Statement of Response to the Draft Water Resources Management Plan 2019 consultation

Contents

1. Introduction

We published our draft Water Resources Management Plan 2019 (dWRMP19) on 2 March 2018, for a 12 week consultation period to 25 May 2018. The plan defines our strategy to achieve a long-term, best-value and sustainable plan for water supplies in the North West. It ensures that we have an adequate supply to meet demand over the 25 years from 2020 to 2045. In this document, we refer to dWRMP19 as our 'draft plan'.

We received 25 formal consultation responses on our draft plan, as well as informal feedback from the consultation events and other interactions. The comments and responses reflect a high level of stakeholder interest in the region's water supply, the environment and our proposals for the future.

This Statement of Response describes how we have taken account of the consultation responses and the changes we have made to the draft plan as a result. It has been sent to those who provided responses on the draft plan and has also been sent to the Secretary of State for Environment, Food and Rural Affairs. Alongside our Statement of Response, on 31 August 2018 we published a copy of our revised draft Water Resources Management Plan 2019 submission (rdWRMP19), referred to in this document as our 'revised draft plan'.

Following publication of our revised draft plan, the Department for Environment, Food and Rural Affairs (Defra) requested further information in support of our plan, prior to the Secretary of State making a decision on next steps. We submitted this further information as requested on 5 April 2019; a copy of our submission is included as an appendix to this updated Statement of Response. On 23rd July 2019 the Secretary of State then confirmed that we should publish our Final Water Resources Management Plan 2019.

We have also prepared a Strategic Environmental Assessment (SEA) Post Adoption Statement, Habitats Regulation Assessment (HRA) and Water Framework Directive (WFD) assessment. We are publishing these documents along with this Statement of Response as part of our final Water Resources Management Plan submission.

This Statement of Response is structured as follows:

- Section 1 explains the background to this document;
- Section 2 describes the consultation process;
- Section 3 summarises the responses we received and our replies;
- Section 4 outlines the activities to finalise the Water Resources Management Plan, as well as our planned future engagement;
- Appendix A details a full breakdown of the responses we received on the draft plan, and how we have taken account of these; and
- Appendix B provides a copy of our submission of further information as requested by Defra in support of our revised draft plan.

2. Our consultation approach

We completed an extensive early pre-consultation phase with regulators and stakeholders in autumn 2016, before starting work on the plan. We contacted over 450 stakeholders and consultees via email, which included stakeholders from our previous Water Resources Management Plans and Drought Plans. The pre-consultation process was supported by four public stakeholder events across the region in conjunction with consultation on our Drought Plan. We also published a briefing note of the key expected plan themes and our approach to plan development. We received numerous comments and questions through our pre-consultation process, as summarised in Section 2.2 of our main report, and took account of these comments in building our draft plan.

The draft plan was published on our company website and was available in hard copy at our Head Office at Lingley Mere, Warrington. Consultation was promoted on our corporate website, through social media platforms, via email to around 700 stakeholders, and through other customer roadshows and through 'business as usual' stakeholder interactions. Our Twitter and LinkedIn posts reached an audience of over 68,000 with 900 likes, clicks or shares of the post. Our Water Resources webpage has had over 2000 visitors since January 2018, and the WRMP video that was produced and shared on social media has received over 5000 views. We ensured that all consultee groups were covered by our engagement activities, in line with the Water Resources Planning Guideline.

During the consultation period, we held three[1] successful consultation events in Knutsford (10 April 2018), Bolton (12 April 2018) and Penrith (16 April 2018), in order to discuss the plan directly with interested parties. The events attracted 26 delegates from 20 different organisations including the Environment Agency, local authorities and councils, recreational groups, conservation and wildlife trusts, local businesses, and public service organisations. We also offered a webinar, however, only one participant (Lake District National Park) was interested in this method of consultation, so we met them personally instead. We also met with the Environment Agency on several occasions[2] in order to discuss the plan and clarify their consultation comments.

A total of 25 written responses[3] on the draft plan were submitted to the Secretary of State from our consultees and Figure 1 shows the key themes of the responses.

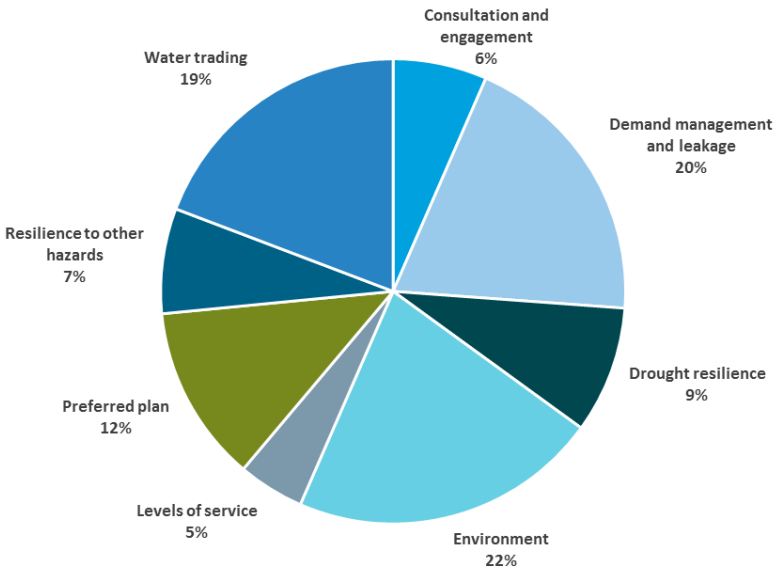

Figure 1 Key themes of consultation responses

[1] We also held a series of roadshows across our region to help us gather feedback and have conversations about our future business plan, which also included water resources related themes and promoted consultation on the draft plan. We also engaged with a variety of organisations or individuals as part of 'business as usual' interactions.
[2] In particular, meetings or teleconferences on the 18 January 2018, 15 March 2018 and 23 May 2018
[3] It is worth noting, given that the number of respondents was similar to event attendance, that the respondents were not necessarily the same organisations or individuals as those who attended the consultation events (and vice versa), demonstrating a broad coverage during consultation.

Draft WRMP19 Consultation Statement of Response

Table 1 shows each respondent and the key themes of the response.

Table 1 Respondents to our draft water resources management plan and the key themes of the response

Respondents to our draft plan consultation	Themes of response
Canal & River Trust	Consultation and engagement; environment; preferred plan; water trading
Carlisle City Council	Consultation and engagement
Cheshire West and Chester Council	Consultation and engagement
Copeland Borough Council	Environment; levels of service; preferred plan
Customer Challenge Group (YourVoice)	Consultation and engagement; demand management and leakage; levels of service; resilience; water trading
Environment Agency	Drought resilience; environment; demand management and leakage; levels of service; preferred plan; resilience; water trading
Friends of the Lake District	Consultation and engagement; demand management and leakage; drought resilience; environment; levels of service; preferred plan; water trading
Group Against Reservoir Development	Water trading
Individuals (four responses)	Drought resilience; environment; demand management and leakage; levels of service (2); water trading (2)
Lake District National Park Authority	Demand management and leakage; drought resilience; environment; levels of service; water trading
National Farmers' Union	Demand management and leakage; environment; resilience
Natural England	Demand management and leakage; environment; levels of service; preferred plan; resilience; water trading
Natural Resources Wales	Environment; preferred plan; water trading
Northumberland County Council	Demand management and leakage; levels of service; resilience; water trading
North West Wildlife Trusts	Demand management and leakage; environment
NuGeneration Limited	Demand management and leakage
Ofwat	Consultation and engagement; demand management and leakage; drought resilience; levels of service; preferred plan; resilience; water trading
South Cumbria Rivers Trust	Demand management and leakage; drought resilience; levels of service
South Lakeland District Council	Demand management and leakage; drought resilience; levels of service; preferred plan; water trading
Welsh Government	Environment; preferred plan; water trading
Windermere Lake Cruises Limited	Demand management and leakage; drought resilience; environment; levels of service; water trading
Windermere Marina Village	Demand management and leakage; drought resilience; levels of service

3. Responses received and our replies

The 25 responses received on the draft plan show a high level of interest in the region's water supply and related environmental factors. There were many expressions of support for the plan, as well as proposals for modification, improvement and clarification.

Several respondents commented on more than one issue, or on different aspects of a single issue. As a result, the 25 responses gave rise to over 200 detailed comments. We have carefully considered all the responses received and have taken account of these in our final plan and supporting documents. The key themes are discussed in the following sections and all the responses, with our replies, are shown in Appendix A.

Table 2 Key themes, with a link to the relevant section in this document

Theme of response	Relevant section in this document
Developing our plan and our approach to consultation	3.1
Leakage reduction	3.2
Reducing per capita consumption	3.3
Drought resilience	3.4
Levels of service, Windermere abstraction licence review, and Windermere and Ullswater operations	3.5
National water trading	3.6
Resilience to other hazards	3.7
Preferred plan	3.8
Environmental assessments and considerations	3.9

3.1 Developing our plan and our approach to consultation

In consulting on our draft plan, our approach was to engage from early in the planning process, innovatively, and more extensively with customers, stakeholders and regulators. During the consultation, we asked for any further views on the tools and techniques that we have used to develop our plan. Whilst this was a major theme at pre-consultation, we felt that this was important given the step-change in approaches used in this plan, compared with previous planning rounds.

Consultation responses

Six respondents specifically stated that they welcomed being consulted on the plan and praised our approach to consultation in their response, particularly through our positive engagement with stakeholders at our public events. Two respondents noted the benefits of our pre-consultation exercise that took place in autumn 2016, which enabled stakeholders and statutory consultees to comment on the issues to be addressed in our plan and assisted meaningful input during plan development.

Three respondents welcomed our decision to use new and more sophisticated methods for our draft plan, including those used to model the supply-demand balance and to explore the potential for water trading. However, two respondents raised that a natural capital approach had not been implemented or integrated with the tools and techniques used in developing this plan. Our approach to natural capital accounting in this plan, and its use in future plans, is explained in Section 3.9 below.

Our approach to customer and stakeholder engagement was also recognised, including the use of innovative approaches such as immersive role-playing research techniques, and the 'build your own plan' (programme choice experiment) tool.

Comments from respondents included Ofwat, who noted that our approach demonstrated good practice in a number of areas, including the approach to wider resilience, third party engagement and customer participation[4]. However, they also requested clarification on how our engagement with our Customer Challenge Group, known as "YourVoice", has shaped our plan and contributed to the decision making process.

Our response to consultation

We received positive feedback regarding our consultation process, and on the new and more sophisticated methods we used to develop our draft plan.

Section 4.1.1 of our *Final WRMP19 Technical Report - Customer and stakeholder engagement* describes how the YourVoice panel has influenced the development of our plan both directly, as well as indirectly, through influencing our wider business plans. Engagement with YourVoice was both through the main panel, and established environment and customer engagement sub-groups. Whilst this is detailed in the technical report, some key example areas where YourVoice has helped to shape our plans include:

- Influenced our approach to specific pieces of customer research by providing feedback on draft survey or research material;
- Working particularly closely on Manchester and Pennines resilience customer engagement to inform solutions in the plan, with YourVoice appointing independent experts to review the approach and our interpretation of the outputs;
- Influenced our draft plan consultation approach through feedback on consultation questions and the plan summary;
- Took part in our consultation events and submitted a formal response, which can be seen alongside all of our representations and responses in Appendix A;
- Emphasised the need for Water Trading and benefit to customers in the North West, which resulted in a joint piece of customer research with other water companies (as detailed in Section 4.3.10 of our *Final WRMP19* main report); and
- Specifically relating to leakage, the YourVoice panel stated that they "wanted the company to go further to reduce leakage than proposed in the draft WRMP, by adopting the more challenging 15% Ofwat target for the 2020-25 period", which influenced our revised draft plan.

3.2 Leakage reduction

In our draft plan, we proposed to reduce leakage by 80 million litres per day (Ml/d) over the 25-year period to 2045, an 18% reduction from the baseline position of 448 Ml/d[5]. It was proposed that 30 Ml/d (7%) of this reduction would be achieved by 2025.

Consultation responses

Thirteen respondents raised the topic of leakage reduction in their response through formal comments. Whilst the respondents supported our proposal for further leakage reductions, twelve said that we should adopt a more ambitious target, of which three respondents recommended that we should specifically meet Ofwat's challenge of a 15% leakage reduction by 2025. One response supported the specific proposals in the draft plan, and recognised that innovation was required to help find smaller leaks to improve the economics of managing leakage at lower levels over time.

[4] https://www.ofwat.gov.uk/publication/united-utilities-water-draft-wrmp19-consultation-response/

[5] The baseline was defined by the 3-year average regional total leakage between 2014/15 and 2016/17. We chose a 3-year average (noting this was originally stated specifically in an earlier version of the water resources planning guideline), because choice of a single year leakage may be significantly influenced by the weather, and this was to represent a normal/representative baseline year. It should be noted our baseline total leakage figure included the existing West Cumbria Resource Zone prior it being formally incorporated into the Strategic Resource Zone early in the planning period.

Informal feedback at the consultation events correlated well with the formal responses received. During interactive sessions, the majority of people favoured leakage reductions as a priority and supported greater reductions in leakage than we proposed in our draft plan, with many supporting a 15% reduction from the baseline.

Comments from respondents included Ofwat, who noted the high importance our customers placed on leakage reduction in customer research, and who requested that further evidence was therefore required to demonstrate why our target was not more ambitious as a result. They also noted that our draft plan proposals were one of the lowest levels of reduction in the industry, and that the plan was therefore perceived to be relatively unambitious in this area with scope for improvement when making national comparison. Ofwat noted that our baseline (from which further reductions are applied) was proposed using a three-year average rather than a specific year.

The comments from the Environment Agency also noted that we needed to be more ambitious with leakage targets in all of our water resource zones, and that reductions greater than those proposed in the draft plan needed to be considered in the revised draft plan. The Environment Agency also noted that we needed to further demonstrate innovative approaches in reducing leakage.

There was some ambiguity as highlighted by Ofwat and the Environment Agency about the derivation of the leakage reduction in percentage terms. This was the result of the West Cumbria Resource Zone being incorporated into the Strategic Resource Zone early in the planning period (as a result of the completion of the Thirlmere transfer scheme) and this is addressed in the revised draft plan. Two respondents provided comments in relation to the need to provide more information in relation to technology and innovation.

Our response to consultation

We still consider that our baseline level of leakage of 448.2 Ml/d[6] is most appropriate as a starting position for reductions between 2020 and 2025. This is because the level of leakage is strongly influenced by the impact of weather each year. In 2017/18, reported leakage was 453.5 Ml/d, compared to the 439.2 Ml/d reported in 2016/17, with the difference predominantly being due to the succession of winter freeze-thaw events between December 2017 and March 2018. For our draft WRMP, we based this on a three-year average of 2014/15, 2015/16 and 2016/17 of 448.23 Ml/d. For our revised draft plan, we will base this on 2015/16, 2016/17 and 2017/18 which is comparably 448.20 Ml/d. This includes a mixture of relatively benign winters (2016/17) as well as more extreme winters (2017/18).

Technology and investment in leakage management has provided significant benefit over time, with leakage levels reducing over the past two decades. We recognise that the right mixture of investment, which incorporates technology and innovation, is needed in order to make a step change in our performance in leakage management. We aim to deliver a balanced approach in reducing leakage significantly in AMP7 (covering 2020 to 2025) that includes a combination of tried and tested options, used in combination with options that are less certain, but are proving successful in trials. We are also proposing to include third-party options that can help deliver stretching targets. Over the remainder of AMP6 (to 2020), there are ongoing trials and this may well lead to some evolution of our approach over the course of AMP7 and beyond. These trials include the permanent deployment of noise loggers, use of satellite imagery and trained sniffer dogs. Further information on these trials can be found in Section 11 of our *Final WRMP19 Technical Report - Demand for water*.

As discussed, there will be an ongoing need to evolve and adapt our approach over time, reviewing the successes and failures of trials, as well as considering the most effective ways of deploying and utilising new approaches and technologies[7]. Overall, we recognise the strength of consultation response on leakage, from customers and stakeholders, as well as the Environment Agency and Ofwat. We understand the balance of affordability with the scale of reduction, and have continued to undertake customer research activities, following the submission of the

[6] Even this baseline position, prior to further leakage reductions being applied in the plan, is lower than the target defined in the 2015 WRMP

[7] These reviews will happen through the Annual WRMP process, as well as in line with our future bid assessment framework

draft plan, around the pace of leakage reductions between 2020 and 2025. This activity is closely linked to our wider business planning, as part of the 2019 price review (PR19), via acceptability testing.

In our revised draft plan, we proposed to move to a more stretching leakage target than the levels set out in our draft plan. In line with the National Infrastructure Commission's long term aspiration to halve leakage by 2050, our proposals in the revised draft plan included a reduction of 190Ml/d (over 40%) by 2044/45, of which 67Ml/d (15%) would be delivered by the end of 2024/25. However, in their initial assessment of our proposed business plan for 2020-2025, Ofwat challenged us to bring forward some of our planned leakage reduction activities to achieve an even higher reduction during the period 2020-25. As outlined above, we recognise the importance that our stakeholders, customers and regulators place on reducing leakage and so we have accepted Ofwat's challenge. Our final plan therefore includes a proposal to reduce leakage by 91Ml/d (20%) by 2024/25.

Taking everything on balance, for our final plan we are:

- **Being more ambitious in our plans to reduce leakage beyond the levels set out in the draft plan**
    - We have considered a range of factors and considerations for moving to a more stretching leakage target in our final plan. We are including a reduction of 20% by the end of 2024/25, basing this percentage on annual leakage performance. We are including a reduction of just over 40% by 2044/45, as we believe longer term improvements in technology and innovation will drive these reductions and change the economics of leakage management, making reductions more affordable over time. However, this aspiration would be reviewed over time through subsequent WRMP planning cycles. We will seek to outperform our leakage targets, realising the importance our stakeholders, customers and regulators place on reducing the overall demand for water.
- **Reducing leakage in all zones across the planning period**
    - In the short term our reductions are focused on the Strategic Resource Zone, as the greatest savings can be achieved there. Our smaller zones are already performing at the industry frontier. However, we anticipate some of the technological development and innovation providing some future benefit. We have forecast this in later in the planning period due to inherent uncertainty. We have confidence that the overall reduction proposed can be achieved through the Strategic Resource Zone, but there is greater uncertainty about how much further the smaller zones could reduce by.
- **Demonstrating clearly the level of support customers and stakeholders place on reducing leakage and support for the plan**
    - We have provided additional information on further customer research that was carried out since our draft plan, and providing this supporting evidence in our *Final WRMP19 Technical Report - Customer and stakeholder engagement.* This includes the acceptability testing that demonstrates customer support for the 15% reduction in leakage that we proposed to achieve by 2024/25 in our revised draft plan, and which we plan to outperform in our final plan by achieving a reduction of 20% by that date.

Our final plan leakage reduction targets are also aligned with the longer term aspiration and findings of the National Infrastructure Commission report of reducing leakage by 50% from current levels by 2050[8].

[8] https://www.nic.org.uk/wp-content/uploads/NIC-Preparing-for-a-Drier-Future-26-April-2018.pdf, page 12

Table 3 shows the key drivers and considerations for further leakage reductions in terms of PESTLE (Political, Environmental, Social, Technological, Legislative and Economic) to help summarise the main drivers behind the decisions we have taken[9].

Table 3 PESTLE considerations (Political, Environmental, Social, Technological, Legislative and Economic) for further leakage reductions

PESTLE category	Key drivers and considerations
Political	• We are an industry outlier using leakage per km and per property metrics at regional level • Reducing demand, including leakage, is a strategic government priority and stakeholder responses have asked us to do more than we set out in our draft plan
Environmental	• Reducing leakage further below baseline is beneficial for the environment • Reducing leakage helps to mitigate the risk of longer-term uncertainty such as climate change and impact positively in relation to levels of service and resilience
Social	• Customers and stakeholders strongly support reducing leakage and wanted us to be more ambitious than our draft plan • The general public and media perceive current leakage levels as being too high, resulting in reputational issues for the industry and resistance against customer water use restrictions during drought • Having a high level of leakage is unlikely to help in persuading customers to reduce their own consumption
Technological	• There are a range of new tools and technologies that are becoming available • Technology and innovation is expected to drive efficiency and change the economics of leakage management
Legislative	• There is no specific legislative driver, however, Ofwat has challenged the industry to set more challenging and stretching leakage reduction targets, or justify why this is not appropriate for a particular company
Economic	• Customers supported on average a 12% reduction in leakage from the Programme Choice experiment that considered wider affordability and bill impact. • Customer valuations from acceptability testing supports the 15% reduction proposed in our revised draft plan • Customer acceptance of bill impact associated with the planned reduction of 20% is supportive.

There are a number of strong drivers for reducing leakage significantly, and the different drivers and considerations led to the decision to move from our draft plan position of reducing leakage by 7% by 2024/25 and 30% by 2044/45, to a final plan reduction of 20% by 2024/25 and just over 40% by 2044/45.

We have also refined our approach to presenting leakage reductions and data in the plan to make our reduction ambitions clearer (or more replicable) for those who are completing their own calculations using the planning tables or data (due to inherent changes in our water resources zones from the previous planning round). As defined at the pre-consultation stage, given the West Cumbria Resource Zone ceases to exist very early in the planning period (our Thirlmere transfer scheme is now due to be implemented by 2021), we completed our plan using the future resource

[9] EU Reference – 'Good Practice on Leakage Management' – Main Report, 2015

zones for WRMP19 to reflect the long-term supply system. This represented the West Cumbria area as part of the new, larger Strategic Resource Zone (current West Cumbria and Integrated Resource Zones combined). However, for the very early part of the planning period (where WRMP15 data still applies for West Cumbria as previously specified in *Draft WRMP19 Technical Report - West Cumbria Legacy),* we did not include the West Cumbria Resource Zone demand data. This was to illustrate, to the reader, the 'step up' in Strategic Resource Zone demand, upon implementation of the Thirlmere transfer scheme. However, this led to some respondents calculating a smaller percentage leakage reduction over the 2020 to 2025 period than we quoted in the plan, as use of the planning tables would not produce the correct total regional leakage without West Cumbria data being included. For the final plan, we have therefore included the West Cumbria Resource Zone demand in the data tables, and presented supply-demand balance graphs differently, to ensure stakeholders using the planning tables can reproduce our own calculations of leakage reductions.

3.3 Reducing per capita consumption

Eight respondents also commented on other demand management activities, including water efficiency and metering. In our draft plan, we proposed to continue to achieve current levels of water efficiency savings, giving an annual saving of one litre per property per day, and to reduce water consumption. This water efficiency saving, in addition to the benefits from increased meter penetration over time, helps to reduce forecast per capita consumption over time.

Based on our analysis of draft plans from each company, our proposed reductions in per capita consumption over the planning period to 2045 demonstrate a high level of ambition. Our plans result in achieving current industry upper quartile performance by the end of AMP7 (2020-2025 investment period). The proposed targets include some allowance for the inherent uncertainty in the per capita consumption forecast, such as the level of metering and the benefit, in terms of household consumption, that this will generate. In order for us to consistently achieve the proposed targets, we must meet the commitments set out in our proposed AMP7 metering programme, and deliver the forecast savings from our water efficiency related activities.

Consultation responses

Comments from Ofwat were supportive of our longer term target to reduce PCC and that a wide range of options were considered. There were a range of responses, with two stakeholders wanting to see more ambitious reduction in consumption through water efficiency, and two that were supportive of the plan and the demand forecasts.

Our response to consultation

As shown in our draft plan, we have included very ambitious reductions in per capita consumption over the planning period to 2045. In fact, we are planning to deliver one of the most ambitious reductions across the industry. Reductions in per capita consumption are achieved from both the water efficiency activity and the benefits of increased meter penetration over time. Over the longer term, we recognise that metering firstly is a highly effective method of reducing demand in its own right, but secondly that it benefits leakage management, through better monitoring and encouraging customers to resolve leaks on their supply pipes or internally. Metering is the key to reducing demand in the longer term and represents over 70% of the long term benefit in terms of reducing per capita consumption (PCC), as shown in Figure 2.

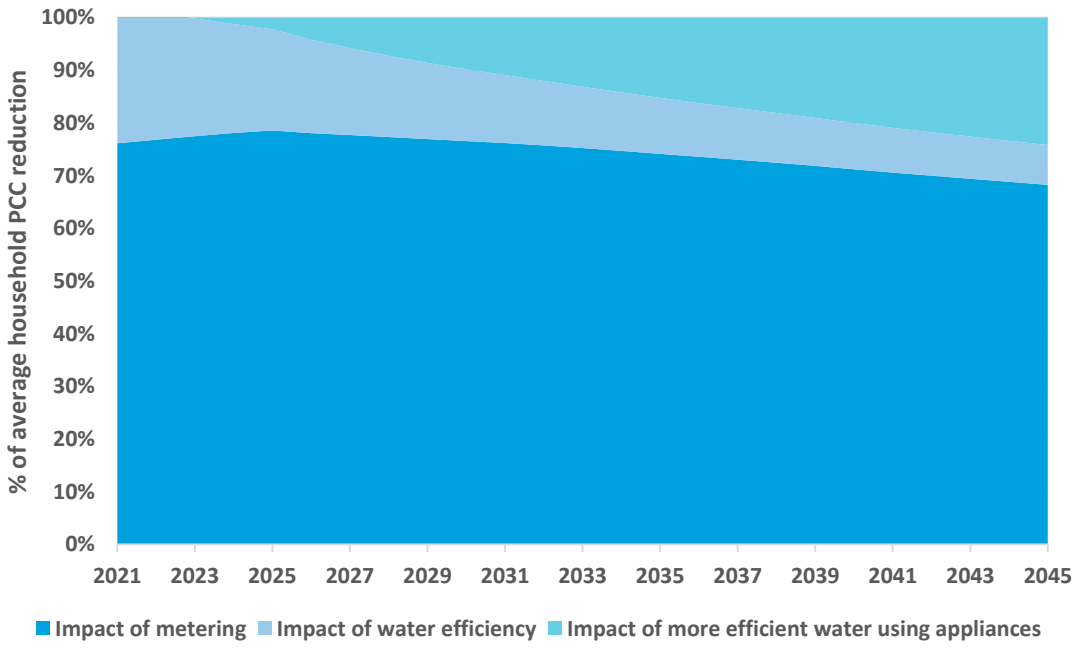

Figure 2 Impact of demand management activities

Noting some stakeholder comments about the scale of water efficiency aspiration in our plan, we believe that the proposal to maintain the water efficiency saving rate from the previous WRMP through the planning period is stretching. Whilst the saving rate in property terms remains the same, it is important not to see this as a 'do nothing' or simply a 'maintain position' in absolute terms, because over time it gets progressively more challenging to make water efficiency savings. The reason for this is that water efficiency products deteriorate and/or are removed over time[10]. The diminishing returns, in terms of household consumption reduction, through water efficiency over the longer term is demonstrated in Figure 3 and the volume we can save through water efficiency alone (separately from the metering benefit) will plateau.

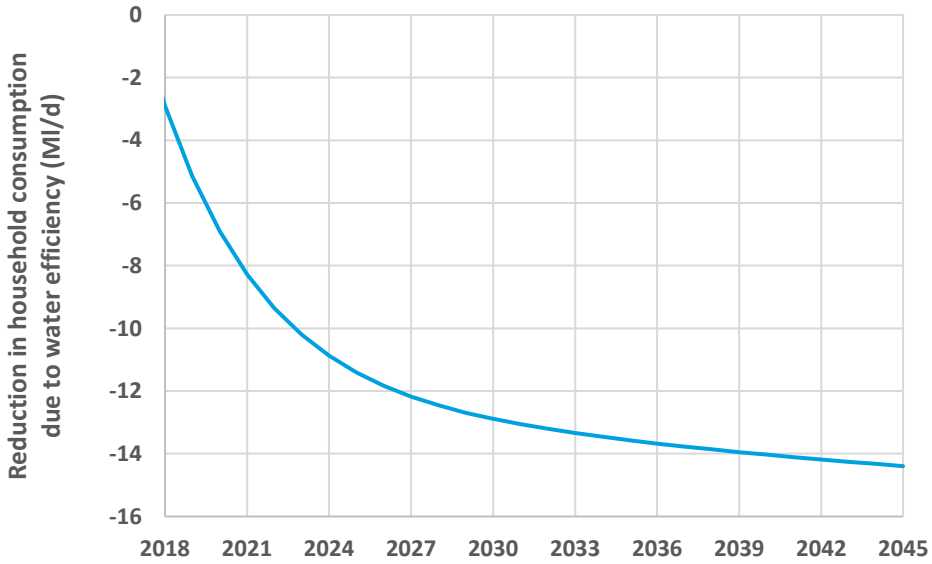

Figure 3 Water efficiency – long-term cumulative savings

Overall, we feel we have set a stretching long term target that requires a significant increase in metering, as well as continuation of our water efficiency strategy. Therefore, we are continuing with this strategy in line with our draft plan.

[10] We model this using a decay rate or half-life of two and a half years.

3.4 Drought resilience

In Section 6.5 of our draft plan, we outlined our strategy to protect our existing levels of drought resilience (i.e. under any future water trading scenarios), and enhance this where possible through activities to meet other drivers (e.g. leakage reduction, resilience enhancements) as explained in Section 6.3.1 of the main report.

Consultation responses

Five respondents supported our conclusion that we already have an appropriate level of resilience to extreme droughts, and welcomed the further improvements as a result of our demand management plan. One respondent also agreed with our view that there is no immediate need for additional investment to further improve drought resilience.

However, one respondent raised a concern that in their view there is currently not sufficient resilience in the Strategic Resource Zone. We have addressed this concern in Section 3.5.

Our response to consultation

We are pleased that there is general agreement with our position on drought resilience. We have updated our forecast of drought resilience levels over the period 2020-45 to take account of our revised leakage reduction programme (Section 3.2). This can be found in Section 16.2 of our *Final WRMP19 Technical Report - Supply forecasting*. As outlined in Section 3.6, we would protect our drought resilience under any future potential trading scenario.

3.5 Levels of service

In Section 6.3 of our draft plan, we proposed to improve our stated minimum levels of service for drought permits and orders from 1 in 20 years to 1 in 40 years on average (or from 5% to 2.5% annual average risk) by 2025. We also proposed to retain the level of service for the frequency of Temporary Use Bans (TUBs, aka hosepipe bans) at no more than once every 20 years on average (5% annual average risk).

Consultation responses

Eight respondents supported our proposal to reduce the frequency of drought permits and orders, whilst one respondent thought that 1 in 20 years was still acceptable.

Seven respondents raised concerns that the Lake District is relied upon too heavily to provide water during drought conditions. Windermere Drought Permit Scenario 2 (Final Drought Plan 2018, Appendix 9) was of particular concern to the respondents, due to the impacts on the local economy and environment, as assessed as part of the Windermere drought permit environmental assessment[11]. One respondent also suggested that the annual risk of drought permits and orders should be the same as the annual average risk of drought orders to ban non-essential water use (1.25% from 2025). The respondent also suggested that the timescale for improving the level of service should be delivered earlier than 2025.

Our response to consultation

We are pleased that the majority of respondents support our proposal to improve stated minimum levels of service for drought permits and orders by 2025. We will continue to work on the practical elements of this proposal, and have included more information about defining a future new drought trigger for the implementation of drought permits and orders in Appendix D of our *Final WRMP19 Technical Report - Supply forecasting*.

We recognise the level of stakeholder concern around drought permits, in particular Windermere Drought Permit Scenario 2. Whenever we invest to improve levels of service this must be carefully balanced against other priorities. We are very pleased that our plans to significantly reduce leakage will allow us to halve the stated frequency of droughts permits. It will of course take time to reduce leakage by the level required to achieve this change, hence the need to set an implementation date of 2025. Our longer term plans for leakage reduction beyond 2025 are also

[11] Windermere Drought Permit Environmental and Socio-Economic Assessment Report (APEM, June 2016)

very ambitious (Section 3.2), and may provide an opportunity to further improve levels of service in the future. We will review this for the next WRMP, which is due to be published in 2024.

It is important to recognise that the levels of service in the WRMP are 'minimum stated levels of service', so the frequency of drought permits and orders should be at least as good as the performance level stated. Apart from the changed level of service (and therefore implementation point) for drought permits in the draft WRMP, the timing of drought interventions is consistent with the principles set out in our Final Drought Plan 2018. This states that non-essential use bans would likely be imposed at the emergency storage level, and we still believe this is an appropriate level given the impacts of these interventions relative to the benefits. By comparison, drought permits are inherently different, in particular that in a drought event they would applied for, and implemented in, a phased manner depending on the circumstances at the time.

For this reason, we do not feel it is appropriate that drought permits should be at the same point as non-essential use bans, particularly as more time is required to complete the process, and to allow phasing of processes to implement them. As a case in question, the two drought permit scenarios at Windermere are phased, bearing in mind the differential in impacts between them. In our Final Drought Plan 2018 (Appendix 6), we added further clarity that the Scenario 2 (lake drawdown) drought permit would be only be expected to be implemented when Haweswater reaches emergency storage. This more severe drought permit would thus have a lower risk than the overall minimum stated level of service for all drought permits, and therefore a similar frequency to non-essential use bans of around 1.25% annual probability (itself a stated minimum service level). We recognise stakeholder concerns on this drought permit option, and in reality, this would only be implemented if absolutely required in a very severe/extreme drought situation. We will consider level of service and drought interventions in subsequent revisions to the Drought Plan and WRMP. We continue to work with the stakeholder group on the potential mitigation measures under the Windermere Scenario 2 drought permit.

3.5.1 Windermere abstraction licence review

Consultation responses

Six respondents referred to our current Windermere abstraction licence review, with some respondents welcoming the commissioning of the review. Several respondents raised the importance of the outcomes being accounted for in our final plan, whilst the Environment Agency specifically requested inclusion within the supply-demand scenarios for the revised draft and final plans.

Our response to consultation

The review of the Windermere abstraction licence is ongoing and we will continue to work with stakeholders and the Environment Agency to determine whether any changes are required to the licence, based on the evidence collected from this study. The conclusions of this study will run beyond the timeframe for WRMP19 updates, therefore we have included a supply-demand scenario in Section 9 of our final plan to show the impacts of a licence change. Any licence change would need to be considered in Annual WRMP reviews, and fully assessed as part of future planning cycles. Our approach to strategic pumping will continue to adopt the approach committed to in Appendix 8 of our Final Drought Plan 2018, which the WRMP19 submission aligns to.

Since this response, the joint review of the Windermere abstraction licence has been completed; the output was shared with the Environment Agency and other stakeholders at an event in Kendal in June 2019. The review has concluded that the current abstraction regime has no significant impact on Windermere or the River Leven, and therefore we will not be seeking any changes to the abstraction licence. However, we are now proposing to remove the Windermere drought permit scenario 2 from our Drought Plan.

3.5.2 Windermere and Ullswater operations

Consultation responses

Several respondents raised concerns over the physical resilience of Windermere and Ullswater pumping stations. Comments from respondents included the Environment Agency, who asked us to clearly outline our proposal to ensure pumping assets at Windermere and Ullswater are maintained to avoid outages that may reduce resilience.

Our response to consultation

Our Water Resources Management Plan accounts for, and aligns to operational principles and commitments included in Appendix 8 of the Final Drought Plan, which has been subject to specific targeted engagement with stakeholders. Further to this, we are planning substantial investment to improve the reliability and resilience of these sources in AMP7 (2020-2025 investment period). We have undertaken a comprehensive engineering investigation to assess the condition of the raw water pumping stations. These investigations are ongoing, and we are identifying key aspects of the performance of these assets (and their associated support equipment such as their power supply) that require improvement. This study will lead to improved resilience to equipment failure.

Our draft business plan for 2020 to 2025 includes approximately £8m of investment in these pumping stations. This substantial investment is intended to reduce out of service time and to ensure pumping capacity is maintained.

In addition to this planned major capital investment, we also plan an improved maintenance and investigation programme for our raw water assets of circa £9m across the period 2020-2025. This maintenance programme will be supported through significant improvements in our maintenance and engineering response capability, brought about by the introduction of our Mobile Asset Resource Scheduling (MARS) system. MARS is planned to reduce response times for high priority equipment repairs and increases the efficiency of our maintenance teams.

These significant planned investments will deliver improved serviceability and performance from our strategic pumping stations by 2025.

3.6 National water trading

In our draft plan, we recommended that we would continue to explore national water trading in the future. We built our future plans around a concept of adaptive pathways, to allow for the uncertainty as to whether a future water trade would occur or have a confirmed need based on other company WRMPs. Based on our appraisals, we proposed a strategy and approach that we stated would be in the interests of customers in the North West in the long-term, and protect customers and environment from any adverse impacts.

Consultation responses

Fifteen respondents commented on national water trading in their response. Eight respondents supported our proposal to explore water trading in the future, recognising our commitment to ensuring that we also maintain reliable supplies for our customers. A further four respondents were amenable to further exploration of water trading, providing that our region's water supplies are not adversely affected; there are no detrimental environmental, social and economic impacts on our region, particularly the Lake District and Wales; and there is a sufficient surplus of water to enable the trade.

Three respondents said that trading should not be considered if there is the likelihood of negative impacts on the Lake District, such as a resulting shortage of supply in the Strategic Resource Zone. Two respondents also wanted any financial benefits to be either used to reinvest in the water supply system (e.g. to improve resilience) or to share this to areas of the region that provide most water resources. One of the respondents also raised concern about whether it was appropriate for customers to pay for exploration of a water trade, given that there was the potential for the proposals not to be implemented. Four respondents also welcomed being consulted further in future as proposals developed.

The Environment Agency and Ofwat also highlighted alignment considerations between our plan and those of the other water companies' involved in the proposed trade, who have not included this in their preferred plan. Ofwat also wanted further justification as to why options had been selected to maintain a level of surplus in the supply-demand balance in our trading part of the plan.

Natural Resources Wales and the Welsh Government both raised the importance of considering how future water trading might contribute to the Welsh Government's well-being goals, supported by appropriate collaboration and engagement. The importance of ensuring no detrimental impact on Welsh communities, customers and the environment was also noted.

Our response to consultation

We are pleased that our proactive approach to water trading has been recognised and that, by and large, there is both an understanding of the need to explore water trading in the plan and tentative support for it based upon our strategy. As explained in the draft plan submission, we listened very carefully to customer and stakeholder views from pre-consultation and other engagement activities in developing our plans, so we are pleased that this has been recognised through the consultation process.

In taking on-board prior feedback when appraising the required options to facilitate a water trade, we went beyond a simple supply-demand balance approach and instead used new, sophisticated appraisal methods (known as "extended methods") to ensure that customers and the environment were protected. Our approach was driven by the clear customer and stakeholder concern that water trading would result in impacts to customers (e.g. levels of service, resilience) and the environment. Feedback indicated a requirement that these be protected. This guided our approach at the pre-consultation stage of the WRMP process. This was an important part of our extended methods options appraisal approach to developing a plan that would provide the necessary reassurance, whilst also preventing barriers to water trading that would otherwise occur (with the resulting loss of benefit to customers in other regions). Recognising that a surplus has an inherent value, for example, greater drought resilience, we do not feel that it is appropriate that customers lose this benefit. This is particularly acute considering the enhanced leakage reductions, proposed in the WRMP, which customers have valued (based on expected benefits) and ultimately paid for. Therefore, we used the extended methods options appraisal process to develop a plan for an assumed trade and prevent deterioration from this position. However, it is important to note, that we have not developed the options set under the water trading pathway to maintain a surplus supply-demand position per se, but rather, prevent deterioration in the metrics used in the extended methods process, as documented in Section 4 of our *Final WRMP19 Technical Report - Options appraisal*. These metrics represented water resources performance, reflecting customer and stakeholder feedback/impacts.

We have undertaken further engagement since the draft plan submission with both Severn Trent Water and Thames Water. We have also written to both companies to formally confirm the position from this dialogue. A water trade from the North West has not been selected during the 25 year planning period in their preferred plans at this stage. In the case of Thames Water, an export totalling 90 Ml/d from Vyrnwy was selected as part of their long term preferred plan (from 2081 onwards). Thames Water also considered a number of scenarios in their draft plan. The Severn Thames transfer is called on under a variety of scenarios tested. The earliest the transfer is required in these scenarios is in the 2030's. The scenarios select a range of different support from Vyrnwy, up to 180 Ml/d. Severn Trent Water has confirmed that it would like to work with us to explore a potential smaller 60 Ml/d export to support its WRMP24 submission. We have also worked with Severn Trent and Thames Water to ensure alignment between the three companies' plans, agreeing consistent dates and requirements for further work.

At this stage, as recognised in the draft plan, we acknowledge that further work would need to be done for future planning cycles to explore water trading in more detail, in particular should there be a confirmed need from another water company. This would involve further work to explore the nature of a water trade, along with the required options and any associated risks requiring further investigation (as identified in our environmental assessments). The pace and scope of further work will be dependent on the likelihood and timing of a future water trade, driven by other company plans, but, as stated in Section 4.3, we will continue to explore and collaborate around water trading

in the appropriate forums (e.g. Water UK, Water Resources North, Water Resources West etc.) towards WRMP24[12]. Section 8 of the *Final WRMP19* main report provides further detail on the studies and investigations proposed in the 2020-2025 period. This follows engagement with Thames Water, Severn Trent, the Environment Agency and Defra, and we have set out our contribution to the work needed between 2020 and 2025 in Section 8.4 of the main report.

The revenue benefits of a future water trade in particular would be in part dependent upon the specific future proposals. At present we indicatively estimate that this would benefit customer bills by approximately 40 pence per year. However, customer research complemented some of the consultation stakeholder feedback that this should be reinvested in the water supply system of the North West. Our Strategic Environmental Assessment has also considered the well-being goals for Wales. As with the financial benefits of water trading, further work would be required to assess this further. The planned work between 2020-2025, referred to in the previous paragraph, includes further environmental studies on the potential options to facilitate a water trade, and a study to assess the contribution that transfer options will make to the well-being goals for Wales contained in the Well-being of Future Generations (Wales) Act 2015.

3.7 Resilience to other hazards

In our draft plan, we assessed water supply resilience to hazards other than drought for the first time as an explicit part of the planning process. We identified the need to mitigate resilience risks to water supplies in Manchester and the Pennines and developed five potential solutions to address this issue.

Consultation responses

Three respondents welcomed our approach to increasing resilience, whilst a further three made specific response on the Manchester and Pennine Resilience scheme. Two of these respondents suggested a preference for solution D (rebuild all tunnel sections) as the preferred solution, due to it offering the greatest resilience, being more cost-effective, and minimising effects on the environment, when compared to the other solutions.

Further customer research and informal feedback at the consultation events, as well as other stakeholder sessions, also showed a preference for solution D or solution E, with little support for lower cost, higher residual risk options.

However, the respondents also raised queries related to the alternative options. Of particular concern to the Environment Agency were the proposals for river and groundwater abstractions. The Environment Agency also raised a number of queries with the Strategic Environmental Assessment (SEA), regarding the cumulative assessment of effects and inconsistency in the treatment of geology in assessment of solution D. They also recommended that the SEA should include a full cumulative effects assessment of the solutions for the Manchester and Pennine Resilience scheme with the options proposed in the preferred plan.

In addition to formal consultation responses, following engagement with stakeholders we also received directly a number of letters relating to the issue. The Greater Manchester Infrastructure Advisory Group, the Greater Manchester Resilience Forum, and the Mayor of Greater Manchester all welcomed the priority given to the long-term resilience of water supplies and said that the preferred plan must provide an appropriate and long-term solution to the issue. The Mayor of Greater Manchester confirmed that the Greater Manchester Combined Authority (GMCA) formally endorsed his recommendation. The Lancashire Resilience Forum Local Authorities sub-group expressed support for the need to carry out the works and said that the group's preference was for solution D.

After we submitted evidence, the Drinking Water Inspectorate (DWI) wrote to us commending support for the proposals and confirming that the proposed scheme is consistent with the requirements of Defra's Strategic Policy Statement published in September 2017, and DWI guidance on principles for the assessment of drinking water quality provisions within the PR19 process[13]. In particular, the DWI noted that "we are satisfied that the proposed

[12] A number of stakeholders have raised the environment in the context of natural capital, which we plan to apply in WRMP24. Please see Section 3.9.1 for more details.

[13] As set out in DWI Information Letter 03/2017, published on 12 September 2017

scheme adopts a sound risk based approach to management of water supplies from source to tap using a water safety plan approach".

Our response to consultation

We have considered the evidence from customer engagement, consultation, economic and environmental appraisals to select a preferred solution for Manchester and Pennines resilience.

Using multi-criteria analysis, we tested the sensitivity of the solution selection to different weightings of the factors considered (to ensure that a particular solution was not preferred due to over-reliance on one particular criterion). Because the environmental impact of solution D performs favourably in comparison with other solutions, and it has high marginal benefits compared to cost, this solution was also the most robust option. This was also the most cost-beneficial solution.

Looking at all these results in the round it is clear that solution D represents the best solution for customers and the environment to provide resilient water supplies for the long term. Therefore we are selecting solution D as part of our preferred plan. Fully detailed evidence has been provided to Ofwat as part of our business plan and an explanation of the methods and results is in included in our *Final WRMP19 Technical Report - Water supply resilience*.

We have completed our options appraisal to select a preferred solution for Manchester and Pennine Resilience, which has been informed by the environmental appraisals as well as customer preferences and cost-benefit analysis. The preferred solution (solution D) has relatively low environmental impacts compared to other candidate solutions. It does not include new abstraction from the River Wyre, rivers in the Bowland area or other sources, and therefore these options will not be considered further. The updated Water Framework Directive assessment concludes, at this stage, that the preferred solution would not cause a deterioration in WFD status. However, further detailed WFD assessment should be undertaken on Option 37-42 as it has been assigned a medium level of impact in the individual, cumulative and protected area assessments.

At the draft plan stage, the preferred solution for the Manchester and Pennine Resilience scheme had not been determined, therefore the SEA of this element was undertaken at a high level, due to the level of information and detail available at that time. Subsequently, an SEA of alternative solutions was undertaken to help inform the selection of the preferred Manchester and Pennine Resilience solution. As solution D has now been selected as the preferred solution, a cumulative effect assessment has been undertaken to determine the impact of the revised preferred plan. Further information is provided in Section 3.9 with regards to the updated cumulative assessments, however in respect of Manchester and Pennine Resilience solution D, it was assessed as having negative but uncertain effects on water quantity and quality as a detailed study of the geology of the tunnel route has not been undertaken at this time, reflected in the findings of the WFD assessment. The HRA found that the options constituting solution D would not have any effects on European sites, alone or in combination with the preferred plan.

3.8 Preferred plan

In the draft plan, our preferred plan comprised four components:

- To further reduce leakage by a total of 80 Ml/d over the planning period to 2045, a reduction of just over 18% from the baseline position of 448 Ml/d (with 30 Ml/d or 7% by 2025);
- To improve levels of service for drought permits and orders to augment supply from 1 in 20 years to 1 in 40 years (moving from 5% to 2.5% annual average risk);
- To mitigate the resilience risk to water supplies in Manchester and the Pennines; and
- To continue to explore national water trading.

Consultation responses

The formal feedback through consultation, as well as the informal feedback during our consultation events, was that we had the right combination of strategic choices, with five respondents commenting as such in their response.

Several respondents said that we should be more ambitious with our proposed leakage reductions, and one respondent raised that they did not think increasing drought resilience was a priority.

In terms of our preferred plan meeting our objective of being the most cost-effective and sustainable long-term solution, one respondent commented that whilst customer research showed strong support for leakage reduction, there are limits to how much customers are willing to pay for leakage reduction beyond economic levels. They also suggested that improving levels of service for drought permits and drought orders is a lower priority for customers. Ofwat specifically raised that we should continue to engage with customers regarding potential bill impacts.

We also received a number of comments in relation to options that had been selected as part of the portfolio to support the water trading pathway. These comments related to both the proposed scope of some of the options and whether there could be any environmental consequences of using them (see Section 3.8.1).

Our response to consultation

In developing this final plan we have continued to engage with customers on plan choices, in particular completing further work to explore choices based on the bill impacts. This includes customer acceptability testing of the potential programme to develop our Business Plan for 2020 to 2025, within which the scale of leakage reductions was a key component, as well as specific targeted engagement on Manchester and Pennines resilience, and water trading. All these pieces of engagement had a strong bill impact element. Whilst the detail of the research is included in *Final WRMP19 Technical Report - Customer and stakeholder engagement*, Sections 6 and 7 of the *Final WRMP19* main report explain the choices made in the development of our revised draft plan.

In addition to our baseline activities, such as demand management, our preferred plan now includes the following updated strategic choices:

- Adopt an enhanced leakage reduction comprising a total of 190 Ml/d over the planning period to 2045, a reduction of just over 40% from the baseline position of 448 Ml/d. By the end of 2024/25 we plan to reduce leakage by at least 91 Ml/d, or 20%;
- Improve level of service for drought permits and orders to augment supply from 1 in 20 years to 1 in 40 years (moving from 5% to 2.5% annual average risk);
- Increase resilience to others hazards, specifically for our regional aqueduct system associated with Manchester and Pennines resilience. This involves completing solution D, which involves rebuilding all single line sections of the relevant aqueduct.

Given that a water trade has not been selected by other water companies in the core 25-year part of the planning period as part of their preferred plans, it no longer features in our preferred plan and is included instead as an adaptive pathway. This is because there is a strong possibility that water trading will take place in the future, either from Lake Vyrnwy, or from other sources and with other trading partners. As such we feel that our future planning should retain a strong focus on water trading, even though it does not specifically feature in our preferred plan. The adaptive pathway could form part of a future preferred plan in later planning reviews or cycles.

3.8.1 Options

In our draft plan, we outlined a number of options to reduce the level of leakage and maintain our supply-demand balance. We also included a number of options to support a potential future water trade.

Two respondents, including Ofwat, were positive about our options identification and appraisal process, particularly with regards to our engagement with third parties, and consideration of environmental impacts in our option selection. Two respondents also welcomed further consultation if any of the proposed options for water trading would affect Wales. Two respondents also asked for greater clarity on the options appraisal process and how each feasible option was selected for the preferred options set. This is now clearly outlined in our *Final WRMP19 Technical Report - Options appraisal.*

Four respondents raised concerns with some of the options selected in the preferred plan. We discussed these potential issues with the Environment Agency and Natural Resources Wales, following the end of the consultation

period in order to agree an approach for the revised draft plan, which we have detailed below. It is worth noting that a number of these concerns relate to the options that we proposed to support a potential future water trade. As documented in Section 7.7.1 of our draft plan, we recognised the need for further discussions with the regulators, further assessment and possible mitigation, with sufficient time to do this in the timescales for any potential water trade. However, we have addressed the specific concerns below, which has also lead to an updated portfolio of options to address the water trading adaptive pathway, as assessed through the extended methods process.

Responses that commented on the options for Manchester and Pennine Resilience are discussed in Section 3.7.

3.8.1.1 Python Mill borehole (WR114)

Three respondents specifically referred to the Python Mill borehole option (WR114), with possible issues surrounding the lack of available water for abstraction and uncertainty in relation to the impacts of water quality changes on the Rochdale Canal Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI).

Although, from the available information[14], we still consider that there might be water available from the Northern Manchester Carboniferous aquifer that could be used to support water trading, we concur that yields may be uncertain. We also recognise that there could be potential impacts on the SAC that, without sufficient mitigation, could cause impacts on the designated site species; this was highlighted in our draft plan. With these uncertainties in mind, the lack of current available data to support the development of a groundwater conceptual model, and whether significant additional costs may be required for mitigation of impacts, we have decided to discount the Python Mill borehole option from our final plan and utilise an alternative option that was already specified in our draft plan (Tytherington boreholes). This option delivers the same supply system benefit.

3.8.1.2 Thorncliffe Road (WR100) and Franklaw (WR101)

One respondent raised a concern that some of the preferred options may affect the Water Framework Directive status as they are currently part of the proposed investigations under the Water Industry National Environment Programme (WINEP), those options being Thorncliffe Road (WR100) and Franklaw (WR101).

The proposed abstraction from the Furness aquifer at Thorncliffe Road has, as part of its scope, already included a negotiated reduction in overall licensed volumes from our other operational borehole site in the same area located at Schneider Road. We have already recognised, prior to submission of our draft plan, that this would be required in order to ensure no deterioration in WFD objectives for the Furness aquifer system. Therefore, we consider that this option should be retained in our final plan.

The scope for the abstraction from the Fylde aquifer as part of the Franklaw option, relates to reinstatement of a mothballed borehole site and modifications to the peak abstraction capability of other boreholes in the Franklaw and Broughton borehole group. This is to allow the borehole group to support water trading. We recognise that whilst the proposed increased abstraction would not be available all of the time due to the current abstraction licence constraints and potential changes through the proposed WINEP investigations, reinstatement of this capability would offer significant benefits to meet peak demand requirements. The additional 30 Ml/d to support intermittent use for water trading is considered realistic and would include optimisation of some of the existing borehole abstractions to ensure that any current or future changes to the abstraction licence conditions can be achieved. Therefore, we consider that this option should be retained in our final plan with the recognition that further investigative and collaborative work is required between ourselves and the Environment Agency. This would interface with subsequent work to explore the nature of a future water trade (e.g. mode of utilisation).

3.8.1.3 Managing reservoir compensation flows (WR159/160)

Two respondents commented on the preferred options to manage reservoir compensation flows (WR159), as four reservoirs are located within the South Pennine Moors SAC and Special Protection Area (SPA). One of the respondents also raised concerns with the option to improve reservoir compensation release control (WR160), specifically from Thirlmere and Haweswater, due to the potential for detrimental impacts on a number of SAC sites.

[14] http://environment.data.gov.uk/catchment-planning/WaterBody/GB41202G101800 showing overall good quantitative status under the second cycle of river basin planning under WFD

We recognise that there is a need to work collaboratively with the Environment Agency further on these options to reduce compensation flow from certain reservoir groups in order to support the proposed utilisation associated with water trading. The proposed compensation reduction changes would be in accordance with our currently agreed statutory requirements. Any proposed changes to these requirements, which we are not aware of at this current time, would need to be discussed and agreed between ourselves and the EA. Therefore, we have retained these options in our final plan, with the recognition that further investigative and collaborative work is required between ourselves and the Environment Agency. We will undertake this work during 2020-25.

3.8.1.4 Shropshire Union Canal (WR820/821)

Two respondents also made comment on the options for a new third party abstraction from the Shropshire Union Canal at Hurleston (WR820/821), due to uncertainties on the operational effect this could have on the River Dee and associated impacts on the River Dee and Bala Lake SAC.

For our draft plan, option WR820 comprised 15 Ml/d capacity of new water from the Birmingham Canal (BCN) system surplus. WR821 comprised the same 15 Ml/d, plus a further 15 Ml/d from the River Dee system existing licences and/or possibly more water from the existing Shropshire Union Canal system (Belvide Reservoir). At the time, the exact quantities from each source had not been concluded, and we agreed with the third party that there is a requirement for further hydrological monitoring to confirm the exact quantities of water that would be available for each source, or how these different sources would interact to provide the water available over time. However, we understood that in principle these numbers were suitable for the long-term strategic plan (noting the timescales for the water trade explored and statement of the need for further work to inform WRMP24). The third party has indicated that this work could be started soon, although no date has been agreed as yet, but it is assumed that this work will follow on after the completion of the WRMP19 planning round. It is recognised that further engagement surrounding River Dee regulation would need to be discussed with the Dee Consultative Committee including Natural Resources Wales and the Environment Agency in relation to these options, but no further specific discussions have taken place to date. It was assumed that these options do not require any new abstraction licence volumes and that the scope can be met from within the existing abstraction licences.

During the consultation period, the third party provided further evidence that the additional 15 Ml/d as part of WR821 could be met by flows from Belvide Reservoir, and therefore the option would not require any new abstractions of River Dee water in order to function. Based on this, we propose to retain WR820 and WR821 as options within our final plan options selection process.

3.9 Environmental assessments and considerations

Alongside our draft plan we published a number of environmental reports. The remit of each is detailed below:

- Strategic Environmental Assessment (SEA) report – required to assess the likely significant economic, social and environmental effects of the draft plan and to identify ways in which adverse effects can be avoided, minimised or mitigated and how any positive effects can be enhanced.
- Habitats Regulations Assessment (HRA) report – required to support an HRA of the draft plan for the period 2020 to 2045, and to determine whether any aspects of the WRMP (alone or in-combination) could have significant or significant adverse effects on the integrity of any European sites.
- Water Framework Directive (WFD) report – required to demonstrate the potential level of WFD impact associated with each WRMP feasible option and, if necessary, the level of further assessment that may be required in order to fully demonstrate WFD compliance. It also includes a review of our proposals for how we will operate our existing abstractions to determine whether they meet the criteria for sustainable catchments and comply with the WFD.
- Environmental and social (E&S) costs reports – required to assess the feasible options (supply-demand options and resilience options) in terms of their capital, operating, and social and environmental costs, in order to inform selection of options for the preferred plan.

Consultation responses

Six respondents commented on our environmental reports in their consultation response. Three respondents said that the environmental reports have correctly identified the likely significant effects of our plan, and one agreed with the recommendations for avoiding, reducing or off-setting significant effects.

Three respondents also suggested improvements in our approach to clarify in our final plan. These are addressed below.

As discussed in Section 3.7, the Environment Agency recommended that we produce an SEA that includes a full cumulative effects assessment of the solutions for the Manchester and Pennine Resilience scheme with the options proposed in the preferred plan. The Environment Agency also recommended that we should include the potential impact of the options on priority species and habitats within the SEA and options appraisal process.

The Environment Agency and Natural England said that it would be beneficial to include an assessment of the effect of water trading in the SEA. One respondent also commented that it is not clear in the plan how the environmental and social costs of each option were calculated to inform our preferred plan.

Our response to consultation

At the draft plan stage, the preferred solution for the Manchester and Pennine Resilience scheme had not been determined. Therefore, the assessment of this element was undertaken at a high level, due to the level of information and detail available at that time. Subsequently, an SEA of alternative solutions was undertaken to help inform the selection of the preferred Manchester and Pennine Resilience solution and this was published alongside the SEA of the draft plan. Of the five Manchester and Pennine Resilience options put forward in our draft plan, solution D has now been selected as the preferred solution. A cumulative effect assessment has therefore been undertaken as part of the updated SEA to determine the impact of the revised preferred plan, incorporating a combination of preferred demand management measures and the resilience options comprising solution D.

We have also updated the SEA to consider effects on priority species and habitats such as Atlantic salmon and this is reflected in the appraisal matrices (under SEA Objective 1) contained in Appendix D and Appendix E of the SEA.

With regards to water trading, as set out in Section 5.3 of the revised SEA, and Section 4 of the revised WFD (and previously included in Section 5.3 of the HRA at draft plan stage), we agreed with Thames Water that any environmental impacts downstream of Lake Vyrnwy in the Severn catchment, and in the Thames catchments associated with a possible transfer, would be assessed in Thames Water's Water Resources Management Plan. The

updated SEA assessment is therefore based on the findings of the SEA prepared in support of Thames Water's draft plan, which includes an assessment of the downstream impacts of the transfer.

Whilst a bulk transfer does not currently feature in Thames Water's (or any other water company's) preferred plan, exploration of water trading remains our preference. To align our plan with others, water trading no longer forms part of our preferred plan, but we have retained our strategy to facilitate a potential future water trade within an adaptive pathway, which could form a future preferred plan if water trading was subsequently required in future. As a result, the revised SEA contains an assessment of the cumulative effects of the two trading portfolios we have identified.

An assessment of the environmental and social (E&S) costs and benefits of each feasible option considered during the options identification and appraisal process for WRMP19 has been completed and is detailed in Section 5.4.1 of our revised draft plan. The E&S costs and benefits were combined with whole life financial costs to derive the Average Incremental Social Cost (AISC) values for each feasible option; the AISC values were subsequently used to generate a ranked assessment of overall option costs. Further information in relation to the options identification and appraisal process, including E&S costing, is contained in Section 5 of our final plan, and the accompanying *Final WRMP19 Technical Report - Options appraisal*.

In response to consultation feedback, we have published the Environmental and Social Costs reports, detailing the assessment of the supply-demand options and resilience options of our preferred plan. These reports provide a clear explanation and audit trail of the process and data used to assess the E&S costs of the feasible options identified for WRMP19, and the subsequent outputs.

3.9.1 Natural capital and environmental net gain

Consultation responses

Three respondents recognised the importance of using a natural capital approach in our planning going forwards, although two respondents expressed the hope that natural capital accounting would have been applied in the development of our draft plan. Two respondents also recommended demonstrating our commitment to embedding the principle of environmental net gain.

Our response to consultation

We engaged an external consultant to complete a literature review and comparative analysis of different approaches to environmental and social impact assessment, including a natural capital approach. We determined that implementation of a natural capital approach for WRMP19 was not practical as there is currently insufficient guidance and the lack of a defined framework from which to make decisions.

However, we recognise the benefits to this approach and the importance of using it for future planning rounds. As we continue to mature in our use of natural capital approaches, as described in Section 5.4.1 of our final plan, we aim to develop a better understanding of how they can be applied across our wholesale business and use the approach to guide subsequent water resources planning development for WRMP24.

Environmental net gain will be embedded for new infrastructure projects in our capital programme at an individual project level, from 2020 onwards. We are currently working with Natural England to discuss our approach to net gain, and are also using the 2012 Defra Metric to assess biodiversity net gain within our engineering projects, which can be expanded in the future to include environment net gain.

3.9.2 Catchment management

In Section 4.7.3 of our draft plan, we outlined our approach to integrated catchment management to continue to deliver biodiversity improvements.

Consultation responses

Three respondents commented on catchment management in their response, highlighting how we can improve our catchment management approach further. One respondent also asked for clarification on our approach to sustainable catchment management to improve resilience of the water supply to West Cumbria.

Our response to consultation

Further detail on our approach to catchment management is detailed below, and included in Section 4.7.3 of our final plan.

Understanding the interactions between the land and the water is crucial to the successful management of our essential water resources. Catchment management investigates these interactions and works to combat or mitigate the activities in the catchment that are detrimental to the sustainability of the water quality and biodiversity, as well as reducing the risk of flooding to downstream communities. We continue to manage water catchments in the most effective, efficient and responsible manner to protect and improve raw water quality and quantity. We manage our catchments in partnership with our tenants and other land owners to enable the restoration of the upland ecosystems to deliver multiple benefits in terms of water quality, quantity, biodiversity, access and recreation. In non-owned catchment land we work creatively with landowners and tenants to influence the land management practices and enhance water quality.

Through the delivery of our ground-breaking 'Sustainable Catchment Management Programme' (SCaMP)[15], which began in 2005 and aims to secure multiple benefits at a landscape scale, we are recognised within the UK water industry as being at the forefront of catchment management. We have evolved our SCaMP approach in the 2015 to 2020 period to focus on 31 drinking water 'Safeguard zones' regardless of land ownership, and our integrated catchment programme, which supports Defra's catchment based approach to improving rivers and bathing waters. This approach relies heavily on working in partnership with other land owners and stakeholders to promote the principles of sustainable catchment management. The impact of Brexit on future agri-environment policy will have significant implications on us as a business, as a major upland land owner, as a water and wastewater service provider and as a stakeholder in the management of the natural environment. Throughout Defra's consultation period we have been engaged with stakeholders to listen to and share our views with politicians, academics, environmental groups and farmers. Our response is centred on the following principles:

- Our primary role is to safeguard water quality
- We recognise the importance of farming, forestry and recreation across our land (and all parts of the region)
- The balance between some competing tensions needs to be discussed openly between the various parties in order to seek workable solutions
- We believe all of the activities need to be done in a sensitive way with regards to the environment and long-term future
- Where agri-environment schemes (and similar) are in place we would like these to be monitored to ensure full compliance
- Where compliance (to these schemes or other agreements) is not happening we would seek to resolve this with reference back to our primary role

Our key messages are:

- Agri-environment payments have enabled us to deliver SCaMP by providing a sustainable income for our tenant farmers who have reduced livestock numbers to protect water quality and enable investment in habitat restoration.
- Going forward, catchment resilience will depend on some form of payment, but this does not have to come from public money if competition can drive efficiencies in a market of private funders, e.g. insurance companies, food and drink industry, water companies.

[15] https://www.unitedutilities.com/corporate/responsibility/environment/catchment-management/

- Agriculture should not be separated from the environment at a policy level, in line with the aspirations stated in the 25 Year Environment Plan.
- Farming for water and nature will be the best way forward for some areas and food security is not a significant issue.
- Winning over the hearts and minds of farmers will be key to the success of future funding schemes.

Going forward, catchment resilience will be key. Catchment resilience is an important issue given recent experiences, such as Storm Desmond in December 2015, which caused severe flooding in parts of Cumbria[16], and the fact that the UK climate projections (UKCP09) are predicting more frequent, intense storm events.

Since the outcome of an Examination in Public in 2014, as set out in our *Final WRMP19 Technical Report - West Cumbria legacy*, we are working to deliver a project to cease abstraction from Ennerdale Water and other sources in West Cumbria by 2022. This will result in the use of Thirlmere Reservoir to supply West Cumbria, and resilience of the uplands to safeguard this supply is essential. We can significantly improve the resilience of Thirlmere, one of our largest catchments, by implementing sustainable land management regimes. This will be achieved by a focus on restructuring landscape and vegetation to withstand the impact of severe weather and environmental change by:

- Restoring natural processes – required for fully functioning catchment hydrology and vegetation. This includes measures such as river restoration, tree planting and allowing natural regeneration to address soil compaction and flash flows better than the current shallow-rooted grass; and
- Sustainable catchment management – because the restored natural processes will support a more sustainable upland economy not reliant on the current system of subsidies. We will work with Natural England as a key partner and enabler via agri-environment funding, which is likely to become based on environmental outcomes such as provision of carbon storage, flood attenuation and the improvement of biodiversity.

Following the PR19 Technical Submission to DWI in December 2017, DWI have provided a letter of support, confirming that they agree with our approach and that this project should be included in the business plan.

[16] https://www.ceh.ac.uk/sites/default/files/2015-2016%20Winter%20Floods%20report%20Low%20Res.pdf

4. Finalisation of our Water Resources Management Plan

4.1 Ensuring our plan is legally compliant by adhering to the WRMP Directions

The Water Resources Management Plan Direction 2017 came into force on 22 April 2017. It sets out the requirements a statutory water undertaker must meet with respect to publication and consultation of a draft Water Resources Management Plan, and the publication of a final plan.

Through consultation, the Environment Agency raised that we had not fully complied with five of the requirements in our draft Water Resources Management Plan. In Section 4.1 of our *Revised Draft WRMP19 Technical Report - Assurance and governance*, we have provided a table of the Directions, with cross-referenced evidence that we have complied with each one in our revised draft Water Resources Management Plan.

4.2 Our final Water Resources Management Plan

On 31 August 2018 we published a revised draft Water Resources Management Plan that incorporated the changes we made to our plan in order to take account of:

- Comments received from consultees, as set out in Section 3 and Appendix A;
- Further customer research, including a re-run of our programme choice experiment, as well as more specific research on programme bill impacts, Manchester and Pennine Resilience and water trading;
- Further advice from regulators, including items to help improve consistency and understanding of the plan; and
- New information that has become available since publication of the draft plan, including the updated guidance.

These changes have resulted in an updated preferred plan, as discussed in Section 3.8, which constitutes enhanced leakage reduction, improved levels of service and increased resilience to others hazards.

Following the publication of our Statement of Response and revised draft Water Resources Management Plan, Defra requested further information in support of our plan, prior to the Secretary of State making a decision on next steps. We submitted this further information as requested on 5 April 2019 (see Appendix B). On the 23rd July 2019 the Secretary of State then confirmed that we should publish our Final Water Resources Management Plan 2019.

Copies of this Statement of Response, our final plan and accompanying reports are available at: https://www.unitedutilities.com/corporate/about-us/our-future-plans/water-resources/water-resources-management-plan/.

If you require any further information please contact: Water.Resources@uuplc.co.uk

4.3 Future engagement

Water resources planning is an ongoing process, not a one-off deliverable, and this applies in particular to dialogue with our customers and stakeholders. Pre-consultation and consultation processes have supported the development of WRMP19 to date, however, now that the plan has been formally adopted it will be reviewed each year as part of the Annual WRMP process, which may result in updates using the latest evidence and position. Similarly, beyond WRMP19, we commit to continue active engagement on activities associated with the WRMP to support the WRMP24 planning round and future Drought Plans. This future activity is also informed and guided by the recent consultation process. Future expected activities include, but are not limited to:

- Ongoing collaborative work with other companies, regulators and stakeholders, as appropriate, to explore future water trading:
    - Senior management providing leadership and coordination of the work on the transfer scheme across the various parties, ensuring effective governance arrangements are in place, and engagement with multiple stakeholders

  - Environmental studies for a number of supporting options, including a screening phase and more detailed investigations at a smaller number of sites
  - More detailed engineering assessments of the scope and costs of the supporting options, supported by multi-discipline site based investigations
  - A study to assess the contribution that our transfer options will make to the well-being goals for Wales contained in the Well-being of Future Generations (Wales) Act 2015
  - A study to assess whether changes to the magnitude of timing of River Severn support would affect water levels at Vyrnwy reservoir and the environmental effects of any changes
  - On-going proactive participation as part of the national water trading/planning agenda, and supported by our active involvement in Water Resources West, Water Resources North and Severn Working Group and Modelling Group activities
- Continued active engagement with Cumbrian stakeholders, and in particular, continued engagement (in line with Drought Plan commitments) with stakeholders associated with Windermere operations;
- Circulation of the Annual WRMP (our Annual Water Resources Review) to our stakeholder distribution list, and publication on our website;
  - Engagement with 3rd party options providers as part of our bid assessment framework which will be submitted to Ofwat later this year
- Further targeted engagement with 3rd party WRMP19 options selected in the plan, including within the water trading pathway, and thus including substitute or alternative options;
- Ongoing regular engagement with our regulators in defined liaison meetings;
- Engagement and collaboration with catchment partners as part of the activities described in Section 3.9.2, including in particular agricultural interests, and to pilot and develop natural capital approaches (Section 3.9.1);
- Work with the Environment Agency and associated stakeholders, where appropriate, to explore potential opportunities to collectively and collaboratively use reservoirs to mitigate flood risk whilst protecting essential water supply services;
- Work closely with the relevant planning authorities and stakeholders as part of infrastructure work to implement the Manchester and Pennine resilience options, including to consider environmental net gain as part of these activities (Section 3.9.1), and;
- Continuing to engage with local authorities and non-household retailers on a routine basis to consider future growth and new development, and consider the impacts on future demand, alongside activities to encourage water efficiency with domestic customers.

Appendix A – Details of consultation responses and our replies

Respondent	Item	Point of detail made in the response	Our reply
Canal & River Trust	1	The respondent welcomes our assessment of canal transfer schemes as feasible options, and the inclusion of one in our preferred plan. They believe that investment into canal schemes will allow the waterways to contribute fully in delivering significant social and economic outcomes and that this should be included in our assessment of all feasible options.	We thank the Canal & River Trust for their positive comments regarding our engagement with them, and the assessment and inclusion of a canal transfer scheme in our preferred plan. We have undertaken further dialogue directly with Canal & River Trust to discuss the option selected in the draft WRMP submission, and also around our plan approach. For the revised draft WRMP19 submission, whilst the latest options appraisal now does not include a specific water trade with the Canal & River Trust under the water trading pathway as part of the best-value plan, we commit to continue to explore this option further, in particular because the option is sensitive to the third-party costs included and we understand that further work may result in a change to this position for future planning cycles. We will continue to explore the potential for future water trading with the Trust towards WRMP24. Section 4 of our *Revised Draft WRMP19 Technical Report - Options appraisal* contains an overview of the extended methods process used for selecting a portfolio of for the water trading pathway and the difference in the methodology between the dWRMP and rdWRMP.
Canal & River Trust	2	The respondent welcomes our approach to engagement with stakeholders, including discussions with the Canal & River Trust regarding the scale of the issues we face and how the Trust could potentially help to resolve them.	We thank the Canal & River Trust for their comments on our approach to working with stakeholders. We appreciate the Trust's input to the development of our draft WRMP and we hope we can continue to work with them in order to define mutually beneficial solutions.
Canal & River Trust	3	The respondent raises that in our draft plan it is not clear how social and environmental benefits of feasible options have been calculated. The respondent asks us to consider including the quantified social and environmental costs and benefits for all feasible schemes in our final plan.	An assessment of the environmental and social (E&S) costs and benefits of each feasible option considered during the options identification and appraisal process for WRMP19 has been completed. The E&S costs and benefits were combined with whole life financial costs to derive the Average Incremental Social Cost (AISC) values for each feasible option; the AISC values were subsequently used to generate a ranked assessment of overall option costs. This is detailed in Section 5.4.1 of our *Revised Draft WRMP19* main report, with further information in relation to the options identification and appraisal process, including E&S costing, provided in the accompanying *Revised Draft WRMP19 Technical Report - Options appraisal*. In response to this comment, we will publish our full Environmental and Social Costs report prepared in support of WRMP19. These reports provide a clear explanation and audit trail of the process and data used to assess the E&S costs of the feasible options identified for WRMP19, including our rdWRMP preferred plan options, and the subsequent outputs.
Canal & River Trust	4	The respondent expresses that they would welcome the opportunity to discuss the findings of their programme on the positive impacts that are delivered from our waterways so that the social and environmental benefits can be factored into our options assessments.	As we continue to mature in our use of natural capital approaches, as described in Section 5.4.1 of our *Revised Draft WRMP19* main report, we aim to develop a better understanding of how they can be applied across our wholesale business and use the approach to guide subsequent water resources planning development for WRMP24. We will therefore discuss social and environmental benefits with the Canal & River Trust further for future planning rounds and we aim to continue our good relationship of collaborative working for mutually beneficial outcomes.

Respondent	Item	Point of detail made in the response	Our reply
Canal & River Trust	5	The respondent raises that there is a significant difference in the cost information provided (capex and opex figures) in the Market Information Strategic WRZ tables from those originally proposed by the Trust for scheme WR821. They assume that it is due to our treatment and distribution costs but are not certain. They ask for clarity or an explanation for this variance in our final plan.	We thank the Canal & River Trust for highlighting this issue and we provide an explanation here for the observed differences. We were aware of this issue prior to the formal consultation response as there has been active dialogue and engagement with Canal & River Trust related to this item, via personal communications and email. This response aims to summarise the key reasons for differences in costs for transparency. There are a number of reasons why costing will differ from those provided to us by the Canal & River Trust: - It is correct in that costs will be higher in part due to additional work and costs required on the option for our element of the scheme, to make it a viable option. These additions have followed consistent principles with the costing of our own options. - Where Average Incremental Cost (AIC) is presented, the numbers will vary depending on whether WAFU benefit or capacity has been used. Whilst the water resource planning tables utilise WAFU benefit in the calculations, our models have used capacity (we will return to this point again below). - Where AIC values are presented, these are derived over 80 years and using discounting approaches in-line with the planning guidelines, where we understand that Canal & River Trust AIC values are discounted over 25 years and may use different underlying discounting techniques. For our revised draft WRMP, whilst the latest options appraisal now does not include a specific water trade with the Canal & River Trust under the water trading pathway as part of the best-value plan, we commit to continue to explore this option further, in particular because the option is sensitive to the third-party costs included and we understand that further work may result in a change to this position for future planning cycles. We will continue to explore the potential for future water trading with the Trust towards WRMP24. Further related information is provided under the response to item 7 below.
Canal & River Trust	6	The respondent asks for greater transparency on how the canal schemes have been assessed to ensure that the optimum supply solutions are developed for our customers.	The extended methods process, which was used for selecting supply (and demand) schemes for the water trading pathway, is outlined in Section 4 of our *Revised Draft WRMP19 Technical Report – Options appraisal*. We have also included a high-level overview of the process in Section 7.2 of our *Revised Draft WRMP19* main report.

Respondent	Item	Point of detail made in the response	Our reply
Canal & River Trust	7	The respondent raises that there are differences in the option benefit published in the Market Information Strategic WRZ tables to the original scheme benefit proposed by the Trust. They seek clarification as to the reasoning behind our assumptions to ensure that the canal schemes proposed have been evaluated fairly and consistently.	We thank the Canal & River Trust for acknowledgement of our ongoing engagement surrounding this option. The difference between options capacity and the WAFU benefit is based on upon water resources modelling outputs given the non-linear nature of responses in a system such as the Strategic Resource Zone. This testing was completed for WRMP19 options using the system without water trading in place, noting that for the water trading pathway an EBSD options appraisal (which primarily needs an estimate of WAFU benefit) was not considered the most appropriate approach. This is because our objective under the water trading options appraisal, based on customer and stakeholder feedback received, was to prevent deterioration of service to customers from the position without water trading in place. This is why we used an 'extended methods' options appraisal process using Robust Decision Making (RDM) principles, rather than a simple traditional supply-demand balance based assessment that we did not consider was sophisticated enough to assess the complex nature of the water trading planning problem. In options appraisal terms, the difference between the WAFU benefit assessment and capacity is superfluous, as the extended methods use the option as required up to its capacity as an inherent part of the simulation and options process. We have added further detail to the plan in Section 4 of the *Revised Draft WRMP19 Technical Report - Options appraisal* to explain in more detail this process following consultation that Atkins have completed for this part of the WRMP. That said, it is also worth noting some other aspects related to this response. Firstly, water trading itself only occurs 15% of the time, so utilisation is relatively low over time. Secondly, the WAFU impact shown in the tables of 81 Ml/d reflects the impact of the water trade to the supply-demand balance only (with enabling works in place). However, as described above, given our objective not to deteriorate system performance as a result of the trade the drivers for options selection are primarily driven by the extended methods process. We recognise that the WRMP process is now more sophisticated than ever before, and it is therefore important to recognise that summary table data (based on traditional 'aggregated' supply-demand planning methods) can only give a flavour as to the water resources picture in WRMP19. The new methods are more sophisticated, yet also newer in concept, so should the Canal & River Trust require further information in addition to the extra information in the submission reports and this response we would be happy to explain further in person as we continue to actively engage on options.
Canal & River Trust	8	The respondent raises that our Python Mill option needs to be considered with a current Trust priority project. They say that water quality of supply from Python Mill may be a constraint, particularly as parts of the Rochdale Canal are SSSI. They ask us to continue engagement with the Trust on the development of this scheme.	The Python Mill borehole option has been removed from the revised draft WRMP following feedback received on this option regarding the availability of water and the potential impacts to the SSSI and SAC. This is explained further in Section 3.8.1.1 of this Statement of Response. At the draft WRMP stage, as outlined in Section 7.7.1 (Page 123) of the *Draft WRMP19* main report at that time, we identified a substitute option given potential risks associated with the option. We thank the Canal & River Trust for their comments on this option as part of the consultation process.

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Respondent	Item	Point of detail made in the response	Our reply
Canal & River Trust	9	The respondent notes that they have committed resources to proactively identify and cost schemes that support future water trading. They are concerned that if future trading doesn't happen, their time and effort spent developing these schemes has been wasted.	We understand that it takes time and money to develop options for future water trading and wish to thank the Canal & River Trust for its input into the Water Resources Management Plan process. We are committed to a fair and equitable assessment of all options and have selected third party options in our draft WRMP. We will continue to work proactively with third parties to support potential new water exports from our area.
Canal & River Trust	10	The respondent asks us to consider the following summarised key points in preparation of our revised draft and final plans: - Inclusion of quantified social and environmental costs and benefits for all feasible schemes; - Provide greater cost transparency on the assessment of canal schemes and the assumptions made, ensuring that the optimum supply solutions are developed for United Utilities customers; and - Continue our engagement with the Trust on the development of the Python Mill borehole scheme.	Taking account of the comments raised in this response we have: - Published the Environmental and Social Costs reports from work completed by our environmental consultants (Amec Foster Wheeler, now Wood) to give greater transparency on this element of the costs (Environmental and Social Costs of Water Resources Management Plan 2019 Supply-Demand Options; Environmental and Social Costs of Water Resources Management Plan 2019 Manchester and Pennine Resilience Options); - Undertaken further dialogue directly with Canal & River Trust to discuss the option selected in the draft WRMP19 submission, and also around our plan approach. We have also added further detail from the work completed by Atkins to select the options in the revised draft WRMP19 submission, as well as clarifying points around capacity and WAFU values elsewhere in our response. We have also added further information to Appendix G of the *Revised Draft WRMP19 Technical Report - Options identification* which clarifies for all options the reason for any options to be screened out from the process prior to options appraisal; and - Clarified the current position on the Python Mill scheme elsewhere in our response (item 8), but will continue to engage on this option in future should this become relevant.
Carlisle City Council	11	The respondent welcomes being consulted on the draft plan and confirms that they have no specific comments to make at this stage. The respondent informs us of a future housing proposal in Carlisle that they are willing to discuss with us in further detail.	We thank Carlisle City Council for taking the time to respond to our WRMP consultation and are pleased that there are no issues of concern. We have previously met with Carlisle City Council to discuss St Cuthbert's Garden Village (Carlisle South) which has included attendance at a stakeholder engagement event in January 2018. This is in addition to our regular liaison meetings. We are aware of the proposals in the adopted local plan and the emerging proposals for St Cuthbert's Garden Village and look forward to continuing this engagement as proposals develop. In particular, we are keen to work alongside Carlisle City Council and any development partners to ensure the delivery of the garden village is an opportunity to deliver an exemplary development which is responsive to the challenges of the 21st century, in particular the challenge of climate change and also the requirement for new water connections, so that we can ensure this is accounted for in the future. We encourage proposals to be delivered with strategic direction from Carlisle City Council to ensure a co-ordinated and holistic approach to the delivery of water and wastewater infrastructure. We look forward to working with Carlisle City Council further on this development.

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Respondent	Item	Point of detail made in the response	Our reply
Cheshire West and Chester Council	12	The respondent welcomes being consulted on the draft plan and for the continued liaison in local plan development. They share details of their draft local development plan and point out that it complements the proposed strategy within our plan. They welcome future consultation and liaison as our plan develops.	We thank Cheshire West and Chester Council for sharing its local plan with us and we have used it to inform our WRMP19 directly, via a plan-based property and population forecast, which helps us forecast the future demand for water. We will continue our regular liaison with Cheshire West and Chester Council, providing updates as our plan develops.
Copeland Borough Council	13	The respondent notes that their main priority has been to see Copeland connected to the Wider Strategic Resource Zone, which is being met being met through the Thirlmere transfer project currently under construction.	We thank Copeland Borough Council for taking the time to respond to the consultation on our draft plan and for their support of this strategic project.
Copeland Borough Council	14	The respondent notes that they do not have the technical expertise to express a preference for many of the issues raised, options proposed and preferred option. They understand that a balance has to be struck between the options available, targets and cost implications, and say that the preferred options seem reasonable. They would like to see the best environmental and sustainable options progressed that maintain and enhance existing levels of service and supply at a viable cost, and ideally enhance them.	We have progressed the best environmental and sustainable options that maintain and enhance existing levels of service and supply at a viable cost in our revised draft WRMP. Further details can be found in Section 5.4.1 of our *Revised Draft WRMP19* main report, and we will also publish our Environmental and Social Costs reports prepared in support of WRMP19. These reports provide a clear explanation and audit trail of the process and data used to assess the E&S costs of the feasible options identified for WRMP19, including our rdWRMP preferred plan options, and the subsequent outputs.
Customer Challenge Group (YourVoice)	15	The respondent welcomes our approach to incorporating new planning processes, tools, and techniques in developing our draft plan, as well as our approach to earlier and more extensive engagement. They also welcome the emphasis given to managing water demand and reducing leakage.	We thank the Customer Challenge Group (YourVoice) for their positive comments relating to these matters.

Respondent	Item	Point of detail made in the response	Our reply
Customer Challenge Group (YourVoice)	16	The respondent feels that we should adopt a higher leakage reduction target, by adopting Ofwat's target of 15% reduction by 2025, for a number of reasons: - Our customers attach a high priority to reducing leakage, with 93% considering that we should be doing more; - Reducing leakage has risen up the political agenda and is now a national policy priority; - Customer research and stakeholder consultation undertaken in autumn 2017 (which included 'willingness to pay' acceptability testing) revealed strong support for going beyond our proposed 7% leakage reduction target, although there are limits to how much customers may be prepared to pay for leakage reduction beyond economic levels; - We perform relatively poorly in this area in comparison to the water industry average; and - Enhanced levels of leakage reduction will make it easier to deliver other priorities such as improving drought resilience, minimising the environmental impact of abstraction and sending the right messages to customers about water efficiency and conservation. The respondent believes that achieving better performance in leakage reduction should not automatically equate to increased costs for customers. They also believe that we need to explore ways in which new technology and innovation can be used to gain a better understanding of our water network and how further leakage reduction can be driven.	We thank the Customer Challenge Group (YourVoice) for their comments regarding leakage. In the YourVoice meeting in July 2018, we discussed our proposals to increase our long-term leakage ambition target to 40%, by 2045. We understand that our stakeholders wish us to continue to be ambitious on our leakage detection and repair activities both now and in the long term, and we have taken this consultation feedback seriously. The details relating to our proposed more stretching and ambitious leakage reduction targets is detailed in Section 6.2 and 7.4.2 of our *Revised Draft WRMP19* main report. Summary details can also be found in Section 3.2 of this Statement of Response.

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Respondent	Item	Point of detail made in the response	Our reply
Customer Challenge Group (YourVoice)	17	The respondent welcomes our strong focus on the future resilience of our water supplies. They say that further investment to improve drought resilience going beyond the levels achieved by delivery of our enhanced demand management plan would not be justified, as there is a lower prevalence of extreme drought situations in the North West compared to other areas of the country, and our system is already able to withstand at least a 1 in 200 year event.	We thank the Customer Challenge Group (YourVoice) for their comments regarding resilience of our supplies. We agree with the view that we already have an appropriate level of resilience to extreme droughts and that there is no further immediate need to specifically invest and improve our resilience position further in this area.
Customer Challenge Group (YourVoice)	18	The respondent highlights that whilst customers place some value on improving levels of service for drought permits and orders, it is not a relatively high priority. They understand that the proposed improvements will be delivered through planned leakage reductions so will not carry additional costs to customers.	We agree that whilst customers place some value on improved levels of service, research shows this not to be a priority investment driver in its own right. As a result, improvements will be delivered as a supplementary benefit of our demand management activities and will not carry additional costs to customers.

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Respondent	Item	Point of detail made in the response	Our reply
Customer Challenge Group (YourVoice)	19	The respondent notes the importance of investigating the potential of water trading and recognises that the majority of customers are happy to support water trading being considered. However, they raise that there are concerns about whether there will be a sufficient surplus of water to allow trading, and say that trading should not have any detrimental impact on customers in our region and must contain sufficient safeguards to ensure that their water supplies are not adversely affected. This applies both to the shorter term costs of exploring and developing potential delivery plans, which should not be borne by our customers, and the longer term costs and gains arising from the implementation of water trading. The respondent welcomes and encourages us to continue to work with other water companies to explore the potential of water trading and customer attitudes in more detail, through a joint research project.	It is important to recognise that, given customer and stakeholder concerns (noting the potential for these to become a barrier to water trading), we have not sought to simply trade away our surplus, which has an inherent 'value' for customers in the North West such as increased resilience. This approach is also particularly salient as the scale of the final planning surplus is only achieved through enhanced leakage reductions and other demand management activities, which UU customers will have essentially have paid for, along with the resulting benefits. Our plan has therefore used sophisticated simulation planning methods to produce a plan that does not impact on resilience or the environment, whilst ensuring this objective is met in the best-value way. The work undertaken to date as part of our WRMP19 submission has been proactive, to ensure that any water trading need can be met in future in the way desired by customers. That said, expenditure of time and effort in this regard to date has been a necessary part of the WRMP process, given government and regulatory expectations. In terms of future work, we are committed to continue working with others on appropriate technical and environmental aspects in 2020-25. This will allow the transfer options to be considered further in future WRMPs so that an export can be made available when it is needed. We have allocated £1.0m in our business plan for our contribution to this work. Should other companies' plans change and require work materially greater than this, e.g. significant over and above detailed engineering studies, we would expect the costs of this to be recovered in a similar way as for the importing company's other water supply options. We will continue with the activities set out in Section 8.4 of the *WRMP19 main report,* because they have the potential to bring value to North West customers in the long-term. It is also worth noting that for our revised draft WRMP submission, we have completed further customer research on customer attitudes to water trading (in collaboration with Severn Trent Water and Thames Water), which is summarised in Section 4.3.10 of our *Revised Draft WRMP19 Technical Report - Customer and stakeholder engagement.*
Customer Challenge Group (YourVoice)	20	The respondent notes that they attach a strong priority to promoting increased water efficiency in homes and businesses as a key element of our demand management plans. They welcome the extension of metering and the development of initiatives such as the 'lowest price guarantee'. The respondent supports our proposed research to use behavioural economics techniques to better understand how customers respond to water efficiency home audits and water-saving devices.	We thank the Customer Challenge Group (YourVoice) for their comments in relation to our water efficiency initiatives.

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Respondent	Item	Point of detail made in the response	Our reply
Customer Challenge Group (YourVoice)	21	The respondent supports the Manchester and Pennine Resilience scheme, sharing our view that the deterioration of the aqueduct presents serious risks to both the safety and reliability of water supplies to a substantial part of the region, and that action is needed to manage and mitigate these risks. They highlight Option D or E as their preferred solution. They also raise that consideration will need to be given to whether the additional £4 annual bill impact associated with Option E compared with Option D is justified by the extra reduction in supply interruption risk that would follow.	We have considered the candidate solutions for the Manchester and Pennine Resilience scheme and have completed our options appraisal to select a preferred solution. This has been informed by customer preferences, environmental appraisals, cost-benefit analysis and a multi-criteria analysis. We have also considered the range of stakeholder views on the options. Looking at this evidence in the round, solution D is preferred compared to solution E. It is more cost-beneficial and has relatively low environmental impacts compared to solution E, and the multi-criteria analysis shows that solution D performs well against a range of criteria. Further detail can be found in Section 6.4 of our *Revised Draft WRMP19* main report.
Customer Challenge Group (YourVoice)	22	The respondent welcomes our approach to developing earlier and more extensive engagement with customers and stakeholders, including the development and application of a range of new tools and techniques to supplement traditional 'willingness to pay' approaches. They particularly welcome the introduction of a pre-consultation phase and the establishment of a technical stakeholder group, which allowed a wide range of stakeholders and statutory consultees to inform and contribute to plan development. They understand that we took these comments into consideration in preparing our draft plan. They believe that the quality of customer engagement has been considerably enhanced by: - The use of both qualitative and quantitative surveys to explore customer priorities for water services; - More in-depth WaterTalk customer panel discussions about leakage reduction and costs; - Behavioural economics-based studies seeking to better understand customer motivations and barriers to metering and water efficiency; and - The development of innovative new techniques such as the interactive online tool to allow customers to 'build their own plan'.	We thank the Customer Challenge Group (YourVoice) for their comments and are pleased that they found our pre-consultation activities beneficial. We appreciate their input to the development of our plan. Details of our customer engagement activities have been updated to include those undertaken for the development of the revised draft WRMP, and can be found in our *Revised Draft WRMP19 Technical Report - Customer and stakeholder engagement*. Section 4.1.1 also specifically references our engagement with YourVoice through the process to develop this plan, with references to examples of key influences.

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Respondent	Item	Point of detail made in the response	Our reply
Customer Challenge Group (YourVoice)	23	The respondent raises the relatively poor attendance at the stakeholder consultation events held in April 2018 to discuss the draft plan. They say that they will discuss with us the impact on the overall consultation exercise, as well as what lessons can be learned for future stakeholder engagement exercises.	Whilst we would have ideally liked higher numbers at the consultation events (particularly at the Bolton and Knutsford events), and recognise the importance of our discussions to improve moving forward, we also feel that it is important to note comparison to other company WRMP processes or experiences. The level of attendance to the events overall is similar to previous planning rounds and our understanding of some other comparable company consultation events. The numbers of attendants typically correspond to the level of concern stakeholders might have on the plans, which is why attendance numbers are typically higher for companies in the South East, and indeed, in our own area, Cumbrian stakeholders often have a greater direct interest in our activities. It is also worth noting that we offered three stakeholder events, plus a webinar, to give stakeholders as much opportunity as possible to directly engage, whereas we note that some other companies only offered one event or even no events at all. Having three events did have the downside effect of lower individual attendance numbers at some events, noting the Penrith event was significantly better attended. As the Customer Challenge Group (YourVoice) have acknowledged, we have engaged with stakeholders more widely. This has included business as usual engagement routes (e.g. regular meetings), specific engagement around the Manchester and Pennine Resilience scheme, and the PR19 company business plan (for the period 2020-2025) customer and stakeholder events and research; in some cases, attendees whom we may have expected to attend the consultation events have been extensively engaged in those alternative forums. As the Customer Challenge Group (YourVoice) note, we will further discuss this area and will strive to adopt any lessons learnt that may help us increase attendance in future, such as reducing the number of stakeholder events we hold. Further details of our engagement with our Customer Challenge Group (YourVoice) can be found in Section 4.1.1 of our *Revised Draft WRMP19 Technical Report - Customer and stakeholder engagement*.

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Respondent	Item	Point of detail made in the response	Our reply
Environment Agency	24	The respondent welcomes our draft plan looking to further enhance resilience to drought, reduce the frequency of drought permits and potentially provide water to other companies. They highlight the importance of the West Cumbria scheme to increase resilience. They also note that we plan to reduce demand over the planning period through increased metering and water efficiency proposals. However, the respondent raises that we have historically had relatively high leakage, and that the leakage reduction in our draft plan does not meet Ofwat's 15% leakage reduction challenge for AMP7. They recommend that we are more ambitious with our short-term and long-term leakage targets in all zones, by exploring the use of innovative approaches to achieve further leakage reductions. They also say that we have not presented sufficient evidence to demonstrate compliance with all WRMP Directions, and ask us to provide more details to show how we comply.	We thank the Environment Agency for their positive comments regarding our preferred plan. Further details in response to the key recommendations and improvements raised by the Environment Agency are provided below.

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Respondent	Item	Point of detail made in the response	Our reply
Environment Agency	25	The respondent considers our proposed water transfer to be a bold and positive step. They recommend that we work closely with Thames Water and Severn Trent Water to further explore the trade and remove any barriers, and determine whether this option should be included in their respective company plans. They say that if other companies are not going to include this option in their final plan, then we should remove it from our final plan and include it instead as a scenario.	We have invested significant time and effort to proactively contribute to the national water trading agenda, using an innovative pathways approach to explore the potential for a future water trade in the WRMP19 submission (even though at the draft WRMP stage this was only a 'candidate option' for Thames Water with no confirmed need). We are therefore appreciate the Environment Agency's recognition of our work on the Severn Thames transfer. We adopted a pathways approach (essentially a very detailed scenario) for water trading as we recognised the potential alignment challenges between company plans. This was also on the expectation that the WRMP19 planning round would not be entirely conclusive with regards to the Severn Thames transfer, and thus regardless of whether it was selected in other company plans, there would be a need for continuing future work on this option. By adopting a pathways approach, we believe this has removed some potential barriers to a water trade by allowing effective engagement and consultation on these long-term strategic proposals; this is a stated aim of the Environment Agency. Water trading was included in our preferred plan at the draft WRMP stage, because our preference was to continue to explore this in future. Following this consultation feedback, and meetings with the Environment Agency, we recognise that there is a desire for consistency across the industry: trades that are not part of one company's preferred plan should not form part of another company's preferred plan. For the revised draft WRMP, both Thames Water and Severn Trent Water have confirmed that the option does not feature in their preferred plans within the standard 25-year planning period. Therefore, our revised preferred plan and preferred options do not include water trading. However, it remains our preference to continue preparatory work so that the Severn Thames transfer can be selected in future preferred plans. We have therefore continued to describe this as a pathway in the plan, as an adaptive pathway for trading that would be triggered should it subsequently feature in the preferred plan for another company, and continue to recommend that all parties continue working together on the strategic transfer. We remain committed to continued work with others on water trading beyond WRMP19 towards the WRMP24 planning cycle.

Respondent	Item	Point of detail made in the response	Our reply
Environment Agency	26	**Recommendation 1** The respondent recommends that we continue our work with other water companies, regional water resource collaborations and relevant technical working groups to explore new transfers and shared resources. They also recommend that we co-ordinate with Thames Water and Severn Trent Water, and any other stakeholders including the Environment Agency and National Resources Wales, to identify the work needed to appraise the feasibility of the transfer. They expect to see a co-ordinated approach in the plans so stakeholders can understand the interactions between the companies, and the cumulative impacts of the transfer. They say that if the option is not included in the other companies' plans then we should remove it from our preferred plan and instead include it as a scenario, to ensure that our plan is consistent with the other water companies.	We have addressed the majority of this recommendation through appropriate changes to the revised draft WRMP19 submission, as outlined under item 25. We will continue to explore water trading in future, building on our approach in WRMP19, and drawing on the ongoing collaborative, multi-organisational work through, for example, WaterUK, Water Resources North, and the River Severn Working / Modelling Groups. Given our experience in WRMP19, we will also actively support and engage on the WRMP24 planning framework. We have undertaken further engagement since the draft WRMP submission with both Severn Trent Water and Thames Water. We have also written to both companies to formally confirm the position from this dialogue. A water trade from the North West has not been selected in their preferred plans in the standard 25-year planning period at this stage. Thames Water considered a number of scenario in their draft plan; the Severn Thames transfer is called on under a variety of scenarios tested. The earliest the transfer is required in these scenarios is the 2030's. The scenarios select a range of different support options up to 195 Ml/d in total. The 195 Ml/d support comprises of 180 Ml/d from Vyrnwy reservoir and 15 Ml/d from Severn Trent at Mythe. We have agreed to continue to work on the Severn Thames transfer beyond WRMP19. For Severn Trent Water, they have confirmed that they would like to work with us to explore a potential smaller 60 Ml/d export to support their WRMP24 submission. To ensure consistency between plans, our revised draft WRMP does not include a water export as part of the final planning or preferred plan/options position, however, we have still presented an alternative plan pathway to reflect the potential for the aforementioned schemes to be adopted. We expect to take a primary role in joint work with companies and regulators in future around trading via the River Severn in future.
Environment Agency	27	R1.1 The respondent highlights inconsistencies between our draft plan and Thames Water's plan regarding the trade. The respondent recommends that our final plan and Thames Water's plans should align and provide an SEA assessment of the cumulative effects of the water trading proposals.	As set out in Section 5.3 of the *Strategic Environmental Assessment of the Revised Draft Water Resources Management Plan 2019*, United Utilities agreed with Thames Water that any environmental impacts downstream of Lake Vyrnwy in the Severn and Thames catchments associated with a possible transfer would be assessed in Thames Water's Water Resources Management Plan. Whilst water trading remains our preference, a bulk transfer does not currently feature in Thames Water's (or any other water company's) emerging WRMP during the 25-year planning period and therefore water trading is not part of our preferred plan for WRMP19. Whilst water trading is no longer part of our preferred plan, we have retained an assessment of the trading options under an alternative pathway in Appendix F of the *Strategic Environmental Assessment of the Revised Draft Water Resources Management Plan 2019* for reference. This includes a cumulative effects assessment using information provided by Thames Water relating to the effects of the Severn Thames transfer downstream of Vyrnwy.

Respondent	Item	Point of detail made in the response	Our reply
Environment Agency	28	R1.2 The respondent raises concerns with some of our preferred options, including Franklaw and Thorncliffe Road. They also raise concerns about sustainability of the preferred options to manage reservoir compensation flows. The respondent recommends that further work is required to ensure no deterioration is caused by the preferred options.	We understand the concerns raised, as both Franklaw and Thorncliffe Road options (WR100 and WR101) are detailed in the proposed AMP7 (2020-2025 investment period) WINEP for investigation. We also understand the comments in relation to the reduction of compensation flows options (WR159 and WR160). For the purposes of our revised draft WRMP, we consider that retaining these options as part of the plan pathway to support water trading is acceptable at this stage (given the lead time for any options to be confirmed and/or implemented), in particular with regard to the proposed utilisation of these options to support water trading is low (15% or lower) and therefore the recent actual abstraction. However, as stated at the draft WRMP stage, we recognise that in relation to all of these options, further collaborative work and detailed assessments are required between ourselves and the Environment Agency to ensure that there is no deterioration of existing water body status through their implementation and operation. This is detailed further in Sections 3.8.1.2 and 3.8.1.3 of this Statement of Response. We discussed our proposed responses to these questions with the Environment Agency following the closure of the consultation window and no issues were raised. It should also be noted that the options no longer form part of our preferred plan for WRMP19, as water trading is not part of the preferred plan.
Environment Agency	29	R1.3 The respondent raises concerns with the Python Mill option. They recommend that we re-consider this option in our options appraisal based on their additional evidence.	In light of the concerns raised by the Environment Agency, taking into account the uncertainties identified in the HRA with regard to possible effects on the Rochdale Canal SAC, we have decided to discount the Python Mill option from our revised draft WRMP and will instead utilise the alternative option of Tytherington, which was specified in our draft plan, as part of the plan pathway to support water trading. This is detailed further in Section 3.8.1.1 of this Statement of Response. It should also be noted that the options no longer form part of our preferred plan for WRMP19, as water trading is not part of the preferred plan.

Respondent	Item	Point of detail made in the response	Our reply
Environment Agency	30	R1.4 The respondent asks for more clarity on the options to increase abstraction at Hurleston, in relation to the River Dee. They recommend that we re-consider this option in our options appraisal based on their additional evidence, and discuss the option further with Natural Resources Wales and the Environment Agency.	The scope of these options and how they would operate in conjunction with the regulation of the River Dee was queried by the Environment Agency during the consultation window and we provided feedback to this question on 29 March 2018. We have since discussed this option further with Natural Resources Wales and the Environment Agency at a workshop on the 18 June 2018. For the draft WRMP, option WR820 comprised 15 Ml/d capacity of new water from the Birmingham Canal (BCN) system surplus. WR821 comprised the same 15 Ml/d plus a further 15 Ml/d from the River Dee system existing licences and/or possibly more water from the existing Shropshire Union Canal system (Belvide Reservoir). It is understood that these options do not require any new abstraction licence volumes and that the scope can be met from within the existing abstraction licences. During the consultation period, the third party provided further evidence that the additional 15 Ml/d as part of WR821 could be met by flows from Belvide reservoir, meaning that the option would not require any Dee water in order to function. Based on this, we propose to leave WR820 and WR821 as options within the revised draft WRMP as part of the plan pathway to support water trading. Further detail is provided in Section 3.8.1.4 of this Statement of Response. It should also be noted that the options no longer form part of our preferred plan for WRMP19, as water trading is not part of the preferred plan.
Environment Agency	31	R1.5 The respondent notes that the impacts on priority species and habitats do not appear to have been considered within the SEA. They recommend that we include the potential impact of our options on priority species and habitats within the SEA and options appraisal.	With specific regard to options WR099b (Worsthorne) and WR101 (Franklaw), the Environment Agency's comments are noted and will be considered further by our environmental consultant, Wood (previously Amec Foster Wheeler). For the avoidance of doubt, the SEA has considered effects on priority species and habitats, such as Atlantic salmon, and this is reflected in the appraisal matrices (under SEA Objective 1) contained in Appendix D and Appendix E of the *Strategic Environmental Assessment of the Revised Draft Water Resources Management Plan 2019*. However, it should be noted that the options no longer form part of our preferred plan for WRMP19, as water trading is not part of the preferred plan.
Environment Agency	32	R1.6 The respondent says that it is unclear how the feasible options appraised made it into the preferred options. They recommend that we provide more clarity around the process as to how each feasible option was selected for the preferred options set.	While we appreciate that WR099b has slightly more negative effects than WR099a and WR099c (5 for WR099b as opposed to 3 for WR099a and WR099c) in the SEA, this is only one part of the overall options identification and appraisal process. As stated in Section 7.2.5 of our *Revised Draft WRMP19 Technical Report - Options identification*, we used the SEA assessment results to identify the potentially significant effects for the feasible options and we translated the results from each assessment into a simple scoring system that could be applied to the secondary screening. We did this by counting where significant negative effects (- -) were reported against constructing and operating the option as a way of indicating a potential significant risk. We decided not to use the minor negative effect scores (-) as there were many more of these which might be possible to be overcome with mitigation. Therefore, all the WR099 options made it through secondary screening and moved forward to options appraisal. AISC ranking, incorporating environmental and social costs, is one approach we use to create portfolios for testing in extended methods and, as WR099b has a lower AISC than WR099a and WR099c, WR099b was generally selected over WR099a and WR099c using this method.

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Respondent	Item	Point of detail made in the response	Our reply
Environment Agency	33	**Recommendation 2** The respondent looks forward to working with us and asks us to provide assurance that all final planning supply options for the Manchester and Pennine Resilience scheme will not significantly affect the environment.	Since publication of the draft WRMP, we have progressed environmental appraisals of the Manchester and Pennine Resilience options. We shared our Strategic Environmental Assessment (SEA), Habitats Regulations Assessment (HRA) and Water Framework Directive (WFD) assessment with the Environment Agency and Natural England on 7 March 2018 and published these for consultation alongside the draft WRMP. Since then, we have carried out further work to integrate the assessments into a single set of reports for the revised draft WRMP. The Strategic Environmental Assessment now includes an assessment of the cumulative effects and has addressed apparent inconsistencies reported to us by the Environment Agency. We have continued to work with the Environment Agency, for example holding briefings on 15 March and 23 May 2018, and a workshop on the environmental appraisals on 18 June 2018. Work on the environmental implications of the options has been reflected in the selection of a preferred solution for the Manchester and Pennine Resilience scheme. We look forward to continuing to work with the Environment Agency as we take the preferred solution forwards. We have completed our options appraisal to select a preferred solution for the Manchester and Pennine Resilience scheme, which has been informed by the environmental appraisals, as well as customer preferences and cost-benefit analysis. The preferred solution (solution D) has relatively low environmental impacts compared to other candidate solutions. It does not include new abstractions, e.g. from the River Wyre or from other sources.
Environment Agency	34	R2.1 The respondent says that there is limited evidence in the plan to justify the need for a solution to resilience issues. They recommend that we include additional information on the Manchester and Pennine Resilience risks and how the proposed options address those risks.	We have added updated evidence to justify the need for a solution to address resilience issues in Manchester and the Pennines into Sections 6.4 and 7.4.3 of our *Revised Draft WRMP19* main report, including references to customer and stakeholder engagement, and third-party assurance. Appendix A of the *Revised Draft WRMP19 Technical Report – Supply* resilience also provides further and expanded detail in support of the main report content. Furthermore, we have provided a full set of evidence to Ofwat to support the need for the scheme as part of the Business Plan process and are happy to share that with the Environment Agency on request.
Environment Agency	35	R2.2 The respondent raises concerns with some of the options selected for the Manchester and Pennine Resilience scheme, particularly with regard to the potential for increased abstraction from the River Wyre catchment. They recommend that further work is required to ensure no deterioration would be caused by any of the options. They also recommend that we investigate the Wyre abstraction further or provide an alternative.	We have completed our options appraisal to select a preferred solution for the Manchester and Pennine Resilience scheme, which has been informed by the environmental appraisals as well as customer preferences and cost-benefit analysis. The preferred solution (solution D) has relatively low environmental impacts compared to other candidate solutions. It does not include new abstraction from the River Wyre, rivers in the Bowland area or other sources. The Manchester and Pennine Resilience solutions referred to in this response are not our preferred solution and so will not be considered further.

Respondent	Item	Point of detail made in the response	Our reply
Environment Agency	36	R2.3 The respondent notes that Table 5.1 of the Manchester and Pennine Resilience WFD assessment report presents a "low confidence" in the assessment for four of the five potential solutions presented. They recommend that we confirm in the plan that we have sufficient confidence in the WFD assessment to comply with WFD and decide which solution is likely to have the least impact on WFD objectives. They also recommend that we provide further evidence and complete additional assessments in order to increase the confidence in our WFD assessment of the potential solutions, or explain why the options we select are appropriate given that they are based on low confidence Water Framework Directive assessment.	We have completed our options appraisal to select a preferred solution for the Manchester and Pennine Resilience scheme, which has been informed by the environmental appraisals as well as customer preferences and cost-benefit analysis. The preferred solution (solution D) has relatively low environmental impacts compared to other candidate solutions. The updated WFD assessment of the two options comprising solution D, has concluded that one of options has been assessed as having no or minimal impact with a high level of confidence. The second option has been assessed as having a medium level of impact with a low level of confidence, as a detailed study of the geology of the tunnel route has not been undertaken at this time. Further assessment at the project stage, and dialogue with the Environment Agency, would increase the level of confidence and likely result in a reduction of the level of impact. Notwithstanding this, it is unlikely that Article 4.7 would be invoked as the designs should be able to incorporate any mitigation required to reduce any potential impact on WFD waterbodies to an acceptable level.
Environment Agency	37	R2.4 The respondent raises concerns that two of the five potential solutions include new abstractions which have the potential to limit the opportunity for other potential abstractors to get an abstraction licence in the catchments upstream. They recommend that this risk is reflected in the SEA under Objective 8. They also recommend that we consider the types of abstraction licence we could apply for to govern this activity, and present the information within our final plan and associated environmental assessment reports.	We have completed our options appraisal to select a preferred solution for the Manchester and Pennine Resilience scheme, which has been informed by the environmental appraisals as well as customer preferences and cost-benefit analysis. The preferred solution (solution D) has relatively low environmental impacts compared to other candidate solutions. It does not include new abstraction from the River Wyre, rivers in the Bowland area or other sources and therefore there is no potential for impacts on existing or future abstractors. Notwithstanding the above, in response to this comment, the potential for impacts on abstractors associated with the other Manchester and Pennine Resilience solutions will be considered.

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Respondent	Item	Point of detail made in the response	Our reply
Environment Agency	38	R2.5 The respondent notes that the SEA associated with the Manchester and Pennine Resilience scheme does not consider the cumulative effects of the solutions with the effects of the options proposed in our preferred plan for wider water resources management. They recommend that we present a full cumulative effects assessment in our final plan and associated environmental assessment reports.	Section 6.2 of the *Strategic Environmental Assessment of the Revised Draft Water Resources Management Plan 2019* includes a high level assessment of plan alternatives. This includes Plan Alternative 4 which comprises of: continued demand management, a programme of leakage reduction, water trading and the Manchester and Pennine Resilience programme. However, as highlighted in the draft SEA, as our preferred Manchester and Pennine Resilience solution had not been determined at that stage, the assessment of this element of the WRMP was necessarily undertaken at a high level, due to the level of information and detail available at that time. Subsequently, an SEA of alternative solutions was undertaken to help inform the selection of the preferred Manchester and Pennine Resilience solution. The accompanying report *(Strategic Environmental Assessment of the Draft Water Resources Management Plan 2019 - Environmental Report Supplementary Information: Draft Resilience Options)* set out that, once the preferred solution has been identified, it will be subject to further detailed assessment if required. In this context, a detailed assessment of the preferred Manchester and Pennine Resilience solution (solution D) has been undertaken and the cumulative effects of the WRMP assessed in the revised SEA *(Strategic Environmental Assessment of the Revised Draft Water Resources Management Plan 2019).*
Environment Agency	39	R2.6 The respondent notes that the cumulative assessment of minor positive effects appear to be treated differently to minor negative effects in the SEA. They recommend that we address this inconsistency and make changes for our final plan and associated environmental assessment reports.	We thank the Environment Agency for this comment and offer further explanation. The significant positive effects identified in respect of health reflect the potential for a Manchester and Pennine Resilience solution to significantly enhance the resilience of supply to over two million customers, ensuring the long term continuity of a clean and safe water supply at a regional scale. In contrast, adverse effects on air quality and landscape would be largely localised and temporary, such that they would not be significant. However, where a solution is considered likely to result in substantial emissions to air, and/or involve extensive works within nationally designated landscapes (e.g. Solutions B, C and E), the potential for significant negative effects on these air quality and landscape has been identified. With this in mind, we consider that the assessments are correct and do not propose to make any changes.
Environment Agency	40	R2.7 The respondent notes that there is uncertainty in the use of the terms “temporary” and “short-term” in the SEA. They recommend that the report defines these terms to address this potential inconsistency in our final plan and associated environmental assessment reports.	We thank the Environment Agency for this comment and offer further explanation. Whilst works would be temporary, the scale of investment associated with the construction of the Manchester and Pennine Resilience solutions would be regionally, if not nationally, significant. In contrast, effects on biodiversity and transport would be localised and would therefore not be considered significant. With this in mind, we consider that the assessments are correct and do not propose to make any changes.

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Respondent	Item	Point of detail made in the response	Our reply
Environment Agency	41	R2.8 The respondent notes that there appears to be an inconsistency in the treatment of geology in the SEA assessment of solution D. They recommend that we address this inconsistency and make changes for our final plan and associated environmental assessment reports.	The findings of the SEA (prepared to assess the impacts of the Manchester and Pennine Resilience solutions) in respect of biodiversity reflect those of the HRA, which states that geological investigations have indicated that the risk of works affecting groundwater bodies is minimal due to the dominance of low-permeability geological formations and the depth of the pipeline. In contrast, the effects in respect of water (SEA Objective 3) reflect the WFD assessment, which highlights that a detailed study of the geology of the tunnel route has not been undertaken at this stage such that in the context of that assessment, its methodology and regulatory requirements, some uncertainty remains. The revised SEA, assessing the preferred plan (including solution D) has the same conclusion. In this context, a detailed geological study in support of solution D will be undertaken at the project stage.
Environment Agency	42	**Recommendation 3** The respondent raises that there is a lack of information in our draft plan relating to the long-term investment and maintenance strategy to avoid outages and ensure resilience of the pumping stations on the lakes Windermere and Ullswater. They ask us to provide assurance of the resilience of these pumping stations and clearly outline our proposal to ensure they are maintained to avoid outages that may reduce resilience.	Ullswater and Windermere are strategically important water sources. We are planning substantial investment to improve the reliability and resilience of these sources in AMP7 (2020-2025 investment period). We have undertaken a comprehensive engineering investigation to assess the condition of the raw water pumping stations. These investigations are ongoing, and we are identifying key aspects of the performance of these assets (and their associated support equipment such as their power supply) that require improvement. This study will lead to improved resilience to equipment failure. The current draft United Utilities business plan for 2020-2025 includes approximately £8m of investment in these pumping stations. This substantial investment is intended to reduce out of service time and to ensure pumping capacity is maintained. In addition to this planned major capital investment, we also plan an improved maintenance and investigation programme for our raw water assets of circa £9m across the period 2020-2025. This maintenance programme will be supported through significant improvements in our maintenance and engineering response capability, brought about by the introduction of our Mobile Asset Resource Scheduling (MARS) system. MARS is planned to reduce response times for high priority equipment repairs and increases the efficiency of our maintenance teams. These significant planned investments will deliver improved serviceability and performance from our strategic pumping stations by 2025.
Environment Agency	43	R3.1 The respondent recommends that we present information in our final plan to show how we will maintain and improve the large pumping stations at Windermere and Ullswater so that they are fully available for abstraction when needed. They also recommend that we set out our long-term investment and maintenance strategy for improving the pumping stations.	As per the response to item 42 above, we have provided more details on our plans to invest to improve the resilience of our pumping stations.

Respondent	Item	Point of detail made in the response	Our reply
Environment Agency	44	The respondent raises that we have not explored and presented the potential impact of our current Windermere abstraction licence review in our plan. They recommend that we present alternative options to the current Windermere abstraction strategy and present a scenario in relation to the licence review in our final plan. (R3.2)	We have been conducting a review of the Windermere abstraction, including examining potential impacts of the implementation of eight scenarios of the hands-off-flow condition in the licence. We have now outlined this study in Section 9.2 of our *Revised Draft WRMP19* main report and test one of these scenarios (informed by stakeholder dialogue) as a WRMP supply-demand balance scenario. We have also added specific narrative around this scenario. Since this response, the joint review of the Windermere abstraction licence has been completed; the output was shared with the Environment Agency and other stakeholders at an event in Kendal in June 2019. The review has concluded that the current abstraction regime has no significant impact on Windermere or the River Leven, and therefore we will not be seeking any changes to the abstraction licence. However, we are now proposing to remove the Windermere drought permit scenario 2 from our Drought Plan.
Environment Agency	45	**Recommendation 4** The respondent notes that the leakage reduction in our draft plan does not meet Ofwat's 15% leakage reduction challenge for AMP7. They recommend that we are more ambitious with our short-term and long-term leakage targets in all zones, by exploring the use of innovative approaches to achieve further leakage reductions. They say that where the proposed level of leakage is changed, we should set out the impact on the supply-demand balance and options.	We thank the Environment Agency for their comments regarding leakage. Following customer and stakeholder engagement, including following consultation, we understand that our stakeholders wish us to continue to be ambitious on our leakage detection and repair activities both now and in the long term and we have taken this consultation feedback seriously. The plan has been amended accordingly. As such, we have set out a more ambitious and stretching target to reduce leakage across all of our water resource zones over the course of the planning period. We have focused our AMP7 (2020-2025 investment period) reduction where there is greatest benefit in our largest Strategic Resource Zone. Our smaller water resource zones (Carlisle and North Eden) are already considered to be performing at the frontier. However, we anticipate some of the new approaches and innovations that are developed to offer longer-term benefits in all of our water resource zones. At this stage, we could not quantify the benefit in these smaller water resource zones, so we have forecast reductions in the longer term. Further details can be found in Section 3.2 of this Statement of Response and also in Sections 6.2 and 7.4.2 of our *Revised Draft WRMP19* main report (supported by appropriate additional detail as referenced in the technical reports).
Environment Agency	46	R4.1 The respondent says that our draft plan currently suggests a leakage reduction of 3.7% by 2025. They recommend that we explore our proposed leakage levels further with our customers and Board to see whether we can meet a more ambitious target, and if this cannot achieved, clearly explain and justify why this is the case. They recommend that where the proposed level of leakage is changed, we should set out the impact on the supply-demand balance and options in our final plan.	We thank the Environment Agency for their comments, and following consultation are setting out a more stretching target to reduce leakage. We note that some readers of the draft plan noted differences in the leakage reduction proposed in the text and tables, which was due to how future changes to the resource zones early in the planning period were accounted for in the planning process. We have clarified this in the plan and amended our data submission given this understanding as to how stakeholders are utilising the tables, and to avoid misinterpretation. Further details can be found in Section 3.2 of this Statement of Response, and also in Section 7.4.2 of our *Revised Draft WRMP19* main report.
Environment Agency	47	**Recommendation 5** The respondent raises that we need to ensure our plan is legally compliant by adhering to the WRMP Directions.	To ensure our plan is legally compliant, we have adjusted our technical reports to meet the WRMP Directions. The specific locations are documented in the responses to items 48, 49, 50, 51, and 52 below.

Respondent	Item	Point of detail made in the response	Our reply
Environment Agency	48	R5.1 The respondent raises that we have not correctly stated the average annual risk for restrictions, as required by Direction 3(b). They recommend that we provide an estimate of planned annual risk as a percentage for temporary water use restrictions, ordinary drought orders, and emergency drought orders, for all of our resource zones. They also recommend that we state how the annual risk will change over the planning period following the implementation of the options set out in our plan.	We made this information available in the draft WRMP for the two system modelled water resource zones (Strategic Resource Zone and Carlisle Resource Zone). However, following dialogue with the Environment Agency, it has been clarified that this was raised as the Barepot and North Eden Resource Zones which did not include assessments. We have now completed this work and the information is provided in Section 16.2 of our *Revised Draft WRMP19 Technical Report – Supply forecasting*. The information provided includes the benefits of options (further leakage reduction), as they are implemented over the course of the planning period.
Environment Agency	49	R5.2 The respondent raises that there is no information presented in the draft plan to describe the assessment of greenhouse gas emissions likely to arise from the options in our plan, and no statement that this information is published elsewhere, as required by Direction 3(d). They recommend that we include an assessment of the greenhouse gas emissions from our current operations and each of our preferred options (future operations).	Please see Section 5.2.2 of our *Revised Draft WRMP19 Technical Report - Options appraisal* for a chart of greenhouse gas emissions for our current baseline operations and our future operations. At the draft plan stage the baseline operations assessment was still being completed.
Environment Agency	50	R5.3 The respondent raises that we have not provided an estimate of the impacts of climate change on our future demand forecasts and our final plan options, as required by Direction 3(e). They recommend that we include an assessment of the impacts of climate change on demand and our options in our final plan.	Please see Section 7.2 of our *Revised Draft WRMP19 Technical Report - Demand for water* for a chart showing the impact of climate change on our demand forecast. This uses the findings from the Impact of Climate Change on Water Demand UKWIR project carried out in 2013. Section 7.2.3 of our *Revised Draft WRMP19 Technical Report - Options identification* documents how we incorporated climate change risk in our options screening process.
Environment Agency	51	R5.4 The respondent raises that we have not fully described how we plan to implement metering as part of our preferred programme, or provided costs, as required by Direction 3(f). They recommend that we include further details of our metering programme and describe how we will implement this metering in our final plan, along with the costs of installing and operating the meters.	We thank the Environment Agency for their comments and have ensured that this information is provided in the revised draft plan. As outlined in Section 3.3 of this Statement of Response, metering is an important component of our demand management activity. We have provided this further information in Section 2.2 of our *Revised Draft WRMP19 Technical Report - Demand for water*. We have provided additional detail around the implementation and costs over time for our metering programme.

Respondent	Item	Point of detail made in the response	Our reply
Environment Agency	52	R5.5 The respondent raises that we have not provided an individual assessment of the cost-effectiveness for each type of household metering, as required by Direction 3(h). They recommend that we provide this assessment for selective, optant and change of occupier metering, presenting each metering type individually to allow comparison.	We have considered a number of metering options, as described in detail in Section 3.6.1 of our *Revised Draft WRMP19 Technical Report - Options identification*. A comparison of cost-effectiveness of different metering types is explained in Section 2.2 of our *Revised Draft WRMP19 Technical Report - Demand for water*, and the relative AISC to other option types can be seen in Appendix A of our *Revised Draft WRMP19 Technical Report - Option appraisal.*
Environment Agency	53	**Improvement 1** I1.1 The respondent asks us to demonstrate how our plan supports the objectives for Drinking Water Protected Areas. They say our plan should also show a long-term commitment to assessing risks, developing and implementing Safeguard Zone Action Plans where they are needed.	Our approach to Drinking Water Protected Areas and Safeguard Zones was detailed in the *Draft WRMP19 Technical Report - Options identification*. It is included in the revised technical report, and now also outlined in Section 4.7.3 of the *Revised Draft WRMP19* main report, with some detail provided below. We have worked with the Environment Agency to provide evidence for safeguard zones to be applied to a number of catchments in the North West. We follow a number of national best practice and company-specific innovative techniques to understand the risks to DWPAs. As part of the risk assessment process required by Regulation 27 (in England) and Regulations 28 (in Wales) of the Water Supply (Water Quality) Regulations 2016, we identify any actual or potential risks to human health within the catchments of raw water sources and established a raw water monitoring programme accordingly. Risks to raw water quality are also identified through a variety of other mechanisms, including information and data gathered by the Environment Agency. Data gathered for operational purposes (i.e. operational raw water monitoring) is used by ourselves and the Environment Agency to monitor risks in DWPAs. Where catchment measures are considered the most appropriate to protect supplies against long term risks of pollution, we work with the Environment Agency to designate safeguard zones for both surface and groundwater sources. We have in-house catchment teams that manage the 56,000 hectares of catchment land in our ownership as well as working with third parties to encourage the adoption of best practices on the remaining 720,000 hectares of non-owned catchment land. Risk assessments, investigations and operational monitoring data is used to support the identification of Safeguard Zones and the appraisal of measures to manage and reduce risks to raw water quality. Data is shared between the Environment Agency and ourselves to assess and manage the risk to raw water quality. Local partners are engaged to implement catchment measures where appropriate and can often be involved at the start of the process where their local expertise is used to assist with risk assessments and investigations. We follow our Wholesale Risk Asset Planning process when assessing the risk of deteriorating raw water quality. The water catchment methodology aims to translate the strategic aims set out in our water catchment strategy into practice for those involved in the management of the risk. The methodology covers how raw water quality issues with catchment land should be raised and addressed. It is essential that the methodology is used together with the Drinking Water Safety Plan (DWSP) to correctly assess risk and record actions taken to control risk.

Environment Agency	54	**Improvement 2** I2.1 The respondent asks us to clearly explain and justify the 24 Ml/d increase in outage allowance in the Strategic Zone between WRMP15 and this draft plan, which does not seem to be supported by recent Annual Review outage experienced data submissions.	As well as generally updating data and taking account of our latest operational outage processes, for WRMP19 we have improved the calculation of outage and included a greater coverage of event and asset types. In particular, the increase may be attributed to the inclusion of additional events (e.g. pollution events) and wider consideration of asset types (failure of raw water and potable water aqueducts that underpin WAFU). Section 13 of our *Draft WRMP19 Technical Report - Supply forecasting* explains the differences in the calculation methodology for the outage allowance from the previous WRMP, and a comparative table of WRMP15 to WRMP19 with the key reasons for the differences included in Section 13.4. Given the step change from the previous WRMP, we appreciate that the Environment Agency would like further clarity on the appropriateness of this change. We have fully reviewed our outage calculation and all the components which are accounted for; where appropriate we have incorporated new elements as outlined in the *Draft WRMP19 Technical Report – Supply forecasting* (and the revised draft equivalent). Over the last five years, we have developed and enhanced our operations process, such as the use of the POPS (Production Outage Planning System), which has allowed us to more accurately plan and track outage, process referenced in annual WRMP reviews. This latest information has been used in our processes, as well as the methodology changes mentioned above. Having compared our outage levels to other companies, we do not consider the % of outage relative to WAFU to be close to an outlier, and considered this when exploring outage percentiles. We note the Environment Agency comparison to Annual Review outage levels. We consider it appropriate to recognise that the WRMP19 outage value is an allowance, based on a planned level of risk, as opposed to something that would necessarily be observed year on year. The WRMP15 allowance planned for a 5% probability of exceedance, therefore outage levels would normally be below this level and only occasionally exceeded. Between 2014/15 and 2017/18, our regional annual reported outage level has been 78 Ml/d, 70 Ml/d, 73 Ml/d and 81 Ml/d respectively. This implies observed outage to be around allowance levels of 77 Ml/d more frequently than may be expected, and we would interpret as providing support to the increased allowance at WRMP19. We fully recognise the importance of reducing outage as far as practicable (noting reference to key raw water assets mentioned elsewhere in consultation responses such as Windermere and Ullswater under item 19). As part of our Business Plan process, there is a new measure to reduce unplanned outage more generally. During AMP6 we have heavily invested in improving our operational maintenance capability, implementing a mobile, SAP based, work and resource scheduling system across our Wholesale business. Building upon this foundation, coupled with targeted capital investment and recently formed operational engineering teams we are starting to see a real change in our maintenance performance and asset reliability. During AMP7 (2020-2025 investment period) there will be a continued and substantial focus upon wider Totex solutions to drive up asset reliability and availability as we target an improved, unplanned outage position. At this time it is not possible to quantify the resulting future reductions in the WRMP outage allowance as a result of these interventions. However, we will consider whether a change to the stated WRMP outage allowance is required as part of the Annual WRMP and 5-yearly WRMP reviews using the evidence and experience resulting from embedment of these processes.

Respondent	Item	Point of detail made in the response	Our reply
			It is also worthy of note that our water trading proposals as presented in the draft WRMP, and retained as an adaptive pathway, intend to protect a stated base resilience and environmental position, rather than to utilise available supply-demand surplus; therefore the changes in the allowance outage would not necessarily affect the scale of options selected under that pathway.
Environment Agency	55	**Improvement 3** I3.1 The respondent asks us to include a commitment in our final plan to assess and use reservoirs to reduce flood risk downstream, working with the Environment Agency and other partners. They suggest that we could set out plans to re-evaluate the triggers on our control curves for these reservoirs or the effects of such operations on overall resilience. They also say that the plan should include the impact of any reservoir-related flood mitigation schemes on the supply-demand balance and WFD objectives.	We continue to engage with the Environment Agency on the potential use of reservoirs for flood mitigation. We recognise the Government's strategic priorities and objectives for Ofwat which state that water companies should consider the use of reservoirs for flood mitigation without having adverse impacts on costs and services. The issues associated with impacts on costs and services have been raised with the Environment Agency, and we are working together to seek opportunities to trial using reservoirs for flood mitigation, but without adverse impact on costs and services, including the potential impact on water resources. In our discussions to date, we have raised some specific concerns relating to potential future liabilities. For example, if water is released from the reservoir in advance of a storm event, and this in itself causes or contributes to environmental damage or flood, we do not believe that we should suffer any additional costs. We routinely receive claims from people who perceive they have been affected in flood events and allege that we have been responsible for the problem by opening flood gates. This is not a practice we operate at present, but if we did, then this could create more potential claims of this nature. We also have concerns about the potential that a reservoir may not actually fill following a release event and therefore the operation of reservoirs for flood mitigation would have to be carefully considered in the context of the supply-demand balance. If, for example, a predicted storm event triggered the release of water from one of our reservoirs, but subsequently, the magnitude of the event was found to be inaccurate, there is a risk that we could experience potential shortages of water at a future time if essential storage of water had been unnecessarily released. Should these be severe enough to require future mitigation through drought scenarios (e.g. drought permits) we may be criticised for not adequately conserving water for public supplies. There is clearly the need for future discussions between ourselves and the Environment Agency before any proposals or trials are commenced. If any such schemes came to fruition, changes to the supply-demand position would be considered through the annual WRMP process or longer term, through subsequent full WRMP reviews.

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Respondent	Item	Point of detail made in the response	Our reply
Environment Agency	56	**Improvement 4** I4.1 The respondent asks us to consider the uncertainty related to time limited abstraction licences. They say that we should explore this issue further and if necessary, include an allowance for uncertainty in our plan, for example, with a scenario setting out how any lost supply would be replaced.	We have written to the Environment Agency to seek further details and explanation as to the concerns raised around the Thirlmere time limited licence. We subsequently met the Environment Agency in June 2018 to discuss further. Concerns relate primarily to the mitigation study and subsequent mitigation which is currently being undertaken for the Thirlmere transfer scheme. The study includes hydrological, geomorphological and ecological monitoring and aims to design a flow regime, which would provide benefits to the ecology of St Johns Beck downstream of Thirlmere Reservoir. We have requested confirmation that the Environment Agency does not plan any changes to other existing time limited licences which our plan assumes will not be affected. From dialogue to date, we consider that the draft WRMP position of assumed renewal is appropriate to all abstraction licences and thus no additional allowance is needed in the revised draft WRMP in this regard. A scenario was considered and discounted from the revised draft WRMP because there was no specific evidence of the nature or scale of a future abstraction licence change. Work is ongoing between ourselves and the Environment Agency to resolve the issues through other means and thus a principle of renewal has been applied to Thirlmere in the revised draft WRMP. We will continue to work closely with the Environment Agency and Natural England as the study progresses to ensure appropriate mitigation. We will consider any resulting requirements further as part of the Annual WRMP process.
Environment Agency	57	**Improvement 5** I5.1 The respondent raises that we have included voids in our household meter penetration calculations, without explanation, which is inconsistent with the rest of the industry. The respondent asks us to use the formulae provided by the Environment Agency within our plan and associated planning tables, or provide a justification for this change.	We have previously discussed the planning tables as part of our engagement activities with the Environment Agency. For household meter penetration, we have reverted the formula to reflect the original formula in the official planning tables to provide the Environment Agency with cross-company consistency. However, as discussed with the Environment Agency, we believe that the formula in the official planning tables is incorrect as the percentage calculation of metering penetration should include a metered voids value in both the top and bottom of the equation respectively.
Environment Agency	58	I5.2 The respondent raises that we have included voids in our water taken unbilled calculations, without explanation, which is inconsistent with the rest of the industry. The respondent asks us to use the formulae provided by the Environment Agency within our plan and associated planning tables, or provide a justification for this change.	We have previously discussed the planning tables as part of our engagement activities with the Environment Agency. We have historically reported void underground supply pipe leakage (USPL) as being included in “Water Taken Unbilled”, so we altered the formula to account for this. However, on discussion with the Environment Agency, we have altered “Water Taken Unbilled” so it no longer includes void USPL. It should be noted that any subsequent comparisons between WRMP19 and prior annual reporting data will show a step change and, therefore, cannot be directly compared at this time.
Environment Agency	59	The respondent sent further minor comments to us. These comments identify areas which would further improve the clarity of our draft plan, but are not material to maintaining public water supplies or protecting the environment.	We will provide a Statement of Response relating to the minor comments, separate to this document, to the Environment Agency with our responses to address these minor comments.

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Respondent	Item	Point of detail made in the response	Our reply
Friends of the Lake District	60	The respondent says that our use of stochastic and data generation techniques demonstrates a very thorough appraisal and analysis of the risk and consequences of managing our sources during plausible extreme droughts and the potential impact of climate change.	We thank Friends of the Lake District for their comments on the innovative and sophisticated techniques used to develop our plan.
Friends of the Lake District	61	The respondent welcomes renewed attention to leakage, continued demand management and increasing metering. They express their hope that these targets will not be reduced in the final plan. However, they raise that they have been arguing for decades that there needs to be more focus on leakage and that Sustainable Economic Leakage Levels are not environmentally sustainable. They advocate an ambitious programme of leakage reduction. The respondent suggests that if this had been resolved earlier, it would have potentially removed the need for the hugely expensive and damaging new pipeline that is currently being built to provide water to West Cumbria. They say that demand management measures, compulsory meters and more efficiency could make the savings even more marked.	We thank Friends of the Lake District for their comments regarding leakage. We understand that our stakeholders wish us to continue to be ambitious on our leakage detection and repair activities both now and in the long term and we have taken this consultation feedback seriously. As such, we are proposing setting more stretching and ambitious leakage reduction targets in our revised draft WRMP. Further details can be found in Section 3.2 of this Statement of Response. Until the Thirlmere transfer scheme is completed, West Cumbria is a separate water resources zone. Even with significant further leakage reduction in West Cumbria, this would still have meant we would have had to design a new water supply scheme to allow the revocation of the Ennerdale Water abstraction licence to occur. The Thirlmere pipeline was considered to be the most effective way of allowing us to cease abstraction from Ennerdale. We are exploring ways of persuading more people to opt for a water meter, and at the current time are not designated as a water stressed region, so do not have the option to compulsory meter, other than with exceptional circumstances e.g. customers with swimming pools. A summary position on our water efficiency and metering plans is also included in Section 3.3 of this Statement of Response.
Friends of the Lake District	62	The respondent does not consider that our target level for water efficiency is ambitious enough, as it builds resilience and is vital to meeting challenges such as climate change uncertainty, expected population growth, changing patterns of consumption and increased environmental responsibilities. They say that more can be done to improve this, through campaigns and imaginative customer engagement.	We have set up a number of trials to approach the subject of water efficiency in a different way and move away from traditional approaches. A summary position on our water efficiency and metering ambitions is included in Section 3.3 of this Statement of Response, and further detail of our activities is set out in Sections 2.2 and 2.3 of *Revised Draft WRMP19 Technical Report - Demand for water.*

Respondent	Item	Point of detail made in the response	Our reply
Friends of the Lake District	63	The respondent suggests that more links should be made between the use of water and its source, highlighting the impact water use has on our landscapes, especially in Cumbria and during times of hot weather and lower reservoir levels.	We share your view that making the link between how our customers use their water and the effect that may have on water sources and subsequently landscapes is vitally important. This is never truer than in times of dry weather when some of our reservoirs are visibly lower. We carry out water efficiency campaigns all year round and in times of dry weather those communications are increased significantly to help reduce the demand for water from our customers by demonstrating the potential impact on some of those reservoirs. We are working closely with partners to help us share this message and would welcome help from any organisation that wishes to share our water efficiency messages with their membership. Our customer research and engagement activities have also flagged this link given stakeholders raised similar points at pre-consultation (for example, when communicating the impacts of drought permits / orders to engage on level of service choices).
Friends of the Lake District	64	The respondent supports our conclusion that we have an appropriate level of resilience to drought, subject to continued Windermere modelling and discussions regarding hands off flow and when to pump.	We note and thank Friends of the Lake District for their support of this element of the plan. The review of the Windermere abstraction licence is ongoing and we will continue to work with stakeholders and the Environment Agency to determine whether any changes are required to the licence, based on the evidence collected from this study. The conclusions of this study will run beyond the timeframe for WRMP19 updates, therefore we have included a supply-demand scenario in Section 9 of our *Revised Draft WRMP19* main report to show the impacts of a licence change. Any licence change would need to be assessed as part of future planning cycles and Annual WRMP reviews. Our approach to pumping will continue to adopt the approach committed to in Appendix 8 of our Final Drought Plan 2018, which the WRMP19 submission aligns to. Since this response, the joint review of the Windermere abstraction licence has been completed; the output was shared with the Environment Agency and other stakeholders at an event in Kendal in June 2019. The review has concluded that the current abstraction regime has no significant impact on Windermere or the River Leven, and therefore we will not be seeking any changes to the abstraction licence. However, we are now proposing to remove the Windermere drought permit scenario 2 from our Drought Plan.
Friends of the Lake District	65	The respondent agrees that there is no further immediate need to invest to improve our resilience further, on the basis of the evidence provided and its interpretation.	We thank Friends of the Lake District for their comments on our drought resilience and levels of service, and are pleased they agree with our conclusion that there is no further immediate need to specifically invest and improve our resilience position further.
Friends of the Lake District	66	The respondent welcomes our proposal to halve the future risk of requiring drought permits and orders, as they have expressed concerns for many years that Lake District sources are seen as the backstop source during drought conditions with undesirable environmental consequences. They seek confirmation of this proposal in our final plan.	We note and thank Friends of the Lake District for their support of this element of the plan. Our proposal to change the minimum stated level of service (from 1 in 20 to 1 in 40 years) for drought permit implementation remains in place for the revised draft WRMP, and will be implemented by 2025 following the first batch of leakage reduction activities.

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Respondent	Item	Point of detail made in the response	Our reply
Friends of the Lake District	67	The respondent wishes to be kept fully informed as options are developed for water trading, to remain reassured that Lake District sources are unaffected and contribute to future discussions should this change. They wish to ensure that there is no increase in water taken from Cumbria with consequential decreases in landscape quality. They raise concerns regarding the potential impact of water trading in long term on Cumbrian water supplies, and also in the short term regarding the ecological implications of water mixing.	We thank Friends of the Lake District for their participation in the planning process for WRMP19. Our strategy, as outlined in the plan, is to ensure that resilience and the environment is not impacted by any water trading proposals. We understand the concerns raised and will continue to consult with Friends of the Lake District as we work further with the wider industry on national water trading. Our approach to engagement will be tailored based on the outcome of the WRMP19 planning cycle, such as the likely earliest point of any water trade or the level of certainty that a future trade will take place. However, we envisage at the very least further exploration of water trading into the WRMP24 planning round, and will look to build on our engagement approach to WRMP19.
Friends of the Lake District	68	The respondent is pleased that some of the options considered will not be taken forward as they feel they would have had unacceptable landscape impacts.	We thank Friends of the Lake District for their comments on our options identification and appraisal process. During the assessment of options, we developed a comprehensive methodology to ensure that potential environmental impacts were recognised and we endeavoured to ensure that options taken forward for selection would not cause any environmental damage. In this regard, the formal consultation process is important to ensure that we have made the correct decisions. We are pleased that Friends of the Lake District have no concerns with any of the options in our preferred plan.
Friends of the Lake District	69	The respondent has not expressed an opinion on the alternative solutions for the Manchester and Pennine Resilience scheme as none of the options impact on the use of Lake District sources. They wish to be consulted where site works take place in Cumbria.	We confirm that none of the five shortlisted solutions that we considered for the Manchester and Pennine Resilience scheme impact on Lake District sources. Furthermore, the preferred solution (solution D), does not include any work within the Lake District National Park. It does however include some tunnel works in south Cumbria. We will consult with Friends of the Lake District as we develop our proposals on the Manchester and Pennine Resilience scheme.
Friends of the Lake District	70	The respondent says that they found the pre-consultation exercise useful for setting the scene and explaining the issues to be explored in our plan, enabling meaningful input during plan development, in particular through the stakeholder group. They welcome the same consultation approach in future.	We thank Friends of the Lake District for their comments and are pleased that they found our pre-consultation activities beneficial. We appreciate their input to the development of our plan. We will look to building on our WRMP19 approach in future planning cycles.
Friends of the Lake District	71	The respondent thinks that our Environmental Report (SEA) correctly identifies the likely significant effects of our plan.	We thank Friends of the Lake District for their comments and are pleased that they consider our environmental reports to correctly identify the likely significant effects of our plan.

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Respondent	Item	Point of detail made in the response	Our reply
Friends of the Lake District	72	The respondent wishes to be kept informed of any proposals to use Thirlmere for flood mitigation, and potential impacts on water resources.	There are currently no proposals to change the arrangements we have with Keswick Flood Action Group in terms of operation of the reservoir for flood mitigation. A mitigation study is currently being undertaken for the Thirlmere transfer scheme. The study includes hydrological, geomorphological and ecological monitoring and aims to design a flow regime which would provide benefits to the ecology of St Johns Beck downstream of Thirlmere Reservoir. We will keep Friends of the Lake District informed of any proposals which may affect Thirlmere.
Friends of the Lake District	73	The respondent wishes to be fully involved in discussions on the future of redundant assets arising out of the West Cumbria pipeline project.	We will keep Friends of the Lake District informed of any proposals that involve future redundant assets that occur as part of the West Cumbria pipeline project. We will discuss with them, and all relevant stakeholders, when appropriate.
Group Against Reservoir Development	74	The respondent strongly welcomes our positive approach to water trading, having advocated the Severn-Thames transfer since the public inquiry into Thames Water's WRMP in 2010, and were encouraged by the news that we had responded to Thames Water's EU Journal advertisement inviting bulk supply offers. They recognise our considerable investigations in making water available for transfer, whilst maintaining reliable supplies for our customers.	We thank Group Against Reservoir Development (GARD) for their detailed and comprehensive consultation response, particularly their positive comments regarding our work to facilitate a future water trade and we recognise their considerable support of the Severn-Thames transfer.
Group Against Reservoir Development	75	The respondent recommends that we undertake our own review of the Vyrnwy support option before finalising our plan, rather than accepting Thames Water's findings.	There is a weight of evidence produced nationally which shows that water trading and transfers can be cost effective and resilient options, for example from Water UK and National Infrastructure Commission. We have put forward the Vyrnwy/River Severn option for Thames Water to consider. However, Thames Water is responsible for preparing their Water Resources Management Plan, showing how they will meet the needs of customers within their area of supply. Within that plan, Thames Water is responsible for assessing and selecting options necessary to meet their own customers' needs.
Group Against Reservoir Development	76	The respondent urges us to ensure our approach to making water available for transfer is matched by an even-handed assessment by Thames Water.	Noting the publication by NIC [https://www.nic.org.uk/wp-content/uploads/NIC-Preparing-for-a-Drier-Future-26-April-2018.pdf] and Ofwat's published assessments [https://www.ofwat.gov.uk/regulated-companies/resilience-2/water-resource-planning/ofwats-engagement-wrmp19/] of Water Resource Management Plans, we are confident that regulatory processes are in place to secure an even-handed assessment. Where uncertainty remains, Ofwat's publication suggests that work should continue on the Severn Thames transfer [https://www.ofwat.gov.uk/wp-content/uploads/2018/06/IN-1812-Draft-water-resources-management-plans-2019-Overview-of-Ofwats-responses.pdf]. We are committed to continue working with others to progress work on the supported Severn-Thames transfer option, and present proposed future work in Section 8.4 of our *Revised Draft WRMP19* main report.

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Respondent	Item	Point of detail made in the response	Our reply
Group Against Reservoir Development	77	The respondent recommends that we are not deterred by the findings of Thames Water's draft WRMP. They urge us to continue to press the case for making the transfer from Vyrnwy reservoir available to meet South East England's needs.	We are not deterred by the findings in Thames Water's draft WRMP and are proposing to continue working with Thames Water and others on the supported Severn-Thames transfer option.
Group Against Reservoir Development	78	The respondent proposes that regulation releases of up to 400 Ml/d could be made with reduced yield, which would be guaranteed by a Vyrnwy reservoir control line below which no regulation releases would be made. They support a regulation release larger than 180 Ml/d, although they recognise that investigation is needed, as higher releases are not acceptable to Natural Resources Wales or the Environment Agency because of the possible impact on salmonid spawning and juveniles.	While the hydrological yield of Vyrnwy reservoir is a constraint within which we must work, we are open to considering different patterns of release if this would provide greater benefit to South East water supplies. We agree that environmental impacts of the release pattern will need to be properly assessed, but note that flood management releases of up to 405 Ml/d (at the Vyrnwy gauge) already occur in the baseline.
Group Against Reservoir Development	79	The respondent notes that Thames Water have used artificially generated stochastic yields rather than historic yields. They recommend that we challenge Thames Water's use of stochastic data for the yield assessments.	In our Water Resources Management Plan we have assessed options on the basis of historic yields. We are not in a position to comment on the detail of Thames Water's appraisals.
Group Against Reservoir Development	80	The respondent notes that they understand, following discussions with us, that the high opex costs quoted by Thames Water are due to them containing the full cost of our inter-company charges for the transfer. They say that as our draft WRMP only allows for a loss of 81 Ml/d for providing the transfer, and the AIC costs of our replacement sources are less than about 60 p/m3, it is difficult to see how these costs can be justified. The respondent raises that they are uncertain whether the seemingly excessive costs quoted by Thames Water for the Vyrnwy support option are due to high costs quoted by us for the bulk supply or Thames Water's interpretation, possibly combined with an excessive mark-up. They recommend that we investigate this and make the results publicly available.	Our proposed price reflects recovery of the Water Resources Management Plan option costs, along with a return on capital consistent with that assumed at the PR14 price control. We would expect the payments from Thames Water to be included within the operating costs of the Severn Thames transfer in Thames Water's plan. However, we would also expect this to include other costs, including for example payments to other providers of water resource and costs to operate the Severn-Thames pipeline.
Group Against Reservoir Development	81	The respondent recommends that we explore the potential for phased development of the Vyrnwy support option and include details in our final plan.	We are open to phased development of the Vyrnwy support option, and have added some text into Section 6.5 of our *Revised Draft WRMP19* main report to make this clear.

Respondent	Item	Point of detail made in the response	Our reply
Group Against Reservoir Development	82	The respondent recommends that we challenge any attempt by Thames Water or the Environment Agency to adopt a 20-30% allowance for transmission losses in the River Severn or to disallow a put-and-take on re-abstraction of releases for transfer.	We have experience of put-and-take arrangements operating effectively within the North West, e.g. the River Dee and the River Wyre. We see no practical constraints to adopting this form of operation on the River Severn, although it will need coordinated working between various institutions. We have put forward an assessment of such coordination issues in a paper*: 'What role for System Operators in the water sector?', November 2017,* which is available at https://www.unitedutilities.com/globalassets/z_corporate-site/about-us-pdfs/looking-to-the-future/what-role-for-system-operators-in-the-water-sector-november-2017.pdf. We are willing to work with other parties to take this forward. We think that flow trials could usefully inform a more accurate assessment of losses and are willing to work with others to understand this further.
Group Against Reservoir Development	83	The respondent recommends that we challenge Thames Water's claim that the Abingdon reservoir has similar drought resilience to the Vyrnwy support option, drawing attention to Atkins' finding that the yield from Vyrnwy support is unchanged even at droughts up to 1:1000 years.	All other things being equal, we would expect that, hydrologically, a reservoir some distance from the existing sources (i.e. Vyrnwy), with different inflow patterns, would be more resilient than a reservoir within the Thames catchment. Indeed work by Atkins for Water UK (2016) showed that there was a relatively low spatial coherence between drought events in the South East and the North West / North Wales.
Group Against Reservoir Development	84	The respondent recommends that we consider the information in Thames Water's draft WRMP on geology and local water levels for their Abingdon reservoir option, and whether they have been subjected to the same degree of risk-averse assessment as they have applied to Severn-Thames transfer options.	Thames Water is responsible for preparing their Water Resources Management Plan, showing how the company will meet the needs of customers within its area of supply. Within that plan, Thames Water is responsible for assessing and selecting options necessary to meet customers' needs. We are not in a position to comment on the detail of Thames Water's options appraisal process.
Group Against Reservoir Development	85	The respondent recommends that we undertake a thorough independent review of Thames Water's cost estimates that have led to their selection of the Abingdon reservoir as their preferred option for the future Upper Thames source and the rejection of the Severn-Thames transfer supported by Vyrnwy. They say the review should scrutinise Thames Water's assessments of the yields of the options as well as the estimated costs.	Please see response to item 84 above.
Group Against Reservoir Development	86	The respondent says that Thames Water's SEA scorings, which are highly subjective, have been heavily biased against the Severn-Thames transfer option and in favour of the Abingdon reservoir. They recommend that we challenge Thames Water's SEA scorings.	Please see response to item 84 above.

Respondent	Item	Point of detail made in the response	Our reply
Group Against Reservoir Development	87	The respondent proposes that we should undertake our own review of Thames Water's analysis before finalising our plan, as the reports are not truly independent, focusing on: - the validity of the stochastic flow data for the River Severn that Thames Water have used in their modelling of Severn-Thames transfer options; - the validity of using stochastic river flow data as the primary source of data for yield assessments, rather than historic flow records; - Thames Water's assessments of the yield of unsupported and supported Severn-Thames transfer options, including consideration of the magnitude of regulation releases and the extent of sharing of Vyrnwy reservoir storage; - the impact of regulation releases in the River Vyrnwy and River Severn, with proposals for mitigation if needed; - assumptions for regulation release transmission losses in the River Severn and the acceptability of 'put-and-take' licence conditions for the lower Severn abstraction at Deerhurst; - review of the seemingly excessive NPV capex and opex costs that Thames Water have allowed in their cost estimates for the Vyrnwy support option, which do not appear consistent with United Utilities' estimates of costs for replacement sources; - the potential for phasing Severn-Thames transfer options to allow an adaptable approach to meeting uncertain future deficits; and - consistency of approach in the comparative assessments of Severn-Thames transfer and Abingdon reservoir options, with particular regard for assessment of yield, cost estimation, allowance for climate change, resilience to droughts worse than the design standard, assessment of environmental impact and adaptability to uncertain future deficits.	Please see response to item 84 above.

Respondent	Item	Point of detail made in the response	Our reply
Lake District National Park Authority	88	The respondent acknowledges that we have decided to take a natural capital approach in future, but asks us to consider integrating the approach with using new tools and techniques in any further activities used to help develop the plan, now and in the future. They believe that adding a natural capital valuation of the leakage reduction will help explain and improve awareness of the environmental impact of our proposal, and will also help factor the wider environment in our decision making, which is not currently clear in relation to leakage reduction. They say it is critical that a natural capital approach also takes into account, and is blended with, economic, social and cultural capital to create a holistic decision making framework. The respondent would be willing to work with us on developing a natural capital approach and also wants to explore the cultural capital of water in the landscape, in particular how it supports the economic functioning of lake levels.	We thank the Lake District National Park Authority for their comments, and we do take into account external benefits in assessing our options. We engaged an external consultant to complete a literature review and comparative analysis of different approaches to environmental and social impact assessment, including a natural capital approach. We determined that implementation of a natural capital approach for WRMP19 was not practical as there is currently insufficient guidance and the lack of a defined framework from which to make decisions. However, we recognise the benefits to this approach and the importance of using it for future planning rounds. As we continue to mature in our use of natural capital approaches, as described in Section 5.4.1 of our *Revised Draft WRMP19* main report, we aim to develop a better understanding of how they can be applied across our wholesale business and use the approach to guide subsequent water resources planning development for WRMP24. This is discussed further in Section 3.9.1 of this Statement of Response and reflected in our revised draft WRMP.
Lake District National Park Authority	89	The respondent supports our proposal for further leakage reduction as current leakage represents nearly 25% of total supply and twice the maximum abstraction rate from Windermere. They consider this to be a waste of natural resource that could be used to support the economic functioning of lake levels for the water based tourism economy in the Lake District, and provide resilient habitats for wildlife, as well as recreational opportunities for people's health and wellbeing. The respondent raises that they would like to see a more ambitious target of leakage reduction.	We thank the Lake District National Park Authority for their comments regarding a desire for increased leakage reduction, in relation to minimising abstractions such as at Windermere. We share this desire to ensure that our operational activities protect and enhance the environment and we recognise the importance of demand management in achieving this goal. We understand that our stakeholders wish us to continue to be ambitious on our leakage detection and repair activities both now and in the long term and we have taken this consultation feedback seriously. As such, we are proposing setting more stretching and ambitious leakage reduction targets in our revised draft WRMP. Further details can be found in Section 3.2 of this Statement of Response.

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Respondent	Item	Point of detail made in the response	Our reply
Lake District National Park Authority	90	The respondent agrees that we have an appropriate level of resilience to extreme droughts through demand management and that there is no further immediate need to invest and improve our resilience position further. However, they say that the scenario modelling work currently being undertaken with the Windermere Stakeholder Liaison Group to assess lake levels on Windermere may provide evidence to revisit the need for investing in and improving resilience. They wish to see a conclusion made about the impact this may have on the system.	Please refer to our response in item 64, regarding the Windermere abstraction study, which we continue to progress. Please note also that in the revised draft WRMP submission, we have significantly enhanced our leakage reductions through the planning period, as described in Section 3.2 of this Statement of Response. Since this response, the joint review of the Windermere abstraction licence has been completed; the output was shared with the Environment Agency and other stakeholders at an event in Kendal in June 2019. The review has concluded that the current abstraction regime has no significant impact on Windermere or the River Leven, and therefore we will not be seeking any changes to the abstraction licence. However, we are now proposing to remove the Windermere drought permit scenario 2 from our Drought Plan.
Lake District National Park Authority	91	The respondent agrees with our strategic choice to improve levels of service for drought permits and orders, providing leakage targets are met to supply the headroom water supply across the system and the Lake District is not relied upon to provide water in times of drought, which could have negative impacts upon the natural environment.	We are pleased that the Lake District National Park Authority supports our strategic choice to improve minimum stated levels of service for drought permits and orders by 2025. Our approach to levels of service and our abstractions in the Lake District is discussed further in Section 3.5 of this Statement of Response.

Respondent	Item	Point of detail made in the response	Our reply
Lake District National Park Authority	92	The respondent says that it is worth exploring water trading providing that the impacts upon and opportunities for the environment, society and the economy of the Lake District are fully assessed and safeguards put in place to protect its water resources. They say that they would only support water exporting if it resulted in net benefits to the Lake District National Park, including enhancement of the National Park's special qualities and attributes of Outstanding Universal Value. The respondent also wishes to explore how the landscape, outside of SCaMP areas, can provide opportunities for payments for public goods and ecosystem services such as high quality clean raw water. They are willing to work with us on this, to develop our joint understanding on what water trading might mean for the National Park, given that it is included in the Strategic Zone and, in the longer term, could be used to back up and supply water in times of local surplus when water is traded to drier areas in addition to the already identified potential water trading with Thames Water.	We thank the Lake District National Park Authority for their comments regarding a potential future water trade and their willingness to work with us. We will continue to engage with the Authority as our work regarding water trading continues. Taking part in national water trading is something that could only occur in the medium to long term. A considerable amount of further investigation would be required before getting to this point. Even at this early stage of exploring the possibilities of entering such an agreement, we have put significant effort into ensuring that customers and the environment in the North West would be protected. This was informed by the responses received during the pre-consultation process. Our approach has not been to "trade away our surplus", but to develop sophisticated new tools and techniques which are designed to modify the supply system in a way that protects customers and the environment, yet represents the 'best-value' options to achieve these objectives. A range of new supply and demand options have emanated from this process, selected from hundreds of resource and demand options considered; for further details please see our *Revised Draft WRMP19 Technical Report - Options identification*. These options would be further assessed should national trading become more of a reality. Section 8.4 of the *Revised Draft WRMP19* main report outlines the future investigation planned, whilst Section 3.6 of this Statement of Response gives our current position on the sharing of water trading benefits. Although we determined that implementation of a natural capital/ecosystem services approach was not practical for WRMP19, due to insufficient guidance and the lack of a defined framework from which to make decisions, we aim to develop a better understanding of how they can be applied across our wholesale business and use the approach to guide subsequent water resources planning development for WRMP24. We have so far undertaken a Corporate Natural Capital account, working with leading industry experts to demonstrate our awareness and understanding of the value of the land in our ownership. We will continue to evolve our natural capital approaches, and we will be taking part in a pilot of Defra's metric to value ecosystem services at Thirlmere and of net gain and habitat banking working with Greater Manchester Authority. Further details on our approach can be found in Section 5.4.1 of our *Revised Draft WRMP19* main report. Note also response 207, which has relevant themes with this response.

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Respondent	Item	Point of detail made in the response	Our reply
Lake District National Park Authority	93	The respondent believes that our preferred plan contains the right combination of strategic choices, providing opportunities to maintain and enhance water supply, and recognises the emphasis placed upon water efficiency and leakage reduction, which should contribute to the protection of natural assets in the Lake District providing the targets are met. They say they have no concerns regarding any of the specific options selected, providing their concerns are positively managed for the benefit of the National Park.	We thank the Lake District National Park Authority for their comments and are pleased that they agree this is the right combination of strategic choices and have no concerns with any of the options in our preferred plan. We understand that our stakeholders wish us to continue to be ambitious on our leakage detection and repair activities both now and in the long term, and we have taken this consultation feedback seriously. As such, we are proposing setting more stretching and ambitious leakage reduction targets in our revised draft WRMP. Further details can be found in Section 3.2 of this Statement of Response.
Lake District National Park Authority	94	The respondent says that if Manchester and Pennine Resilience scheme works were to take place in the Lake District National Park, they would wish to work closely with us to minimise the impact upon the National Park's special qualities and World Heritage Site attributes of Outstanding Universal Value. They raise that it is currently unclear from our proposals whether works will take place in the National Park and therefore do not hold a view on which solution to support.	We fully support the Lake District National Park Authority with the need to protect and enhance the Lake District National Park. Having now concluded our options appraisal for the Manchester and Pennine Resilience scheme, the preferred solution (solution D) does not include any work within the Lake District National Park.
Lake District National Park Authority	95	The respondent notes that they can see how we have responded to their pre-consultation and that our feedback has allowed them to understand our current position.	We thank the Lake District National Park Authority for their positive comments on our incorporation of their pre-consultation responses in our plan.
Lake District National Park Authority	96	The respondent thinks that the Environmental Report (SEA) correctly identifies the likely significant effects of our draft plan, and agrees with the conclusions and recommendations for avoiding, reducing or off-setting any significant effects. They say that they are keen to work with us in future to understand the impact on the World Heritage Site's Outstanding Universal Value, which is not dealt with in detail in the SEA.	We are pleased that the Lake District National Park Authority thinks that the environmental reports correctly identify the likely significant effects of our plan and agrees with our conclusions and recommendations for avoiding, reducing or off-setting significant effects associated with the implementation of the plan. The assessment of both feasible and preferred WRMP options, as well as the Manchester and Pennine Resilience solutions, has identified where there is the potential for effects on the Lake District National Park World Heritage Site. No change is therefore proposed at this stage. We welcome the opportunity to work with the Lake District National Park Authority on future WRMPs.
Lake District National Park Authority	97	The respondent is willing to work with us to develop our indicators in relation to monitoring the impact of our plan on the English Lake District World Heritage Site.	We thank the Lake District National Park Authority for their offer of support in relation to impacts of the plan on the English Lake District World Heritage site and we aim to discuss this further with them in due course following submission of the revised draft plan.

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Respondent	Item	Point of detail made in the response	Our reply
National Farmers' Union	98	The respondent would like to see clear provision made to deliver uninterrupted water services into rural areas, as farms are vulnerable to low mains water pressure and demand rapid response to interruptions.	We have common targets and ambitions for levels of service for interruptions across our region, and do not provide preferential service to urban areas. Substantial effort is deployed in planning for mitigating supply failure in both rural and urban areas, accounting for the particular challenges faced by customers and our teams. Our network is already very flexible, with the majority of customers supplied from a single Strategic Resource Zone.
National Farmers' Union	99	The respondent would like to see close correlation between our WRMP and drought plan to ensure high levels of service for farming customers, as the agricultural sector is vulnerable to 'temporary use bans'.	The levels of service in our Water Resources Management Plan and Final Drought Plan 2018 for customer restrictions are consistent, including for temporary use bans and non-essential use bans.
National Farmers' Union	100	The respondent notes that our plan should demonstrate an appetite for effective engagement between farmers, ourselves, and regulators, to understand how to better work together to make water use more sustainable.	We have engaged with a range of stakeholders on the issues and opportunities around water resources. As part of that engagement we have worked closely with our Customer Challenge Group (YourVoice) to help shape the Water Resources Management Plan and its ambition. A member of the National Farmers' Union is part of the main YourVoice group and an environment sub-group, and has been instrumental in ensuring the voice of the farming community has been heard and fed into the WRMP consultation process. We also held 10 stakeholder sessions across the region, of which water resources and aspects of the plan were discussed. The National Farmers' Union were invited and attended, where they had the opportunity to represent the views of their members. Our strategy for catchment management is discussed further in Section 3.9.2 of this Statement of Response.
National Farmers' Union	101	The respondent notes that our plan should recognise the importance of climate change and its potential impact on water resources during drought events. They say that further research may be needed to better understand how to reduce the uncertainty in water resources planning for the benefit of farmers.	We put considerable effort into determining the potential impacts of climate change on water resources, including accounting for the uncertainty in our estimates. As a starting point we used 10,000 climate change projections (from UKCP09) and then developed a new, extremely fast computer model to examine the detailed effects of as many of these as possible. As an industry we recognise that there is more to do in this area to continue to improve our understanding and reduce uncertainties in climate change assessment, particularly around how climate change influences droughts, and as such look forward to the release of UKCP18 for inclusion in future plans. We are also keen to explore the opportunity to improve water resources planning by working much more closely with other sectors such as agriculture and power, and see the recent establishment of groups such as Water Resources North as potential mechanisms to support this.
National Farmers' Union	102	The respondent notes that our plan should contribute to improvements in resilience, including prevention of abstraction that has a damaging effect on the environment. They say it should also explain how quickly any necessary remedial action will be taken.	As described in Section 4.7.3 of our *Revised Draft WRMP19* main report, we have worked closely with the Environment Agency to assess the impact of our plan on the Water Framework Directive, in particular ensuring that it does not lead to deterioration of water bodies that we abstract from now, or plan to abstract from in the future. Further detail can be found in our *Revised Draft WRMP19 Technical Report - Supply forecasting* and in Section 3.9.2 of this Statement of Response.
National Farmers' Union	103	The respondent notes that our plan should commit to a twin-track approach that assesses demand management and new resource options on an equal long-term economic basis, taking full cost and benefit account of environmental and social effects.	As outlined in Section 5.4.1 of our *Revised Draft WRMP19* main report, we have included environmental and social costs in our appraisal of all supply and demand options. Although using a natural capital approach was not practical for WRMP19, we are committed to adopting a natural capital approach as part of the process for WRMP24 onwards. This is discussed further in Section 3.9.1 of this Statement of Response.

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Respondent	Item	Point of detail made in the response	Our reply
National Farmers' Union	104	The respondent notes that our plan should favour the introduction of compulsory household metering in areas where water resources are under stress to the point of full cost/benefit justification, alongside improved tariffs and measures to protect those on low incomes.	We thank the National Farmers' Union for their comment, but at the present time do not have the legal authority to compulsory meter households beyond new properties or those meeting certain criteria (e.g. ownership of swimming pools) and thus cannot do this on a wider scale without being designated as a water stressed area. We do, however, recognise that metering is vital for the longer term management of demand and we have set out our long term programme which is summarised in Section 4.2.4 of our *Revised Draft WRMP19* main report (with further detail in *Revised Draft WRMP19 Technical Report - Demand for water)*. We currently have measures in place to protect vulnerable customers.
National Farmers' Union	105	The respondent notes that our plan should contain water efficiency plans to encourage and incentivise engagement and action between us and customers on water usage.	We thank the National Farmers' Union for their comments and provide updates on trials and initiatives to promote water efficiency in Section 4.2.3 of our *Revised Draft WRMP19* main report (with further detail in *Revised Draft WRMP19 Technical Report - Demand for water)*. We note that non-household retail businesses have a role to play in working with their customers in managing water efficiency.
National Farmers' Union	106	The respondent notes that our plan should recognise the importance of leakage reduction plans that take full account of environmental costs and benefits, and fully achieve sustainable economic levels as quickly as possible.	We thank the National Farmers' Union for their comments, and note that we already operate below our sustainable economic level of leakage, and are setting more stretching and ambitious targets following consultation feedback. These assessments already include social and environmental costs and benefits. Further details can be found in Section 3.2 of this Statement of Response.
National Farmers' Union	107	The respondent notes that our plan should explore opportunities to further investigate sharing water resources and developing new resources in partnership with other companies and other sectors, such as farming.	For our draft WRMP, we developed a commercial strategy in order to allow other water companies, water/wastewater retailers and third parties the opportunity to put forward ideas for either managing demand or for the supply of new resources. An important resource management option that has been considered in this plan relates to the bulk transfer of water into, out of and within our supply area (e.g. linking water resource zones). Options to improve the connectivity between water companies and to better share or utilise existing abstraction licences can potentially lead to better value for customers. Please also see our response to item 26, and Section 6.5 of our *Revised Draft WRMP19* main report, where we explain how we have engaged proactively with other water companies to investigate the sharing of water resources as part of a national water trading. We welcome the opportunity to continue to work with third parties, including the agricultural sector, to potentially develop new resource options for the next Water Resources Management Plan. This could be achieved either through direct liaison or the new Bid Assessment Framework that will be published in future. With reference to our previous response to item 101, we are also keen to explore the opportunity to improve water resources planning by working much more closely with other sectors such as agriculture and power, and see the recent establishment of groups such as Water Resources North as potential mechanisms to support this.
National Farmers' Union	108	The respondent notes that our plan should acknowledge government commitment to see water use fall, as stated in its 25 Year Environment Plan.	We have provided further details on this in Sections 3.2 and 3.3 of this Statement of Response document. In Section 4.2 of our *Revised Draft WRMP19* main report, we have set out our ambition to reduce per capita consumption (PCC), which we plan to achieve via metering and water efficiency activity. Our *Revised Draft WRMP19 Technical Report - Demand for water* further details our baseline activity in this area and the innovations in metering and water efficiency that we are currently trialling to help us deliver on our ambitions.

Respondent	Item	Point of detail made in the response	Our reply
National Farmers' Union	109	The respondent notes that our plan should embrace a multi-sector approach, looking beyond current focus on public water supplies mainly for domestic consumption, and increasing awareness of the needs of other water users such as farming, and how best we can drive forward efficiency and optimise water use.	We thank the National Farmers' Union for their comments in relation to optimisation of water usage and collaborative working to ensure water efficiency remains high on the agenda. Using the agricultural sector as an example, when we engage with farmers on an individual basis as part of our approach to catchment management, we include water management as part of the whole farm plan. This includes private supply systems. We always encourage efficiency both for the benefit to the farm business and also the benefit to reducing run-off into other water sources, which can affect water quality in the environment. When we define our supply-demand position, we consider the current and future needs of other water users when setting the appropriate level of abstraction for public supply and forecasting how the demand for water may change. The non-household demand forecast includes use by the agricultural sector, which is discussed further in our *Revised Draft WRMP19 Technical Report - Demand for water* where we also examine the potential impact of customers substituting water from a public source to a non-public source or vice versa. The scenario was developed using results from a National Farmers' Union survey, see Section 3.5 of our technical report. We will continue to engage with stakeholders, including the agricultural sector in our messaging for water efficiency and through engagement on future mechanisms as appropriate, such as abstraction reform and Defra's Water Abstraction Plan.
National Farmers' Union	110	The respondent notes that further action may need to be taken where water use from existing water resources is likely to have a detrimental impact on the water environment through abstraction. They support any proposals in our plan that would relieve some pressure on local habitats and reduce threats to abstraction by minor users.	As described in Section 4.7.3 of our *Revised Draft WRMP19* main report, we have worked closely with the Environment Agency to assess the impact of our plan on the Water Framework Directive, in particular ensuring that it does not lead to deterioration of water bodies that we abstract from now, or plan to abstract from in the future. Section 7 of the *Revised Draft WRMP19 Technical Report – Supply forecasting* is where we discuss our approach to dealing with sustainability changes in WRMP19 and how this helps improve the environment. Further detail can be found in our *Revised Draft WRMP19 Technical Report - Supply forecasting* and updates on projects form part of the Annual WRMP process.
National Farmers' Union	111	The respondent says that our plan should include a commitment to promoting water efficiency and smart metering, particularly in view of the risk of more frequent and longer droughts. They say more research into effective approaches to metering, tariffs and customer behaviour are required.	We thank the National Farmers' Union for their comments and have set out our commitments clearly in Section 4.2.3 of our *Revised Draft WRMP19* main report. We have installed over 400,000 smart meters and are looking at innovative ways of using this data and providing information to customers. Our *Revised Draft WRMP19 Technical Report - Demand for water* contains further details.
National Farmers' Union	112	The respondent recognises that whilst it is not technically or economically viable to achieve zero leakage, we need to do more to understand the full benefits as well as costs of leakage reduction, and to achieve reduced leakage levels as quickly as possible.	We thank the National Farmers' Union for their comments regarding leakage. We understand that our stakeholders wish us to continue to be ambitious on our leakage detection and repair activities both now and in the long term and we have taken this consultation feedback seriously. As such, we are proposing setting more stretching and ambitious leakage reduction targets in our revised draft WRMP. Further details can be found in Section 3.2 of this Statement of Response.

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Respondent	Item	Point of detail made in the response	Our reply
National Farmers' Union	113	The respondent says that our plan should demonstrate a commitment to investigating the potential for sharing water resources and developing new resources in partnership with others, taking account of all costs and benefits to customers and the environment.	We consider that our approach to working with third parties on potential sharing of water resources and water trading is one of the best in the industry; Ofwat highlighted our good practice approach to third party engagement in their response to our draft WRMP consultation (see item 151). Our approach to identifying such options is discussed in detail in Section 5 of our *Revised Draft WRMP19* main report. Please also see our response in item 107, which summarises how we have investigated opportunities for sharing of water resources. Please also see Section 3.6 of this Statement of Response, which provides further detail on water trading. The work we have completed takes account of both monetised and non-monetised environmental and social costs to ensure that proposals are cost effective. This is discussed further in our *Revised Draft WRMP19 Technical Report - Options appraisal*.
National Farmers' Union	114	The respondent notes a number of ways for storing or supplying water, including raising dams to store more water; using treated effluent to augment river resources; using canals to transfer water; construction of new reservoirs; desalination.	We thank the National Farmers' Union for highlighting the benefits of certain types of options. Our options identification process considered all of these option categories and we provided scopes for a number of schemes that we then costed and also accounted for potential positive and negative environmental or societal impacts through the SEA process. These factors, along with the outcome of customer and stakeholder engagement on options types has been considered within the options appraisal process. Further detail on these aspects may be found in our *Revised Draft WRMP19 Technical Report - Options identification* and *Revised Draft WRMP19 Technical Report - Options appraisal.* At the draft WRMP stage, the plan included supply-demand options to facilitate a potential future water trade. However, at the time of developing the revised draft WRMP submission, water trading has not been included in other company preferred plans. Therefore, at this stage, such options are only included in an adaptive plan pathway. As we continue to explore water trading and any new supply-demand needs in future planning cycles we will bear in mind such feedback on options types.

Respondent	Item	Point of detail made in the response	Our reply
National Farmers' Union	115	The respondent notes that carefully designed catchment initiatives can be popular with farmers. They are willing to work in partnership with us to develop catchment approaches and support farmers in their efforts to improve the water environment.	We thank the National Farmers' Union for their comments regarding catchment management initiatives. Management of water resources includes engagement and collaboration with other users across the landscape, and we would welcome the input of the National Farmers' Union and its members to continue to collaborate and engage in issues such as resilience related to shared resources. It is critical that we continue to improve the proactive catchment based management efforts. We appreciate that the National Farmers' Union state their willingness to work in partnership with water companies to develop catchment approaches, such as SCaMP, and support farmers in their efforts to improve the water environment. Indeed, we are already working with the National Farmers' Union, for example, through the steering group for safeguard zones in Cheshire. We always look to share the learnings from catchment measures, recognising that many measures will take several years, if not decades, of sustained effort and behavioural change in order to reverse deterioration and deliver an improvement in the water environment. The impact of EU exit on future agri-environment policy will have significant implications on us as a business; as a major upland land owner, as a water and wastewater service provider and as a stakeholder in the management of the natural environment. Throughout Defra's consultation period we have been engaged with stakeholders to listen to and share our views with politicians, academics, environmental groups and farmers. This is detailed further in Section 3.9.2 of this Statement of Response.
Natural England	116	The respondent notes our commitment to environmental enhancement through implementation of our plan. They wish to see an explicit commitment to the principle of environmental net gain being embedded in our approach, particularly in new infrastructure projects. They wish to see our final plan acknowledge our work in embedding biodiversity net gain and extending it to cover wider environmental net gain.	Our work in embedding environmental and biodiversity net gain is discussed in Section 3.9.1 of this Statement of Response and in Section 5.4.1 of the *Revised Draft WRMP19* main report. We have referred to our work with Natural England in this area.
Natural England	117	The respondent welcomes the range of measures that we have proposed to further reduce demand, specifically our commitment to improving leakage reduction, and are pleased to see our recognition of the environmental benefits of this through greater availability of water in reservoirs, lakes and rivers. They welcome the fact that we have outperformed our leakage reduction target in the current plan, to below the Sustainable Economic Level of Leakage (SELL). However, the respondent would like to see a greater level of ambition for leakage reduction, in order to achieve an environmental net benefit.	We thank Natural England for their comments regarding leakage. We understand that our stakeholders wish us to continue to be ambitious on our leakage detection and repair activities both now and in the long term and we have taken this consultation feedback seriously. As such, we are proposing setting more stretching and ambitious leakage reduction targets in our revised draft WRMP. Further details can be found in Section 3.2 of this Statement of Response. We are looking at new technology and innovation that helps to find leaks more efficiently than current methods. Our assessment fully incorporates social and environmental costs in making the assessments, and we outline our future plans in terms of developing how we value the environment within the planning process in Section 3.9.1 of this Statement of Response.

Respondent	Item	Point of detail made in the response	Our reply
Natural England	118	The respondent notes our commitment to improving levels of service for drought permits and orders, non-essential use bans, and emergency drought powers. They understand that more work is required on how this would work in practice, but welcome improved levels of service that would mean more water available in lakes, reservoirs and rivers.	We thank Natural England for their positive comments regarding our commitment to improving minimum stated levels of service for drought permits and orders by 2025. In Appendix D of our *Revised Draft WRMP19 Technical Report - Supply forecasting* we have set out how we would make the changes in practical terms, in a future Water Resource Management Plan or Drought Plan.
Natural England	119	The respondent notes our aspirations to improve the resilience of our supply network against a range of hazards, and that the WRMP19 plan is focused on targeting improving resilience of the Manchester and Pennine Aqueduct. They note that we are seeking views on the five solutions proposed, and welcome the supplementary HRA and SEA provided. They say that the SEA provides pointers to which of the solutions provide the greatest resilience benefit and which are most harmful to the environment, and note that the SEA concludes that solutions C and E have the greatest range and magnitude of environmental effects, whilst D and E offer the greatest resilience benefit. They suggest that on this evidence, solution D is the most preferable. However, the respondent says that they found the presentation of the solutions and options as part of the scheme confusing, and that it is complex to compare the solutions. The respondent notes that there is uncertainty about the effects on water quality through new groundwater abstractions in solutions A, B, D and E. They say that their preference is for a solution that has the least effect on designated sites, protected landscapes, priority habitats and species, biodiversity, and which has the lowest carbon emissions and air quality effects.	We have completed our options appraisal to select a preferred solution for Manchester and Pennines resilience, which has been informed by the environmental appraisals as well as customer preferences and cost-benefit analysis. The preferred solution (solution D) has relatively low environmental impacts compared to other candidate solutions. For example, no groundwater abstractions (and no new abstractions) are required under solution D and therefore there is no potential for impacts on water quality. Without further guidance, it is unclear how the solutions could have been presented in a different manner. Notwithstanding this, the presentation of our preferred Manchester and Pennine Resilience solution in the revised SEA has been amended accordingly.

Respondent	Item	Point of detail made in the response	Our reply
Natural England	120	The respondent agrees with the conclusion in the HRA that the resilience solutions are unlikely to have significant effects on European sites, alone or in combination. They recognise that additional environmental investigation and HRA will be required at the project level, and are reassured by the conclusion that there is nothing to suggest that effects on European sites would be an unavoidable outcome of the resilience options/solutions. They note that whichever resilience solution is adopted, there will be need for considerable engagement with Natural England at the pre-application and formal consultation stages of individual options. The respondent therefore welcomes the early contact from us in early 2018, where we began dialogue regarding the solutions and options for the Manchester and Pennine Resilience scheme. They welcome continued early engagement in order to help with to help with options appraisal, advising on commissioning environmental work to improve the quality of results and assistance with the Discretionary Advice Service (DAS).	We thank Natural England for providing these views and we look forward to continuing to work with Natural England as we take the preferred solution forwards.
Natural England	121	The respondent wishes to see an acknowledgement in our final plan of the consideration we have given to sustainable catchment management to improve resilience of the water supply to West Cumbria after 2022, when this part of the Strategic Zone will become primarily dependent on Thirlmere as its water source. They recognise the challenges that we face over land use change, and highlight the need for us to engage and consult with a range of interested parties over what this management might look like. They will continue to help and support us in this respect.	Our strategy for catchment management, and our partnerships with tenants and landowners, is discussed further in Section 3.9.2 of this Statement of Response, and we have added further detail into the wider submission. We will continue to report on progress in West Cumbria as part of the Annual Water Resources Management Plan review, which is shared with stakeholders. We thank Natural England for their commitment to continue to work with us regarding catchment management.
Natural England	122	The respondent appreciates that there is considerable uncertainty about the timing and demand for supply associated with water trading. They say that the 'pathway' approach therefore makes good sense, with an adaptive plan at this stage that allows for potential future trading.	We thank Natural England for their comments regarding our work to facilitate a future water trade and use of our adaptive pathway approach. We describe our plans for further investigation of water trading in Section 8.4 of the *Revised Draft WRMP19* main report.

Respondent	Item	Point of detail made in the response	Our reply
Natural England	123	The respondent understands the need for supply options to facilitate water trading and appreciates that this is an early stage in identifying these options, but welcomes the completion of the HRA. They say that it would be helpful if our plan included an assessment of the effect of the transfer in terms of the effects outside of our supply area. They note that the HRA and SEA direct to Thames Water's draft plan for this, but it does not consider the potential transfer.	As set out in Section 5.3 of the *Strategic Environmental Assessment of the Revised Draft Water Resources Management Plan 2019* (and previously included in Section 5.3 of the *Draft Water Resources Management Plan 2019: Habitats Regulations Assessment*), we have agreed with Thames Water that any environmental impacts downstream of Lake Vyrnwy in the Severn and Thames catchments associated with a possible transfer would be assessed in Thames Water's Water Resources Management Plan. We have checked with Thames Water, and the Strategic Environmental Assessment (SEA) and Habitats Regulations Assessment (HRA) of its draft WRMP does consider the potential transfer of water from Vyrnwy via the River Severn. Whilst a bulk transfer does not currently feature in Thames Water's (or any other water company's) preferred plan, exploration of water trading remains our preference. To align our plan with others, water trading no longer forms part of our preferred plan, but we have retained our strategy to facilitate a potential future water trade within an adaptive pathway, which could form a future preferred plan if water trading was subsequently required in future. As a result, Appendix F of the *Strategic Environmental Assessment of the Revised Draft Water Resources Management Plan 2019* contains an assessment of the cumulative effects of the two trading portfolios we have identified, with the assessment of option B2 revised to reflect the findings of Thames Water's draft WRMP SEA. As the HRA is an assessment of the plan that is intended for adoption, and is not required to consider alternatives at the screening/appropriate assessment stages, the assessment undertaken at draft WRMP stage has been retained in Appendix H of the *Revised Draft Water Resources Management Plan 2019: Habitats Regulations Assessment*, but has not been updated.
Natural England	124	The respondent says that they are happy with the conclusion for Option WR099b (Worsthorne), that significant effects on bird interest features from the nearby South Pennine Moors Phase 2 SPA can be avoided by avoiding construction activities during the breeding season.	We thank Natural England for their comment, however, it should be noted that this option no longer forms part of our preferred plan for WRMP19, as water trading is not part of the preferred plan, as explained in Section 3.6 of this Statement of Response. We describe our plans for further investigation of water trading options under the adaptive pathway in Section 8.4 of the *Revised Draft WRMP19* main report.
Natural England	125	The respondent notes uncertainty on the effects on the Rochdale Canal SAC from the Python Mill supply option (WR114). They say that the identification of an alternative source provides the necessary level of safeguard to enable a conclusion of no adverse effect at this stage in planning.	We thank Natural England for their comment on this option, and the recognition of the potential alternative source that we included in our draft WRMP. In light of the concerns raised by the Environment Agency and Natural England, taking into account the uncertainties identified in the HRA with regard to possible effects on the Rochdale Canal SAC, and due to the fact that water trading no longer forms part of our preferred plan for WRMP19, option WR114 (Python Mill Borehole) is not being taken forward as a preferred WRMP option (or within the water trading adaptive pathway). This is explained further in Section 3.8.1.1 of this Statement of Response.

Respondent	Item	Point of detail made in the response	Our reply
Natural England	126	The respondent says that they are reassured that the control structures associated with option WR159 can be appropriately located and constructed to avoid loss or damage to interest features within the European Sites, or can be omitted from the list of reservoirs if the project-level HRA shows that there will be an effect.	We thank Natural England for their comments in relation to option WR159 relating to the improved reservoir compensation controls. We understand that there will need to be further discussions with Natural England and the Environment Agency regarding this option and to ensure there are no impacts on designated sites. We will continue this dialogue to ensure that if the option is considered further for implementation, project level HRA impacts have been considered early on in the process. However, the option no longer forms part of our preferred plan for WRMP19, as water trading is not part of the preferred plan as aforementioned. We describe our plans for further investigation of water trading options under the adaptive pathway in Section 8.4 of the *Revised Draft WRMP19* main report.
Natural England	127	The respondent raises that the proposals for Thirlmere and Haweswater as part of option WR160 need re-examining before they can be satisfied with the conclusion. They say that our environmental consultant, Wood (previously Amec Foster Wheeler), are incorrect in their assumption that St John's Beck does not support the habitat interest feature of the River Derwent & Bassenthwaite Lake SAC. The respondent also raises that Wood have not given any consideration to the environmental effect of more exacting control of the compensation flow to the licensed rates, and that it might have a significant effect on SAC designated watercourses and add to existing water quality problems. They suggest it would be prudent to omit Haweswater from the list of options, and give further consideration to the potential effects of the proposed control at Thirlmere.	We thank Natural England for their comments in relation to option WR160 relating to the improved reservoir compensation controls. We understand that there will need to be further discussions with Natural England and the Environment Agency regarding this option to ensure there are no impacts on designated sites. We will continue this dialogue to ensure that if the option is considered further for implementation, project level HRA impacts have been considered early on in the process. However, the option no longer forms part of our preferred plan for WRMP19, as water trading is not part of the preferred plan. We describe our plans for further investigation of water trading options under the adaptive pathway in Section 8.4 of the *Revised Draft WRMP19* main report.
Natural England	128	The respondent says that some consideration should be given to the effect of a more tightly controlled discharge to the River Lowther as part of option WR159.	We thank Natural England for their comments in relation to the River Lowther and the potential effects of reducing the compensation. We understand that there will need to be further discussions with Natural England and the Environment Agency regarding this option to ensure there are no impacts on designated sites. We will continue this dialogue to ensure that if the option is considered further for implementation, project level HRA impacts have been considered early on in the process. However, the option no longer forms part of our preferred plan for WRMP19, as water trading is not part of the preferred plan. We describe our plans for further investigation of water trading options under the adaptive pathway in Section 8.4 of the *Revised Draft WRMP19* main report.

Respondent	Item	Point of detail made in the response	Our reply
Natural England	129	The respondent notes that the HRA identifies an uncertain operational effect of option WR821 (Shropshire Union Canal and Llangollen) on the River Dee and Bala Lake SAC. They would like reassurance that this source could be replaced by other sources if it is concluded that there would be an adverse effect on the SAC, or suggest that this option should be omitted from our final plan.	Please also see our response to item 30. It is understood that water from the River Dee would not be required for this option. Notwithstanding this, the option no longer forms part of our preferred plan for WRMP19, as water trading is not part of the preferred plan. We describe our plans for further investigation of water trading options under the adaptive pathway in Section 8.4 of the *Revised Draft WRMP19* main report.
Natural Resources Wales	130	The respondent welcomes the opportunity to consult on the draft plan and highlights that they have reviewed the plan with respect to Welsh interests only.	We thank Natural Resources Wales for taking the time to respond to the consultation on our draft plan and note that they have reviewed it with respect to Welsh interests only.
Natural Resources Wales	131	The respondent confirms that they have no comments on the information provided on supply options that could affect Wales. They expect to be consulted further should these options, or any other option that could affect Wales, be progressed further for the final plan, to fully address any environmental considerations and mitigation requirements. They also expect to be consulted on the revised SEA and HRA reports.	We have consulted with Natural Resources Wales throughout development of our plan to date, including through to development of our revised draft WRMP. This has included our proposals on water trading, our Hurleston supply option to facilitate this trade, and revision of our SEA and HRA. We held a workshop with a number of consultees in June 2018, including Natural Resources Wales, to discuss these proposals in further detail. We will continue to engage with Natural Resources Wales on an ongoing basis beyond WRMP19, particularly as the proposals for national water trading develop. Whilst water trading remains United Utilities' preference, a bulk transfer does not feature in Thames Water's (or any other water company's) emerging WRMP and therefore water trading is no longer being pursued as part of the preferred plan for WRMP19. This is explained further in Section 3.6 of this Statement of Response. We also describe our plans for further investigation of water trading options under the adaptive pathway in Section 8.4 of the *Revised Draft WRMP19* main report.
Natural Resources Wales	132	The respondent says that we should continue to work with them, the Environment Agency, and other water companies who have an interest in the River Severn, to ensure the modelling capability for the river is improved to better understand the water availability and environmental implications for options involving the River Severn.	We will continue to collaborate with all parties to support the water trading agenda and its subsequent further assessment towards the WRMP24 planning cycle. We recognise that there are a number of different responses of data and models for the River Severn, given the inherently different historic applications and purpose of each of the models in question. We agree that it is important for us to fully participate in groups such as the River Severn Working Group and associated Modelling Group to further develop common approaches and improved capability for the benefit of all parties. We will continue this form of engagement, as has proved so successful over many decades on the likes of the River Dee, where we have taken a key role in model development. We make commitments to future engagement in Section 4.3 of this Statement of Response.

Respondent	Item	Point of detail made in the response	Our reply
Natural Resources Wales	133	The respondent notes that the SEA has considered how our plan, in relation to our operations in Wales, contributes to objectives and goals of the Well-being of Future Generations (Wales) Act and Environment (Wales) Act. They ask us to summarise this information within the final plan.	Analysis of the preferred plan indicates that there is unlikely to have any significant impact on the achievement of the well-being goals or the objective for sustainable management of natural resources. This is because the construction and operation of the associated preferred options would not have any significant environmental effects in Wales, a reflection of their location and lack of hydrological connectivity with Welsh water bodies. This information is included in Section 6.5 of the *Strategic Environmental Assessment of the Revised Draft Water Resources Management Plan 2019*, and as requested, we have now summarised this information in Section 1.3.2 of our *Revised Draft WRMP19* main report. We also comment on the Well-being Act in the context of water trading within Section 3.6 of this Statement of Response.
Natural Resources Wales	134	The respondent asks us to consider working with Thames Water, Severn Trent Water, and other interested stakeholders, to jointly investigate opportunities to improve the environment and contribute to the Welsh Government's wellbeing goals around Llyn Vyrnwy.	We envisage further joint work with these organisations after the WRMP19 planning round to further explore water trading and Lake Vyrnwy as a core part of the proposals that have been assessed in our WRMP. As outlined elsewhere, at this time, the use of Lake Vyrnwy for water trading does not form part of the Severn Trent or Thames Water preferred plans, but we expect to explore this further towards WRMP24. We will continue to consider the Welsh Government's wellbeing goals as part of exploration of Lake Vyrnwy use, as appropriate. Whilst water trading remains our preference, a bulk transfer does not feature in Thames Water's (or any other water company's) emerging WRMP and therefore water trading is no longer being pursued as part of the preferred plan for WRMP19. However, we have retained an assessment of how a future trade could work as an adaptive pathway in Section 8 of the *Revised Draft WRMP19* main report, and outline our future plans and engagement in Section 3.6 of this Statement of Response.
Northumberland County Council	135	The respondent notes that they have no plans for significant increases in population in parts of the county that overlap into the Carlisle and North Eden Resource Zones.	We thank Northumberland County Council for taking the time to respond to our draft plan and note their information regarding future demand.
Northumberland County Council	136	The respondent notes the relatively limited supply surplus in the Carlisle Resource Zone, and are reassured by the strong management approach set out in our plan, involving enhanced leakage reduction, improved levels of service for drought permits and orders, increased resilience to other hazards and the continued exploration of national water trading.	We thank Northumberland County Council for their comments and are pleased that they are reassured by the strategic choices in our preferred plan for the draft WRMP. We note that our strategic choices for the revised draft WRMP remain the same, with the exception that water trading now does not feature in the preferred plan (as explained in Section 3.6 of this Statement of Response), but has been retained as an adaptive pathway in Section 8 of the *Revised Draft WRMP19* main report.
North West Wildlife Trusts	137	The respondent highlights a number of areas in which we could show leadership in best practice: catchment management and restoration; stopping pollution; wise use of water opportunities; and keeping our rivers flowing.	We thank North West Wildlife Trusts for their comprehensive response, particularly with regards to catchment management. Our strategy for catchment management is discussed further in Section 3.9.2 of this Statement of Response.

Respondent	Item	Point of detail made in the response	Our reply
North West Wildlife Trusts	138	The respondent says that there is a strong case for us to invest in natural flood management in upland catchments as we own large areas of land.	Our strategy for managing water catchments includes reducing the risk of flooding to downstream communities. This is discussed further in Section 3.9.2 of this Statement of Response.
North West Wildlife Trusts	139	The respondent asks to commit to assessing natural capital with the intent of integrating it into our decision making. They are keen to develop this work with us.	We determined that implementation of a natural capital approach for WRMP19 was not practical as there is currently insufficient guidance and the lack of a defined framework from which to make decisions. However, we recognise the benefits to this approach and the importance of using it for future planning rounds. As we continue to mature in our use of natural capital approaches, as described in Section 5.4.1 of our *Revised Draft WRMP19* main report, we aim to develop a better understanding of how they can be applied across our wholesale business and use the approach to guide subsequent water resources planning development for WRMP24. This is discussed further in Section 3.9.1 of this Statement of Response. We have a long standing history of working with the North West Wildlife Trusts and we will continue to look for opportunities to work in partnership where we have common interests.
North West Wildlife Trusts	140	The respondent says that it would be exemplary for us to demonstrate net gain in our capital projects, as recognised in the 25 Year Environment Plan. They are keen to help us in the development of net gain projects.	Environmental net gain will be embedded for our new infrastructure projects at an individual project level. This concept will incorporated at the planning stage of each project. This is discussed further in Section 3.9.1 of this Statement of Response and Section 5.4.1 of our *Revised Draft WRMP19* main report. We have a long standing history of working with the North West Wildlife Trusts and we will continue to look for opportunities to work in partnership where we have common interests.
North West Wildlife Trusts	141	The respondent says that the ending of long-term agricultural tenancies on our land gives us the opportunity to improve upland environments by managing the land differently. They note that where we have full agricultural tenants, options for addressing these issues are more limited, but where tenancies become vacant, a very different approach could be taken.	We are committed to managing our catchments in partnership with our tenants and other land owners. Our strategy for catchment management, including upland environments, is discussed further in Section 3.9.2 of this Statement of Response and Section 4.7.3 of our *Revised Draft WRMP19* main report.
North West Wildlife Trusts	142	The respondent welcomes a partnership with us to deliver high quality, easy-to-treat raw water into reservoirs, rivers and aquifers.	We have a long standing history of working with the North West Wildlife Trusts and we will continue to look for opportunities to work in partnership where we have common interests, including land management for multiple benefits.

Respondent	Item	Point of detail made in the response	Our reply
North West Wildlife Trusts	143	The respondent welcomes our work to reduce pollution, as reflected in our environmental performance figures for 2016, though says that there is more work and investment required.	We thank North West Wildlife Trusts for their acknowledgement of our work to reduce pollution we welcome the opportunity to work with them further. Working with the Environment Agency, we design catchment safeguard zones to protect water sources from pollution. Safeguard zones and other catchment initiatives rely heavily on partnership working with land owners and other stakeholders to deliver sustainable and resilient catchments. Through the evolution of SCaMP, we have developed an integrated catchment approach. The principles behind this approach enable us to deliver effective and efficient water management outcomes at a catchment scale. It brings together our understanding of water quality, water resources and flood management by taking a holistic systems approach to planning and service delivery. An example of this integrated approach is the Petteril Project where work in partnership with the Eden Rivers Trust to address nitrate issues in a groundwater safeguard zone has been combined with a project to address wider water quality and flooding issues in the catchment. Further information can be found in Section 3.9.2 of this Statement of Response and Section 4.7.3 of our *Revised Draft WRMP19* main report. Further detail on activities we have completed to protect water sources against pesticides is also provided in Section 3.2.15 of our *Revised Draft WRMP19 Technical Report - Options identification*.
North West Wildlife Trusts	144	The respondent supports a number of ways to reduce demand that we have included in our plan, including scaling up our demand management programmes in reducing leakage, improving water efficiency, and increasing metering.	We thank North West Wildlife Trusts for their comments and are proposing significant leakage reductions in our revised draft plan, and continue to increase metering levels. This is described further in Section 3 of this Statement of Response.
North West Wildlife Trusts	145	The respondent asks us to ensure that we are transparent about the environmental risk of water supply options.	We have published our Environmental and Social Costs reports alongside our revised draft WRMP to ensure transparency and provide details of our options assessment process. The E&S costings process is detailed in Section 5.4.1 of our *Revised Draft WRMP19* main report.
North West Wildlife Trusts	146	The respondent believes that they are a natural partner for us, and offer to be a delivery partner, a monitoring partner, an advocate and a supporter of our work.	We have a long standing history of working with the North West Wildlife Trusts and we will continue to look for opportunities to work in partnership where we have common interests.
NuGeneration Limited	147	The respondent asks us to clarify how we have allowed for a potential increase in future local demand, given that they are not currently in a position to specify their water demand requirements.	In the WRMP planning process, we use an uncertainty allowance called target headroom to allow for future uncertainties like those related to the demand for water. For WRMP19, these demand-related uncertainties are documented in Section 10 of our *Revised Draft WRMP19 Technical Report - Demand for water*. However, the same approach was used for WRMP15, when we were sizing the Thirlmere transfer to West Cumbria. To ensure we can allow for the potential increase in future local demand, we encourage a continuous working relationship with NuGeneration Limited to agree clear joint assumptions as to the water supply and wastewater requirements of this development going forwards.

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Respondent	Item	Point of detail made in the response	Our reply
NuGeneration Limited	148	The respondent asks us to clarify what spare capacity is available over current demand, before and after the new Thirlmere transfer scheme is implemented.	The Thirlmere transfer scheme has been designed at a capacity of about 85 megalitres per day (Ml/d) to account for "critical period" and "peak" type demands, similar to those documented in Section 7.3 of our *Revised Draft WRMP19 Technical Report - Demand for water*. In Regulatory Reporting 2016/17, "critical period" demand for water in West Cumbria was 52.5 Ml/d.
NuGeneration Limited	149	The respondent asks us to clarify what would trigger the need to implement the contingency plan detailed in Section 4 of our technical report on West Cumbria Legacy.	The contingency plan for the Thirlmere transfer scheme was originally defined as part of the 2015 WRMP and it has subsequently been updated each year. That previous report outlined that the contingency plan would be triggered for any reason that the Thirlmere transfer scheme proved 'undeliverable'. At the time, whilst the overall risk was considered to be low, the main risks associated with this included: - Additional ecological surveys or results of such surveys over and above those currently identified that causes a delay to the project delivery timescale; - Unforeseen ground conditions (geotechnical) preventing completion of the scheme; - Planning permissions, approvals and any resultant restrictions. Now that all necessary planning permissions have been achieved and the project is in the construction phase, the residual risks of triggering the contingency plan are considered to be very low.
NuGeneration Limited	150	The respondent welcomes the opportunity for further discussions around their water supply requirements once this information is sufficiently developed.	We welcome the opportunity to work with NuGeneration Limited regarding their water supply requirements once this information is sufficiently developed.
Ofwat	151	The respondent notes that our plan demonstrates good practice in a number of areas, including the approach to wider resilience, third party engagement and customer participation.	We thank Ofwat for their positive comments and recognition of good practice in these areas.

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Respondent	Item	Point of detail made in the response	Our reply
Ofwat	152	The respondent raises that the short-term leakage reduction in our draft plan is one of the lowest in the industry. They could not see evidence that there was customer support for our proposal or that it reflected the high importance customers place upon leakage reduction. They raised that leakage reduction was identified as customer's most favoured option, alongside encouraging the use of meters, but did not know how the research had influenced the final preferred programme. The respondent requires that we consider the level of leakage reduction further and justify this in our final plan.	We thank Ofwat for their comments regarding leakage. We understand that our stakeholders wish us to continue to be ambitious on our leakage detection and repair activities both now and in the long term and we have taken this consultation feedback seriously. As such, we are proposing setting more stretching and ambitious leakage reduction targets in our revised draft WRMP. Further details can be found in Section 3.2 of this Statement of Response and also in Sections 6.2 and 7.4 of our *Revised Draft WRMP19* main report (with further detail in supporting technical reports where referenced). We will provide greater clarity in terms of customer support in our revised draft WRMP and PR19 submission. The customer support for demand management options lead to this type of option forming the basis of our WRMP19. In our Draft WRMP19 baseline demand forecast, we set out our ambition to significantly reduce per capita consumption. We plan to achieve this via metering and water efficiency activity. Our *Revised Draft WRMP19 Technical Report - Demand for water* documents our planned metering programme, as well as the innovative approaches we are using to encourage meter uptake and promote water efficiency. In our Revised Draft WRMP19, following customer and stakeholder feedback, we are proposing an increased leakage reduction programme, effectively preselecting leakage options with the aim of maintaining resilience and reducing the likelihood of requiring supply options in the future.

Ofwat	153	The respondent notes that we have attempted to resolve wider national issues by considering water trading opportunities, but note that the trade included in our plan is not consistently represented within Thames Water and Severn Trent Water's plans, and that there is a mismatch in timing. They require further work in progressing the trade and encourage us to continue working with the other companies to ensure consistency. The respondent recommends that we continue to explore water trading, even if the uncertainty is not resolved by the final plan. They require revision to the final plan to reflect the outcomes of ongoing developments in this area.	Our revised draft WRMP does not include a water export from the North West to ensure alignment to the Thames Water preferred plan, however, we have retained a water trading pathway covering this potential strategic long-term option (or a smaller variant to Severn Trent Water or others in future). This reflects our recommendation in the plan that this is explored further towards WRMP24. We adopted a pathways approach (essentially a very detailed or scenario) in WRMP19 for water trading as we recognised the potential alignment challenges between company plans. This was also on the anticipation that the WRMP19 planning round would not be entirely conclusive with regards the River Severn transfer, and thus regardless of whether it was selected in other company plans, there would be a regulatory expectation of continuing future work on this option. By adopting a pathways approach, we believe this has removed some potential barriers to a water trade by allowing effective engagement and consultation on these long-term strategic proposals. Water trading was included in our 'preferred plan' at the draft WRMP19 stage, because our preference was to continue to explore this in future. Following this consultation feedback and meetings with the Environment Agency we recognise that there is a desire for consistency across the industry: trades that are not part of one company's preferred plan should not form part of another company's preferred plan. For the revised draft WRMP19, both Thames Water and Severn Trent Water have confirmed that the option does not feature in their preferred plans within the standard 25 year planning period. We have undertaken further engagement since the draft WRMP19 submission with both Severn Trent Water and Thames Water. We have also written to both companies to formally confirm the position from this dialogue. A water trade from the North West has not been selected in their preferred plans in the standard 25 year planning period at this stage. Thames Water considered a number of scenarios. The Severn Thames transfer is called on under a variety of scenarios tested. The earliest the transfer is required in these scenarios is the 2030's. The scenarios select a range of different support options up to 195 Ml/d in total. The 195 Ml/d support comprises of 180 Ml/d from Vyrnwy reservoir and 15 Ml/d from Severn Trent at Mythe. We have agreed to continue to work on the Severn Thames transfer beyond WRMP19. For Severn Trent Water, they have confirmed that they would like to work with us to explore a potential smaller 60 Ml/d export to support their WRMP24 submission. Given the current position (that a water export from the North West has not been selected in other company plans), our final planning and preferred plan/options submitted do not include water trading. However, we have retained a pathway in the plan for trading that would be triggered should it subsequently feature in the preferred plan for another company and continue to recommend that water trading is pursued. We will continue to work with others on water trading beyond WRMP19 towards the WRMP24 planning cycle. This will build on our approach to WRMP19, drawing on the ongoing collaborative, multi-organisational work through, for example, Water UK, Water Resources North, the River Severn Working/Modelling Groups etc. Given our experience in WRMP19, we will also actively support and engage on the WRMP24 planning framework.

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Respondent	Item	Point of detail made in the response	Our reply
Ofwat	154	The respondent says that we have used methods and data appropriate to the scale and complexity of the problem, particularly through the use of complex methods to address the potential large export to Thames Water.	We thank Ofwat for their comments regarding the tools and techniques we have used to assess the challenges highlighted in our plan.
Ofwat	155	The respondent says that we have demonstrated a clear approach to non-drought resilience, including freeze-thaw, and consideration of Ofwat principles of 'resilience in the round' within our draft plan.	We thank Ofwat for their comments regarding our approach to non-drought resilience. We have since reviewed the recent extreme freeze thaw events in 2018 against our previously modelled assessment, which demonstrated that our freeze thaw modelling based on the 2010/11 events has been an appropriate basis for testing our system to extreme demand events. Further detail on this is provided in Appendix B of our *Revised Draft WRMP19 Technical Report - Water supply resilience*.
Ofwat	156	The respondent highlights that we have demonstrated good practice in our wide ranging approach to customer participation and the use of innovative approaches, such as immersive role-playing research techniques.	We thank Ofwat for their positive comments regarding our innovative approach to consulting on our plan.
Ofwat	157	The respondent says that our draft plan is comprehensive, with the plan summary containing a clear overview of the plan and key consultation questions posed to the reader. They note that this is complemented by a customer booklet providing a high-level overview of the consultation process and the strategic choices selected in our preferred plan.	We thank Ofwat for their comments regarding our draft plan and the suite of documents published alongside our draft plan.
Ofwat	158	The respondent notes that customer views regarding levels of service have been explored and indicate that improvement is valued but not considered a priority for investment, with the findings of this research reflected in our choice to enhance service with respect to drought orders and permits through the proposed leakage reductions. They raise that it is unclear in our draft plan whether relative drought resilience levels was discussed with other companies. They recommend that this could be explored further.	We have undertaken further research, building upon our resilience levels of service research that we have already conducted, to see if additional context of other water companies' resilience levels influence our customers' decisions. This is discussed further in Section 4.3.6 of our *Revised Draft WRMP19 Technical Report - Customer and stakeholder engagement*.

Respondent	Item	Point of detail made in the response	Our reply
Ofwat	159	The respondent notes that customers appear to be generally supportive of water trading, although they have expressed concerns regarding the security and quality of their supply, and the potential cost and environmental impacts of facilitating the trade.	We have taken account of customer views on water trading throughout the process of developing our WRMP19. Our approach to extended methods options appraisal was driven by the clear customer and stakeholder concern that water trading would result in impacts to customers (e.g. levels of service, resilience) and the environment, providing the necessary reassurance, whilst also preventing barriers to water trading that would otherwise occur (with the resulting loss of benefit to customers in other regions). Details of customer views on water trading, and how we have taken account of these when developing our proposals, were provided in Section 2.5 and Section 6.5 of our *Draft WRMP19* main report. We have subsequently added further detail to Section 6.5 in particular within our *Revised Draft WRMP19* main report. We have recently undertaken a joint piece of customer research with Thames Water and Severn Trent Water regarding water trading, which found that customers in our region still have concerns about the impact on security of supply and water quality, as well as bill impacts and the environment; although some customers were also accepting of national water trading. Further details can be found in Section 4.3.10 of our *Revised Draft WRMP19 Technical Report - Customer and stakeholder engagement*. At this stage, as recognised in the draft plan, we acknowledge that further work would need to be done for future planning cycles to explore water trading in more detail, in particular should there be a definite confirmed need from another water company. This would involve further work to explore the nature of a water trade, along with the required options and any associated risks requiring further investigation. Section 8.4 of the *Revised Draft WRMP19* main report summarises our planned future work.
Ofwat	160	The respondent recommends that we continue to engage with customers regarding potential bill impacts.	Since the draft WRMP, we have completed acceptability testing research across our water and wastewater programme, including aspects related to water resources investment such as leakage. We have also undertaken further comprehensive research on the bill impacts and choices for the Manchester and Pennine Resilience scheme, research on water trading which included a bill impact component, and rerun our water resources Programme Choice Experiment. The details of research with a bill impact component subsequently undertaken are discussed in Sections 4.3.8-4.3.10 and 5.2 of our *Revised Draft WRMP19 Technical Report - Customer and stakeholder engagement*.
Ofwat	161	The respondent raises that it is not clear from our draft plan how our engagement with the Customer Challenge Group has shaped the plan and contributed to the decision making process. They require clarification on this in the final plan.	We have set out a clearer view on how we have engaged with the Customer Challenge Group and how that engagement has shaped our plan. Detail of this can be found in Section 4.1.1 of our *Revised Draft WRMP19 Technical Report - Customer and stakeholder engagement*.
Ofwat	162	The respondent says that the demand forecast is well documented and reference to the industry guidance has been made and appears to have been followed.	We thank Ofwat for their comments regarding our approach to demand forecasting. Our demand forecasts adhere to the guiding principles and the Water Resources Planning Guideline, and our *Revised Draft WRMP19 Technical Report - Demand for water* demonstrates the way in which we have consistently applied the latest methods and national best practice.

Respondent	Item	Point of detail made in the response	Our reply
Ofwat	163	The respondent raises that insufficient evidence is presented on the baseline leakage trends and how engagement with non-household retailers has shaped the demand forecast. They express concerns around the approach to baseline leakage, and highlight inconsistencies between the narrative and the data included in the planning tables: - The 'base year' leakage figure, 448 Ml/d is based on a three year rolling average and is higher than the reported 2016-17 actual performance figure, 439 Ml/d; and - It is unclear why, in the Strategic Zone's planning tables, total baseline leakage rises from 426 Ml/d in 2021-22 to 440 Ml/d in 2022-23, subsequently remaining constant for the remainder of the planning period. The respondent requires further justification for the trends presented to be provided in our final plan. They also require greater clarity on how engagement with non-household retailers has influenced the demand forecast.	We summarised our position on a number of aspects related to this response in Section 3.2 of this Statement of Response. In our revised draft WRMP, we have set out our rationale and approach to setting baseline positions and provided a robust justification for our baseline position in Section 4.2.2 of our *Revised Draft WRMP19* main report (with further detail in Section 4.6 of *Revised Draft WRMP19 Technical Report - Demand for water)*. The Strategic Resource Zone is the name for the combined Integrated Resource Zone and West Cumbria Resource Zone, as a result of the Thirlmere transfer. In our draft WRMP, we stated that the Thirlmere transfer would be implemented in 2022/23 and, as the planning tables start in the year 2020/21, there are a few years of purely Integrated Resource Zone data before the West Cumbria Resource Zone data is added in. While this is strictly correct, the addition of the West Cumbria Resource Zone data has made it appear like the baseline leakage is rising. For our revised draft WRMP, we have presented the combined Integrated Resource Zone and West Cumbria Resource Zone view from 2020/21 in the planning tables, with a note that this will only be the situation once the Thirlmere transfer to West Cumbria is delivered. It is also worth noting that we are aiming to deliver and implement the Thirlmere transfer to West Cumbria a year earlier than previously forecast, now expected by 2021. Section 3.2 of our *Revised Draft WRMP19 Technical Report - Demand for water* states that we "identified no tangible or quantifiable change in water efficiency practices" and, therefore, in our non-household consumption forecast, we have incorporated a continuation of the water efficiency trends we have seen historically. However, we have also included water efficiency scenarios (covered in Section 3.5 of our *Revised Draft WRMP19 Technical Report - Demand for water*) to show the potential in this area and we are working directly with non-household retailers to explore this further (we have included more detail on the work that in ongoing in Section 3.2 of our *Revised Draft WRMP19 Technical Report - Demand for water).*
Ofwat	164	The respondent highlights that we have demonstrated good practice in calculating available supply in line with guidance and using statistical approaches to help determine low frequency drought yields with higher levels of confidence.	We thank Ofwat for their comments regarding our approach to the calculation of our supply forecast.
Ofwat	165	The respondent notes that we have adopted an appropriate approach to determining target headroom.	We thank Ofwat for their comments regarding our approach to determining target headroom.
Ofwat	166	The respondent says that the supply-demand balance profile presented is in line with the assumptions of individual supply and demand components and appears to be consistent with guidance across the scenarios modelled.	We thank Ofwat for their comments regarding our supply-demand balance profile. The supply-demand scenarios modelled are presented in our *Revised Draft WRMP19 Technical Report - Options appraisal*, as well as being summarised in Section 9 of the *Revised Draft WRMP19* main report.

Respondent	Item	Point of detail made in the response	Our reply
Ofwat	167	The respondent highlights that we have demonstrated good practice in determining options, with appropriate screening criteria and processes for developing lists of options, and using an independent external consultant to undertake the screening process.	We thank Ofwat for their comments regarding our approach to options identification and appraisal.
Ofwat	168	The respondent requires greater clarity in our plan on the results of the options screening process and for us to provide greater rationale on the reasons for rejection of options.	We have updated the wording and tables in our *Revised Draft WRMP19 Technical Report - Options identification*, specifically Appendix G, to show the final reasons for the screening out of options in the overall process.
Ofwat	169	The respondent highlights that we have demonstrated good practice in engaging with third parties during our option submission process, in particular in holding a market engagement event.	We thank Ofwat for their comments regarding our approach to engaging with third parties during our development of supply and demand options to support a potential future water trade.
Ofwat	170	The respondent asks for greater clarity on the rationale of the supply options to support the trade of water, as it appears the aim is to maintain the surplus at the level it was prior to the transfer rather than to simply ensure the supply-demand balance is maintained.	Our approach was driven by the clear customer and stakeholder concern that water trading would result in impacts to customers (e.g. levels of service, resilience) and the environment. Feedback indicated a requirement that these be protected. This guided our approach at the pre-consultation stage of the WRMP process. This was an important part of our extended methods options appraisal approach to develop a plan that would provide the necessary reassurance, whilst also preventing barriers to water trading that would otherwise occur (with the resulting loss of benefit to customers in other regions). Recognising that a surplus has an inherent value, for example, greater drought resilience, we do not feel that it is appropriate that customers lose this benefit. This is particularly acute because our system would benefit from enhanced leakage reductions proposed in the WRMP which customers have valued (based on expected benefits) and ultimately paid for. Therefore, we used the extended methods options appraisal process to develop a plan for an assumed trade from the year 2035 to prevent deterioration from this position. However, it is important to note that we have not developed the options set under the water trading pathway to maintain a surplus supply-demand position per se, but rather, prevent deterioration of the metrics used in the extended methods process (as shown in Figure 34 and Table 20 of the draft WRMP). These metrics represented water resources performance reflecting customer and stakeholder feedback / impacts.
Ofwat	171	The respondent says that there are inconsistencies between the leakage reductions presented in the narrative and planning tables. They require this inconsistency to be addressed in our final plan.	We thank Ofwat for their comments and understand that this is a function of AMP7 (2020-2025 investment period) water resource zone changes. We have made changes to this in our revised draft WRMP, as summarised in Section 3.2 of this Statement of Response, and made amendments to the tables and wider submission accordingly.
Ofwat	172	The respondent highlights good practice in our approach to metering, particularly our free meter option and price promise.	We thank Ofwat for their comments regarding our approach to metering.
Ofwat	173	The respondent welcomes our target to reduce average per capita consumption in the long term by 2045, considering a wide range of water efficiency options.	We thank Ofwat for their comments.

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Respondent	Item	Point of detail made in the response	Our reply
Ofwat	174	The respondent notes that they are not providing comments on the Manchester and Pennine Resilience scheme, but expect to see a full justification for it in our business plan, including evidence of customer participation and a risk and costings assessment.	Subsequent to the draft WRMP, we provided a full set of evidence to Ofwat on 3 May 2018 as part of the business plan, covering the justification for the Manchester and Pennine Resilience scheme, including customer participation, risk assessments and cost assessments.
Ofwat	175	The respondent raises that the 'enabling works' option is a significant proportion of the total supply option cost in the planning tables but only limited information is provided on the scheme in the draft plan narrative.	More information on the 'enabling works', including the options considered and the scope of the selected option, has been provided in Section 6.4 of the *Revised Draft WRMP19 Technical Report - Options appraisal.*
Ofwat	176	The respondent highlights an inconsistency between the planning table and narrative for the third party supply option WR821.	The two figures of 4 Ml/d and 30 Ml/d relate to different aspects of option size or benefit. 30 Ml/d relates to the capacity of the scheme, whereas 4 Ml/d relates to an estimate of WAFU benefit to the supply-demand balance. We are continuing dialogue with the Canal & River Trust on this option, which will continue beyond the WRMP19 planning round and support future trading assessments contributing to WRMP24. This will allow us to further refine cost and options benefits accordingly. The explanation of WAFU benefit and its low relevance to the extended methods (as opposed to the more limited aggregated traditional approaches) process has been covered in a response directly to the Canal & River Trust (item 7).
Ofwat	177	The respondent notes that there is evidence of independent assurance of the draft plan and of engagement with the United Utilities Water executive team and the Board during the plan development and its approval.	We thank Ofwat for the acknowledgement regarding assurance of our draft WRMP. In line with the Defra guiding principles around collaboration with customers and consensus on delivery plans, we have continued to gain Board assurance on our revised draft WRMP, ensuring that the consultation period has resulted in an appropriate final plan and will be integrated into our wider business planning. Further information is detailed in Section 10 of our *Revised Draft WRMP19* main report.
Ofwat	178	The respondent highlights that we have demonstrated clear ambition through the inclusion of a national supply solution, taking into account the outcomes from the Water UK national project in the Severn-Thames transfer and the extension of statistical weather modelling to further assess the coincidence of drought in different areas of the country.	We thank Ofwat for their comments regarding our work to facilitate a future water trade. This remains a key and important theme in the revised draft plan.

Respondent	Item	Point of detail made in the response	Our reply
Ofwat	179	The respondent welcomes the fact we are part of the 'Water Resources North' regional group, and expresses that it expects the group to work to identify opportunities to support both regional and national water resources.	As mentioned in the draft WRMP submission, we are part of the Water Resources North group, which was inaugurated in 2017 to further promote collaborative working on water resources between organisations (currently water companies and regulators) in the North of England in future. Given the scale of some of the water resources challenges across the country, such regional planning groups are important to promote collaboration between organisations on water resources planning, and to support the national planning agenda. This builds on the progress made by organisations such as Water Resources South East (WRSE) and Water Resources East (WRE). We have participated in three meetings to date, with the key focus being to explore the role of the group in future to support subsequent cycles of the water resources planning process. It has also proven useful to discuss respective WRMP19 positions between the constituent companies to promote alignment of revised draft WRMPs. Whilst future group activities are still being defined, informed by the needs and outcomes from the WRMP19 planning round, it is envisaged that the group will play a key role in consolidating knowledge and seeking future opportunities, particular around water trading and transfers of water. Whilst large scale trades have been explored between WRMPs, as well as considering smaller scale options as part of the process, developing a collective and consolidated understanding of the opportunities and risks across the North, linking to the national water trading agenda. We envisage workshops on this topic after submission, and also a future broadening of the group interactions to collaborate with other sectors and organisations.
South Cumbria Rivers Trust	180	The respondent raises that the impact of our abstraction from Windermere on the availability of water in the catchment must be taken very seriously. They note our ongoing consultation with them and other stakeholders in relation to the Windermere abstraction licence review and the Windermere drought review. The respondent raises that our use of this water resource poses significant risks to the lake and river if there is a future need to implement a drought permit or drought order.	We continue to work with the stakeholder group on these studies to assess the impact of operation on Windermere and the River Leven and potential mitigation measures under the Windermere Scenario 2 drought permit. Please note our responses in item 64 and item 206 regarding the abstraction study and Windermere drought permit mitigation respectively. Since this response, the joint review of the Windermere abstraction licence has been completed; the output was shared with the Environment Agency and other stakeholders at an event in Kendal in June 2019. The review has concluded that the current abstraction regime has no significant impact on Windermere or the River Leven, and therefore we will not be seeking any changes to the abstraction licence. However, we are now proposing to remove the Windermere drought permit scenario 2 from our Drought Plan.
South Cumbria Rivers Trust	181	The respondent highlights that in the event of a drought permit/order, abstracting water from Windermere outside of the 'times of plenty' poses significant risks to biodiversity, local businesses and tourism in and around Windermere. They say that impacts of the drought permit options should be reconsidered.	There are two proposed drought permit options at Windermere which are described further in our Final Drought Plan 2018. For each of our drought permits and orders, we have prepared 'shelf-copy' environmental assessments, which consider the impacts of implementing a drought permit or order on the physical environment (hydrology, water quality), ecology (including fish) and landscape and recreation. These assessments have been prepared in consultation with the Environment Agency, Natural England and other stakeholders.

Respondent	Item	Point of detail made in the response	Our reply
South Cumbria Rivers Trust	182	The respondent welcomes our draft plan looking to further enhance resilience to drought, reduce the frequency of drought permits and to maximise the use of Windermere's water resource during 'times of plenty' to offer maximum protection to Windermere and the River Leven.	We note and thank South Cumbria Rivers Trust for their support of this element of the WRMP. These proposals remain in place for the revised draft WRMP submission. Our operations will continue to follow the practice outlined in Appendix 8 of our Final Drought Plan 2018.
South Cumbria Rivers Trust	183	The respondent notes that high leakage rates pose a significant risk to unnecessary pumping from Windermere. They encourage us to demonstrate a greater commitment to reducing leakage.	We thank South Cumbria Rivers Trust for their comments regarding leakage. We understand that our stakeholders wish us to continue to be ambitious on our leakage detection and repair activities both now and in the long term and we have taken this consultation feedback seriously. As such, we are proposing setting more stretching and ambitious leakage reduction targets in our revised draft WRMP. Further details can be found in Section 3.2 of this Statement of Response.
South Lakeland District Council	184	The respondent welcomes the draft plan's overall assurances of continuing and improving security of water supply in Cumbria and the North West, if projected trends of reducing demand continue.	We thank South Lakeland District Council for their comments regarding our draft plan.
South Lakeland District Council	185	The respondent welcomes the commissioning of a review to assess the impact of our abstraction licence on Lake Windermere in relation to recreational users, commercial interests and the environment. They raise the importance of the outcomes being fully taken into account in our final plan.	Please refer to our response in item 64 regarding the Windermere abstraction study, which we continue to progress. The outputs of this study will not be available in time to inform the revised draft WRMP submission, although we are including a scenario to assess the potential impacts of licence change in the WRMP19 process (see Section 9 of our *Revised Draft WRMP19* main report). The next steps in a WRMP context will be dependent on the conclusions of both the study and associated regulatory / stakeholder dialogue. It is likely that this will feed into future Annual WRMP reviews and five yearly WRMP plan cycles, given the WRMP19 timescales that we are currently completing. Since this response, the joint review of the Windermere abstraction licence has been completed; the output was shared with the Environment Agency and other stakeholders at an event in Kendal in June 2019. The review has concluded that the current abstraction regime has no significant impact on Windermere or the River Leven, and therefore we will not be seeking any changes to the abstraction licence. However, we are now proposing to remove the Windermere drought permit scenario 2 from our Drought Plan.
South Lakeland District Council	186	The respondent supports the approach taken to developing our draft plan and remains willing to work with us in later stages of our plan preparation, including during our consideration of the implications of the above review of the impact of our abstraction licence at Windermere in relation to recreational users, commercial interests and the environment.	We thank South Lakeland District Council for their comments, and will continue our consultation with them through the stakeholder group for the Windermere abstraction licence review that we have been undertaking. Since this response, the joint review of the Windermere abstraction licence has been completed; the output was shared with the Environment Agency and other stakeholders at an event in Kendal in June 2019. The review has concluded that the current abstraction regime has no significant impact on Windermere or the River Leven, and therefore we will not be seeking any changes to the abstraction licence. However, we are now proposing to remove the Windermere drought permit scenario 2 from our Drought Plan.

Respondent	Item	Point of detail made in the response	Our reply
South Lakeland District Council	187	The respondent supports our intention to reduce leakage by 80Ml/d (or 18%) by 2045, but recommends that our targets are increased.	We thank South Lakeland District Council for their comments regarding leakage. We understand that our stakeholders wish us to continue to be ambitious on our leakage detection and repair activities both now and in the long term and we have taken this consultation feedback seriously. As such, we are proposing setting more stretching and ambitious leakage reduction targets in our revised draft WRMP. Further details can be found in Section 3.2 of this Statement of Response.
South Lakeland District Council	188	The respondent welcomes improved resilience to drought through demand management, but says that this needs to be kept under review to reflect and take full account of the study considering the impact of our abstraction licence on Lake Windermere and the River Leven.	We agree that demand management, and its effects on resilience, should be kept under continual review. Formally this will take place through the five-yearly WRMP process, supported by annual reviews on delivery and progress against the formally adopted plan. We have incorporated the findings of the study as a WRMP scenario. Our *Revised Draft WRMP19* main report now includes a full section on the Windermere licence study (Section 9.2.1), and we summarise various related aspects in Section 3.5 of this Statement of Response. Since this response, the joint review of the Windermere abstraction licence has been completed; the output was shared with the Environment Agency and other stakeholders at an event in Kendal in June 2019. The review has concluded that the current abstraction regime has no significant impact on Windermere or the River Leven, and therefore we will not be seeking any changes to the abstraction licence. However, we are now proposing to remove the Windermere drought permit scenario 2 from our Drought Plan.
South Lakeland District Council	189	The respondent recognises the potential benefits of water trading, particularly if financial returns support enhanced levels of investment in maintaining infrastructure and reducing leakages and benefit water consumers in the North West and South Lakeland. They say that water trading should only be considered after the completion of the review of the impact of our abstraction licence on Lake Windermere and any necessary changes are in place.	We thank South Lakeland District Council on the recognition of the benefits of exploring water trading in our WRMP19 process. We recently completed further customer research on the attitudes to water trading, which is now presented in Section 4.3.10 of the *Revised Draft WRMP19 Technical Report - Customer and stakeholder engagement*. Given the scale of bill reduction, the potential to reinvest any returns from water trading was a key theme raised. This customer research, along with this consultation feedback, will be taken into account in informing our approach and policy in future, noting that water trading is currently still a long-term proposal subject to confirmed need based on other company WRMPs. The water trading proposals will continue to be explored into the WRMP24 planning round. The timescales are therefore such that, by this time, the Windermere abstraction review would be completed and any resulting recommendations already pursued. Further details can be found in Section 3.6 of this Statement of Response. Since this response, the joint review of the Windermere abstraction licence has been completed; the output was shared with the Environment Agency and other stakeholders at an event in Kendal in June 2019. The review has concluded that the current abstraction regime has no significant impact on Windermere or the River Leven, and therefore we will not be seeking any changes to the abstraction licence. However, we are now proposing to remove the Windermere drought permit scenario 2 from our Drought Plan.
South Lakeland District Council	190	The respondent supports the overall mix of priorities and measures in our preferred plan, subject to the issues and concerns raised above.	We thank South Lakeland District Council for their comments regarding our preferred plan and have addressed each of their concerns raised above.

Respondent	Item	Point of detail made in the response	Our reply
Welsh Government	191	The respondent notes that supply schemes that could affect Wales would only be required if another water company takes up the Vyrnwy water trade option and that the recipient company would be responsible for the environmental assessment of the trade. They wish to be consulted further should these options be progressed further for the final plan, along with Natural Resources Wales, including consultation on the revised SEA and HRA.	At this stage, the Vyrnwy water trade option has not been selected as part of other water companies' WRMP19 submissions, although we anticipate that this will be explored further for the WRMP24 planning round. We will continue to engage with the Welsh Government and Natural Resources Wales as part of exploring the potential for future water trading, and will ensure any resulting proposals address the relevant environmental considerations as part of the SEA, HRA and WFD processes. Our proactive approach to water trading ensures that, should any water trading option be selected in future, such assessments have already been considered to an appropriate stage as part of WRMP19. Further details can be found in Sections 3.6 and 4.3 of this Statement of Response, with specific reference to Wales.
Welsh Government	192	The respondent seeks assurance on a number of principles with respect to water trading: - Welsh communities and customers would not be disadvantaged and would not have to bear any resultant costs; - There would be no detrimental impact on the environment or wider ecosystem impacts e.g. recreation and amenity; - There would be no risk to the resilience of water resources in Wales for the duration of the agreement, and it will not result in Welsh water companies needing to find water resources that would be more expensive or environmentally detrimental; and - Any agreement should be reviewed or expire by the end of the 25-year WRMP period.	We thank Welsh Government for making clear the assurances they would require, should a water trade from Lake Vyrnwy be pursued in future based on confirmed need by other companies. We will fully take account of these considerations as part of developing future proposals, as appropriate. However, at this stage, in response to these points it is worth noting: - We would ensure that Welsh communities or customers would not be disadvantaged, as the costs of any water trade would ultimately be borne by the receiving water company; - The principle of our plan has been to ensure that the environment and customers are protected from any water trade. Future proposals would be subject to full SEA, HRA and WFD assessment, the former of which accounts for the impacts on recreation/amenity. Broadly, the volumes and patterns of use of Lake Vyrnwy would be comparable to without a water trade, just with a change as to which water company is utilising the water at a given time (recognising that there would be changes to the river flow regime downstream of the reservoir itself if that is used to convey the water); - Linking to the above, there would be no impact on Welsh water companies or resilience resulting from the proposals; and - Any water trade would need to be subject to detailed contractual and licencing considerations, detailing periods of review etc. associated with this. We note Welsh Government requirements for any subsequent agreements being pursued.
Windermere Lake Cruises Limited	193	The respondent welcomes our decision to use the most sophisticated methods available to model the supply-demand balance.	We thank Windermere Lake Cruises Limited for their comments regarding the tools and techniques we have used to model the supply-demand balance.

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Respondent	Item	Point of detail made in the response	Our reply
Windermere Lake Cruises Limited	194	The respondent raises that it is essential that there is sufficient resilience built into our plan to be able to deal with the consequences of more severe/extreme droughts in the future.	We agree and have developed industry-leading tools and techniques to investigate drought resilience, as outlined in Section 4.4.8 of our *Revised Draft WRMP19* main report. Whereas in the past, our planning has focused on the worst historic droughts, we now also incorporate more severe synthetic but 'plausible' events (using stochastic hydrology), and couple these with the effects of climate change using the UKCP09 projections. As shown in Section 16 of the *Revised Draft WRMP19 Technical Report - Supply forecasting*, using these sophisticated tools we have forecasted our resilience to severe and extreme droughts over the course of the 2020-45 planning period. We measure resilience to this type of event in terms of how frequently we expect to implement emergency drought orders such as standpipes, bowsers or rota cuts. In all of our resource zones the anticipated frequency is less than 1 in 1000 years (0.001% annual chance). This resilience takes into account an emergency storage allocation that we retain for this type of event. May to July 2018 was a very dry period, and once the data become available we will update our assessments to see if there is any impact on our assessment of drought resilience. In addition to understanding the risk to our existing supply system from drought, we can also use these tools and techniques to test the benefits of new supply or demand options. This process will ensure that our supply system of the future is resilient to severe / extreme droughts. We will also continue to develop our tools and techniques, and look forward to the release of the UKCP18 climate change outputs.

Respondent	Item	Point of detail made in the response	Our reply
Windermere Lake Cruises Limited	195	The respondent notes that daily demand for water appears to have troughed in 2014 with a higher level of demand in 2015. They raise that the reasons behind this need to be properly understood as it could have significant implications for future demand estimates.	Demand forecasting is subject to inherent uncertainty accounted for in target headroom. Short-term fluctuations may be contrary to long-term forecasts or trends based on a range of external factors. We commented on the recent upturn in demand in Section 4.3.8 of our *Draft WRMP19* main report and presented a 'fan style' plot in Figure 19 (Section 4.3.8) showing a range of plausible scenarios (with further commentary included in *Revised Draft WRMP19 Technical Report - Demand for water*). Since 2015/16, we have also seen further short-term increases in demand that we will continue to monitor closely as part of the Annual WRMP process (noting that some of these have been driven by specific short-term factors such as freeze-thaw events). We will also continue work to further explore the drivers behind these patterns, recognising the demand management response to changing demand trends is important to ensure an ongoing supply-demand balance. We have updated our demand forecasts for our revised draft WRMP submission with revised base year data, taking account of this short-term trend, as well as assessing the impact of the uncertainty in a demand scenario. This has resulted in a 'closing' of the baseline supply-demand position, which has been a supporting driver for our choice to significantly increase leakage reductions to 15% over the first five years of the planning period, along with the customer and stakeholder feedback on the draft WRMP proposals. It is also worth noting that, at the time of writing, we are experiencing periods of increased demand caused by an extended period of above average temperatures and low rainfall across the North West. To date, having assessed data to the end of June 2018, the scale of demands experienced are consistent with those expected within the WRMP19 forecasts and modelling. Therefore, it is too early to conclude if current events warrant any update to the demand forecasts until we have observed a full year of data. We will consider the implications of the current event in the next Annual WRMP review.
Windermere Lake Cruises Limited	196	The respondent believes that we should be more ambitious in our leakage reductions, and aspire to industry leading performance, as the baseline regional leakage total is 448 Ml/d (which is 218% of the maximum daily abstraction from Windermere), and by 2044/45, total leakage will still be 368 Ml/d (or 180% of the maximum daily abstraction from Windermere).	We thank Windermere Lake Cruises for their comments regarding leakage. We understand that our stakeholders wish us to continue to be ambitious on our leakage detection and repair activities both now and in the long term and we have taken this consultation feedback seriously. As such, we are proposing setting more stretching and ambitious leakage reduction targets in our revised draft WRMP. Further details can be found in Section 3.2 of this Statement of Response.
Windermere Lake Cruises Limited	197	The respondent says that there does not seem to be any comparison with other water companies' levels of leakage reduction and that this is a serious omission.	We thank Windermere Lake Cruises for their comment. This information was provided in the technical reports, and we appreciate the set of documents is large, so will look to improve referencing between the main plan and technical reports. Comparison in terms of leakage and metering can be found in Section 4.5 of our *Revised Draft WRMP19 Technical Report - Demand for water.*

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Respondent	Item	Point of detail made in the response	Our reply
Windermere Lake Cruises Limited	198	The respondent expresses their hope that the draft plan would have embraced the concept of natural capital. They believe that natural capital accounting should be applied throughout the plan.	We thank Windermere Lake Cruises Limited for highlighting the benefits of a natural capital approach. We engaged an external consultant to complete a literature review and comparative analysis of different approaches to environmental and social impact assessment, including a natural capital approach. We determined that implementation of a natural capital approach for WRMP19 was not practical as there is currently insufficient guidance and the lack of a defined framework from which to make decisions. However, we recognise the benefits to this approach and the importance of using it for future planning rounds. As we continue to mature in our use of natural capital approaches, as described in Section 5.4.1 of our *Revised Draft WRMP19* main report, we aim to develop a better understanding of how these approaches can be applied across our wholesale business and use natural capital to guide subsequent water resources planning development for the next planning round, WRMP24. This is discussed further in Section 3.9.1 of this Statement of Response and Section 5.4.1 of our *Revised Draft WRMP19* main report
Windermere Lake Cruises Limited	199	The respondent says that they do not think there is currently sufficient resilience in the Strategic Resource Zone which is evidenced by the need to retain options within our Drought Plan, such as Windermere Scenario 2, which have unmitigated seriously adverse consequences for the local economy and environment.	We thanks Windermere Lake Cruises Limited for their views on our level of resilience. Our level of resilience to severe and extreme droughts is relatively high compared to that of other companies. Whilst on balance, given our assessments of resilience and customer/stakeholder feedback, we do not consider it appropriate to specifically invest to increase resilience, resilience is further increased as part of our plans as a supplementary benefit of enhanced leakage reductions. The scale of leakage reductions has been significantly increased in the revised draft WRMP. That said, it is normal for a water company to retain options (including drought permits) in its Drought Plan to help tackle droughts that are more severe than those experienced in the past, even though their likelihood of occurrence is expected to be low (as in this case). From a water supply perspective, these options add to the overall level of resilience in a resource zone to protect public water supplies in a very extreme event. Creating a supply system that was resilient to very extreme, but in-theory plausible droughts, without the support of Drought Plan options, would be prohibitively expensive. Having said this, we are acutely aware of the adverse impacts that drought permits can have, in particular Windermere Scenario 2. We are undertaking a study to look at mitigation options for this drought permit, as outlined in our response to item 206.
Windermere Lake Cruises Limited	200	The respondent welcomes the investment in the Haweswater Aqueduct maintenance project and agree with the approach proposed. They express the hope that during the delivery of this project every effort will be made to avoid unnecessary stress on other resources within the Strategic Resource Zone and that the level of service for drought permits and orders will be maintained throughout the duration of the works.	Works for Manchester and Pennine Resilience will be carried out by constructing new tunnel sections parallel to the existing aqueduct. During the periods of construction we will therefore be able to continue using the existing aqueduct and sources of water as we do today. Once the new tunnels are constructed, we will need short periods of outage to switch the operation from the old tunnels to the new section. These outages will be managed in a similar way to the aqueduct outages we carried out in 2013 and 2016. Careful monitoring and planning will be carried out to make sure that hydrological conditions are appropriate so that the outages can go ahead without causing unnecessary stress on the water supply system within the Strategic Resource Zone.
Windermere Lake Cruises Limited	201	The respondent raises that there have been a number of changes to the Strategic Resource Zone which will impact on the available supply, such as the pending connection of West Cumbria, which will significantly increase demand and increase stress in periods of drought.	We have assumed that this response refers to the abstraction sustainability improvements made at Swindale Beck. These, and further proposed sustainability changes, are already fully incorporated into the modelling for this WRMP to determine supply availability in the Strategic Resource Zone. The revised draft WRMP ensures that we have sufficient supply to meet demands, noting that we have enhanced our leakage reductions aspirations as part of our updated plan.

Respondent	Item	Point of detail made in the response	Our reply
Windermere Lake Cruises Limited	202	The respondent says that planning must be undertaken and capital allocated to improve the physical resilience of assets in order to mitigate drought problems.	As per our response to item 42, we have provided more details on our plans to invest to improve the resilience of our pumping stations. This is also covered within Section 3.5.2 of this Statement of Response.
Windermere Lake Cruises Limited	203	The respondent welcomes our proposal to reduce the annual average risk of drought permits and drought orders to augment supply from 5.0% to 2.5% by 2025.	We note and thank Windermere Lake Cruises Limited for their support of this element of the plan.
Windermere Lake Cruises Limited	204	The respondent suggest that the annual average risk of drought permits and drought orders should be improved to be the same as the annual average risk of drought orders to ban non-essential water used (1.25% from 2025).	The stated levels of service in the WRMP are 'minimum stated levels of service', so the frequency of drought permits and orders should be at least as good as the performance level stated. Apart from the changed level of service (and therefore implementation point) for drought permits in the draft WRMP, the timing of drought interventions is consistent with the principles set out in our Final Drought Plan 2018. This states that non-essential use bans would likely be imposed at the emergency storage level, and we still believe this is an appropriate level given the impacts of these interventions relative to the benefits. By comparison, drought permits are inherently different, in particular that in a drought event they are applied for, and implemented in, a phased manner depending on the circumstances at the time. For this reason, we do not feel it is appropriate that drought permits should be at the same point as non-essential use bans, particularly as more time is required to complete the process, and phasing of process to implement them. As a case in question, the two drought permit scenarios at Windermere are phased, bearing in mind the differential in impacts between them. In our Final Drought Plan 2018 (Appendix 6), we added further clarity that the Scenario 2 (lake drawdown) drought permit would be only be expected to be implemented when Haweswater reaches emergency storage. This more severe drought permit would thus have a lower risk than the overall minimum stated level of service for all drought permits, and therefore a similar frequency to non-essential use bans of around 1.25% annual probability (itself a stated minimum service level). We recognise stakeholder concerns on this drought permit option, and in reality, this would only be implemented if absolutely required in a very severe/extreme drought situation. We will consider level of service and drought interventions in subsequent revisions to the Drought Plan and WRMP.
Windermere Lake Cruises Limited	205	The respondent believes that the timescale for delivering improvements to the level of service for drought permits and orders is too long and should be delivered earlier than 2025.	In stating a minimum level of service we need to be confident that it can be achieved. As set out in Section 6.3 of our *Revised Draft WRMP19* main report, the improvement to level of service for drought permits and orders can be achieved due to the lower levels of abstraction associated with enhanced leakage reduction over 2020-25. The levels of leakage reduction planned during this period are very stretching and will be extremely difficult to outperform. We will nevertheless strive to do so, and if we manage to reduce leakage earlier than planned, the actual likelihood of implementing drought permits and orders will be decreased. However, right now we have insufficient confidence to plan for a change to the stated minimum level of service before 2025. In Appendix D of our *Revised Draft WRMP19 Technical Report - Supply forecasting* we have set out how we would make the changes in practical terms, in a future Water Resource Management Plan or Drought Plan.

Respondent	Item	Point of detail made in the response	Our reply
Windermere Lake Cruises Limited	206	The respondent strongly believes that where a drought permit and order has unmitigated seriously adverse consequences, such as Windermere Scenario 2, the option should be excluded from any drought plan and the resulting supply-demand balance should be reconsidered with alternative sources being used as a compensatory measure.	Firstly, we fully recognise and appreciate the concerns you have around the consequences of the Scenario 2 drought permit at Windermere. We expect to complete the mitigation measures study shortly, which should enable us to appropriately mitigate the risks/consequences. The implications of the study will be considered as part of the next iteration of our Drought Plan. However, if a feasible mitigation regime was not identified then this could result in this scenario being reconsidered as part of that review. It is worth noting though, that in a WRMP19 context the supply-demand balance assessments do not account for the benefits of drought permits or orders. The new assessments for WRMP19 of drought resilience, taking account of more severe or extreme events than historically observed, also exclude the potential benefit of drought permits to determine the level of risk.
Windermere Lake Cruises Limited	207	The respondent raises concerns about national water trading given the limited surplus between forecast supply and demand (including headroom) for the Strategic Resource Zone and that all forecasts/projections involve a degree of uncertainty. They believe that trading will result in more stress in times of drought for areas such as Windermere, having an adverse impact on businesses, communities and the environment.	Taking part in national water trading is something that could only occur in the medium to long term. A considerable amount of further investigation would be required before getting to this point. Even at this early stage of exploring the possibilities of entering such an agreement, we have put significant effort into ensuring that customers and the environment in the North West would be protected. This was informed by the responses received during the pre-consultation process. Our approach has not been to "trade away our surplus", but to develop sophisticated new tools and techniques which are designed to modify the supply system in a way that protects customers and the environment (yet represents the 'best-value' options to achieve these objectives). A range of new supply and demand options emanated from this process. A transfer from Kielder was considered along with many other options. Whilst it was not selected at this stage (on the grounds of cost) it would be further assessed should national trading become more of a reality. We agree that accounting for uncertainty in both our measured data and forecasts is critically important. In addition to headroom modelling we followed the principles of a technique called Robust Decision Making (RDM) which allowed us to examine uncertainties such as drought, climate change and demand to an extent not attempted in the water industry before. Therefore, we can be confident that our plan accounts for uncertainty in the best possible way at this time. This 'extended methods' process is outlined in Section 7.2 of our *Revised Draft WRMP19* main report. Our water trading position is summarised further in Section 3.6 of this Statement of Response.
Windermere Lake Cruises Limited	208	The respondent believes that investment should be made to create a national water network, connecting our Strategic Resource Zone to Kielder.	We note that this comment is of relevance to government policy as opposed to our company WRMP approach as such. However, it is worthy of note that our approach to developing a proposed approach to enable future national water trading has been developed to ensure resilience and the environment in the North West is protected. In appraising the options to meet this objective, we have treated all types equitably, and as it stands a specific transfer solution such as Kielder has not been selected given its relative cost to the level that it would not be justifiable in our WRMP. As it currently stands, there would need to be a specific policy objective for certain schemes of this type to provide justification for its selection.

Respondent	Item	Point of detail made in the response	Our reply
Windermere Marina Village	209	The respondent raises concerns that we have retained Windermere Scenario 2 within our Drought Plan 2017, due to serious unmitigated adverse impact on the local economy and environment. They say we should make greater efforts to reduce the likelihood of drought scenarios occurring through improved management of resources and leakage reduction.	As described in our response to item 206, we continue to work on the study to identify appropriate mitigation measures in the unlikely eventuality that the Scenario 2 drought permit is implemented. In our revised draft WRMP submission, we have significantly enhanced our proposed leakage reduction activities through the planning period, as described in Section 3.2 of this Statement of Response.
Windermere Marina Village	210	The respondent says that we should give leakage reduction a higher priority, and target a higher level of leakage.	We thank Windermere Marina Village for their comments regarding leakage. We understand that our stakeholders wish us to continue to be ambitious on our leakage detection and repair activities both now and in the long term and we have taken this consultation feedback seriously. As such, we are proposing setting more stretching and ambitious leakage reduction targets in our revised draft WRMP. Further details can be found in Section 3.2 of this Statement of Response.
Windermere Marina Village	211	The respondent believes that we should consider the long-term viability of Windermere as a resource. They note that the pumping station at Calgarth is outdated and often suffers from significant outages, whilst abstraction from Windermere can have a detrimental impact on the economy of the Lake and the ecology of the Lake and River Leven. The respondent suggests that we consider alternatives to Windermere, along with a far reaching review of the abstraction licence.	As per our response to item 42, we have provided more details on our plans to invest to improve the resilience of our pumping stations. Please also refer to our response to item 64, regarding the Windermere abstraction study, which we continue to progress. The outputs of this study will not be available in time to inform the revised draft WRMP submission, although we are therefore including a scenario to assess the potential impacts of licence change in the WRMP19 process (see Section 9.2.1 of our *Revised Draft WRMP19* main report). The next steps in a WRMP context will be dependent on the conclusions of both the study and associated regulatory / stakeholder dialogue. It is likely that this will feed into future Annual WRMP and 5-yearly WRMP plan cycles given the WRMP19 timescales. Since this response, the joint review of the Windermere abstraction licence has been completed; the output was shared with the Environment Agency and other stakeholders at an event in Kendal in June 2019. The review has concluded that the current abstraction regime has no significant impact on Windermere or the River Leven, and therefore we will not be seeking any changes to the abstraction licence. However, we are now proposing to remove the Windermere drought permit scenario 2 from our Drought Plan.
Individual 1 (AF)	212	The respondent raises that it is unacceptable that over 25% of treated water is lost to leakage. They say that we should put a greater emphasis on reducing leakage.	We thank the respondent for their comments regarding leakage. We understand that our stakeholders wish us to continue to be ambitious on our leakage detection and repair activities both now and in the long term and we have taken this consultation feedback seriously. As such, we are proposing setting more stretching and ambitious leakage reduction targets in our revised draft WRMP. Further details can be found in Section 3.2 of this Statement of Response.
Individual 1 (AF)	213	The respondent says that water trading should not be considered if it is likely to result in any shortage of supply in the Strategic Zone. They are concerned that changes made to the Haweswater catchment and the inclusion of West Cumbria may not be fully taken into account in total water available.	We would not enter any water trading agreement without suitably protecting customers and the environment. Water trading would be subject to significant further investigation and we have developed a plan to protect water supplies in the North West (see Section 3.6 of this Statement of Response for more details). The supply forecasting modelling for our WRMP19 submission reflects changes to water availability resulting from sustainability reductions to licences in the Haweswater catchment, along with the Thirlmere transfer to West Cumbria.

Respondent	Item	Point of detail made in the response	Our reply
Individual 1 (AF)	214	The respondent raises that there will be will be significant damage to the economy of South Lakeland if Windermere Scenario 2 is invoked as a result of water shortage. They say that we should fully utilise our strategic pumping capacity when conditions are available.	As per Appendix 8 of our Final Drought Plan 2018, we have committed to pump from Ullswater and Windermere when Haweswater is below the resource state curve, subject to appropriate caveats as described in detail within the plan. WRMP19 aligns to these operational principles. We continue to work on the study to identify appropriate mitigation for the Scenario 2 lake drawdown levels drought permit in engagement with stakeholders and regulators (see also item 206). We provide a summary of our position on related issues in Section 3.5 of this Statement of Response.
Individual 1 (AF)	215	The respondent says that our strategic pumping capacity may need considerable new investment due to its age. They recommend that we ensure that at least 50% of our pumping capacity is always fully available and will be used when Haweswater is below RSC. They say the cost of pumping and pump maintenance should be compared with the damage of an implemented drought plan and lake drawdown.	We recognise the importance of Windermere pumping choices and maintenance on the operation of our water supply system and on Windermere. Previously, as part of the Final Drought Plan 2018, different pumping regimes were examined which confirmed the use of the current resource state curve and we have made further commitments to pump appropriately subject to appropriate caveats as described in detail in this plan; WRMP19 aligns to these operational principles, recognising the comments around maintenance and potential impacts of unavailability. Ullswater and Windermere are strategically important water sources. We are planning substantial investment to improve the reliability and resilience of these sources in AMP7 (2020-2025 investment period). We have undertaken a comprehensive engineering investigation to assess the condition of the raw water pumping stations. These investigations are ongoing, and we are identifying key aspects of the performance of these assets (and their associated support equipment such as their power supply) that require improvement. This study will lead to improved resilience to equipment failure. The current draft United Utilities business plan for 2020-2025 includes approximately £8m of investment in these pumping stations. This substantial investment is intended to reduce out of service time and to ensure pumping capacity is maintained. In addition to this planned major capital investment, we also plan an improved maintenance and investigation programme for our raw water assets of circa £9m across the period 2020-2025. This maintenance programme will be supported through significant improvements in our maintenance and engineering response capability, brought about by the introduction of our Mobile Asset Resource Scheduling (MARS) system. MARS is planned to reduce response times for high priority equipment repairs and increases the efficiency of our maintenance teams. These significant planned investments will deliver improved serviceability and performance from our strategic pumping stations by 2025. We will continue to work on the study to identify appropriate mitigations for this drought permit in engagement with stakeholders and regulators.

Respondent	Item	Point of detail made in the response	Our reply
Individual 2 (CV)	216	The respondent supports our proposal for further leakage reduction, but thinks that our target should be higher over a shorter timeframe. They say that customers should be prepared to pay more for the safeguarding of water, and suggests that income from water trading could also be used to offset investment in leakage reduction.	We thank the respondent for their comments regarding leakage. We understand that our stakeholders wish us to continue to be ambitious on our leakage detection and repair activities both now and in the long term and we have taken this consultation feedback seriously. As such, we are proposing setting more stretching and ambitious leakage reduction targets in our revised draft WRMP. Further details can be found in Section 3.2 of this Statement of Response. Any water trading option would be expected to benefit customers, and research we have carried out has stated a preference for reinvesting any benefit into making improvements in performance in priority areas, rather than receiving a small reduction in bills. We would therefore consider reinvesting any water trading benefit in this way.
Individual 2 (CV)	217	The respondent does not support our strategic choice to improve levels of service for drought permits and orders, saying that 1 in 20 years is acceptable.	We recognise that improving levels of service for drought permits and orders is of a relatively low priority for some customers from our research and engagement activities. Therefore, rather than invest directly in new options, the improvements will be delivered as a supplementary benefit of our demand management activities, such as enhanced leakage reduction.
Individual 2 (CV)	218	The respondent agrees with our proposal to export water in the future and wishes to be consulted as we explore this further.	We thank the respondent for their support of a potential future trade and welcome further consultation as we progress our proposals.
Individual 2 (CV)	219	The respondent supports our chosen combination of strategic choices in our preferred plan, with the exception of thinking that improving levels of service for drought permits and orders is not a priority.	We thank the respondent for their positive comments regarding the strategic choices in our preferred plan. As explained above, improvement to levels of service for drought permits and orders will be delivered as a supplementary benefit of our demand management activities and requires no additional investment.
Individual 2 (CV)	220	The respondent believes that focusing on reducing leakage will reduce any environmental impact. They say that protection of habitats is crucial and that if there is any risk to habitats as a result of increased water abstraction then further focus and cost should be spent on preventing leakage as a priority. The respondent believes that only “avoiding” significant effects associated with our plan is acceptable, not “reducing” or “off-setting”.	We thank the respondent for their comments regarding a desire for increased leakage reduction, in relation to reducing environmental impact. We understand that our stakeholders wish us to continue to be ambitious on our leakage detection and repair activities both now and in the long term and we have taken this consultation feedback seriously. As such, we are proposing setting more stretching and ambitious leakage reduction targets in our revised draft WRMP. Further details can be found in Section 3.2 of this Statement of Response. We have also published a suite of revised environmental reports. Measures have been identified to, in the first instance, avoid adverse effects identified through the environmental assessments before consideration of mitigation.
Individual 3 (PS)	221	The respondent provides detailed information on possible ways of using water mains network models to assist with leakage reduction.	We thank the respondent for their detailed and comprehensive feedback and suggestions, and are developing a wide range of technologies and techniques to improve our ability to detect leakage, and appreciate such input. The options currently selected to meet our planned leakage reductions are included in Section 7.4 of the *Revised Draft WRMP19* main report. Further details are provided in Section 4.8 and 11 of our *Revised Draft WRMP19 Technical Report - Demand for water* cover more detail on our approach and leakage innovations.

Respondent	Item	Point of detail made in the response	Our reply
Individual 4 (SL)	222	The respondent says that the draft plan was well-written and readable, evidence-based, and with appropriate conclusions. However they raise that there is a lot to read and therefore consultees may not be able to follow the conclusions made. The respondent suggests that we communicate issues such as leakage clearly in the plan.	We thank the respondent for their feedback on our draft WRMP and positive comments (including overall support for our plan) balanced with appropriately constructive feedback. The observation is correct that there is a balance to be struck between the detail in the submission (ensuring the appropriate evidence for those that wish to see this, and to meet the requirements of the regulatory planning guidelines) and accessibility. Our approach in this regard has been very carefully considered (acknowledging that we should continually strive to improve), and the main report itself is actually shorter in length than our 2015 WRMP despite a greater complexity and coverage of the themes. In our view, it is also more accessible to stakeholders than many other company plans, which often include more technical detail within the main report. The need for accessibility for a range of parties led us to the 'tiered' approach to document submission, with a very high-level customer facing summary, the main report, and then much more detailed technical content in the supporting Technical Reports for readers to tailor their reading accordingly. In reality, the vast majority of readers of the main report are likely to be stakeholders and regulators, so the respondent is right to raise the point as to whether customers grasp the full context on decisions such as leakage. This is why, for both the draft WRMP, and subsequently revised draft WRMP, we complete separate customer engagement and research on such themes that do not rely upon a full read of the plan. This has included further research, in particular on leakage, water trading and non-drought resilience. This complements the consultation process, as it allows us to specifically provide context on complex themes and test the views of customers on these, to then inform the revised draft WRMP. We evidence this work in the *Revised Draft WRMP19 Technical Report - Customer and stakeholder engagement* and summarise this in Section 2 of our *Revised Draft WRMP19* main report. This type of work allows us to engage with consumers on the trade-offs and choices in the plan, as well as taking account of views from consultation, to then on-balance determine the updates to the WRMP19. We have also made improvements to the Summary of our Plan (Executive Summary) of the main report to make the content more accessible to any customers who look at this.
Individual 4 (SL)	223	The respondent says that reducing leakage is not economic and leads to higher bills. They also comment that fixing leaks may negatively affect the environment.	We thank the respondent for their comments and feedback, and factor into the assessment of leakage options external factors such as carbon, social and environmental costs as well as benefits. We are already operating below our sustainable economic level of leakage, however, in recent years there have been significant technological advancements and we are looking to new methods that we anticipate will change the economics of managing leakage, to enable lower levels of leakage to be achieved more efficiently. Please see Section 3.2 of this Statement of Response for more details.
Individual 4 (SL)	224	The respondent believes that the areas that supply water should get the best service, so Cumbria should be favoured. They say that a water trade should give significant benefits to our customers.	We note the respondent's suggestion as to who should receive the benefits of any potential future water trade. As we continue to engage on this potential future pathway, we will consider this further as appropriate. Similar themes have also been raised in new water trading research completed since submission of the draft WRMP. Please see Section 3.6 of this Statement of Response for more details.

Appendix B – Further information submitted to Defra in support of our revised draft plan

1. Introduction

This is United Utilities response to Defra's request for further information detailed in the letter dated the 8th February 2019. Following the submission of this information it will be included in the statement of response, published on the company's website and a copy sent to those that made representations on the draft WRMP19.

2. Resilience Investment and Outage Reduction

'A number of respondents, including the Environment Agency, were concerned about the resilience of the Ullswater and Windermere pumping stations. The company proposes a large investment before 2025 to improve the resilience of these pumping stations. If these pumping stations are not available then demand is moved onto other sources in the zone which compounds the issue of crossing drought triggers more often than the WRMP and drought plan suggest should happen. The company should explain what benefit this investment will provide, given the critical nature of these pumping stations in ensuring supplies in the Strategic zone. This additional information should describe what the £8M is being spent on, when it is being spent and how this investment will improve resilience. For example, will this investment mean that the assets are out of action less frequently and for shorter periods of time?'

United Utilities has currently allocated approximately £8m in AMP7 (Asset Management Period 2020-2025) to refurbish our raw water pumping stations, this includes both the Ullswater and Windermere pumping stations. This is a substantial investment within the total capital expenditure planned for the water resources price control and shows our commitment to ensure the resilience of these assets. The planned expenditure was included in our business plan submission in September 2018 and reflected in the IAP (Initial assessment of plans) in January 2019. In addition, maintenance is routinely undertaken on these assets and refurbishment has been carried out in AMP6 to ensure the reliability of these raw water pumping stations (Table 1).

Raw water Pumping Station Name	Description
Windermere	Bearings replaced on various pumps and one pump has received a full refurbishment
Ullswater	Five pumps and the ancillary systems refurbished in AMP6 (Delivered through a prioritised phased programme to ensure availability to minimise the risk of impacts during dry weather)
Haweswater	New motor on one pump
Lune	Two low lift pumps fully refurbished, two motors replaced and one high lift pump refurbished
Wyre	All five pumps refurbished in FY18
Caton	Bearing refurbishment and motor replacement in 2018

Table 4: Maintenance activities completed during AMP6 at key raw water pumping stations

We have undertaken significant maintenance to date as these pumping stations are large and complicated equipment which needs regular maintenance and therefore planned outage to ensure reliability (Figure 1).

Figure 1: Picture of Windermere raw water pumping stations

2.1 Timelines

The planned improvements to these pumping stations will involve complex major engineering activity, and will itself result in a period of outage for these assets. All major engineering work carried out by United Utilities is planned and scheduled with great care, to ensure that customer supplies are not interrupted. These are scheduled in an agile and flexible manner, taking into account progress with other major works (e.g. Haweswater Aqueduct maintenance) which may involve system outage, and the regional water resources position at the time. Planning of this work will ensure that multiple pumping stations are not refurbished at the same time to reduce the risk posed if this work were to coincide with a dry weather period. This approach will increase the construction period, however this is essential to protect customer supplies. Our current high level schedule for delivery is as follows, however we will provide regular updates on the progression of these pumping stations:

- At the start of AMP7 this project will be progressed through our WRAP process (Wholesale Risk and Asset Planning Process), to identify and score any associated risks and to consider the potential operational responses to these
- Requirements will be distilled as a result of WRAP, and these will be assessed by our internal engineering team who will independently challenge the risks; understand root cause; develop notional solutions in order to better define the scope, constraints and anticipated benefits of the interventions
- The project will then be presented with the collected evidence to senior management for approval to progress
- Our programme approach will be used to consider project interdependencies, so that batching and scheduling of these interventions is developed in the context of the wider system
- The project will be issued to our Capital Delivery Partners to design and build in accordance with our contractual framework agreement
- Project to be completed by the end of the AMP period, however this project will be prioritised to complete as early as possible in the AMP.

2.2 Proposed Scope

The scope of the refurbishment requires in depth engineering investigations, however the current proposed scope is as follows:

Ullswater Pumping Station

The current scope planned for the Ullswater pumping station in the AMP is; refurbishment of the electrical installation, upgrading of instrumentation and control systems, refurbishment of the pumps and their associated mechanical equipment and pipework.

Windermere Pumping Station

The current scope planned for the Windermere pumping station in the AMP is; refurbishment of the electrical installation, refurbishment of the pumps and their associated mechanical equipment and pipework.

2.3 Benefit of Refurbishment

Both Ullswater and Windermere pumping stations are over 50 years old and require regular planned maintenance to ensure reliability, however this planned maintenance can itself interfere with the availability of the stations. Once the planned refurbishment is completed the reliability and availability of the pumping stations will increase by decreasing the risk associated with outage. There will however be a requirement for planned outages to take place to ensure essential maintenance work. As with any asset there will continue to be a risk of reactive outages. We have modelled the impact of these key assets to our outage assessment with the assumption that the planned refurbishment is completed, together the assets contribute less than 1Ml/d to our assessed outage allowance. We believe that with the investment planned to be delivered that both of these stations will be available as required to support operational requirements, however we are not able to give a value at which we expect outages to reduce as these assets will still require regular planned maintenance in the future.

3. Outage Allowance

'The company WRMP and Business Plan for PR19 demonstrate it has high levels of unplanned outage. The company should include additional information in the final WRMP to explain its high levels of unplanned outage and how it intends to reduce this over time to come more in line with the industry average. The company should explain how the investment in the Ullswater and Windermere schemes will affect the company's outage allowance.'

Whilst the "outage allowance" included within our WRMP19 and our reported "unplanned outage" performance commitment to Ofwat are related, they are not the same measures. The following are the principal factors that result in differences between our performance as reported in each measure:

Difference	Unplanned Outage	Outage Allowance
Water Treatment Works output	"Peak Week Production Capacity". This is the maximum daily production that could be expected from a works for a period of seven days.	"Long term sustainable maximum production" . Whilst in many cases these figures are the same or similar they are not always, this is especially the case for larger, more complex works.
Hydrology or hydraulics	Not especially constrained by sustainable yield considerations, as it is focused upon a relatively short seven day duration, and typically raw water storage would ensure that a source could be utilised to either its licence or hydraulic constraint to support an unplanned outage.	Constrained to deployable output, which is itself highly dependent upon sustainable yield, in drought conditions.
Types of outage	Only includes the impact of unplanned outages, with various allowed exclusions.	Includes all credible outages during a drought condition.
Basis for target	Derived from historic and future expected performance.	Based upon a probabilistic simulation with an overall exceedance probability; our draft WRMP19 currently uses 80% exceedance.

In WRMP19 we adjusted our total dry year outage allowance from 77.3Ml/d (WRMP15) to 102.9Ml/d (Which is within industry norms). In WRMP15, the 95th percentile was used in deriving the outage allowance. A pan-industry review of outage allowance showed that percentiles selected were typically lower, and that we had adopted a more risk-averse view than most other water companies. Therefore, for WRMP19, we have reconsidered the choice of percentile and level of outage risk, in combination with the 75th-90th percentile range specified in the UKWIR 2016 guidance. This was also necessary because of several additional factors, including experience of actual outages and greater consideration of key potable water assets since the last planning round and to ensure adherence to best practice industry guidelines (UKWIR, 2016). The 80th percentile has been chosen to determine the outage allowance volume for each water resource zone for WRMP19. We are therefore confident we are within industry average for our outage allowance and it is the correct planning choice for WRMP19.

These changes were also made to reflect the wider range of operational events that could impact our ever more connected supply system, such as:

- Repairs across our potable, strategic, aqueduct system
- The increased outage rates associated with our industry leading deployment of start up to waste across all of our water treatment works
- More accurate accounting for the impact of outages of intermittently used assets
- Increasing raw water quality deterioration such as the impact of geosmin and 2MIB

Whilst this headline figure reflects a stated increase in outage, it was changed to align with the new operational realities of a flexible supply system operating within tighter water quality parameters partially delivered through automated shut-down and start up to waste capabilities. Modelling our system with a level of outage that reflects operational risk, enables us to ensure we are not stating a level of service that we cannot provide to our customers.

One of the key factors with the inherent flexibility of our integrated supply system is when outages occur the risk of supply loss or DO impacts is lower. Since much of the customer demand in our region can be met through multiple sources, we can react to unplanned failures in an economically more optimal manner, than if the demand could only be met with a single supply, where service is at risk immediately upon failure. We are often able to schedule our response to an unplanned outage in a cost effective and planned way, potentially tolerating a longer duration of outage, trading off speed with efficiency of response.

The stated unplanned outage performance and future targets reported in our PR19 business plan are due to be updated as part of Ofwat's early submission of regulatory data in May 2019. Whilst the figures are yet to be finalised, following the cross-industry alignment work we expect that our revised targets will be substantially lower than our earlier submission, bringing our future planned performance significantly closer to industry norms.

We will include an explanation of our expected levels of outage and our historic levels of outage within our final WRMP19 as requested.

We are aware that our performance in both planned and unplanned outages has a direct impact upon the level of service that our customers expect from us as a competent utility, providing an essential monopoly service. We are therefore initiating a suite of measures to improve our unplanned outage performance, through the remainder of AMP6 and into AMP7;

- We will be adjusting our standard response processes to a loss of production event, to ensure that our planned and proactive maintenance activities target the highest risk assets associated with outage events.
- We will be changing our proactive investment need identification process known as HAZREV (Hazard Review) to more fully incorporate hazards to sufficiency alongside hazards to water quality.
- We will be reviewing existing constraints to production capacity across our business to proactively identify and resolve these wherever practicable.

4. Windermere Licence Review

'The company must agree a timeline with the Environment Agency and local partners for completing the Windermere licence review project. This project is assessing the impact of 8 possible scenarios for the hands off flow on this licence. This issue has been raised in several representations. The company has included a scenario in its revised draft WRMP to represent its current view of the most likely outcome of the Windermere licence review project. The project is still ongoing and will be completed beyond the timeframe for the final WRMP. The 2018 dry weather incident has delayed action on this. The company needs to complete the project and any licence changes would need to be included in future WRMP annual reviews. The company should agree when this project will be completed with the relevant parties and include this commitment in its final WRMP.'

The Environment Agency has acted as a facilitator at meetings with local stakeholders. To date we have held two workshops with both the Environment Agency and local Stakeholders (2nd November 2017 and 4th July 2018), as well as further meetings during 2019 to finalise and present the output from the study.

A draft project report was sent to the stakeholders and the Environment Agency on the 28th September 2018. This was followed by a meeting with The Environment Agency on the 4th February 2019 to discuss the Environment Agency's comments on the draft report. At this meeting the Environment Agency agreed with our assessment of the impact of the different Hands Off Flow (HOF) scenarios on the lake and river hydrology and on our deployable output. The Environment Agency requested to have a further evidence and explanation to be considered in the report in regards to the link between lower flows on the Leven, water quality issues and the extent to which this is influenced by the UU abstraction. This analysis will help determine whether these parameters would have significant ecosystem benefits. This data is being requested from the Freshwater Biological Society by the Environment Agency and the timelines are dependent on when this data is received.

We included one of the Windermere HOF scenario (scenario H in the licence review study) as a scenario in our revised draft WRMP19. Scenario H increases the current HOF[17] on the River Leven to 373 Ml/d year round, however this is not necessarily the most likely scenario as stated in our SoR (August 2019):

> "For the Water Resources Management Plan we have incorporated one of the scenarios from the review into our testing of the preferred plan, reflecting the potential for a future licence change. The selection of which scenario to include in the Water Resources Management Plan was discussed and decided with stakeholders. It was selected simply to help represent the range of potential benefits and impact on supply; it should not be assumed that it is the most likely outcome of the review".

The review has now been completed and the output was shared with the Environment Agency and other stakeholders at an event in Kendal in June 2019. The review has concluded that the current abstraction regime has no significant impact on Windermere or the River Leven, and that the predicted benefits of the alternative scenarios are relatively minor compared to the significant potential impacts on deployable output and risk of severe drought actions. Therefore we will not be seeking any changes to the abstraction licence.

5. Operations and WRMP Assumptions

'The company should provide assurance in its final WRMP that its supply modelling is realistic and will be reflected in actual operation. There are concerns with the frequency it crosses its drought triggers as there is a large discrepancy between modelled and actual frequency of trigger crossings. The company should ensure that decision-making is based on the sustainable levels of abstraction included in the control rules that underpin its supply forecasting models. The company's governance structure must support using sources in line with the

[17] The existing Windermere HOFs are 273 Ml/d (May-Sep) and 136 Ml/d (Oct-Apr)

modelling assumptions in the water resources management plan during dry weather otherwise actual resilience will be well below that claimed within its plans. The company's final plan should address this concern.'

As outlined in our Technical Report – Supply forecasting section 5.1, prior to delivering our draft WRMP19 we reviewed and updated our Aquator model, which we use for our strategic and operational forward planning, WRMP and Drought Plans. Aquator is a rule based model which we align to our operational use of the system; we have built known constraints into the model to align as closely to reality as possible. Within Aquator, our water resources model uses historic/stochastic inflows and applies these to the current system configuration, therefore the actions taken and triggers crossed in a simulation of the 1995/96 drought would not necessarily be replicated in today's model. This is because of system changes, which have been reflected in our models, for example:

Improved resilience through enhancements in system connectivity and resource availability, such as:

- The construction of the West East Link Main (WELM)
- Groundwater changes such as the Royal Oak AMP6 project
- Thirlmere Aqueduct connection to Rivington and Franklaw water treatment works

Our WRMP19 is also written on the basis that West Cumbria is integrated into our renamed 'Strategic Resource Zone'. This connectivity will reduce the water resource risk to West Cumbria and was funded at PR14 after an examination in public in 2015 and inclusion as a preferred option in WRMP15.

WRMP19 incorporates stretching demand reductions in the long term supply demand balance. If these demand reductions are not met, we will be more likely to cross triggers than stated in our revised draft WRMP19. For WRMP24 we intend to build on our 'Adaptive Pathway' approach taking into consideration possible scenarios surrounding demand reductions.

Our water resource modelling includes for outage constraints through our outage allowance, however the model is used to predict resource availability and system vulnerability over a 25 year planning period. The model is unable to predict where outages will specifically occur in the future. The model is also unable to account for unexpected changes to planned work and short term policy changes and both impacted us in 2018. As detailed in section 3 we have put actions in place to improve this position going forward. The relatively high level of outage in 2018 had a number of particular drivers:

- An unusually high impact from planned capital investment, exacerbated by the 'freeze thaw' in early 2018 that reduced the window to carry out this work and caused atypical use of our supply system,
- A change to disinfection policy discussed with the Drinking Water Inspectorate that temporarily led to reduced maximum production capacities at some of our baseload plants which is currently being resolved,
- A substantial regulatory driven capital programme including the implementation of start up to waste, UV and mains cleaning which impacted all water treatments across our system

Our Aquator model is reviewed and adjusted throughout the year to ensure any changes to the supply system are captured. We are in the process of updating all of our resource control curves, which will continue to be used for strategic modelling feeding into WRMP24 and support operational decisions to help to ensure sustainable abstraction. This work should be completed by July 2019. All model changes are under strict governance with a strong internal audit and sign off process, to ensure that the model aligns with the current operation of the system.

We recognise that our governance structures must ensure that operational decisions are in line with our water resource management plan. Whilst we have always had close integration between our operational production planning and strategic water resource modelling teams we have recently further strengthened these links through the creation of a new management role in our production planning team, specifically responsible for strategic liaison between the planners and modellers. We have also reviewed and strengthened further the role of the company hydrologists in the operational decision making processes, both in dry weather and for business as usual situations. At our weekly production planning meeting we have escalated the importance of this by having the Director of Water Services chair the meeting and challenge all decisions. Our Chief Operating Officer is also now chairing a quarterly water resources meeting analysing last quarters decisions and the next quarters plan (taking into

consideration the current water resources position, outage level and projected rainfall and demand). We are also establishing a new design authority to govern the changes to both our operations and our water resources modelling to ensure consistency.

We will operate in a consistent manner between operations and WRMP / drought plan modelling. All other things being equal we would then expect to see actual trigger frequencies aligned to the drought plan, however weather patterns can affect crossing of triggers and therefore the short term view of trigger frequency may not be representative of a long run average. Upper triggers are necessary triggers for operational responses to ensure that we can achieve our targeted level of service as stated in WRMP19 and avoid unnecessary service interruptions, and as such, serve to ensure early warning and interventions prior to any impending dry year. The lower severity drought triggers are primarily our operational risk management precautionary measures to protect against the potential for severe or extreme drought, should dry weather persist, to prevent more onerous interventions further down the line. We have not implemented drought permits since 1995, therefore this is consistent with our current levels of service. In 2018 we did apply for drought permits but we did not implement them, nor did we implement a temporary use ban.

We understand that a particular concern has been our operational use of pumping from Ullswater and Windermere, compared to the modelled use. It states within the current 2018 Drought Plan, in Appendix 8, that we will optimise pumping when below the resource state curve at Haweswater Reservoir. Our Aquator model is configured to enable pumping when the storage at Haweswater drops below the resource state curve. Within the model, the volume of pumping at Ullswater and Windermere is linked to the hands off flows at each of the lakes and includes for spill and waterbank releases. Ullswater, which is directly linked to Haweswater, will usually turn on all available pumps once the pumping buffer has been met. Windermere feeds Watchgate directly, therefore is indirectly linked to Haweswater, the model will optimise the use of this source dependent upon the demand required from Watchgate, and therefore the model is well aligned to operational reality.

6. Resilience of Quarry Hill Treatment Works

'The Quarry Hill water treatment works that supplies water to the northern part of West Cumbria has not proved as resilient as expected during this year. Although these sources are being replaced by the Thirlmere transfer in 2022, the company should include information in the final WRMP on how it will maintain resilient supplies in this area before the transfer scheme is implemented.'

We acknowledge that the Quarry Hill supply system presented resilience challenges during the summer of 2018 and we have since undertaken an in depth review of the root causes to the challenges of supply. We have implemented a comprehensive series of actions to ensure that the risk of loss of supply from the Quarry Hill surface water supplies is minimised prior to the delivery of the West Cumbria transfer scheme. We are making excellent progress with the West Cumbria transfer scheme, which is ahead of our original programme and well placed to be supplying customers before the regulatory commitment date of March 2022.

Our key actions in the Quarry Hill system have included:

- Ongoing weekly reviews of all levels within the Quarry Hill raw water supply system for both surface and ground water sources. We have developed a set of operational trigger points to reduce demands on Quarry Hill and to protect and manage water resources,
- Installation of UV disinfection at Quarry Hill, providing more flexibility on the treatment of different sources
- Installation of a control valve at Chapel House to allow a more flexible and wider range of draw-off flow rates
- Operable and tested network rezones to reduce demand by approximately by 2Ml/d on Quarry Hill
- A robust and tested tankering plan to supplement key areas of the supply system.

This information will be included in our Final WRMP19 Technical Report - West Cumbria legacy.

7. WRMP Direction Compliance

'United Utilities must demonstrate compliance with Direction 3(e) in its final plan.
3 (e) the assumptions it has made as part of the supply and demand forecasts contained in the water resources management plan in respect of— (i) the implications of climate change, including in relation to the impact on supply and demand of each measure which it has identified in accordance with section 37A(3)(b);
The company has not assessed and described the impacts of climate change on each of its preferred options in the final planning scenario. The company must clearly state the impact of climate change on each preferred (final plan) demand options individually, including the assumptions made in the assessment, to meet Direction 3(e).'

It is important for us to consider the likely impact of climate change on our water resources to help define the resilience of our supply system. Our assessment of climate change impacts follows the highest tier of analysis and has been completed to meet the requirements of the latest Environment Agency guidance. Climate change has been assessed in a risk-based manner and our choice of approach is based on the outcomes of a resource zone vulnerability exercise. We engaged with the Environment Agency extensively throughout this process and held a full day special interest session with regulatory stakeholders. Section 4.4.4 of the rdWRMP19 main report covers a high level view of our approach to climate change for each of the zones. Climate change is outlined in detail within Section 10 of the *Technical Report - Supply forecasting.*

As detailed in Section 5.2 of our *Revised Draft WRMP19 Technical Report - Options appraisal*, our preferred plan for WRMP19 constitutes leakage reduction, as well as Manchester and Pennines Resilience. We have assessed there to be a negligible impact of climate change on leakage reduction options and will update Section 7.2.3 of our *Revised Draft WRMP19 Technical Report - Options identification* to cover distribution management options, as well as resource management options.

8. Further changes required

Following our IAP in January 2019, our leakage target in AMP7 has changed from a 15% to 20% reduction. This will improve our supply demand balance in AMP7 and therefore will require to be updated from the rdWRMP19 in order to finalise. The information of this change is presented below:

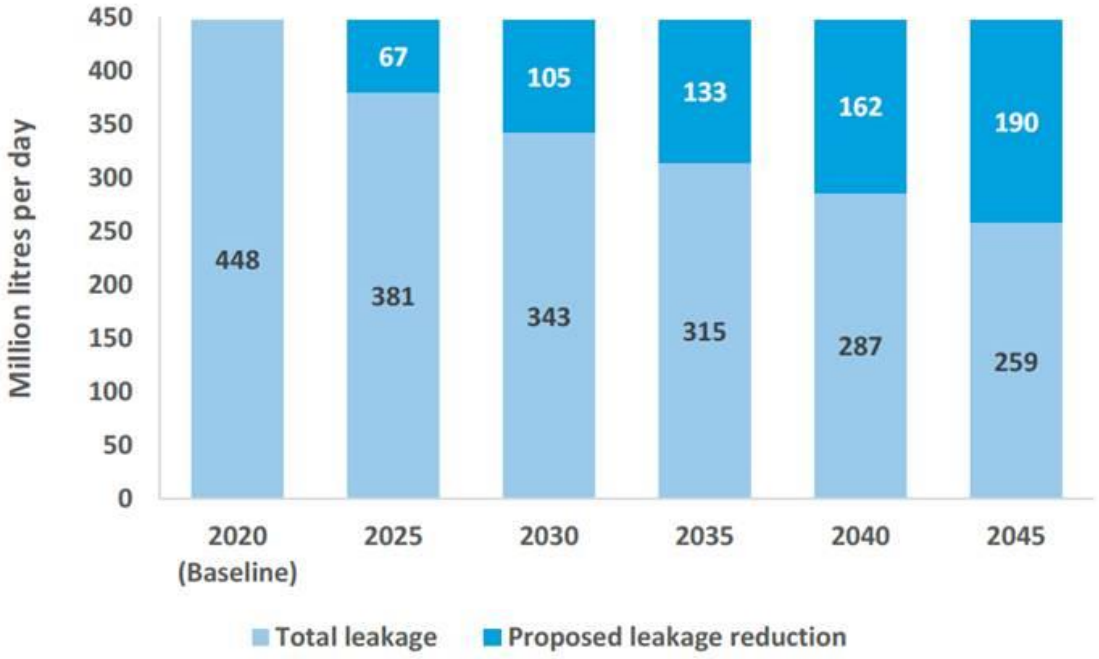

Figure 2: Leakage reductions as presented in the rdWRMP19.

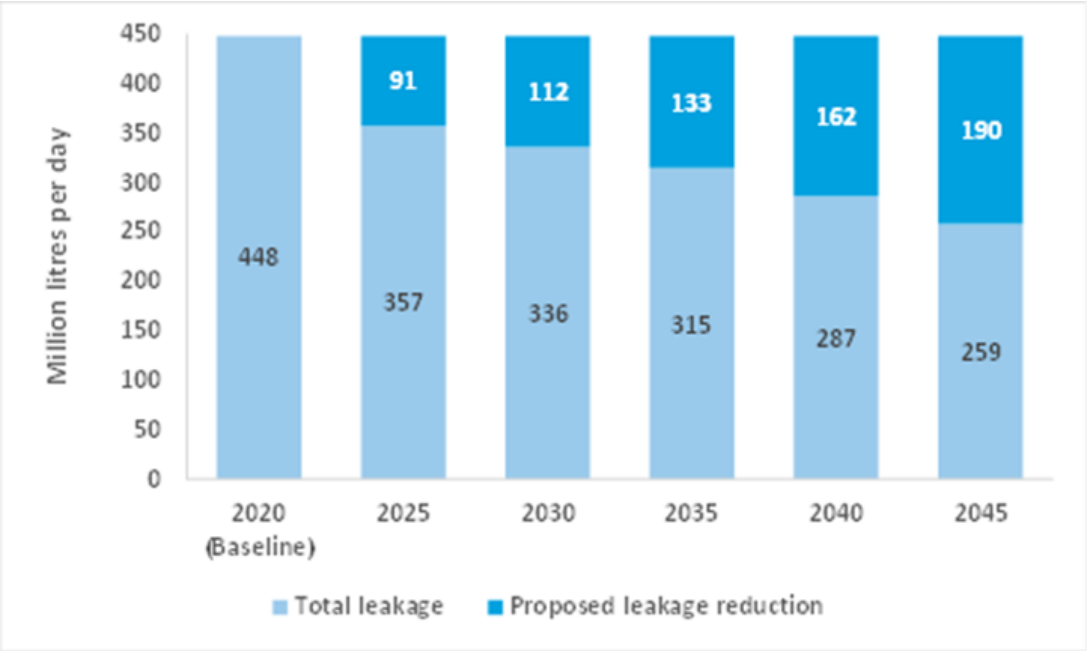

Figure 3: Leakage reductions agreed with Ofwat through the IAP, which will be inputted into the Final WRMP19.

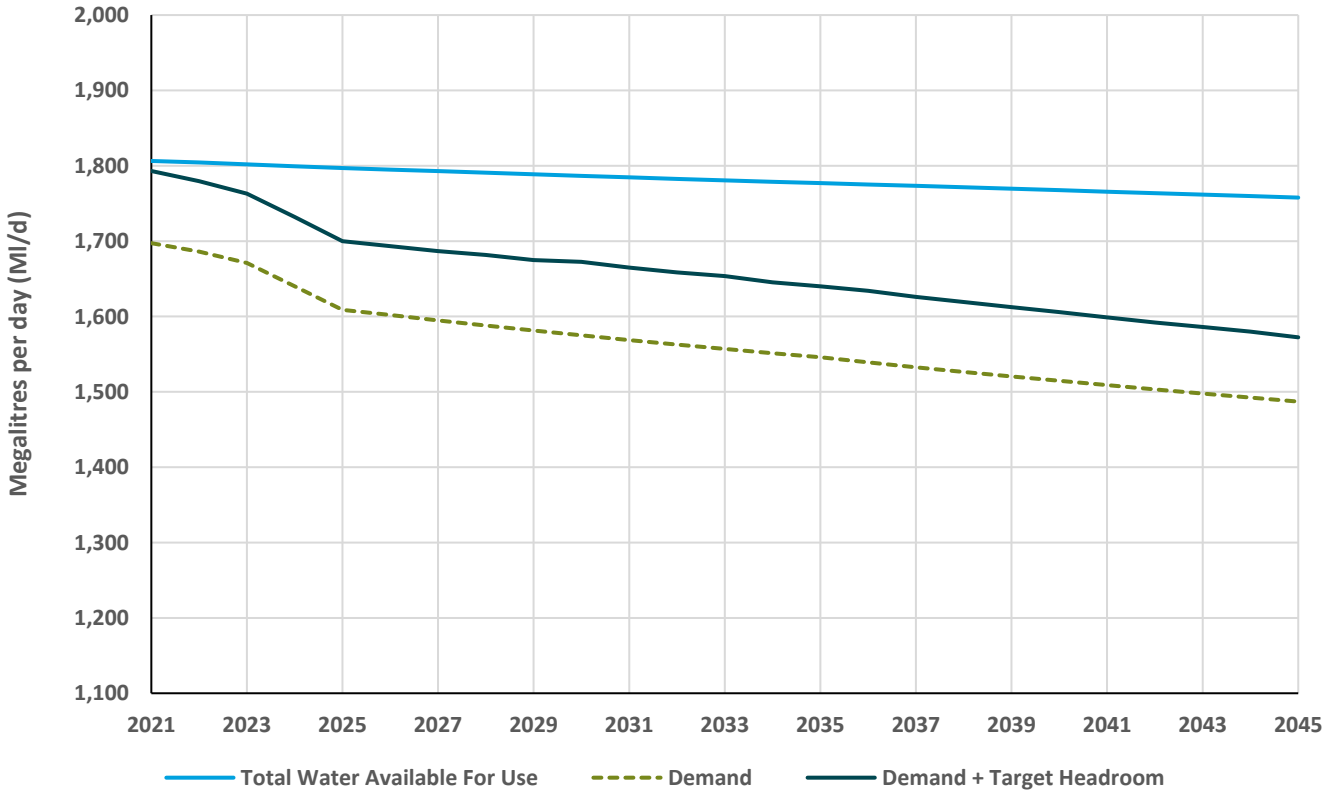

Figure 4: Demonstrating our water available for use and the impact of 20% leakage on our strategic resource zone demand.