed a long-term outcome of 305 annual collapses by 2050. This is a stretching target and ensures our commitment to long-term asset health and that we have a continual glide path of improvement from AMP8. We do not anticipate we will need Enhancement to achieve this target hence LS1 and LS2 having the same values. However the level of sewer renewals will need to increase in the future and we will need to work with Ofwat and other stakeholders to understand what an efficient cost is to achieve that. In the short term we will prioritise improving collapses by effective monitoring, the use of analytics, a focus on reporting and where we do need to intervene, ensuring we get multi service benefits from out investments at an efficient unit rate.

4. LS3-LS3i – Wholesale water totex enhancement expenditure by purpose, core and alternative pathways

All LS3 lines present planned clean Enhancement expenditure over the 2025-2050 period for our core pathway. LS3a/b/c present planned Enhancement expenditure for our alternative pathways as follows:

- LS3a: Statutory investment programme
- LS3b: Our most likely WRMP pathway
- LS3c: Removal of all lead pipework across Yorkshire

Where there is no deviation from the core pathway in tables LS3a/b/c, these cells have been intentionally left blank in line with Ofwat guidance. No expenditure for any alternative pathways is forecasted to occur before 2030. No expenditure lines in LS3 have been proportionally allocated between expenditure categories.

Additional lines added to the LS3 core pathway are:

- Water Enhancement Totex (core pathway); Improvements to river flow - APR 4L.77. This is an AMP7 cost.
- Atypical Expenditure – COVID APR21 4L.70. This is an AMP7 cost.
- DWI - E-CAFF new Target; Enhancement water Capex. This is an AMP8 cost that relates to cyber protection. No investment is expected beyond AMP8.

Alternative pathways presented in the LTDS map between tables and the narrative document as follows:

Table	Pathway number in narrative	Pathway description
LS3/LS4	n/a	Core
LS3a/LS4a	1	Statutory investment programme
LS3b	2	Our most likely WRMP pathway
LS3c	3	Removal of all lead pipework across Yorkshire
LS4d	4	Incineration of sludge to mitigate loss of landbank
LS4f	5	Incineration of sludge to remove forever chemicals
LS4g	6	Wastewater treatment to remove forever chemicals from final effluent
LS4e	7	Enhanced drainage and wastewater management capacity to adapt to climate change

5. LS4-LS4i - LS4-LS4i – Wholesale wastewater totex enhancement expenditure by purpose, core and alternative pathways

All LS4 lines present planned waste Enhancement expenditure over the 2025-2050 period for our core pathway. LS4a/d/e/f/g present planned Enhancement expenditure for our alternative pathways as follows:

- LS4a: Statutory investment programme
- LS4d: Incineration of sludge to mitigate loss of landbank
- LS4f: Incineration of sludge to remove forever chemicals
- LS4g: Wastewater treatment to remove forever chemicals from final effluent
- LS4e: Enhanced drainage and wastewater management capacity to adapt to climate change

Where there is no deviation from the core pathway in tables LS4d/e/f/g, these cells have been intentionally left blank in line with Ofwat guidance. No expenditure for any alternative pathways is forecasted to occur before 2030. The following expenditure lines in LS4 have been proportionally allocated between expenditure categories:

- LS4.12/LS4.13 - Costs for area removed (surface water removed/attenuated) from the network have been taken from the DWMP and split across LS4.12 & LS4.13 lines as the detail and granularity of the solutions is not currently defined and solutions will be a blend of options.

Additional lines added to the LS4 core pathway are:

- Wastewater Enhancement Totex (core pathway) Reduce modelled hydraulic flooding risk for properties (ISF & ESF). This line represents our internal and external modelled flood risk reduction costs which were generated for the DWMP. Specific target definitions can be found within the DWMP. Any costs associated with Living With Water have been removed from this line as they have their own line in the LTDS tables.

- WINEP / NEP Investigations (Frequently Spilling Storm Overflows) Capex. This is an AMP7 cost only.
- Conservation drivers Capex. This is an AMP7 cost only.
- Atypical Expenditure - COVID APR21 4L.70. This is an AMP7 cost only.

Note: for both LS3 and LS4, line references are misaligned between the core and alternative pathways. This is due to differences between the tables in Ofwat's proforma spreadsheet. Therefore, comparison of table lines between core and alternative pathways should be made on the basis of the description of each investment line rather than the line reference number.

6. LS5 and LS6 - Wholesale water and Wholesale wastewater totex enhancement expenditure under scenarios

These tables set out changes in Enhancement expenditure under common and wider reference scenarios. A summary of which pathways are followed under each scenario is provided in the table below. Further information about the factors being tested by each scenario is provided in the LTDS narrative document in sections 3.6 and 4.4-4.10.

Alternative pathway	Description	Scenario type	Scenario	Investment area	Decision point	Trigger point
1	Statutory investment programme	Wider reference scenario	Customer affordability concerns – adverse	Resilience; DWMP; Living with Water	At PR29	Start of AMP9
2	Our most likely WRMP pathway	Common reference scenario	Abstraction reductions – high (adverse)	WRMP	2032 WRMP planning cycle	2049
3	Removal of all lead pipework across Yorkshire	Wider reference scenario	Lead-free Yorkshire – adverse	Drinking water quality	Price Review prior to change in legislation	Upon change in legislation
4	Incineration of sludge to mitigate loss of landbank	Wider reference scenario	Farming Rules for Water – adverse	Bioresources	Price Review prior to change in regulation	Upon change in regulation
5	Incineration of sludge to remove forever chemicals	Wider reference scenario	Society-driven substance intolerance – adverse	Bioresources	Price Review prior to change in legislation	Upon change in legislation
6	Wastewater treatment to remove forever chemicals from final effluent	Wider reference scenario	Society-driven substance intolerance – adverse	WINEP (waste)	WINEP planning round prior to change in legislation	Upon change in legislation
7	Enhanced drainage and wastewater management capacity to adapt to climate change	Common reference scenario	Climate change – high (adverse)	DWMP	Next DWMP planning round	Delivery of DWMP at start of AMP9

7. LS7 - Average total water, wastewater and combined bills under core and alternative pathways

We have submitted alongside the data tables the model which we have used to calculate the bills for submission in table LS7.

The model follows the guidance as provided in the April 2022 publication "PR24 and beyond: Final guidance on long-term delivery strategies".

- Enhancement expenditure has been split into capital and operating expenditure;
- We have used the capital Enhancement expenditure to create new Enhancement Regulatory Capital Values (RCV) for each scenario;
- The return on the new Enhancement RCV has been calculated using our updated PR24 WACC assumption;
- We have based the new Enhancement RCV run-off on our PR24 submitted run off rates;
- As we are anticipating paying a notional corporation tax we have included the tax calculation as provided in the guidance;
- The wholesale long-term revenue requirement is based on operating Enhancement expenditure plus return on new Enhancement RCV plus new Enhancement RCV run-off, plus corporation tax funding;
- We have included a retail margin of 1% by taking the wholesale long term revenue requirement and multiplying this by 1.01;
- We have used our PR24 assumption regarding the split of revenue recovery from household and non-household customers;
- We have divided the household split of the wholesale revenue by our forecast of household customers. The forecast for AMP8 and AMP9 is taken form RR3 and we have extended the forecast by adding on the average increase in customers.