Yorkshire Water

Annex to Yorkshire Water Statement of Response for WRMP24

April 2024

YorkshireWater

Further information required to support a decision on the Water Resources Management Plan

1. Issue 1: Levels of service

Information requested by Defra

Yorkshire Water must set out transparently that customers face a reduced level of service early in the plan and clarify for how long this applies.

The plan assumes drought resilience of 1:100 for 2025-27 (or possibly 2028). The duration of this level of resilience is not clear. Customers have also not been consulted on this approach.

Yorkshire Water must set out a plan that explains to customers the service they will receive, that aligns to the company's resilience claims, and that delivers Government expectations.

Yorkshire Water's Response:

Our long-term drought resilience objective is to meet the Water Resources National Framework requirement to be resilient to a 1 in 500-year drought return period for emergency drought orders (Level 4) by 2039.

In the shorter-term, we aim to achieve a 1 in 200-year drought resilience level as soon as possible. However, at the start of the planning period (from 2025/26 to 2026/27), it is not possible to adopt this resilience level. The immediate deficit in our WRMP24 is a significant change from our WRMP19, which previously did not show a deficit until the mid-2030's in the 1 in 500-year drought scenario.

The early deficit is a result of the new deployable output approaches and latest climate change datasets which we have incorporated into our WRMP24 supply forecast, in line with regulatory guidance and the latest planning methods. This creates a step change in deployable output reduction when

compared to the WRMP19 supply but does not represent actual loss of supply. Until the benefits of further demand management and leakage reductions are realised the WRMP24 deficit cannot be closed, and our level of service is reduced.

As such, in the Grid SWZ DYAA scenario we will be resilient to a 1 in 100-year drought from 2025/26 to 2026/27. From 2027/28 to 2038/39 we will be resilient to a 1 in 200-year drought for Level 4 restrictions, and from 2039/40 onwards a 1 in 500-year drought severity. The East SWZ is resilient to a 1 in 500 drought throughout the planning period.

Additional text on the period the Grid SWZ will be at 1 in 100-year drought resilience level will be included in Sections 9.5 and 11.1 of the main WRMP Technical Document to make the reasons for this clearer. We have also added text to Section 9.5 on customer feedback from WRMP surveys. Customer views of levels of service and drought resilience were mixed with some (44%) wanting us to aim for resilience to the most serious drought events sooner than 2039, whereas a slight majority (56%) were either happy with 2039 or did not think it was a priority.

We consider our approach therefore to be one that balances customer views. In the short-term, we take a twin track approach to invest in both supply and demand schemes and achieve 1 in 200-year drought resilience as soon as feasibly possible. In the longer term we align with the Water Resources National Framework 1 in 500-year drought resilience requirement, which allows demand reductions to accumulate over time, rather than investing in sufficient near-term supply schemes to achieve the 1 in 500-year level sooner than 2039/40. This also aligns with our optimisation modelling which showed the 1 in 500 by 2039/40 scenario to be most optimal.

2.Issue 2: Drought Option Implementation and Levels of Service

Information requested by Defra

Yorkshire Water should remove from the final plan any suggestion that the short duration of drought options implementation would not count towards defining the proposed levels of service. The duration for which drought options are implemented is irrelevant when defining the company's levels of service. If removing this assumption affects the expected levels of service, then the company must set out the actual levels of service that customers will receive.

Yorkshire Water's Response:

We have added some text to the footnote in Table 3.3 of our WRMP24 main technical document explaining that we assume restrictions would always be implemented for a period of at least 3 months, even if the modelling indicates they would be needed for a shorter period. For avoidance of doubt, we count all modelled triggering of restrictions, even if only triggered for a shorter period in the model. This is also described in the updated WRMP24 text in section 3.4.4. The levels of service stated in the plan are those modelled by our PyWR model, and are simply a count of the number of years each restriction is triggered for Level 2 restrictions (TUBs), and Level 3 restrictions (NEUBs/drought permits/ordinary drought orders). For Level 4 restrictions the frequency of restrictions is calculated by the return period analyses described in our WRMP.

3. Issue 3: Resilience in the Context of the 2022 Drought

Information requested by Defra

The company needs to finalise the assessment of the impact of 2022 drought and should specify how it is bringing the lessons learnt into its WRMP. In doing so, Yorkshire Water needs to address all the bullet points raised by the Environment Agency in its representation of the company's WRMP. The company will also need to update control curves and groundwater yields in the revised submission.

Yorkshire Water's Response:

The table in Appendix A below shows all the bullet points raised, in relation to the 2022 drought, by the Environment Agency in its representation of the company's WRMP and our response to those.

Deployable output impacts of 2022 drought

We have also reviewed groundwater deployable outputs, and the yield and control lines of reservoir sources based on our 2022 inflows, including our emergency storage assumptions. These result in a very slight change to our control lines, but no changes to our emergency storage assumptions. Our emergency storage is the larger of 20 days' supply at yield, or 12.5% of reservoir stocks, and in all cases the 12.5% is larger, so this has resulted in no change.

Figure 1 shows the normal and drought reservoir control lines used for the WRMP24 supply modelling, and the updated control lines using inflows including the 2022 drought. It shows that the drought control lines are almost identical, but that the updated normal control lines are a little higher than those used for the WRMP24 modelling. This would result in the use of reservoirs reducing sooner and river use increasing sooner than in the previous modelling. The modelled reservoir stocks are almost the same in both circumstances.

Figure 2 shows the relationship between Yorkshire regional demand and return period of Level 4 drought restrictions for the WRMP24 model, and the revised model with control lines updated to include the 2022 drought. It shows the results are very slightly different, but not to the extent that would require rerunning of the WRMP supply forecasts. When we have selected the 1 in 500 to 1 in 200 scenario, we have rounded the value of the return periods to that closest to the demand increments in our model runs. The update of control lines has resulted in a change from 508 years to 512 years for the 1 in 500 scenario, which means there is no change to our supply forecast, and the same demand multiplier represented the 1 in 500 deployable output estimates for both "old" and "new" reservoir control lines. The results for the 1 in 200 and 1 in 100 scenarios are even closer, with the lines almost indistinguishable for those return periods. We have presented this additional assessment in Appendix F of the main WRMP technical document.

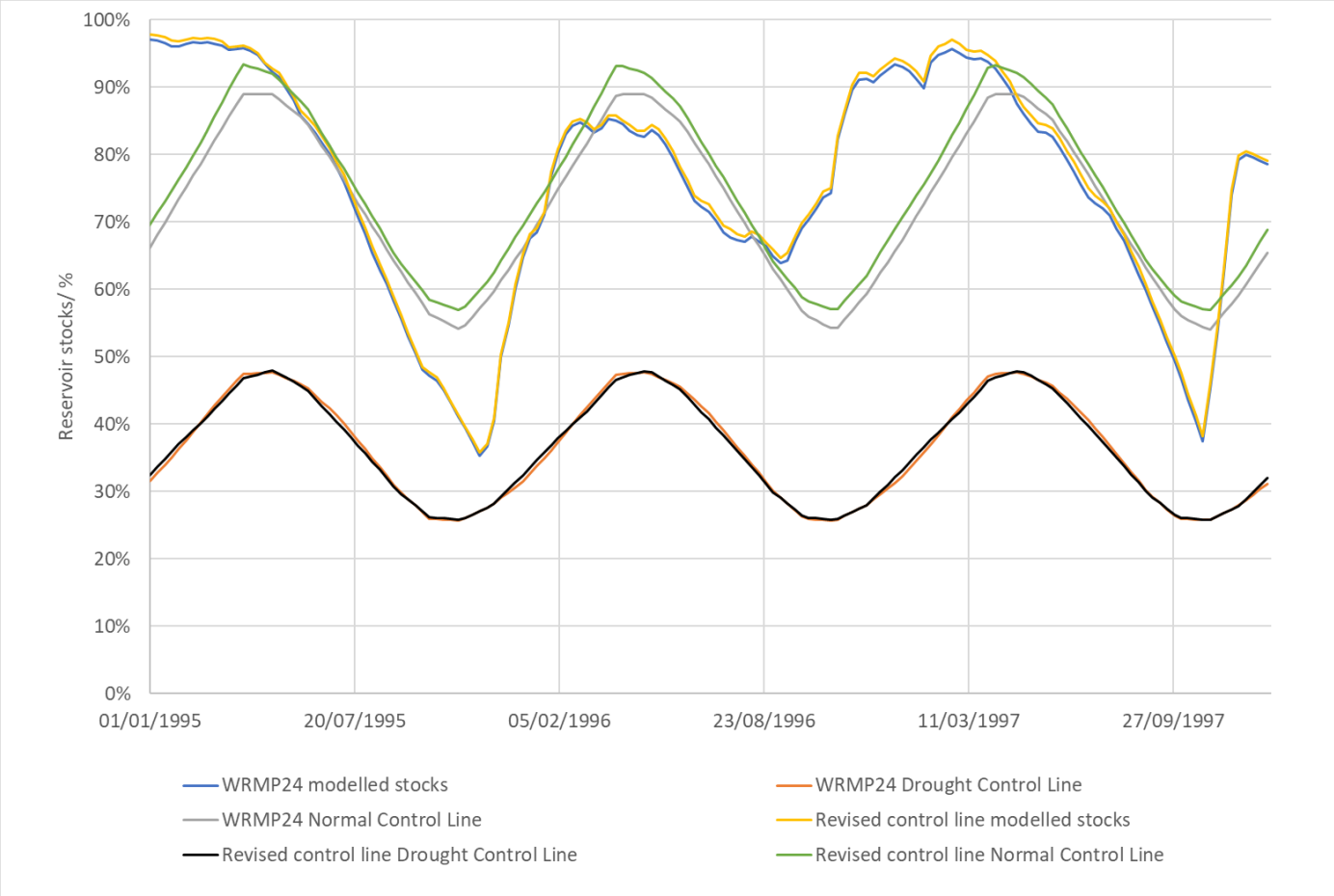

Figure 1-Normal and drought reservoir control lines and modelled Yorkshire Regional group stocks

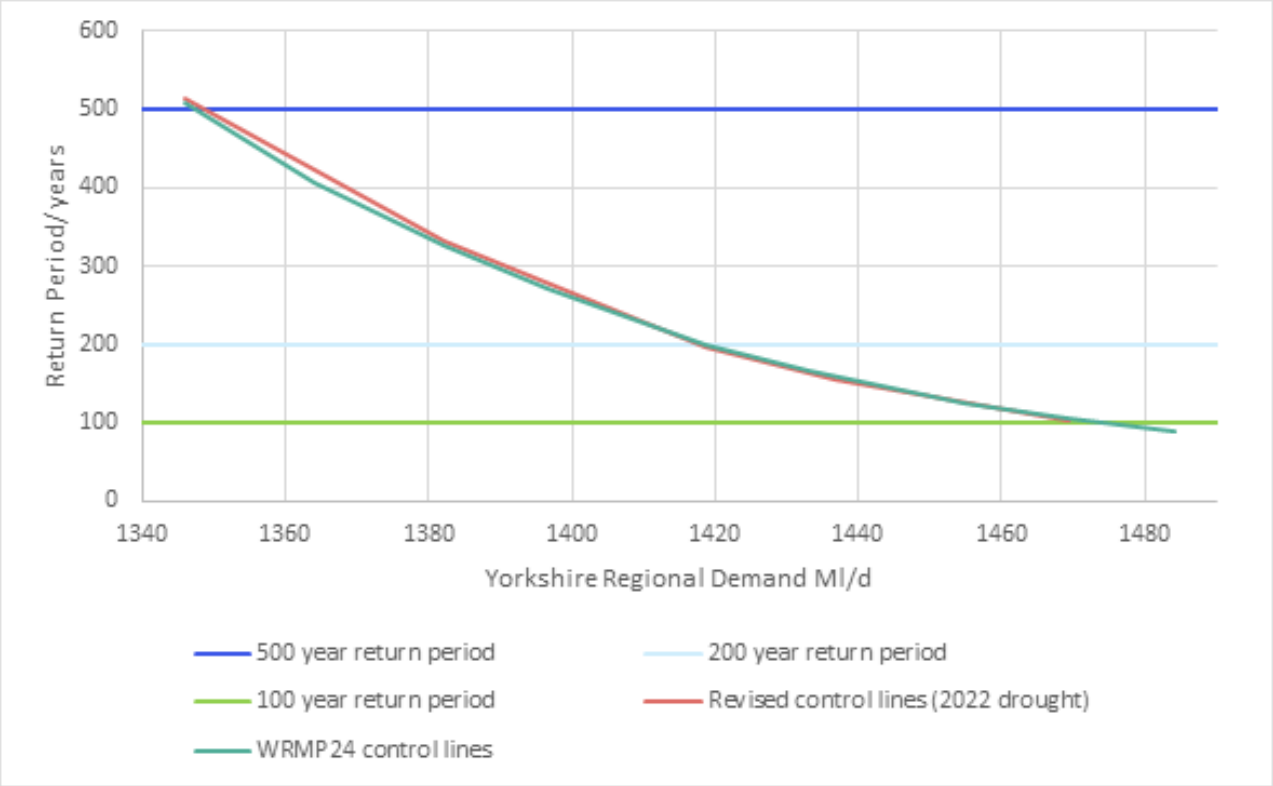

Figure 2- Comparison of deployable outputs for base WRMP models- existing and with revised control lines (2022 drought).

These analyses show that although there are slight differences between the control lines when the 2022 drought is included in the period of record used to generate the control lines, there is no substantive change to the supply forecast, and we have not repeated all supply forecasts using the revised control lines.

We have also reviewed groundwater source reliable outputs (SROs), and again, have not made any changes to the SROs used in the supply forecast based on the 2022 drought. This is because although 2022 was hot and dry, it did not alter the limits of supply for any of our groundwater sources. The groundwater sources are generally unaffected by summer drought. Although reduced winter recharge resulted in lower-than-normal groundwater levels, this did not affect the output of the groundwater sources. In most cases deployable output is restricted by licence and not yield of the groundwater sources. We have presented this additional assessment in Appendix F of the main WRMP technical document.

4. Issue 4: Early Delivery Schemes and Options Development

Information requested by Defra

The company makes clear its dependence on timely implementation of its groundwater options to help resolve its early plan deficit. As these measures have been included, then postponed, in previous water resource management plans, Yorkshire Water should provide assurance that these and other early delivery schemes will be delivered to the WRMP24 timeline.

The company should set out the risks to supply of delayed implementation and explain what mitigation measures it will implement. It should provide quarterly reports on progress via the Environment Agency's Account Manager meetings.

Residual concerns also remain about the extent of options development for consideration within WRMP24. Identification of new alternative options will need to be a priority for the company. Yorkshire Water should ensure that this work is delivered as early as possible in AMP8 to ensure WRMP29 is able to have a broader option suite to meet planning problems.

Yorkshire Water's Response:

WRMP19 supply schemes

Our WRMP19 included four supply-side options in the Grid SWZ solution which were driven by resilience needs identified in our PR19 business plan and learning from dry weather experienced in 2018. Two of the schemes (R63 and R72) have been delivered in AMP7 and do not increase WAFU in the Grid SWZ. Delivery of the remaining two (R9 and R13) is delayed and we have added text to Section 10.2 of the main WRMP24 technical document describing the current position for each option. The position on each option named in WRMP19 is described below.

The R63 North Yorkshire Groundwater Option 2 increases the local supply to a rural area and the R72 River Wharfe licence increase provides additional

resilience for meeting high winter demands following a dry summer. Both options required a variation to an existing abstraction permission we hold with the EA. The applications have been submitted and subsequently approved therefore these schemes are now delivered and available for use operationally, however there is no benefit to WAFU in the WRMP scenarios.

The test pumping for a groundwater licence variation (R9 North Yorkshire Groundwater Option 1) scheduled for 2022/23 has resulted in some complications. We planned to apply for a 2 Ml/d increase to both the daily and peak abstraction limits. However, test pumping has been carried out and identified a risk that the increase to the peak abstraction could impact on a nearby abstractor. We will continue with the scheme; however, we will apply for a licence variation to increase the annual average by 2Ml/d only, and we will not request a change to the daily maximum volume.

The WRMP24 tables and text will be updated to show the benefit starting in 2025/26. This is to allow time for the application to be submitted and determined by the EA. We are assuming the application will be successful mid-way through 2025/26 and have therefore removed the benefit from the pre-plan years and pro-rated the 2025/26 benefit in Table 3 to 1Ml/d, increasing to 2Ml/d from 2026/27 onwards.

The fourth supply-side scheme (R13 East Yorkshire Groundwater Option 2) proposes to relocate an existing borehole. Our WRMP19 included the scheme for delivery in AMP7, with the benefit starting in 2025/26. A decision was made not to deliver this scheme in AMP7, as the WRMP24 decision making process had potential to result in an alternative solution that did not include this option (which was previously included for resilience and not driven by the WRMP deficit). It has since been reselected in our WRMP24 preferred plan, and we shall start the implementation in 2024/25. Preliminary discussions between the Yorkshire Water and local EA groundwater teams have already begun.

Early start WRMP24 supply schemes

We are starting delivery in 2024/25 of options R3 (Increase River Ouse pumping capacity), R3a (River Ouse licence variation 1), R13 and R91 (New internal transfer to North Yorkshire WTW 2), which are included in our preferred plan. We are also starting investigations to enable R8g (Sherwood Sandstone

Boreholes support to North Yorkshire) and R37b(ii)/R86 (River Aire Abstraction option 4 and R86 Aire and Calder WTW), which are needed under the more adverse adaptive pathways. These options are listed in Section 9.5 of our WRMP24 main document as early start schemes. We will report progress on the delivery of the AMP8 supply-side schemes to the EA quarterly.

R91, R3, R3a, R13 and R8g are progressing through the Yorkshire Water 'Capital Process', managed by our Asset Planning team. This is a gated end to end process that the Asset Planning team use to deliver capital projects from initiation through to completion. A summary of the process is provided in Appendix B. The Collaborative Project team (CPT) manage the project programme and any issues or blockers at scheme level. Any issues unable to be resolved at scheme level are escalated through management structure and dedicated escalation sessions set up as required when there is a risk to programme, cost or quality encountered that can't be resolved without further intervention.

R91 New internal transfer to North Yorkshire WTW 2 is linked to a PR24 scheme to refurbish an existing borehole and address water quality issues. Both the DWI and the WRMP R91 schemes have been through gate 2 of the Capital Process and investigation funding has been allocated. Investigations to finalise the scope are now underway and a Strategic Planning partner has been appointed. A programme for delivery with key investigation milestones is provided below. Delivery and construction are scheduled to start in 2025.

DWI North Yorkshire Borehole water quality scheme milestones

Site/Scheme	Yorkshire Water investigation Dates				DWI Notice Dates -Enhanced BH Capicity		
	Gate 2	KM2	KM3	Gate 3	Outline Design	Detailed Design	Compliance
North Yorkshire WTW	22/12/2023	21/03/2024	21/02/2025	19/03/2025	30/04/2025	30/11/2026	30/06/2028

R91 New internal transfer to North Yorkshire WTW 2 milestones

Site/Scheme	Yorkshire Water investigation Dates				WRMP Target Completion Date
	Gate 2	KM2	KM3	Gate 3	Enhanced Distribution interconnectivity
Internal transfer to N. Yorkshire WTW 2	22/12/2023	21/03/2024	21/02/2025	19/03/2025	31/03/2028

R3 (Increase River Ouse pumping capacity), R3a (River Ouse licence variation 1) and R13 (East Yorkshire Groundwater Option 2) have been passed through gate 1 and we are progressing to gate 2. Investigation funding has been allocated and a project team set up. However, the detailed scopes of the investigations are still to be confirmed (with defined milestones) and a contract partner appointed.

R8g Sherwood Sandstone Boreholes support to North Yorkshire is also progressing to gate 2, however the delivery date is 2034/35 and the early start is to enable the scheme details (including the completion of borehole pumping tests) to be verified ahead of construction.

The R37b(ii)/R86 schemes both depend on a new abstraction from the River Aire and R86 option is also dependent on a new abstraction from the River Calder. Under the preferred plan, R37b(ii) River Aire Abstraction option 4 is not required until 2073/74, however, under the more adverse adaptive pathways the R86 Aire and Calder WTW option is required in 2039/40. To keep this pathway open we will start investigations on the rivers Aire and Calder in 2025/26 to undertake, for example, regulatory consultation, detailed assessments of water availability and collect raw water quality data.

Risks and mitigation

Section 10.2 of the main technical document has been updated to include text on the supply-side options and delivery risks we have identified related to these schemes. An additional appendix (Appendix G of the WRMP Technical Document) on supply option delivery has also been added.

We have considered the supply-demand balance impact of delays in the AMP8 supply scheme delivery programme and the potential for unmitigable circumstances arising that cause the options to not provide any benefit. It is unlikely that all options would fail completely but stress testing the plan to this scenario shows in which years there is the highest potential risk of the deficit not being fully closed.

In the near term (AMP8) if there was no benefit from AMP8 supply-side schemes, we would require[1] level 1 to 3 drought actions for an additional year until 2029/30 to meet our supply-demand balance in a dry-year. In a worse-case scenario, where none of the planned AMP8 supply-side solutions resulted in a benefit, the use[1] of drought actions would continue until 2031/32 in the DYAA scenario.

The Grid SWZ would then be at risk of deficit again in 2039/40 for a single year, from 2069/70 to 2072/73 and from 2078/79 until the end of the planning period in 2084/85. The deficit in 2039/40 (-14.85Ml/d) can be closed by delaying the move from 1 in 200 to 1 in 500-year drought resilience by a single year. The deficit from 2069/70 to 2072/73 could be met by bringing the R37b(ii) River Aire scheme forward from 2073/74, whereas the increasing deficit from 2078/79 (-0.59Ml/d) to the end of plan (-12.28Ml/d) would trigger a need for additional intervention. However, the risk is sufficiently further into the planning period that we can consider in future WRMPs.

The WRP24 investment programme is based on the DYAA scenario as this shows a greater deficit than the DYCP. In the DYCP scenario if the AMP8 schemes are unsuccessful, drought options are needed until 2029/30, then we would have sufficient surplus resources to close this deficit with the remaining planned interventions.

Our preferred strategy is to provide a twin track supply / demand solution that safeguards against the risk of relying solely on demand reduction. Although there is potential to mitigate unsuccessful delivery of the AMP8 supply-side schemes with drought actions, this is only feasible if our demand reduction strategy is successful. As the demand strategy carries its own risk, we have included a half demand benefit adaptive pathway. Under this scenario the AMP8 supply-side success is more critical to ensuring our system is resilient to extreme droughts in the future.

We have not compounded the AMP8 supply-scheme sensitivity testing with the half demand benefit scenario, as although individually these scenarios

[1] For avoidance of doubt, "use" and "require" in this context means that we would rely upon the benefit of drought actions to meet our supply-demand balance in a dry year at the target resilience level. It does not mean that the measures would necessarily be applied in those years; implementation would be subject to the drought triggers in our Drought Plan.

present a plausible risk, the probability of demand benefits being halved and all the AMP8 supply-schemes not being realised is low, particularly in the near term. If the risk does materialise as we progress through AMP8, we could need to implement alternative supply-side schemes in AMP9, and we will consider this in WRMP29.

Over the life of the plan, the risk of not achieving demand benefits increases. This is partly because the likelihood of success becomes less certain as we increase reliance on the more innovative techniques and, for PCC, we are assuming Government initiatives will be successful. In addition, as we lower levels of leakage and PCC, it becomes harder to make further reductions each year as we move closer to background leakage and to full meter penetration. However, it is also possible that new demand reduction initiatives will be identified, and we will reassess for each iteration of the plan.

We acknowledge the Environment Agency's concerns in relation to alternative options and we are developing a programme of options identification, development and assessment to support WRMP29. This work will be undertaken in parallel to our emerging Strategic Resources Options (SRO) programme and options development workstreams to support the Water Resources North (WReN) regional plan.

We intend to commence the WRMP29 options development programme in Spring 2024 once the approach has been agreed with the Environment Agency. We will provide the EA with regular updates as part of annual reporting and regular meetings.

5. Issue 5: Strategic Environmental Assessment (SEA)

Information requested by Defra

Yorkshire Water's SEA does not assess all alternative plan options or alternative adaptive pathway options. The SEA is an important statutory document, and the final plan should not be published without this document.

Yorkshire Water need to resolve SEA issues by:

- outlining how the SEA has informed option development; the Environment Agency recommend the SEA should include information on how the SEA has been used to inform and influence plan development. We also recommend this is included in the SEA Post Adoption Statement.

- providing assurance that all alternative options considered in the revised plan for adaptive planning have been assessed in the SEA. There is also very limited information in the SEA (chapter 7) as to why the preferred plan has been chosen over alternative plan options (given the level of impacts envisaged). Please provide further detail

- Improving the scope of SEA relating to Tees transfer option. As this option is required by Yorkshire Water, there are assumptions being made about the accountability of assessment of the option within the Yorkshire and Northumbrian WRMPs. The scope of the SEA should ensure that the accountability and responsibility for the assessment is clearly defined and demonstrates that the SEA scope fully addresses the company's responsibilities with regards the option.

This poses a risk to the environment and to legal non-compliances with the SEA Regulations. The SEA should be submitted to regulators and a review allowed before the final WRMP and SEA are allowed to be published.

Options contained within the WRMP also need to be assessed in combination with the options within the regional and WRMPs that impact on the same features e.g., River Humber.

Yorkshire Water's Response:

The SEA influences the selection of the best value plan by providing an option level assessment for each objective that we use to assess the supply-side options included in a solution programme. We assess the environmental impacts of the individual options and the combined impacts of the whole programme. If there is potential to avoid any adverse or major adverse impacts, we may remove an option from the programme and select a less adverse option instead. However, for the programme to close the deficit it is not always possible to avoid adverse impacts completely and we must identify mitigation measures instead.

A section will be added to the SEA Environmental Report (Section 7.5) to provide more detail on the overall influence of the SEA process, and broader environmental assessment components (e.g., WFD and HRA). This can be categorised into three key areas:

1. Feasible option assessment – all feasible demand and supply-side options were subject to a full assessment against the SEA framework which was also informed by option-level HRA Stage 1 screening, WFD compliance and BNG assessment.

2. WRMP24 decision making metrics – the findings of the SEA were used to inform three of the best value metrics (flood risk management, multi-abstractor benefit, and human and social well-being) used by Yorkshire Water to determine the best value plan. The metric performance of candidate solution programmes (developed through the WRMP24 optimiser model) are compared to assess the impacts of moving away from the least cost solution and identify where metric trade-offs may be required. Although not all SEA objectives are represented in the metrics, these are fully considered and incorporated into the final decision making and preferred plan delivery (e.g., identification of mitigation measures).

3. Plan appraisal – the preferred plan solution, along with all the alternative plans (in response to bullet point 2 above) have been assessed against the SEA framework. A cumulative assessment of the potential impacts of the preferred plan in-combination with each other (intra-plan) as

well as with other relevant plans and programmes (inter-plan) has also been undertaken. Where significant effects have been identified, the SEA will highlight potential mitigation measures that may be required and indicate monitoring proposals. At this stage in the process, these will be determined at a high-level and will be further refined during the more detailed design stages of the schemes as they progress forward for implementation.

Our rdWRMP considered the following plans/adaptive plans: Least Cost, Best Value Plan, Core Pathway and Enhanced Environmental Destination. For our updated rdWRMP Section 7.2 of the SEA will be updated to include all adaptive plans (including Low Environmental Destination, Low Demand and Half Demand Benefit). Section 7.5 will be updated to include text to justify why the preferred plan has been chosen over other alternatives (as detailed in the paragraphs above).

The scope of the SEA includes the Tyne and Tees corridor to cover the potential development of any schemes in this area. This area is included in the environmental baseline review and has informed the overall assessment framework for SEA. Yorkshire Water has undertaken the assessments for the Tees transfer option and shared the outputs of these with Northumbrian Water to ensure consistency. Yorkshire Water has since undertaken further engagement with Northumbrian Water to ensure the plans are aligned. Further text will be added to Section 4 to outline the company's responsibility with regards to assessing the Tees transfer options.

The WFD compliance assessment will be updated to reflect further information now available on the operation of the Tees Transfer options, noting that available operational and environmental data is still limited at this point in time.

WFD Regulations Compliance Assessment Report will reflect these updated assessments at both the option level (Section 3), programme level (Section 4) and preferred plan level (Section 5 and Section 6). Any updates will also be reflected in the SEA and HRA, where appropriate.

Section 7.3 and 7.4 of the SEA Environmental Report already contain the cumulative assessment of options within our own WRMP and with

neighbouring water companies' WRMPs. This section was revised following draft submission to include a cumulative assessment of the Humber Estuary. This concluded that the effects on freshwater inputs to the Humber Estuary from implementation of Yorkshire Water's Preferred Plan on the Humber are not discernible. A similar conclusion was made by Severn Trent Water (STW) and therefore in-combination effects are considered unlikely. The impacts on the Humber are also already contained within the HRA, where in-combination impacts between options within our own WRMP are discussed in Section 6.1.2.2 and also the potential in-combination effects with other plans and projects (namely STW's WRMP) are considered in Section 6.2.2.

By providing the information above, and updating the WFD, HRA and SEA documents, we believe this resolves the issues raised and ensures we are compliant with our legal obligations relating to the SEA. We will share the revised SEA, HRA and WFD documents as soon as possible, and no later than four weeks after submitting this response to Defra.

6. Issue 6: Ambition of the Yorkshire Water Demand Management Program

Information requested by Defra

Ofwat do not consider that Yorkshire Water's PCC ambitions to 2029/30 are sufficient as the company has failed to deliver against commitments in AMP7, has a lower commitment to reducing PCC compared to that set out in WRMP19 and that the reductions demonstrated are comparatively low compared to the wider industry. Ofwat also highlight that additional modelling is required to set out the glidepath for demand reduction and therefore the AMP8 ambition may change.

Yorkshire Water's modelling should be completed before the final plan is published. This should include any glidepaths considered and a commitment to improving PCC ambition.

Yorkshire Water's Response:

We wanted to take the opportunity to assure you that we consider we have set out a robust and ambitious plan for PCC which ensures Yorkshire Water remains at the forefront of industry performance but allows for the changes and impacts post the Covid-19 pandemic. The following summary points support this position:

- We have reviewed the WRMP24 and PR24 tables relating to PCC. The analysis of these tables confirms that Yorkshire Water both using "in-year" and "3-year average" metrics has set targets to achieve the lowest or second lowest PCC in the sector respectively, alongside Southern Water (reference Figure 3 below).
- This target for frontier performance continues into AMP9, including surpassing the interim target of 122l/h/d in 2038 by 7.6l/h/d according to our in-year dry year PCC forecast.
- Our longer-term plan surpasses the 110l/h/d target in 2050 by 4.5l/h/d according to our in-year dry year PCC forecast (reference Figure 4 below).

The data below taken from table OUT1 of the PR24 submission supports the position that Yorkshire Water remains frontier in the sector in terms of performance over the next decade, whilst materially reducing PCC through a blended strategy of interventions.

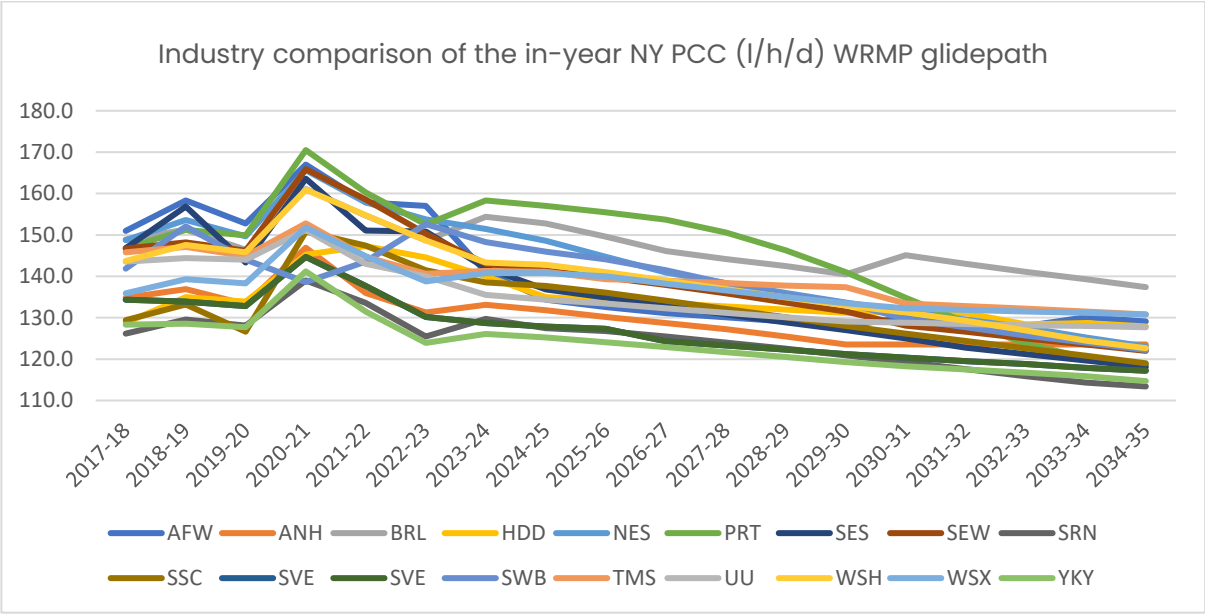

Figure 3- PCC WRMP glidepath to 2035 using normal year in-year PCC when compared to the glidepath's submitted across the industry.

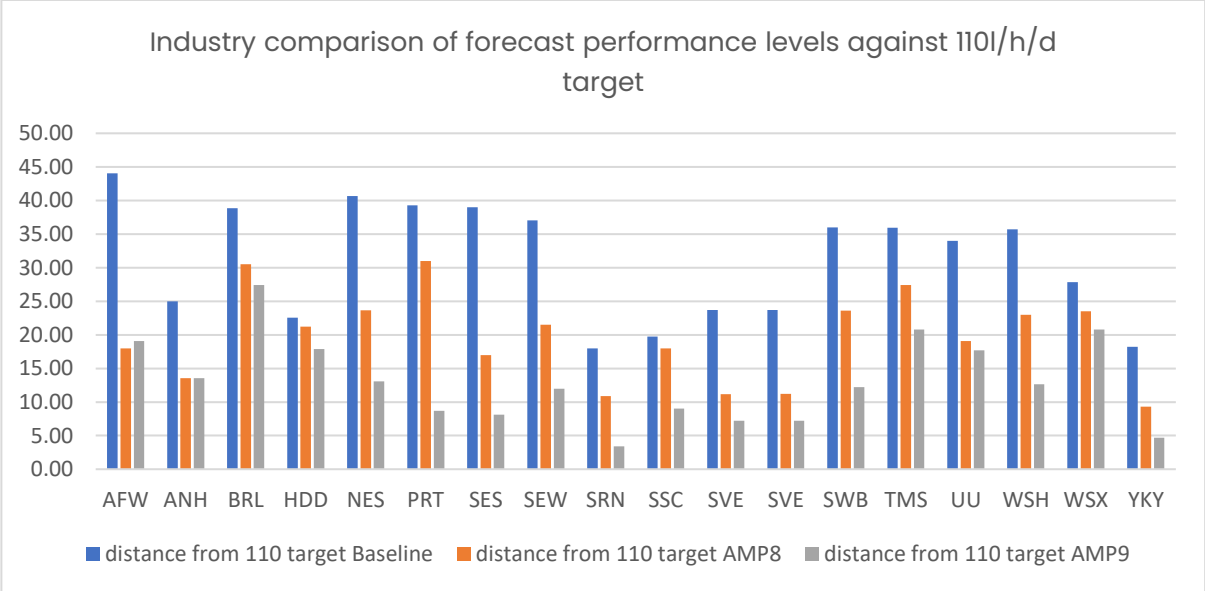

Figure 4- Normal year in-year PCC comparison across the industry based on WRMP glidepaths and the delta to the long-term target of 110l/h/d at present, at the end of AMP8 and AMP9.

As such, Yorkshire Water believes the plan, and the glidepath of associated activities, which was derived through the WRMP optimisation process, to be both ambitious and best value for our customers.

There are differences between WRMP19 PCC forecasts for AMP7 and our AMP7 performance commitment. These differences are related to changes in reporting methodology. WRMP19 provides a three-year rolling AMP7 outturn position of 120.2 l/h/d, whereas the AMP7 performance commitment is based on the new reporting methodology. The new methodology reduced our baseline so when the 8.9% reduction is applied to this, the three-year rolling value is 116.8 l/h/d at the end of 2024/25.

Our current forecast, as presented in our PR24 business plan, is that PCC performance will be a three-year rolling average of 125.1 l/h/d at the end of 2024/25. This shows a 3.1 l/h/d reduction in consumption compared to our baseline.

Our AMP8 forecast to 2029/30 is a three-year rolling average of 120.5 l/h/d. This delivers a further 4.6 l/h/d reduction in consumption over the next AMP, and as presented previously, maintains Yorkshire Water in a frontier position in the industry.

In 2020, at the start of this AMP, the Covid-19 pandemic hit the UK, and we witnessed an unprecedented increase in PCC, driven by universal lockdowns, school closures and the migration of people away from key conurbations. At the same time, this was exacerbated by a hot and dry spring / summer. As we have emerged from pandemic, societal norms have changed with many more people working from home, resulting in increased daytime occupancy, increased water use in the home and therefore, increasing PCC. Artesia have calculated the Covid-19 adjustment as a permanent 1.68% (+2.1 l/h/d) of total household consumption per year from 2022/23 onwards.

When we review our forecasted AMP7 outturn of 120.2 l/h/d (evidenced in our PR19 data tables) and include the adjustments for Covid-19 of +2.1 l/h/d plus the Artesia modelling improvements of +3.6 l/h/d our AMP7 outturn would be 125.9 l/h/d (120.2 + 3.6 + 2.1 = 125.9). Our end of AMP7 projection based on our PR24 data table submission is 125.1 l/h/d meaning that we are on track to outperform this position with the interventions conducted in AMP7 using base funding. No enhancement funding was included in the PR19 business plan.

Our requirement to re-baseline to an appropriate level of performance in AMP8 ensures an ambitious glidepath through to 2050 and a robust plan, funded to the appropriate level. This is underpinned by the latest modelling data (Artesia Multi-Linear Regression Model) and Covid-19 adjustments. This is described in sections 4.3.7 and 4.5.1 in our revised draft WRMP24 submission. Further detail can also be found in our WRMP24 Demand Forecast Technical Report.

Additional Modelling Requirements

Since receiving your letter, we sought further clarity from Ofwat on the requirements, and in their response, they stated the following:

> *"The Ofwat comment in the Defra letter that:*
>
> *"...additional modelling is required to set out the glidepath for demand reduction and therefore the AMP8 ambition may change."*
>
> *is in reference to Yorkshire Water's statement in the Statement of Response that:*
>
> *"A glidepath for PCC in AMP8 is to be determined in the rdWRMP which takes into account the improved data from the Artesia multi-regression model and the adaptive planning required to ensure our 2050 target is achievable."*
>
> *As the statement of response was initially provided on 31st July 2023, and the rdWRMP 1st November 2023, some analysis was carried out without the evidence in the rdWRMP to support the SoR statements. The comment therefore reflects an earlier position. If Yorkshire Water can confirm the glidepaths in the rdWRMP are now reflective of a completed, remodelled, glidepath which includes updated AMP7 positions and proposed AMP8 activities, then we acknowledge that the modelling is therefore complete."*

For all demand reduction options Yorkshire Water followed a process consistent with the latest Water Resources Planning Guidelines. The baseline household consumption forecast is developed using a multi-linear regression

model developed by Artesia Consulting for WRMP24, which was used to baseline the end of AMP7 position. This model calculates pre-intervention per capita consumption, further information on this model is available within the WRMP24 Technical Document section 4.5.1.

For AMP8 the glidepath selected was based on the most efficient program which includes a smart metering retrofit program to replace end of life AMR meters. We also mandated the benefits of water labelling into the preferred plan. This was sufficient to achieve the 110 l/h/d target by 2050. To help close the supply - demand deficit, the plan optimiser had capacity to select more household options. The selected household options are included in table 10.1 of the main WRMP Technical Document. We selected these options based on how frequently they appeared in our optimised scenarios which resulted in a PCC of 103.1 l/h/d by 2050 using the in-year normal year forecast.

We can confirm that the glidepaths produced as part of this iteration of the WRMP24 includes the modelling and optimisation as outlined in the main WRMP Technical Document in section 5.2.1, section 8.4, and section 9.1.1. We therefore believe no further modelling is required.

7. Issue 7: Representation of New Appointments and Variations (NAVs) Within Water Companies WRMP

Information requested by Defra

New Appointments and Variations (NAVS) are required to produce a statutory WRMP. This means that when ensuring alignment with regional and neighbouring water company plans incumbents should ensure alignment with the NAV plans. This means the transfers to each NAV should be described in the plan and contractual volumes should be set out in the planning tables. Yorkshire Water should also ensure properties and populations served by NAVS are not included within the forecasts in the company plan going forward.

This is to prevent double counting of demand components and also overstating supply. The company should ensure the volumes transferred to NAVS are recorded in the planning tables. The company should work with the NAV companies to ensure alignment of assumptions e.g., number of sites, population, property, and contractual volumes. We do not expect incumbents to forecast beyond the appointed sites set out in the NAV WRMPs i.e., new sites will be awarded but the incumbent will not know when and to which NAV. The company should use the WRMP cycle to update the figures and adjust forecasts accordingly.

Yorkshire Water's Response:

Yorkshire Water notes Defra's request to account for New Appointments and Variations (NAVs) within its WRMP, in alignment with the latest available NAV forecast information, and we have revised our WRMP24 in response to this request which we explain in this response. In addition, we acknowledge the need to work in closer collaboration with NAVs going forward, including monitoring the latest NAV position against the forecasts as part of the Annual WRMP review process. We are also starting to engage with NAVs more closely within the regional Water Resource group, Water Resources North (WReN). This will also help ensure alignment of our WRMPs in future iterations of the plan.

We have obtained the latest (March 2024) WRMP tables from the four NAVs that operate in the Yorkshire Water region, namely; Independent Water Networks Ltd. (IWNL), ESP, ICOSA Water Services Ltd. (ICOSA), and Leep Water Networks Ltd. (Leep). We will align our WRMP Table 1g (*WC Level - Existing transfers - Potable water transfers*) with the information in their WRMP Table 1 (*Appointment by Incumbent*), this will ensure contracted volumes and number of sites are represented accurately in our WRMP. We will align the total NAV import volume described in their WRMP Supply-Demand Forecast (Table: *21. Yorkshire Water*, Line: *3BLNAV*) with our potable water export volume (Table: *3a. DYAA Baseline* and Table: *3d DYCP Baseline*, Lines: *5BL*). This aligns the forecasted contracted NAV import with our bulk export volumes.

As well as this we have adjusted our own population, properties, and consumption forecasts[2] accordingly to align with the latest NAV WRMPs and prevent double counting. We will update our WRMP24 tables with any resultant changes to the supply-demand balance (SDB) in Table 3, as well as any changes to the SDB within our WRMP tables on adaptive programmes (Table 7) and WC Level Data (Table 2). This change in methodology will also be reflected in the main WRMP Technical document (Section 3.13.3).

The overall impact on our supply-demand balance of the changes to include the latest NAV WRMP values is modest and does not change the planned investment decisions or our performance commitment glidepaths (that is, per capita consumption (PCC), leakage, and non-household demand). Our final planning distribution input (DI) at company level is impacted by an average decrease of 4.95Ml/d, with the majority of the change impacting the Grid Water Resource Zone. The net average impact on the water available for use (WAFU) is a decrease of 5.97 Ml/d, this has resulted in a net average impact

[2] NAV WRMPs allocate around 5% of DI as Unaccounted for Water, this then is accounted for as Leakage in their supply-demand balance. As this is not a true estimate of leakage as such (and a broad assumption), and represents leakage in their own supply area, we will not be discounting or amending our own leakage glidepath associated with this figure. As well as this, aligning with current methodologies, companies maintain end of AMP7 leakage in the WRMP regardless of growth and then take action to reduce leakage to meet final plan targets. We believe this gives the most accurate leakage glidepath for the Yorkshire region and will work with the NAV groups to ensure assumptions around leakage going forward are consistent and accurate. This aspect of demand is indirectly accounted for (along with other components) in the value for the export of water to NAVs, using their WRMP tables, ensuring an appropriate estimation of YW's supply availability.

to our supply-demand balance of 1.02 Ml/d over the forecasting period, as shown in the figures below.

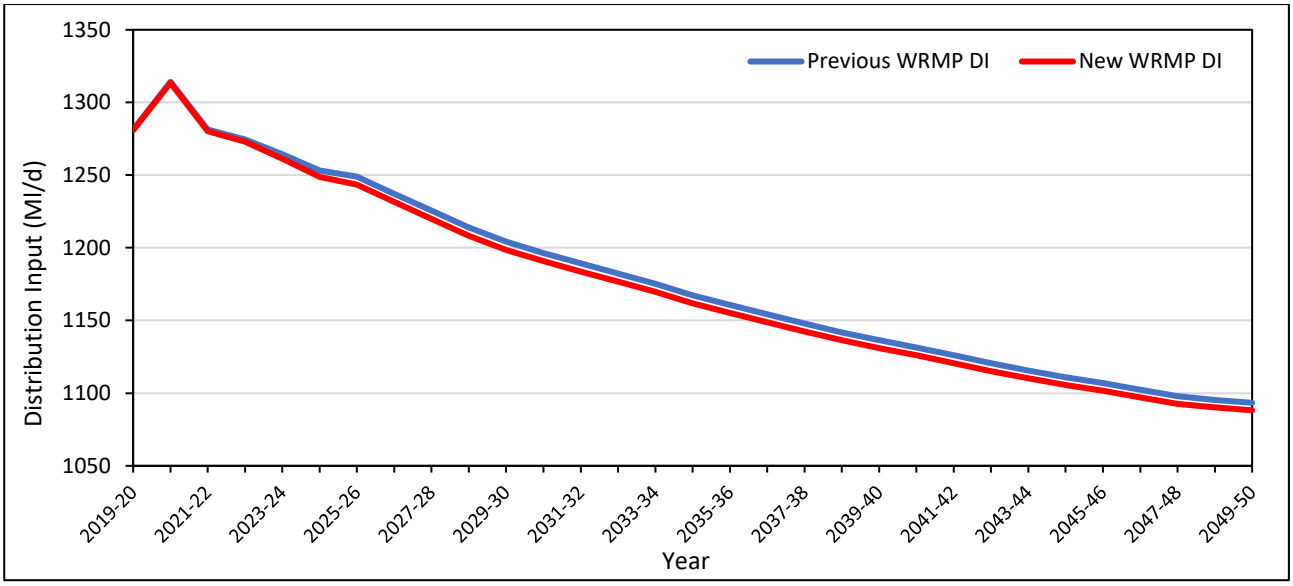

Figure 5- Distribution input (DI) comparing the revised draft WRMP DI and the new WRMP DI taking into account updated NAV exports.

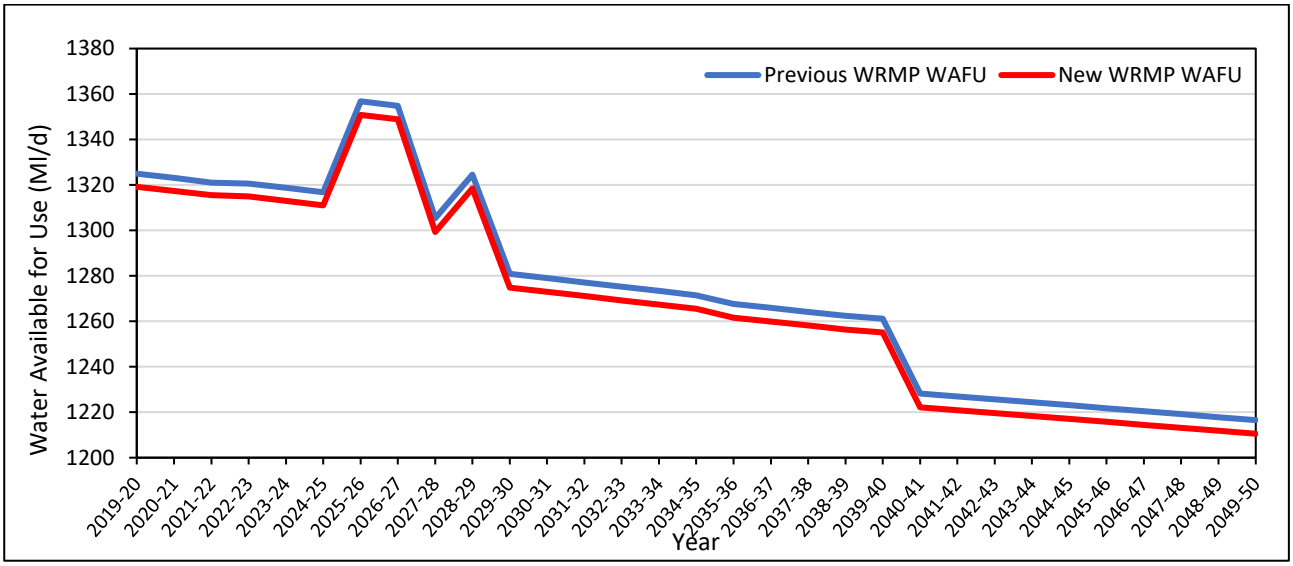

Figure 6- Water available for use (WAFU) comparing the revised draft WRMP WAFU and the new WRMP WAFU taking into account updated NAV exports.

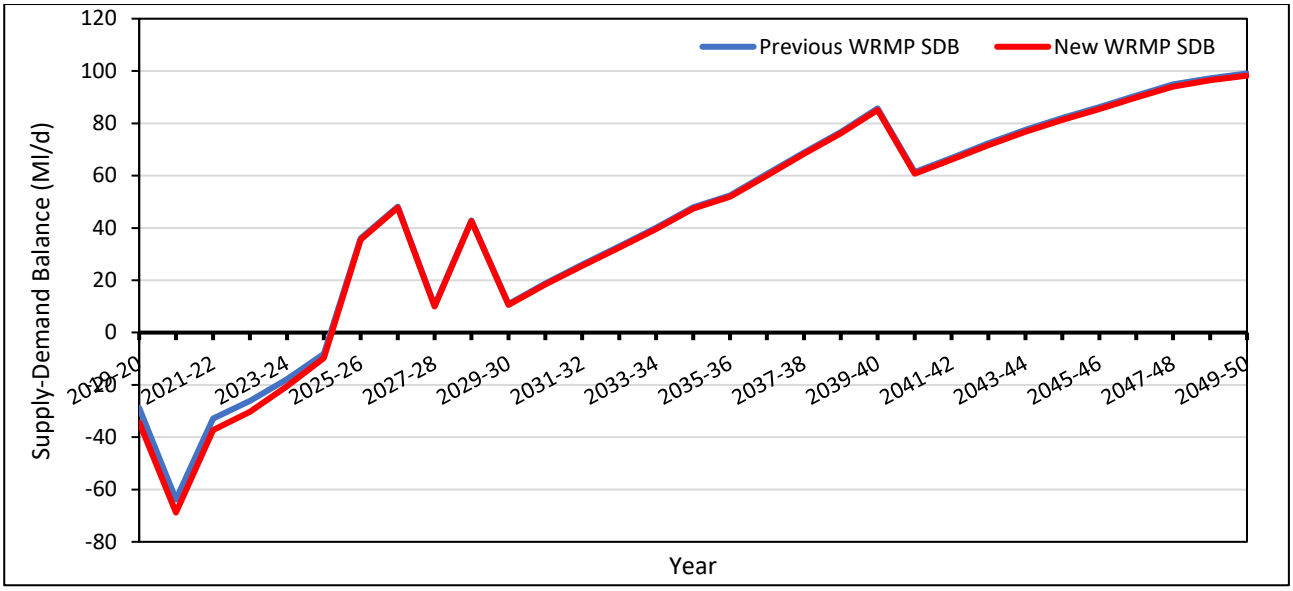

Figure 7-Supply-demand balance (SDB) comparing the revised draft WRMP SDB and the new WRMP SDB taking into account updated NAV exports.

8. Issue 8: Habitats Regulation Assessment (HRA)

Information requested by Defra

To achieve sustainable abstraction, and, in relation to European Sites, to fully comply with the Habitats Regulations, water companies must show in their WRMP how they plan to reduce their reliance on existing damaging abstractions. As previously advised by Natural England and as also set out in the Water Resources Planning Guidelines (WRPG), your WRMP should therefore "ensure that any previous HRA of options included in your preferred plan remains current and covers any material changes in circumstance".

This may require an assessment of impacts upon European Sites from existing abstractions where there has been a material change since any previous HRA. Where impacts are identified, and backed up with evidence, a commitment to implementing a package of measures which together provide pathway for removal of those impacts within a given timeframe should be included within the plan.

This package of measures must be deliverable and have sufficient certainty that it will be achieved within an appropriate timeframe. Moving toward licences capped at levels which have no Adverse Effect On Integrity (AEOI) on European sites, and/or replacing these with alternative, sustainable water sources, alongside realistic demand management and water efficiency measures, may form part of that package of measures.

Where impacts are suspected but sufficient evidence is not currently available to confirm this, a commitment to obtaining this evidence, e.g., via the Price Review programme and the WINEP programme of investigations, should be included in the plan, so that the information is available for WRMP29.

Natural England is unable to conclude that implementation of this WRMP will avoid an adverse effect on the integrity of the River Derwent SAC. This position has not changed since Natural England's representation on the initial draft WRMP. Fundamental to this position is the WRMP's reliance on the continuing use of existing abstraction licences, despite some of these ongoing

abstractions contributing to outstanding concerns on flow compliance within the SAC. The company should ensure that all outstanding issues raised by Natural England in relation to compliance with all relevant statutory requirements, as set out in Annex 2 to Natural England's formal consultation response to the draft plans, are fully addressed.

Yorkshire Water's Response:

The rdWRMP is consistent with Ofwat guidance on Common Reference Scenarios for abstraction, with the rdWRMP core pathway based on the BAU+ requirement to assume default flow standards for European Protected areas in the absence of a local flow agreement with Natural England and the Environment Agency.

We acknowledge Natural England's concerns, and we are working with Natural England and the Environment Agency to collaboratively develop a scope of investigations for the lower River Derwent protected areas. The scope of our AMP8 WINEP includes i) a feasibility study of meeting common standards monitoring guidance for river flows in the Lower Derwent, plus ii) a 'holding line' for mitigation measures pending conclusion of the investigation phase. The WINEP investigation will be undertaken in parallel with a broader programme options identification, development and assessment to support WRMP29.

Our commitment to these investigations is summarised in Section 3.8.3 (WINEP) of the rdWRMP, however we will include more detail in the WRMP and HRA documents to make clear our commitments (alongside those of the Environment Agency in relation to the impacts of its own assets on the Lower Derwent protected areas) in support of WRMP29.

In advance of the updated rdWRMP24 submission, we provided the regulators with a technical note summarising the planning aspects around the delivery of an alternative supply side solution to replace the loss of supply from Yorkshire Water's River Derwent sources. The lead-in time for the alternative solution assumed in the rdWRMP was based on this initial review. Yorkshire Water has since proposed the Tees Transfer as a Strategic Water Resource Option (SRO) ahead of WRMP29, which will consider solution feasibility/deliverability (amongst other aspects) in more detail. We will include more information on this in the WRMP and HRA documents.

Appendix A: Issue 3 – Our response to points raised by Environment Agency in its representation of the company's WRMP

EA Bullet point dWRMP24 consultation response	Yorkshire Water response in October 2023	Additional response
Can the company demonstrate resilience and also look to improve it?	Our rdWRMP will include a Lessons from 2022 Drought appendix (Appendix F of the WRMP Technical Document).	The Lessons from 2022 Drought Appendix considers the points included in section 9.5.1 of the March 2023 updated Water Resources Planning Guideline. The only change to our WRMP24 was the identification of the R91 option to support a local demand area. We are reviewing drought options for the next iteration of our drought plan, but this will not impact on WRMP24. We are continuing to review our resilience as part of our Water Supply Systems (WSS) studies (see below)
Are any temporary or new measures likely to be made permanent or added to drought plan options	Appendix F includes a 'Resilience' section, this lists four operational measures used in the 2022 drought and discusses which will become permanent solutions and states no new drought permits were identified.	No further change
Do assumed benefits from measures reflect the latest understanding/evidence based on data collated e.g., change in demand associated with temporary use bans	Appendix F under the heading Drought action benefits includes a reference to the reduction in demand associated with the TUB.	The text in the drought action benefits section in Appendix F has been expanded to include: Analyses of our demand data have shown that the implementation of TUBs resulted in a reduction in demand of about 42Ml/d from implementation during the period of hot weather, and about 26Ml/d from implementation until the end of October. These values are slightly higher than the savings assumed in WRMP table 6- which indicate about 18Ml/d savings when appeals for restraint, leakage reduction, and TUBs are all implemented in our worst-case historic scenario, but these values will be more similar if the benefits of the TUBs are averaged out over a DYAA scenario. We therefore believe that our assumed benefits are appropriate.
Whether levels of service are appropriate	Levels of service for preferred plan are shown in Table 9.11 of the WRMP Main Technical Report	Additional text added to explain the 1 in 100 level of service in 2025/26 and 2026/27. See response to Issue 1: Levels of service. The levels of service we present in our Drought Plan 2026 will align the WRMP24.
Updating deployable output where understanding has improved around source responses to drought-	-	See response to Issue 3 in this document and drought lessons learnt appendix (Appendix F of the WRMP Technical Report). We have updated reservoir control lines and yields based on inflows until the end of 2022. This results in a slight change in the control lines, an insignificant change in modelled reservoir stocks, and no change in modelled deployable output. Groundwater yields have also been checked and there are no changes as a result of the 2022 drought as groundwater levels did not limit supplies below assessed yields in 2022. Further details of this assessment are provided in Appendix F of the WRMP Technical Report.
Confirm whether any relevant dead/emergency storage assumptions are accurate	-	Additional text added to drought lessons learnt appendix (Appendix F of the WRMP Technical Report) confirming no change in emergency storage assumptions.

EA Bullet point dWRMP24 consultation response	Yorkshire Water response in October 2023	Additional response
Demand forecast assumptions including extent/duration of peak demands compared to those used in plan and whether impacts critical period planning	Although the 2022 drought created some significant challenges for us and led to implementation of drought actions, the demand we experienced did not impact on our dry weather demand forecasting assumptions because: • The demand of 2022 was constrained by drought actions including temporary use bans and the demand presented in the baseline scenario must be unconstrained demand. • We reviewed the demand data, and the 2018 dry year demand was greater than 2022, therefore this provided a more representative uplift than the constrained demand recorded in 2022. In Appendix F (of the WRMP Technical Report) under the heading 'WRMP demand forecast' we explained that the demand in 2022 was influenced by TUBs and not representative of an unconstrained year therefore did not align with the guidelines for base year demand. The critical period demand for our Grid SWZ is presented in WRMP Table 3d and discussed in Section 4.3.6 of our draft plan. We added additional text to the rdWRMP24 to note that 2022 had not resulted in a change to the dry year critical period (DYCP) uplift. In Appendix F under the heading 'Critical period' we expanded on this to explain the analysis.	Additional text (copied below) has been added to the drought lessons learnt appendix (Appendix F of the WRMP Technical Report) to expand on the 2022 demand assessment and the comparison with 2018. We have not changed the critical period text. Total daily average DI for 2022/23 out turned at 1260.32Ml/d compared to a 2019/20 dry year demand forecast of 1281.19Ml/d. We have carried out a regression analysis including PCC values from 2009/10 to 2022/23 and the 2022/23 PCC (123.9 l/h/d) was lower than 2018/19 (133.0 l/h/d). As the WRPG requires the baseline demand forecast to be unconstrained, we have maintained the 2019/20 base year and the draft WRMP24 household uplift calculated by Artesia Consulting using a household multi-linear regression model.
Identification of schemes to improve connectivity and WRZ integrity and remove infrastructural/operational constraints	The Resilience section in Appendix F (of the WRMP Technical Report) refers to pumping station upgrades and the ongoing reservoir compensation flow trial that commenced 10th July 2023 to support the Worth Valley in future droughts. In the outage section (Appendix F of the WRMP Technical Report) we discuss the impact of low flows on the River Ouse in 2022 and a new option added to our rdWRMP24 (R91) to support the local area. This option is part of our preferred plan.	No further change
Bulk supply agreements & pain share	Section on bulk supply agreement was included in drought lessons learnt appendix in rdWRMP.	No further change
Appropriateness of outage forecast	A section on outage was included in Appendix F of the WRMP Technical Report	The following additional text added to drought lessons learnt appendix (Appendix F of the WRMP Technical Report). By including the 2022 outage data in the DYAA and critical period (Grid SWZ only) assessments we ensure our outage allowance includes the events recorded during the 2022 drought period. In line with the UKWIR risk-based planning suggested range for outage, we have used the 85th percentile risk value from the model outputs to represent our outage allowance. In most years our zonal outage values will be lower than the modelled values, however this is an appropriate approach as it plans for the risk that in a dry year outage could be worse than historically experienced. By including an outage allowance, we compensate for a risk that DO may not always be fully available. However, this is an average value and the WRMP process does not prevent an individual outage event creating a risk during a

EA Bullet point dWRMP24 consultation response	Yorkshire Water response in October 2023	Additional response
		drought event. We limit and mitigate this risk through our operational response to drought and our production planning teams will optimise resources and redistribute supplies to meet demand. This includes rescheduling planned outage events that are not necessary at that point in time and escalating repairs to address critical unplanned outages. As part of our drought learning we review outages once the situation recovers and consider any improvements needed to increase future resilience.
If experience has identified issues with the current drought plan the company should note that its drought plan might require an update.	-	Additional text added to the drought lessons learnt appendix (Appendix F of the WRMP Technical Report) states issues which will be addressed in the next drought plan, including: • Assumptions regarding timing of permit applications • Potential additional drought option to transfer from Hebden group to Worth Valley Following the 2022 drought, we applied to formalise the increase in the River Wharfe Annual Licence. This option will be removed from future drought plans.
In light of its experiences in the 2022 drought, the company should:	As above, we can confirm that our rdWRMP will include additional information, in Appendix F of the WRMP Technical Report relating to lessons learned from the 2022 drought and our proposed forward plan in response.	
Identify and incorporate all operational and source provision changes needed into its final plan	The resilience section in Appendix F discusses the actions delivered in the Worth Valley and those that have been made permanent. This relates to the EA major recommendation 1 in its representation on our dWRMP24, which states pinch-points in the Grid WRZ may become apparent only when stress-tested by severe events.' The EA also expressed concern over the robustness of supply to areas served by the small local sources identified in the "Allowing for Uncertainty" technical report. In our SoR to the dWRMP 24 consultation we added: *"In terms of the reference to our 'Allowing for Uncertainty' technical report, Table 4.5 in this report shows potential water quality risks over the life of the plan. It is not identifying local supply-demand risks or suggesting these areas are priority drought risk areas."*	No further changes.
Finalise WSSS project and ensure the outputs feed into the final WRMP.	The WSS studies are 40% complete and will be concluded in AMP8. Risks identified in the studies will be built into the PR24 business planning process taking a risk-based approach. Where solutions demonstrate an increase in deployable output these will be included in the optimisation process for the WRMP going forward (for consideration in the best value plan).	The updated WSS position in presented in Section 3.6 of the WRMP Technical Document which reflects outcomes taken forward into WRMP. The WSS studies will be continued in AMP8 and led by the Water Resources team. The programme is to be developed.

Appendix B: Yorkshire Water Capital Process

- Gate 1: Project initiation and approval – based on business case, available scope details, benefits, and whole life cost.
- Gate 2: Investigation funding approved – a project team will be set up and scope further defined to determine funding for investigations.
- Gate 3: Delivery solution approval – investigations completed and used to confirm viability for delivery.
- Gate 4: Delivery phase funding approval – Scheme design and costs updated, and tender process carried out.
- Gate 5: Design acceptance – Delivery contract(s) awarded, and design packages agreed.
- Gate 6: Construction testing acceptance - Construction phase and construction accepted to ensure assets meet all safety and design requirements.
- Gate 7: Commissioning testing acceptance - Commissioning and testing to confirm asset is performing as required, scope fulfilled and where relevant regulatory compliance achieved.
- Gate 8: Takeover and completion - Final documentation, approval of asset data capture and YW takeover asset on completion.
- Gate 9: Defects completion - Following remediation of all major defects the client issues a defects certificate.