

1. Further information in support of Statement of Response (WRMP24)

1.1 Issue 1: Emergency storage

Summary of issue and further information requested by Defra

The Defra letter states that United Utilities Water (UUV) should:

- Calculate an appropriate emergency storage provision for all United Utilities' reservoirs;
- Set the emergency storage provision level as the Level 4 restrictions failure point within its water resources modelling;
- Include the resulting deployable output volumes as the basis of the supply forecast that underpins the plan; and
- Provide an explanation of the impact these changes have on the deployable output of the reservoirs and the strategic resource zone.

UUV's response

We removed emergency storage from our modelling assumptions because the use of stochastic flow series brings greater resilience to the water resource system deployable output assessment and provides a realistic operational threshold from which to apply level 4 restrictions. As per our Statement of Response to the Environment Agency's representation to the draft WRMP, we strongly disagree with its view on the need to set emergency storage as the point at which level 4 restrictions would be applied to supplies.

In Defra's letter of 22 December, it refers to guidance¹ which states that if a stochastic method is used then "*this improved understanding should inform the emergency storage volume and may reduce the requirement for emergency storage*". However, the phrase "*(but not eliminate it)*" is appended to this reference in Defra's letter of 22 December 2023. **This new addition to the wording is a significant change/clarification that was not previously included nor been through due process of consultation, and is also inconsistent with the approach used in previous years and applied in Drought Plan 2022.**

In previous WRMPs, water companies used emergency storage as a buffer to protect against droughts more severe than those experienced historically, which could not be assessed using historical data sets. However, for WRMP24 the methodology for assessing supply availability has changed radically, to use large synthetic hydrological data sets to assess water resource systems against extreme droughts with return periods up to 1 in 500 years. We believe that this approach is more robust than a simple emergency storage threshold. Furthermore, the latest Environment Agency guidelines² state that "*the point of failure is defined as: implementing exceptional demand restrictions on customers, associated with emergency drought orders, such as standpipes*" and "*your [UUV's] plan should explain how your company defines this level of failure*". The supplementary guidance³ also states that "*the point at which such restrictions would come into force will vary from company to company. You should therefore identify the trigger point at which you would actually implement emergency drought orders*" and "*this could be at the point at which emergency storage is reached, or a specific groundwater level*".

The failure point for each water resource zone should be related to the characteristics and resilience of that zone's supply system, for example large conjunctive use systems with multiple reservoir sources have greater flexibility to move water around the system to mitigate declining storage in individual reservoirs, before needing

¹ UKWIR (2014) *Handbook of Source Yield Methodologies* (p114)

² Environment Agency (2023) *Water Resources Planning Guideline* (Section 4.7)

³ Environment Agency *1 in 500 Supplementary Guidance* (Section 3)

to consider emergency restrictions. **In our case, the failure point used in our revised draft WRMP24 is aligned with our Drought Plan 2022, which was consulted on with the Environment Agency and approved by the Secretary of State.** As outlined in our WRMP24 Statement of Response, in our modelling Emergency Drought Orders (EDOs) are assumed to be implemented when any reservoir reaches dead water storage, or when there are issues with supplying particular areas. At this time, however, other reservoirs (as well as other source types) still have water available which can be moved around to maintain a normal supply to the vast majority of customers, and a reduced supply (i.e. an EDO level of demand) to those directly affected. The revised method being recommended by the Environment Agency will tend towards an overly prescriptive and precautionary approach which is not warranted based on evidence or experience. This will mean that United Utilities would be held to a more strict resilience standard than other water companies, especially those which are largely groundwater based, and therefore don't have the same requirement for emergency storage.

The current approach also reflects our operational experience that it is not appropriate in planning terms to impose severe restrictions such as rota cuts and standpipes on customers when storage drops to the previous emergency storage levels (at which point storage in Haweswater reservoir, for example, would still be at 23%, with a similar percentage overall across all of our reservoirs). This complies with the technical guidance, which requires that our implementation point is operationally realistic. Customers would – quite understandably – be incredulous at the imposition of rota cuts and standpipes whilst a quarter of our resources remained available. Past experience has also shown that such action would not be necessary and would represent an overly precautionary approach.

When we were finalising the WRMP24 supply forecasting assumptions, we met with the Environment Agency on 11 December 2020 to discuss the approach to emergency storage and the point of emergency restrictions. The Environment Agency subsequently confirmed over email on 21 December 2020 in regard to the point of emergency restrictions that *“there isn't a prescriptive policy on the approach to be taken, however, we expect companies to clearly define and explain this through their WRMP24 development. (Including any differences between sources for UU).”* The representation from the Environment Agency at draft WRMP24 consultation stage, and the amendment to guidance made in the Defra's request of 22 December 2023, conflicts with this statement.

In view of the above, which confirms that our approach complies with the published water resources planning guidelines, we are not proposing to make a change to our assumptions regarding emergency storage and the defined failure point of our water resources system in our WRMP24 supply forecast. The request from the Environment Agency to set an emergency storage provision level as the Level 4 restrictions failure point within our water resources modelling is inconsistent with the published guidelines and agreed regional supply methodology. The request should only be set as a requirement through a fair and consistent process involving issue of revised guidelines across all water companies, with reasonable timescales allowed for consultation and full assessment and implementation of resultant supply-demand balance changes. We are aware that this issue has been raised with other water companies, and we would ask that a strategic approach is taken to ensure the same consistent guidance is applied.

If we were to implement this change it would likely lead to a deficit in the early part of the supply-demand balance. It would be infeasible to address this by investing in further leakage and demand reduction because we have already set extremely stretching targets for WRMP24 and PR24. It would be unacceptable to deteriorate our levels of service during AMP8 to resolve the deficit as they have been set in line with the guidance and consulted upon with stakeholders as part of the PR24 process. This leaves the only viable solution as developing new supply options, though this could be challenging and costly due to associated lead times.

There are therefore three options that could be pursued from here:

1. Defra confirms its agreement to the position set out in our response to the representation and advises to publish a final WRMP.
2. Defra confirms its agreement to the position set out in our response to the representation and advises to publish a final WRMP. The Environment Agency can then follow a fair and consistent process involving issue of revised guidelines across all water companies, with reasonable timescales allowed for consultation and full assessment and implementation of resultant supply-demand balance changes in time for WRMP29.

3. The Environment Agency, Ofwat and Defra agree to enable additional investment (potentially up to £500 million, also including transitional investment) in PR24 for new sources of water to increase resilience to accommodate this change. We would then update WRMP24 to include emergency storage and the benefits of these new sources.

If option 3 is preferred, to implement such a significant change at this late stage in the WRMP24 planning timescales would incur substantial rework and risk significant delays in finalising our supply-demand plan and investment needs for AMP8 and beyond. However, as there is a relatively short period of time remaining in which to feed the outputs into the PR24 process, we need to understand the Environment Agency, Ofwat and Defra's preferred option as a matter of urgency and work with speed to ensure that the PR24 final determination properly reflects the necessary cost allowances..

1.2 Issue 2: Feasibility of WRMP24 demand starting point

Summary of issue and further information requested by Defra

When comparing this year's outturn Annual Review Distribution Input (DI) data to the WRMP24 2022/23 glide path, the water company wide DI figure is 46.5 Ml/d above the WRMP24 glide path. This reduces our confidence in the company achieving the forecast starting position in 2025/26 which is 103.6 Ml/d below this year's Annual Review DI. Since the last WRMP19 United Utilities has not met its demand forecast (companywide or in the zones), this is partly due to Covid19, but since then we have not seen demand significantly decrease. This poses a risk to security of supply.

Before the final plan is published, United Utilities must review the starting position for distribution input and provide evidence through a detailed action plan on how the company will achieve these significant reductions by 2025/26 and closely monitor the progress on delivery.

UW's response

We have reviewed our starting position for distribution input (DI) and we are confident in our position. There is an inaccuracy in the data quoted (103.6 Ml/d between the 2022/23 outturn DI and the WRMP24 final planning DI for 2025/26). The 2025/26 figure includes the first year of demand reductions to be delivered during AMP8 as part of the UW Business Plan and therefore does not represent the 'starting position' of WRMP24. The WRMP24 forecast starting position is represented by the 2024/25 DI figure which is 87.43 Ml/d below our 2022/23 outturn DI, and this is the demand reduction which we are targeting over the remaining two years of AMP7 (2023/24 and 2024/25).

We take increases in demand very seriously, and have set up a senior strategic review to create an integrated demand plan. We will update the Environment Agency on this as part of our regular sub-group meetings.

It should also be noted that trends in DI are influenced by a variety of factors, including changes in customer behaviour, variations in weather patterns and external factors such as changing patterns of homeworking arising from the recent Covid-19 pandemic. We continuously monitor DI and have a number of actions in place to ensure that we meet our AMP7 demand reduction targets which underpin the forecast starting point for WRMP24 in 2024/25 as outlined above. We shared our DI action plan, along with our outage action plan, with the Environment Agency in a letter dated 5 January 2024, however for completeness we have included a copy with this response (Appendix A).

Our supply-demand action plan in Appendix A includes details of key activities and progress in reducing each of the key components of demand, which can be summarised as follows:

- Household consumption: we continue to actively engage with customers to encourage more water efficient behaviour, promote the take-up of our free meter option and use metered flow data to identify and fix leaks in the home. We have also launched our proactive enhanced metering scheme and we are on track to meet our AMP7 (2020–25) target of 180,000 meter installations. We are also working on further interventions to reduce household consumption;

- Non-household consumption: we are engaging with retailers, and customers directly where appropriate, to develop our non-household water efficiency programme through a range of approaches including water saving visits, metered data to support leak reductions and water efficient tools and equipment websites/apps. Our programme has already included school visits, rainwater harvesting schemes on allotments and collaboration with a chain of hotels and restaurants, and we are using the learning from our pilot schemes together with business customer research to develop our programme further;
- Operational use and water taken unbilled⁴: our strategies using third party data, the void app and robust processes for third party notifications have enabled us to reduce the number of void properties by around 89,000 since the start of AMP7. We will address the associated increase in water taken unbilled in 2022-23 as part of our integrated demand plan; and
- Leakage: we are making good progress on delivering our AMP7 leakage reduction programme, which includes network sensor installation, pressure management and optimisation, metering our own sites, and using metered flow data across our region to support improved targeting of leaks upstream of district metered areas (DMAs). We have completed the leakage actions in our Cumbrian resource zones set out in our letter of 22 December 2021.

We will continue to closely monitor progress on our programme of demand reductions. We will keep the Environment Agency informed of progress on this and other activities through our regular sub-group meetings and in our Annual Review of the Water Resources Management Plan.

1.3 Issue 3: Realistic supply modelling

Summary of issue and further information requested by Defra

The Environment Agency recommends that the parameters used within United Utilities' modelling systems should be based on realistic constraints. United Utilities have stated that the model parameters will not be changed, but the asset capacity will be increased in line with the parameter values. The evidence provided to date is insufficient to justify the capacities of the West East Link Main (WELM) and Lune-Wyre assets included in the baseline supply forecast modelling and currently poses as a risk to security of supply. The Environment Agency believes that these assumptions amount to an over-representation of available supplies by around 170 Ml/d (Lune-Wyre) and 60 Ml/d (WELM) compared to recent actual use by the company. This represents around 13% of typical average demand in United Utilities' Strategic Grid water resource zone and is significant in the context of the company drought resilience claims.

United Utilities should provide regulators with a programme of work for both assets to demonstrate that the WELM project and the Wyre project will be completed prior to the start of the WRMP24 in 2025 and that they will be able to operate at the modelled maximum capacity. United Utilities should also provide results of scenario assessments conducted to test the likely impact on the resource zone deployable output and the supply demand balance if there is up to a 5 year delay on the delivery of the asset improvements programme of work. The programme of work for each project and the results of the scenarios assessment should be included within the WRMP24.

UJW's response

1.3.1 Model parameters

The parameters in our modelling systems are based on realistic constraints. For each regulatory submission, including WRMP24, these parameters undergo a full update and comprehensive review. This entails compiling data from operational teams and conducting meticulous checks. Crucially, our models are tailored for WRMPs to simulate the future supply system, aligning with the start of the planning period, which is 2025 for WRMP24. With

⁴ At any given time, a small proportion of properties within our region will be classified as 'void'; these are properties which are not currently on the company's billed database, because there is no owner or tenant registered as responsible for the payment of the water bill. Water Taken Unbilled is a component of the demand forecasts, which normally includes any illegal (unbilled) water use in void properties.

regards to ongoing capital projects aimed at increasing or restoring operational capacity for assets like the West East Link Main (WELM) and Lune-Wyre, we have factored these into our models. The following sections provide a detailed overview of the current status of these projects to address the request for additional reassurance around the realistic availability of modelled capacities.

1.3.2 Lune and Wyre project

The Lune and Wyre assets and capacities have now been fully restored after experiencing an outage due to penstock issues. Both penstocks underwent refurbishment.

On 26 April 2023, site work commenced with setup, silt clearance, and the installation of access and health and safety infrastructure. The refurbishment of the north penstock started on 17 July 2023, and the south penstock on 15 August 2023. All on-site activities were successfully completed by 21 September 2023.

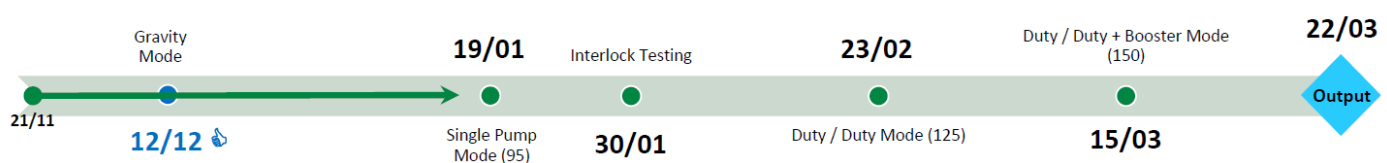
A technical assurance visit to the Lune-Wyre pumps and Water Treatment Works (WTW) A was conducted on 20 October 2023, with the participation of Environment Agency water resources and catchment colleagues. Our team addressed various technical inquiries related to asset performance and maintenance. Subsequently, on 19 December 2023, another session was held with the Environment Agency and one of our senior process engineers. This session focused on reviewing asset capacity and design, including presenting a modelled scenario demonstrating that both the pumping station and WTW can operate at their maximum output of 220 MI/d when conditions require.

1.3.3 West-East Link Main (WELM) project

We are investing £8.8 million to enhance the resilience of our supply system by increasing the flow volume to 150 MI/d through the WELM from WTW E to WTW G. The WELM 150 project includes upgrades to our chlorine dosing booster station at [✂], changes to pipework arrangements within WTW E, enhancements to power assets, installation of water quality monitoring instruments, and relevant software control modifications.

The commissioning phase of the project, initiated in November 2023, is scheduled to conclude by the end of March 2024 (see Figure 1 below). While planned outage dates on the WELM are subject to water production requirements and regional availability, efforts will be made to minimise risks through regular outage requirement discussions. Outages are meticulously managed through our production planning team and production outage permit system, with plans made well in advance.

Figure 1 WELM Commissioning timeline



Current Commissioning timeline reflects delivery programme snapshot taken 15/01/24.

The commissioning program remains on track, aligning with the regulatory delivery date of 31 March 2024, one year before the start of the WRMP24 planning period. To demonstrate project completion and assure outputs, telemetry trend information will be used to show the WELM operating at flows of 150 MI/d for approximately 24 hours, as measured by flowmeters at WTW E and WTW G.

During our session on 19 December 2023 with the EA, in addition to discussing the Lune-Wyre project, we shared details of the WELM 150 work to date, including the outages that occurred in November 2023 as part of the planned works.

We anticipate that the investment in WELM capacity will offer both dry weather and broader strategic benefits to our customers. For example, over the next 15-20 years, we have outlined a programme to increase the resilience of our Haweswater Aqueduct (HARP). The additional capacity provided by the WELM ensures our ability to meet customer demand during this period, contingent on water availability in the south area of the UUW region. Full

capacities at WTW D and the aqueduct A are forecast to be restored by 2028, providing extra water to support demand during these outages. We will provide a regular update to the EA as part of our routine liaison meetings.

1.3.4 Ongoing communications around asset capability

Quarterly, we convene the dry weather planning and operational sub-group meeting, facilitating collaboration between UUW and the Environment Agency's water resources and hydrology colleagues. Discussions within this group inform the quarterly Environment Strategy Group (ESG) meeting. The sub-group meeting frequency is adjusted based on dry weather conditions. The standard agenda includes key outages planned for the financial year, reservoir drawdowns, dry weather response, operational matters, updates on compensation-only reservoirs, and any other relevant topics.

Our interaction with Environment Agency colleagues occurs face-to-face and during site visits to enhance mutual understanding of assets and their contributions to water resources in the northwest of England. For example, the February 2024 sub-group meeting incorporated a site visit showcasing our investments in increased resilience in the water resources supply system in Bowland. The visit encompassed a tour of the new filters at water treatment works B and the weir raising project at Stocks Reservoir for enhanced capacity.

1.3.5 Model realism

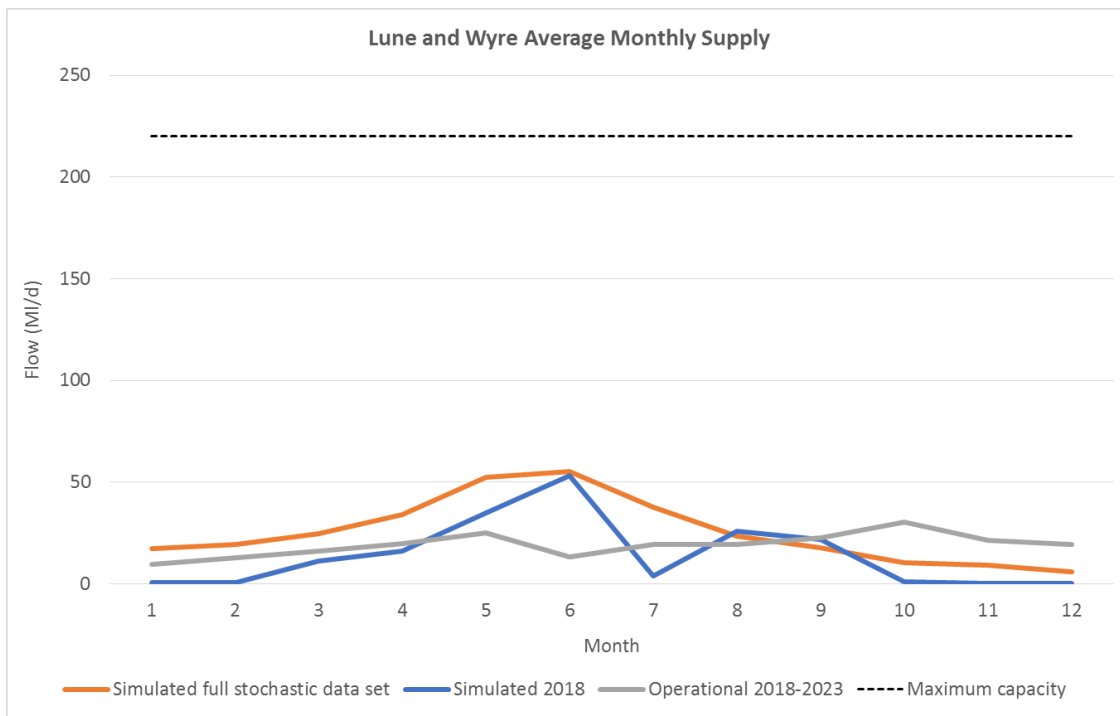
We incorporate various constraints into our models, with asset capacity being a significant factor. However, it is important to note that it is incorrect to equate asset capacity to available supply. Our models consider numerous other constraints, including raw water availability, abstraction licence conditions (with "hands-off-flows" on the Rivers Lune and Wyre), downstream network capacities, and spatially and temporally varying customer demands. Additionally, the models reflect real-life operational decisions, allocating daily abstraction to different sources based on their healthiness and cost. Consequently, few sources operate continuously at their maximum capacity.

The Lune and Wyre are components of the sources supplying WTW A, which includes boreholes, rivers, and reservoirs. The WELM serves as a bidirectional link that, during dry weather, provides a north-south balancing function. The flow direction and volume depend on prevailing supply-demand conditions at the time.

To illustrate how the Lune and Wyre sources are utilised in the model, we conducted new modelling focused on 2018, the most recent Dry Year for which we possess a complete hydrological dataset. This modelling assumed the full 220 MI/d capacity was in place, aligning to the start of the WRMP24 planning period. Figure 2 presents combined Lune and Wyre average monthly supply for:

- A simulation of the full 19,200 year Water Resources West stochastic dataset using the WRMP24 model with the full 220 MI/d capacity in place (orange line);
- A simulation of 2018, the latest year for which we currently hold hydrological data, with the full 220 MI/d capacity in place (blue line); and
- Actual operational data for the period 2018-2023 (grey line).

Figure 2 Lune and Wyre simulated and operational supply



These results demonstrate that:

- The model does not routinely utilise the Lune and Wyre sources at high levels, due to the range of constraints outlined above. The orange line showing the simulation of the full stochastic dataset, with the maximum asset capacity in place, provides a much more appropriate benchmark against which to compare operational use than maximum asset capacity;
- Simulated use in winter is typically constrained by cost as the model can opt for cheaper reservoir sources that are healthy and, potentially, spilling;
- Once storage in these reservoirs starts to decline, use of the Lune and Wyre increases. However, dry year use can become constrained by the hands-off-flow conditions, particularly in July and August.

1.3.6 Scenario modelling

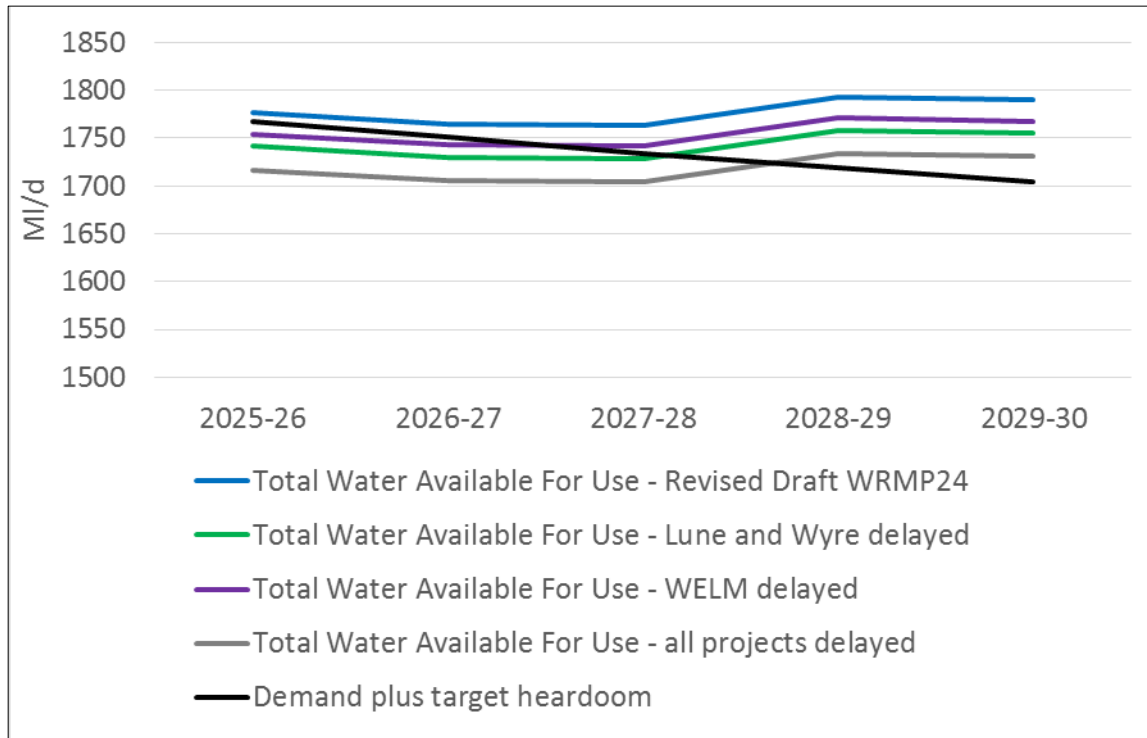
In response to the request for information, we simulated various scenarios to evaluate the potential consequences of a five-year delay to the Lune and Wyre and WELM projects. The assumption used within this scenario was that delivery of each project would be postponed until 2030, although, in reality, the Lune and Wyre project has already been completed. We examined the impact of these projects on deployable output and the WRMP24 supply-demand balance, considering both individual and combined effects. The estimated reductions specified in the Defra request for information were incorporated, with capacities set to 50 Ml/d for Lune and Wyre and 90 Ml/d for WELM.

Table 1 outlines the results of the deployable impact for both projects individually and combined. Additionally, Figure 3 illustrates the impact on the revised draft WRMP24 "dry year annual average final planning" supply-demand balance during 2025-2030. Any delay in either project would result in a supply-demand deficit for the initial 2-3 years of the planning period. Recognising the critical importance of these projects, exhaustive efforts were undertaken to complete the Lune-Wyre project, and to ensure the WELM remains on track for 31 March 2024.

Table 1 Scenario testing of deployable output impact

Scenario	Deployable output impact (MI/d)
Lune and Wyre delayed until 2030	34.9
WELM delayed until 2030	22.4
All projects delayed until 2030	59.6

Figure 3 Impact of 5-year project delays on WRMP24 supply-demand balance



1.3.7 Conclusions

Our response to this issue can be summarised as follows:

- Our models incorporate accurate system constraints, which in some cases are necessarily a forecast of a future position;
- Our models are configured to reflect operational behaviour as realistically as possible. Constraints such as cost reflect the need to minimise the impact of operating our supply network on customer bills. Ignoring these constraints would lead to an overly-optimistic supply forecast;
- We advise that operational use of assets is benchmarked against simulated / expected levels of supply rather than maximum asset capacity; and
- The Lune and Wyre project is complete and the WELM project is on-track to be completed before 2025. Therefore, we have a very high level of confidence that our WRMP24 assumptions are correct. As requested, we have completed several scenarios to demonstrate the impacts of a hypothetical five-year delay to any or all of these projects. We will update the *Final WRMP24 Technical Report – Supply forecast* with this information.

1.4 Issue 4: Strategic Environmental Assessment (SEA) concerns

Summary of issue and further information requested by Defra

United Utilities previously did not include information in the SEA on how the preferred plan has been compared to the other plans such as least cost. Further information was also requested on how characteristics of effects had been included within the SEA.

The following information is still outstanding:

- *Inclusion of the WRMP24 objectives in within the SEA that are stated in Section 1.1 (p11) of the revised draft WRMP24 main report.*
- *Reference to alternative plans such as least cost, best value and best for society and environment, and comparison of these plans to the preferred plan within the SEA,*
and
- *Clarity on how the characteristics of effects are included within the assessment.*
- *Inclusion of information on the time and duration for each potential effect reported in the SEA results table.*

This poses a risk to the environment and to legal non-compliances with the SEA Regulations. The SEA should be updated with this information before publishing the final WRMP24.

UJWs response

The SEA Environmental Report included information on the identification, description and assessment of the likely significant effects of the preferred plan (Section 6.2 and 6.3), reasonable alternative plans to it (Section 6.4) and the revised draft WRMP24 scenarios (Section 6.6).

The SEA Environmental Report has been updated to include:

- The WRMP24 objectives which are presented in Section 1.3 (paragraph 1.3.29);
- Reference to alternative plans, in addition to reasonable alternative plans and scenarios which have already been considered and which are outlined in Section 4.4 with the identification, description and evaluation of effects detailed in a new inserted section (Section 6.5). For the avoidance of doubt this includes the effects of the 'least cost' plan and the 'best for society and the environment' plan;
- The characteristics of the effects considered and associated constraints arising from the nature of the options considered, are included within Section 4.4, which has been amended and extended (see for example paragraph 4.4.5); and
- Amendment to Table 6.12 which presents the findings of the SEA of the preferred programme assessment to include information on the timing and duration of effects.

1.5 Issue 5: HRA Conclusions

Summary of issue and further information requested by Defra

Natural England previously raised that the HRA conclusions were based on investigations which have not yet been concluded, and therefore the conclusions cannot be confirmed but the HRA had not been written to demonstrate this. This has not been addressed in the revised draft plan. The misleading conclusions pose a risk to the environment as they do not accurately reflect the risk the options pose on the environment.

United Utilities should revise the HRA conclusions to accurately reflect that the investigations are ongoing and so the conclusions proposed may be open to change.

UJW's response

The HRA of the rdWRMP24 reflected the data available at the time of reporting. For some options and European sites there are notable indirect, proxy or anecdotal data available that strongly support or confirm a particular conclusion; in other instances the 'direction of travel' of emerging investigations or assessments is noted. In all

instances, however, the HRA clearly identifies the residual uncertainties and caveats the conclusions accordingly – and, critically, provides appropriate plan-level mitigation for these uncertainties. Appendix D of the HRA includes the identification of alternative ‘no adverse effect’ options that could be employed should future investigations demonstrate adverse effects are unavoidable.

This approach to plan-level uncertainty is entirely consistent with WRMP practice and guidance, and allows the plan as a whole to be compliant with the Habitats Regulations even if minor residual uncertainties over individual options cannot be resolved with the data currently available or timescales for WRMP delivery. Importantly, the available data (direct and indirect) strongly suggests that these options will not adversely affect the integrity of any European sites as the magnitude and extent of any environmental changes will almost certainly be too limited (i.e. the available data suggest that the ‘risk’ to the sites is low).

We do not therefore consider the conclusions to be ‘misleading’, as the assessment is inherently precautionary, the uncertainties are clearly stated, and the conclusions appropriately caveated and explained; nor do we believe that the ‘risk’ is not accurately characterised. We should also note that initial outputs from the Lower Mersey Basin and East Cheshire groundwater models essentially confirm the conclusions outlined by the rdWRMP HRA, although these models are still being refined and tested to ensure their robustness (and so these data are not yet set out in the revised HRA).

1.6 Issue 6: New Appointments and Variations

Summary of issue and further 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. United Utilities 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.

UW's response

We recognise that revised draft WRMPs for NAVs have been updated with recently granted sites and we have now aligned our forecasts for WRMP24. For future plans, we will continue to work collaboratively with NAVs on demand forecasting.

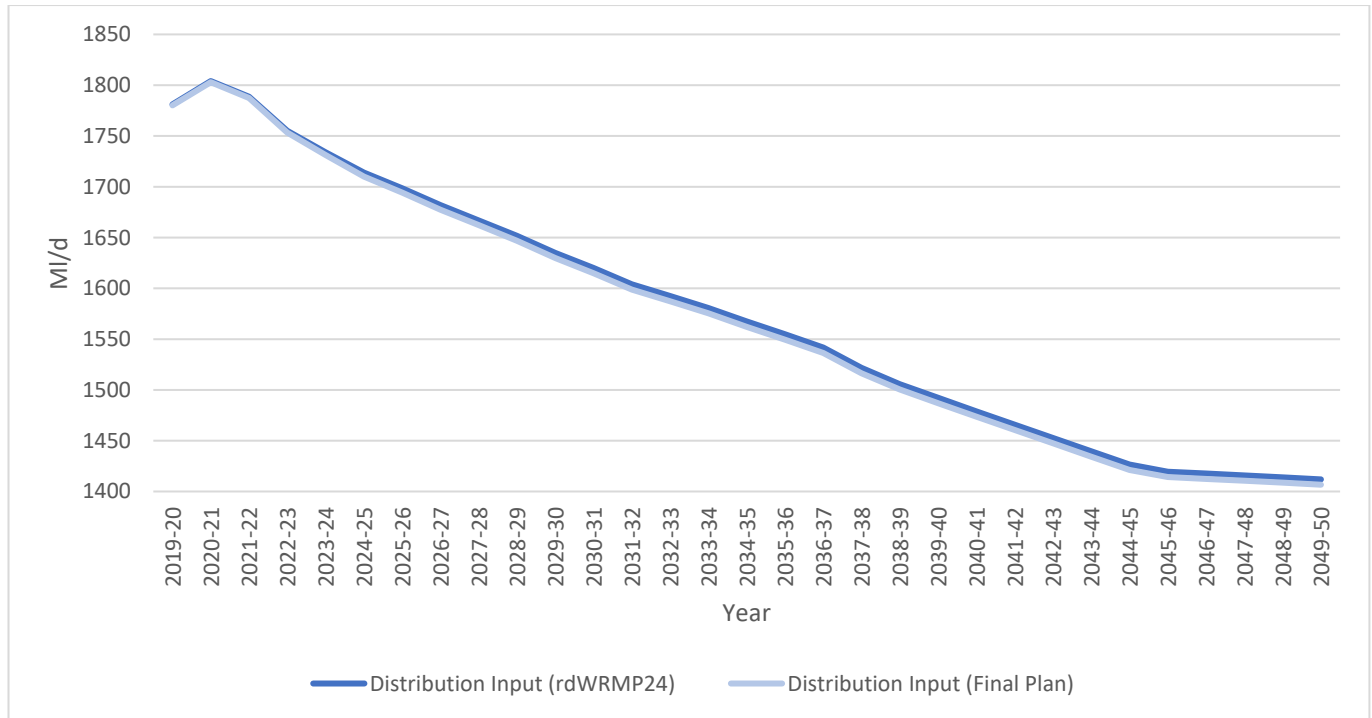
We have obtained the revised draft WRMP tables from each of the NAVs to which Uuw exports water. We reviewed ‘Table 1 appointments by incumbent’ for each NAV and updated the number of sites and contractual volumes in our WRMP to align to those included within NAV WRMPs. There are four NAVs in total where Uuw acts as the incumbent; ESP, ICOSA Water Services Ltd. (ICOSA), Independent Water Networks Ltd. (IWNL) and Leep Water Networks Ltd (Leep). We aligned our potable water exports to NAV forecasts by using their forecasts for final plan distribution input in their revised draft WRMP Table 18, which reflects their forecasted export requirements. We have therefore reduced our own demand forecast components accordingly, and adjusted our population and property forecasts.

Our demand forecast for new connections is based on the set of assumptions described in the *WRMP24 Technical Report – Demand for Water*, which are different to those used by NAVs in their individual WRMPs.

We will update our Final WRMP24 tables with the changes to demand components, distribution input, contractual volumes, property and population. In addition, we will update the information on our NAV forecast in the *Final WRMP24 Technical Report – Demand for water and the Final WRMP24 Technical Report – Supply Forecast*. The impact on our demand forecast for the Strategic RZ in 2025/26 is a reduction of 4.07 MI/d.

In addition, there is a minor reduction in our demand forecast for the North Eden RZ in 2025/26 of 0.015 MI/d. The impact on the supply-demand balance for in 2025/26 is an increase of 1.46 MI/d. The resultant impact on the Strategic Resource Zone final plan Distribution Input forecast is demonstrated in Figure 4.

Figure 4 Update to U UW Strategic Resource Zone final plan Distribution Input



1.7 Issue 7: Drought Technical Report actions

Summary of issue and further information requested by Defra

United Utilities has provided a technical appendix detailing their experiences from the 2022 drought and the lessons identified from this event. However, the technical appendix did not address how they are going to action their lessons identified. Some actions such as the review of Pennine triggers need to be progressed with closer timelines than the next drought plan (WCDP27), due to resilience concerns. The lack of clarity on system response in drought conditions, actions and triggers poses a risk to security of supply and to the environment during a drought. United Utilities should provide further information on their review of the drought level triggers for the Pennine reservoirs and the timeframes this work should be completed. A commitment to delivering this work and the timeframe within which it will be delivered (including how it links to the drought plan update) should be included in the WRMP24. A full update should be provided before April 2024 and the outputs of the review included as an additional appendix to your drought plan. This update should be reported in the 2024 annual review and the appendix also included in this reporting. Updated triggers will then be available for use and incorporated into the Drought Plan via the next (WCDP27) submission.

U UW's response

We will be undertaking a review of how Pennine sources are reflected in our Drought Plan over the course of this year (beginning in March 2024 and working through to autumn/winter 2024). This activity will be the basis of the U UW Drought Plan 2027.

As part of this review, we will consider a number of approaches including drought levels and drought management curves. In our regular Environment Agency liaison meeting on 16 November 2023, the Environment Agency indicated that drought management approaches by other water companies are beneficial; for example control lines for Yorkshire Water reservoirs provide good insight into the risk for each reservoir in the Yorkshire region. We will carry out a review of approaches, including the approach used by Yorkshire Water, to better represent the level of risk across our region.

We maintain regular communication and coordination with the Environment Agency, promptly responding to ad-hoc requests for information. A weekly water resources update is provided, offering details on storage and levels across our raw water sources. The Environment Agency is notified when Haweswater Reservoir approaches or falls below the resource state curve. We also communicate our pumping activities from Ullswater and / or Windermere to support Haweswater. As per our Drought Plan 2022, we increase the frequency of our liaison meetings with the Environment Agency if we experience a dry weather period. The standard agenda covers key outages, reservoir drawdowns, dry weather response, operational issues, and an update on compensation only reservoirs. To enhance the Environment Agency's understanding of risk relating to the Pennine reservoirs, on a quarterly basis we now share a detailed prospects model for our District Metered Zone supply areas.

In response to this request for information we have rescheduled the review and modelling work to be completed by the end of 2024, well ahead of the draft drought plan publication in September 2025. We will present our latest position in the October 2024 pre-consultation, and engage with the Environment Agency to explain developments in the approach at our regular liaison meetings. While we are aiming to adhere to this ambitious programme, we may need to expand the modelling to accommodate the outcome of Issue 1 discussions. This would likely impact on the level of information we can provide in the pre-consultation stage and could defer the outcomes for the Pennine sources into 2025.

We will update the *Final WRMP24 Technical Report - Dry weather lessons learned* to reflect the timescales in which we will carry out the review of drought levels in the Pennines, and include an appendix in Drought Plan 2027 to reflect the final approach resulting from the review.

Appendix A Supply-demand action plan (delivered to Environment Agency on 5 January 2024)

A.1 Household consumption

Actions taken including progress made

We have created an 'always on' communication plan to drive more understanding and appreciation of the value of water, connect customers to where their water comes from and to use the right motivators to encourage more water efficient behaviours, enabling them to achieve the lowest possible bill and help to protect the environment. This includes regional sponsorship of the ITV weather bulletins, regional radio, press, targeted social media, digital, direct messaging and out-of-home placement, enabling us to dial-up the tone as and when required. Water efficiency awareness has increased from the beginning of the AMP to YTD by 31% overall which demonstrates that our messages are reaching customers and helping to support our overall strategy.

We set up a new water efficiency team in October 2023 to increase ability to utilise insight from customer segmentations and consumption data. The team are now working through some complex leak cases to help the customers through to resolution.

We are actively engaging with customers to ask them to switch to a meter. We continue to proactively implement this strategy, with the aim of achieving our AMP7 (2020–25) target of 180,000 meter installations. We continue to promote the Free Meter Option (FMO) and we also encourage customers to switch to a measured charge via the enhanced proactive programme. We remain on target to meet the 180,000 meter installations, which is a combination of customer requested (FMO) and proactive (Enhanced) meter installs. We have identified 700,000 customers who could benefit from the switch to meter and are 30% towards achieving this target. We are doing this using direct communications to individual customers illustrating potential savings, as well as promotion on our website, bills and social media.

Over 54% of customers metered through our enhanced programme are making a saving as at September 2023 with total savings greater than £1m a year. We continue to improve customer processes and engagement and we see very little (less than 5%) of customers contacting us with concerns about this scheme. Our on-site presence and dedicated contact team are proving to be effective in creating a positive customer experience.

We continue to promote the Lowest Bill Guarantee on both our FMO and Enhanced programmes. Alongside this, we provide water saving help and information in regular articles in relevant consumer magazines, online and social media and through targeted communications as well as on bills. We will continue to do targeted FMO promotion where our data tells us that the customer may save money by being on a meter.

We are progressing well with a targeted trial of 3,000 smart meters in AMP7 (2020–2025), which has been designed to help us shape our system requirements, procurement strategy operating model and deployment and customer engagement approach. We expect all meters to be installed by the end of FY23/24.

Accelerated funding (Transitional Investment) from AMP8 has been approved which will enable us to implement foundation work in readiness for mass roll out of smart meters in AMP8. A lot of this activity will be on IT systems for smart meter data management. The work is underway which includes programme delivery, procurement (of smart meters, data communications and installation), deployment strategy and business design and benefit enablement.

We are engaging with customers regionally regarding leaks. Using continuous flow data from our meters to directly engage with customer regarding leaks in the home, overall 70% of customers are fixing their leak following our awareness and call to action nudges.

We are offering high consumers and leak customers the offer of a home audit in zones which are either high consuming or are susceptible to high consumption in dry weather. 20,000 audits have been offered over the last three years, and around 7,000 are to be completed in FY24. Average savings associated with water audits are 67 litres per household, but can range up to 400 litres per household where a leak is found and fixed.

A.2 Non-household consumption

Actions taken including progress made

As part of our non-household water efficiency programme, in collaboration with the Department for Education and Groundwork, we have delivered 63 water saving visits to schools in Manchester and Sefton between April 2022 and March 2023. During the visits 368 leaks were identified and fixed and 319 water saving devices were fitted. Total estimated savings were 5,169 l/day/school. We have secured funding to deliver circa 150 more visits in schools, leisure centres and care homes this year.

We carried out quantitative customer research to understand interest and barriers to business visits. Customer research showed that many non-households immediately see the benefit of having a visit and responses to the proposition were positive, with 61% interested in having a visit. A range of factors will drive interest in the proposition, but for 51% of non-households saving money was the main driver. Our research report can be found on our website⁵.

Ahead of PR24 submission, we started to investigate the potential cost and benefit of installing water butts at allotments to determine the potential return on investment for rainwater harvesting. Initial outcomes indicate that the water butts are used and do drive efficiency (e.g. Brighton Grove saw a 23% year-on-year reduction). We have provided rainwater harvesting solutions to three more allotment sites this year (Birkdale, Peel Brow and Cleavley), with one more site to be completed in the coming months (Haslington). We will use the learning from the allotments to provide self-help guidance on our website for allotment owners on how to reduce water use.

We are exploring other water efficient tools and equipment websites/apps to provide business and domestic customers the ability to self-serve, including the GetWaterFit app.

We are collaborating with Whitbread and Waterscan to look beyond just identifying and fixing leakage, and reducing the baseline consumption of a busy, growing, high water-using hotel chain. We will install water saving technology at a small sample of sites. We have prioritised sites (nine hotels, five restaurants) in the most water stressed regions and oldest sites, to maximise the water saving potential in areas that need it most. Site surveys are expected in January 2024.

Following the success of engaging with domestic customers with continuous flow alarms, we will be replicating this for non-household customers. We already provide retailers with AMR data, but we plan to engage with retailers further to share learnings from our domestic leak communications and encourage them to contact their customers and encourage them to self-fix. Where there is little appetite from retailers we will engage with customers ourselves. This activity will begin in January 2024.

A.3 Operational use and water taken unbilled

Actions taken including progress made

Void performance to date for 2020-2025 has seen a reduction in void properties from 220,000 at the start of the AMP down to 131,000 as at November 2023 month-end.

Deploying strategies for the use of third party data, the void app and robust processes for third party notifications has enabled the reduction in voids ensuring more customers are billed for the water they are using and lowering the cost of bills for all customers.

We will address the increase in water taken unbilled in 2022-23 as part of our integrated demand plan to ensure that our overall Distribution Input meets the required reduction for 2024-25.

⁵ https://www.unitedutilities.com/globalassets/z_corporate-site/about-us-pdfs/p_business-water-efficiency-visits-research/non-household-water-efficiency-visits-report.pdf

A.4 Leakage

Actions taken including progress made

Our AMP7 network sensor programme is 60% complete. To build on this action, we are going to use advanced analytics and alternative targeting models to redeploy acoustic sensors and review detection resource model to drive additional benefits.

Our AMP7 pressure management and optimisation programme is 50% complete. We plan to review area pressure targets and further optimise the relevant pressure management valves utilising the remote capability where it's available.

We are 50% through our plan to meter our own sites, focusing initially on those using over 10 m³/d. We continue to verify the metered data and will use this data, along with site specific information (e.g. treatment processes etc.), to develop a site standard for water use.

We are validating/verifying metered flows to support improved targeting of leaks upstream of district metered areas (DMAs). We have identified a new action, building on our supply-demand action plan from 2021, to further improve targeting of leaks upstream of DMAs.

In the Cumbrian water resource zones, we have completed the actions set out in our letter of 22 December 2021. These included: utilising network sensors (where signal strength issues can be overcome) and enhanced leakage analysis to drive down leakage in high leakage areas (effectively, an intensive care programme for district metered areas with high leakage); increased pressure control, including additional pressure management valves (PMVs) and pressure modulation units, combined with pressure optimisation; new water network meters, as well as flow checking of our distribution input meters and improving estimation of leakage upstream of district metered areas (DMAs); full analysis of the water balance to ensure we are correctly accounting for the water that is going into distribution – this includes incorporating storage change within district metered areas into our leakage calculation; and increasing continuous logging of industrial users and our own sites.

A.5 Outage

Actions taken including progress made

Outage management is critically important to us, as a result of our changes to how we plan and manage outage we will make sure our annual performance is within the outage allowance.

We employed a full time outage readiness manager in 2022. This new role is solely looking into the planning and delivery of our outages and has developed the tools and assessments needed prior to an outage to minimise the length and impact on the regional system. They are now developing the long term outage plan for future years.

We have recruited two analysts to support the outage readiness manager, looking specifically at the outages coming up in the next financial year. One of the considerations is the timing of outages to reduce the number occurring during the summer and potential peak demand events, and during the winter and the potential freeze thaw peak demand events.

A project manager for maintenance and outage program process is joining the outage team and the maintenance planners to produce a process which captures any maintenance activities which can be scheduled at the same time as a planned outage to minimise down-time.

We are grouping outages into an outage window to align outage and maintenance needs. This activity began in Spring 2023 and is ongoing. We have started to identify opportunities where we can combine an outage with several maintenance activities which would have required their own outages. This is meaning there are fewer periods of time where a WTW is unavailable or the output restricted. This is allowing us to plan in more outages with less impact on the regional system. An example of this was the Piethorne planned outage which required a full shut down for 45 days. The difference from previous outage planning was that we liaised with maintenance planning to determine what other tasks were required at Piethorne in the next 24 months which would require Piethorne to shut down. We then reviewed all the other possible work to determine what could work together in

combination with the planned outage. We were able to complete 29 maintenance tasks at the same time, which would have required partial or full outages.

We are undertaking Go/No Go outage planning. For each outage an assessment is undertaken to determine the potential impact, and the system set up in advance of it going ahead. This means that we don't go into any outages where the conditions might mean that the outage has a greater impact on the regional system or be extended due to set up going into the outage. Or, this means that we only go into an outages where the system conditions are set up as required for the outage to have minimal impact.

In our weekly planning, we review the upcoming planned outages for the following few weeks, this allows us to determine if any new constraints have come into the system which may restrict or cause an outage to overrun. It also allows the current conditions (such as a developing dry weather event for example) to be taken into account in the planning process.

We provided the Table of Outages 2022/23 to Environment Agency on 28/7/2023.

Upcoming key outages being undertaken in the next financial year quarter are:

- WTW D ongoing project restriction to 145 MI/d until June 2026 (current estimate);
- Aqueduct A lining from March 2023 until Dec 2028; and
- WTW F 4x 24hr reductions to 360MI/d (December) and 4 week outage for contact tank cleaning in March 2024.

Upcoming key outages in the longer term are:

- Haweswater Aqueduct Resilience Programme (HARP) - from 2028 full and partial outages with programme yet to be confirmed;
- WTW C- in 2024, 4 weeks reduced to 170MI/d for contact tank cleaning; and
- Service Reservoir A- currently planned for 2025.

The West-East Link Main (WELM) pipework already had the capacity to increase to 150 MI/d, however it requires extra chlorine dosing based at booster station A to ensure water quality.

Outage 1 and 2 (pipework pressure testing) are complete. Commissioning and testing were carried out between November 2023 and January 2024. Booster station A commissioning is expected to take place between February and March 2024. On the 19 December 2023, operational colleagues met with the EA to discuss the WELM in more detail as well as the Lune and Wyre.

A.6 Water Available for Use

Actions taken including progress made

Over the past few years we have strategically invested in several schemes, to either bring new sources or connections online or return previous capability to our system:

- Brought online the Widnes boreholes from Drought options to business as usual sources;
- Thirlmere transfer to West Cumbria (which allowed the revocation of relevant West Cumbria licences);
- Variable speed pumps at Denton PS allowing more support from the regional system;
- [✂]
- Wyre Penstock repair;
- WTW D ongoing project along with aqueduct Lining;
- Stocks impounding reservoir increase of embankment by 30cm and increase in WTW B output; and
- WELM 150 MI/d project.

In our water resources resilience plan from 22 December 2021, we also included investment in three boreholes to support our supply network: borehole A, borehole B and boreholes C. We continue to abstract from borehole B. The outcome of the AMP7 WINEP investigation into borehole A indicated that a reduction in the abstraction licence may be needed, and therefore we are no longer considering this option as part of our action plan. Boreholes C has now been developed into a supply option to support water transfers, and forms part of the preferred plan for revised draft WRMP24.

We are continuously updating and adjusting our model based on the latest information and system optimisation, these changes are shared in our annual review and feed into our following strategic plans. We will also provide updates on this via the sub-group meetings.