Revised draft Water Resources Management Plan 2019

Statement of Response

Appendix 7: Our detailed response to all non-questionnaire respondent comments

September 3rd 2018

Appendix	Respondent
7.1	Environment Agency
7.2	Natural England
7.3	Ofwat
7.4	Historic England
7.5	West Sussex County Council
7.6	Kent County Council
7.7	Hampshire County Council
7.8	Worthing & Adur Councils
7.9	Test Valley Borough Council
7.10	New Forest National Park Authority
7.11	Dover District Council
7.12	Canterbury City Council
7.13	New Forest District Council
7.14	Partnership for Urban South Hampshire (PUSH)
7.15	Royal Society for the Protection of Birds (RSPB)
7.16	Salmon & Trout Conservation UK
7.17	National Farmers Union (NFU)
7.18	Kent Wildlife Trust and Sussex Wildlife Trust
7.19	Hampshire & Isle of Wight Wildlife Trust
7.20	Arun & Rother Rivers Trust
7.21	Wessex Chalk Streams and Rivers Trust
7.22	South East Rivers Trust
7.23	Canal & Rivers Trust
7.24	South West Water
7.25	Affinity Water
7.26	Portsmouth Water
7.27	Wessex Water
7.28	West Country Water Resources Group
7.29	Mr Chris Lowe
7.30	Mr William Cutting
7.31	Tracey Crouch MP
7.32	Fawley Waterside Ltd
7.33	Little River Management and Barker Mill Estate
7.34	Isle of Wight Rowing Forum
7.35	Arun District Council
7.36	World Wildlife Fund (WWF)

Appendix 7.1: Environment Agency

	Area of issue	Issue and evidence	Implications	Information or changes required	SWS' Consideration of Response	Changes Required to dWRMP
	Recommendation 1: Improve its approach to outage					
	Southern Water has experienced high outage in three of its resource zones for the last two years that has resulted in or contributed to a dry year deficit in supplies. In its draft plan, the company has not demonstrated that it has made sufficient progress in addressing this issue, with high outage continuing to be forecast in the early years of the planning period. It is not clear if the company has used recent observed outage data to inform its assessment of outage. Doing this will ensure that its forecasts of outage are achievable, accurate and realistic. The company also states that it has followed the recommended UKWIR guidance to assess outage, but it is unclear in the plan if this is the case. It has not used its risk-based planning methodology to assess and forecast outage. This is out of line with the approach the company has taken across the rest of its draft plan. It is unclear why the company has chosen to do this or what the implications of this are to the plan. If actual outage is higher than estimated in the plan, this poses a risk to the security of supplies in a dry year. The company should improve its approach to assessing outage, and describe what it will do to achieve further reductions to outage and show that outage does not contribute to or cause dry year deficits.				Southern Water have set out an outage recovery profile for specific sources that will be delivered during the remainder of AMP 6 and AMP 7. The outage allowance adopted thereafter has been based on a historic analysis of total and partial outage that is appropriate for unplanned events. This profile forms an updated outage allowance scenario reducing to 34.61 Ml by 2025 for a normal/dry year. This method is based on actual outage and schemes to reduce outage. The analysis we completed and presented in the draft Water Resources Management Plan will act as support for this approach, showing that based on historical analysis these levels of outage can be maintained. Furthermore a level of uncertainty is built into the model for outage that could be experienced whilst the outage recovery plan is being implemented. This will add more resilience to each of the water resource zones. The methodology will be detailed in an appendix to Annex 3.	The outage methodology is detailed in appendix F to Annex 3. Also see Annex 3 Section 8 for a high level summary of the appendix
R1.1	R1.1: High outage experienced	The company has indicated high outage compared to WRMP14 outage allowance in its Annual Reviews reporting for 2015/16 and 2016/17. This resulted in concerns to the security of supply in the case of a dry year for 3 of the company's water resources zones. It is a concern that the company may not deliver its outage recovery plan and hence start the WRMP19 plan period (2020 onwards) with higher levels of outage experienced than the draft WRMP19 suggests.	If the company has not assessed the outage allowance adequately there is a risk that the company may again experience higher outage than planned posing a risk to the security of supply.	The company should provide further information on the outage assessment to demonstrate how these high outage events have been incorporated into the outage calculation. It should also provide some reassurance around the recovery of outage to ensure that the planned outage allowance in WRMP19 is appropriate.	An outage recovery plan has been implemented for the remainder of AMP 6 bringing outage levels down to 76.30. The start of the plan (2020) will therefore see a higher level of outage allowance (76.30). A further reduction in AMP 7 has been planned, bringing the levels of outage down to 34.61 by 2025. This profile has been adopted for one of the scenarios to be tested in the investment modelling. The profile in the plan thus follows the planned outage recovery profile and is based on schemes that will be delivered by 2025. For 1:200 and 1:500 year droughts the approach post 2025 is to reduce the outage to the full outage levels maintained during the 2006 drought and adding on the partial outage calculated for 2025 under the outage recovery plan (no partial outage data available for 2006 (29.45)) in order to get a total outage figure. The methodology will be detailed in an appendix to Annex 3.	The outage methodology is detailed in appendix F to Annex 3. Also see Annex 3 Section 8 for a high level summary of the appendix
R1.2	UKWIR Outage allowance methodology (1995)	The company states that it uses the UKWIR (1995) outage allowances for water resources planning methodology. However, it is not clear whether this methodology has been followed. In Annex 3 the company provides a summary output of the outage method used but it provides little detail as to the derivation of the estimates. An additional unpublished supporting document has been presented to the Environment Agency which provides further information of the outage assessment. However, there is still a lack of clarity about whether the methodology has been followed correctly. The outage calculation in the plan is based on an outage allowance where the number of sources increases the outage percentile as resilience increases. This is based on a linear regression graph, however, it is not clear how this has been calculated. The company has presented its outage allowance for each zone and provided a brief explanation of how it has calculated these figures. The company states that it re-ran the existing UKWIR (1995) methodology as used in previous WRMP's. When reviewing the 2009 and 2014 WRMP it is not clear the assessment is in line with the UKWIR methodology. There is no mention of determining probability distributions for magnitude, duration or frequency for sourceworks outage events or of a Monte Carlo analysis (500 iterations recommended) to develop a single distribution which will feed into the outage allowance calculation. Furthermore, it is unclear whether the company calculates outage events for individual sources or sourceworks; UKWIR (1995) states that it should be outage events for sourceworks that are calculated.	If the company is not following the UKWIR (1995) outage methodology it may be overestimating or underestimating the outage allowance in the plan. This could result in issues that have been identified in the past two Annual Reviews of the WRMP14, where actual outage experienced has been significantly higher than the planned outage allowance, resulting in a risk to security of supply in a dry year scenario.	The company should fully explain and demonstrate that it has used and followed the correct methodology to calculate its outage allowance. If this differs from the UKWIR (1995) outage allowance methodology the company should fully outline how the approach differs and justify the reason for this deviation. The company has provided some data, however, it is not clear how the company has used the UKWIR (1995) methodology to develop its outage allowance figures. The company should fully outline the method used and how historic data has been used.	The data required to follow the UKWIR (1995) guidance in it's entirety is unavailable. In light of this several approaches to outage were considered. Firstly a similar method used to PR14 was used, secondly a methodology based on a planned outage profile was used (detail of both approaches will be included as an appendix to annex 3). Rather than over or underestimating outage allowance in the plan, the allowance will be based upon actual achievable outage and supported by the original methodology.	The outage methodology is detailed in appendix F to Annex 3. Also see Annex 3 Section 8 for a high level summary of the appendix
	Outage allowance calculation	The company has used data from historical outage events and the number of sources in a WRZ to calculate outage allowance. The outage allowance for Hampshire Southampton East, Hampshire Southampton West and Hampshire Winchester WRZ's is zero. The company say either this is because there is only one source or historically low frequency outage has been experienced because of the headroom the WRZ carries. The company does not carry as much headroom in these zones as it has done previously as a result of sustainability reductions. The outage allowance in these three zones may not reflect the risk of outage now there is less headroom.	The outage allowance for Hampshire Southampton East, Hampshire Southampton West and Hampshire Winchester WRZ's may not reflect the risk of outage in these zones. If an outage event occurs and there is not enough headroom to buffer this, there may be a risk to security of supply.	The company should demonstrate outage allowances for Hampshire Southampton East, Hampshire Southampton West and Hampshire Winchester WRZ's are accurate given the sustainability reductions in Hampshire WRZ's.	Under the new methodology Hampshire Kingsclere and Hampshire Southampton East still have zero full outage, this is because they currently have no outage. The uncertainty allowance then applies a small level of partial outage to each zone, giving every zone some outage allowance. The methodology will be detailed in an appendix to Annex 3.	The outage methodology is detailed in appendix F to Annex 3. Also see Annex 3 Section 8 for a high level summary of the appendix
R1.3	Recorded outage data	The historic quantitative data used for the outage assessment are inconsistent across the zones with some data only dating back 4 years. In addition, there is no explanation of how historical data has been used for the Kent Medway and Hampshire South zones now that the zones have been split. There are inconsistencies between the information presented in Table 1 and Table 3 of the outage technical note. The outage data sets used to calculate outage allowance in table 1 do not align with the data presented in table 3. Table 3 suggests that no data was available in some years for a number of WRZ's and hence outage allowances are 'n/a'. Table 1 suggests that there were data sets for these years and WRZ's (Hants Rural, Hants Winchester, Sussex Worthing, and Sussex Brighton.)	The quantity and quality of the data gathered on outage will better inform the outage assessment resulting in a more accurate planned outage allowance calculation. It is not clear why the outage allowance in previous years is detailed as 'n/a' if the company hold data sets to be able to assess this.	The company should ensure that it continues to collect good quality outage data to be used in the outage assessment in future plans. It should explain why outage allowance in previous years is detailed as 'n/a'.	Periods of analysis for each WRZ have varied depending on the availability of historic data. The more granular level of data collection will continue through AMP 6 and AMP 7. This will be detailed in appendix F to Annex 3. In the outage technical note for the draft WRMP19, Table 1 showed the datasets used for the outage analysis for each water resource zone for the 2017 assessment. Table 3 showed the datasets available for each of the 2009, 2012 and 2017 outage assessments. Where there were N/A's, this was where in the previous analysis data wasn't available, for example we didn't have a consistent outage reporting process in place and the quality of outage data for some WRZs was not sufficient for the outage allowance calculation. Where a new zone now exists, previous analysis would not have had the data for example in PR09 (2009), data for Hampshire Southampton East wasn't available. For 2017 the N/A's indicate zones where the zone has now been split, Hampshire South and Kent Medway. This table has been removed in Appendix F to avoid confusion. The data availability has instead been detailed in Appendix F to Annex 3.	The outage methodology is detailed in appendix F to Annex 3. Also see Annex 3 Section 8 for a high level summary of the appendix
R1.4	UKWIR Risk Based Planning methodology for outage allowance	The company has not used the more complex methods proposed in the UKWIR (2016) Risk Based Planning methodology for determining its outage allowance. It would be useful to understand the reason for this given that the company has, for other parts of its forecasts, followed a fully risk-based planning, probabilistic approach.	Newer more complex methods for generating outage allowances may be more appropriate given that the size and complexity of planning problems faced by the company and that it has elsewhere followed a fully risk-based plan.	The company should provide an explanation as to why it has not used any of the more complex risk-based planning outage allowance methods given that it has taken a probabilistic approach to the rest of the plan.	Southern Water tested a new approach to generating an outage allowance figure that considered economic factors but this wasn't fully developed for the 2019 plan due to data limitations and will be developed further for the 2024 plan.	The outage methodology is detailed in appendix F to Annex 3. Also see Annex 3 Section 8 for a high level summary of the appendix
R1.5	Options to address outage issues	The company has included some options with benefits which may lead to a reduction in outage. These are mostly regarding nitrate, turbidity and cryptosporidium and hence the large number of catchment management options in the preferred options set. The benefits of these options should be more clearly stated within the plan summary and appropriate annexes. It is not clear if these options will help to reduce or recover outage.	The company should continue to consider options to recover outage to reduce the overall outage in future.	The company should clearly state the expected benefits of catchment management options for outage reduction within the plan summary and appropriate annexes.	We are expecting that our Catchment First programme will deliver the benefit of reducing the frequency and magnitude of outage events caused by raw water quality issues such as high turbidity and pesticides. By working with farmers, landowners and other stakeholders, as we have begun to do within catchments, we expect to see an improvement in raw water quality and consequential reduction in frequency and magnitude of water quality outage incidents, hence reducing our outturn outage levels. Whilst we also have an outage recovery plan this does not currently include any catchment management schemes.	This will be detailed in appendix F to Annex 3. Section 8 of Annex 3 contains a high level summary of the appendix
	Recommendation 2: Confirm bulk supply arrangements and shared resource schemes with neighbouring companies					
	There are multiple issues and inconsistencies with bulk supplies across the company's supply area that does not provide reassurance that these arrangements are secure and reliable. Confirming bulk supply arrangements will provide assurance to customers and regulators that transfers are reliable and should show if any changes to transfers will affect security of supplies and/or the environment. We welcome the proposal of further bulk supply transfers from Portsmouth Water to Southern Water, however there are inconsistencies between the companies' plans with the dates and volumes of these bulk supply options. In relation to the implementation dates of an additional import from Portsmouth Water's Gaters Mill surface water source; Southern Water states that this option is required from 2027 whereas Portsmouth Water's draft WRMP state that this option is not available until 2029. Linked to recommendation 4, this may present a risk to the security of supplies in 2027 in its Western supply area if Southern Water is relying on a transfer that is not available for a further two years. We recommend that the company; works with South West Water (Bournemouth supply area), Portsmouth Water and South East Water to clarify all existing and planned bulk supply arrangements; confirms quantities, implementation dates and legal arrangements of all transfers, including during drought events; and continues to work with neighbouring companies to explore resource sharing in regional working groups				Our proposed bulk supply arrangements have been clarified with other water companies as set out below.	

R2.1	Consistency of bulk supply agreements with Portsmouth Water	Southern Water Services (SWS) currently has a bulk supply agreement in place with Portsmouth Water (PW) of 15 Ml/d being supplied from PW to Hampshire Southampton East Water Resources Zone (WRZ). The timings of this transfer do not align between the company's plans. SWS states it begins in 2017/18 and will be reduced to 5Ml/d from 2027/28 onwards in severe and extreme droughts whereas PW states this begins in 2018/19 and will continue to 2045. There are inconsistencies with the dates and quality of the additional import from PW options of 9 Ml/d and 21 Ml/d. SWS state a raw water import of an additional 9 Ml/d will be available from 2023/24. PW states potable water will be available from 2022/23. There is a raw water import form PW based on development of Havant Thicket reservoir of an additional 21Ml/d in SWS plan and potable water in PW plan. Southern Water's plan text states this begins in 2027, however the date the company provides in the water resources planning tables does not align with this.	It is important both companies ensure they have a shared understanding of the volumes and dates at which the bulk supply will commence. There is a risk to Southern Water's security of supply if the bulk supply is not available when the company require it.	The company should confirm and detail the volumes of water, quality and timings for delivery of transfers with neighbouring companies. The company should ensure its plan aligns with its tables and other company plans. This should include details about whether any changes to transfers will affect security of supplies and/or the environment and how the transfer will operate during droughts. This will provide assurance to customers and regulators that transfers are reliable.	We have discussed and clarified these assumptions with PW and will show alignment with PW's WRMP in the revised draft plan including: - the new agreement for a 15 Ml/d transfer from PW to HSE WRZ being available from 2018/19 and through the planning period - the bulk supply volume reduced to 7.5 Ml/d in the extreme drought scenario (1 in 500 year) - the additional 9 Ml/d import available from 2024/25 onwards - the additional 21 Ml/d import available from 2029/30 onwards If these bulk supplies become available before these dates then we will utilise them, subject to contract conditions.	Table 1 of existing bulk supplies will be updated in Annex 5. Fact files for new bulk supplies will be updated and Annex 9 (Western area final strategy, section 7.3) will reflect any changes in dates
R2.2	Bournemouth bulk supply	There are inconsistencies with the volume and date of the transfer between South West Water's Bournemouth zone and Southern Water. The company state this is a 10 Ml/d option in Hampshire Southampton West WRZ with the potential start date of 2027 depending on the scale of the Fawley desalination scheme. South West Water does not include this option in its preferred plan or WRP tables and suggests this is a 20 Ml/d scheme with a possible delivery date of 2025 to 2030. Furthermore, Southern Water does not discuss whether there are any risks or uncertainty around this option. It is not clear whether this bulk export from South West Water is sustainable.	It is not clear whether this bulk supply option is a preferred option to be progressed as it does not currently appear in both company's plans. The Southern Water plan also lacks detail about the sustainability of this option.	The company should engage with South West Water to ensure that the plans are aligned. Southern Water's plan should also outline whether there are any risks or uncertainty around the sustainability of this option.	We have had further discussions and received additional information from South West Water and Bournemouth Water for the potential imports from them. We will reflect this updated information as feasible options in our updated plan as follows: - 15 Ml/d bulk supply from Wessex Water reliable in normal years and drought (1 in 20 year) only from 2025/26 onwards; 0 Ml/d in severe drought and extreme drought. - 20 Ml/d from SWW reliable in normal years, drought and severe drought (1 in 500 year) only from 2026/27 onwards. The revised draft plan now includes a bulk supply from South West Water of 20 Ml/d	Fact files for new bulk supplies will be updated and Annex 9 (Western area final strategy, section 7.3) will reflect preferred schemes with these assumptions
R2.3	Risk to Water Framework Directive (WFD) water body status from bulk supply agreements	There is uncertainty around whether the company and donor companies have considered WFD no deterioration in relation to bulk supplies. The plan does not provide a narrative as to whether there are any concerns over the sustainability of the transfers.	If donor companies have not considered WFD no deterioration in relation to bulk supplies to SWS there is a risk that donor companies may not be able to provide these volumes. For example, if licences were in future to be capped at recent actual volumes. This may pose a risk to security of supply for the company.	The company should ensure it engages with neighbouring companies to understand the impacts WFD no deterioration might have on its supply from these transfers. This risk and uncertainty should be reflected in the revised and final WRMP.	The Environment Agency has clarified that it requires confirmation that any additional abstraction required to support new bulk supply arrangements have been assessed by the donor water company against WFD risk of deterioration criteria. We have sought confirmation from neighbouring companies with whom we are proposing new bulk supply options in our revised draft WRMP19 (i.e. South West Water (Bournemouth Water), Portsmouth Water and South East Water). We have updated Annex 16 (WFD Report) to confirm that WFD assessments have been carried out by Portsmouth Water, South East Water and Thames Water, whilst South West Water has advised that they will be carrying out further investigations for its Bournemouth Water bulk supply scheme in dialogue with the Environment Agency which will need to be completed by 2020 so as to inform the detailed design of the scheme and identify the need for any mitigation measures.	Annex 16 (WFD Report) has been updated to provide confirmation of the WFD no deterioration assessments carried out by donor water companies in Section 3.
R2.4	Consistency in volumes between shared resources	Raising Bewl reservoir by 0.4m in Kent Medway West WRZ is an option in the company's preferred plan. Bewl reservoir is a shared resource with an agreement between South East Water (SEW) and SWS that SEW are entitled to 25% of the volume of the reservoir. There is no detail in the plan as to how this option affects the current agreement between SWS and SEW.	If different assumptions are made by the two companies as to how much water each is entitled to following the delivery of this option, this may have an impact on security of supplies. The current agreement is likely to need amending to include the details of this option, should the option be brought online.	The company and SEW should agree together how the volume of water from this option will be shared between the companies. The company should update the plan with this information and ensure they engage with SEW around an amended agreement, should this option be brought online.	The raising Bewl Water reservoir option was not selected by Southern Water or South East Water in their revised draft WRMPs. The raising Bewl Water reservoir option was selected in Southern Water's draft WRMP and we had agreed with SEW that we would pay for this scheme, and take the full benefit of it as SEW did not require the additional benefit that it would provide. If the scheme is selected at some point in the future we will discuss with South East Water whether they would wish to share the cost and benefit of the scheme. The River Medway Scheme agreement would be updated accordingly.	Annex 9 has been updated to reflect the fact this option is no longer selected in our preferred strategy.
R2.5	Consistency of bulk supply agreements with South East Water	The Sandwich Wastewater Treatment Works (WWTW) indirect potable water reuse options in Kent Thanet WRZ have been selected as preferred options by South East Water (SEW).These options are not selected by Southern Water as Aylesford water reuse scheme is selected as a shared option with SEW instead. There are inconsistencies with volumes and dates of the transfer from SEW to SWS Kent Thanet WRZ. The company detail in the tables this transfer commences in 2027/28, with an initial volume of 1.88 Ml/d, increasing to 2 Ml/d in 2028/29 and in annex 11 strategy for the Eastern area 2029. SEW state a transfer of 2 Ml/d will supply SWS Kent Thanet WRZ, commencing in 2029. There are no details on how this transfer will operate during drought events.	This may have an impact on security of supply if companies do not align the transfers in the WRMP's. It is important both companies ensure they have a shared understanding within the WRMP's of the volumes and date at which the bulk supply will commence.	The company should confirm and detail the volumes of water and timings for delivery of transfers with neighbouring companies. The company should ensure the plan and tables align with the other company plans and if any changes to transfers will affect security of supplies and/or the environment, including how the transfer will operate during drought events. This will provide assurance to customers and regulators that transfers are reliable.	SWS will liaise will SEW to ensure both companies do not select the same scheme in their revised draft WRMPs. SWS is in liaison with SEW to ensure the SEW to Kent Thanet WRZ bulk supply is represented consistently in each company's WRMP. The current assumption is that both companies will show a 2 Ml/d bulk supply in all planning scenarios from 2025/26 onwards.	Fact files will be updated as appropriate to reflect consistent volumes and earlies start dates. The preferred strategy will be reflected in the Technical Overview, Annex 11 (Eastern area final strategy) and the WRP tables.
	Recommendation 3: Be more ambitious by reducing leakage in both the long and short term					
	In its consultation document, the company has committed to a 15% reduction in leakage, but its draft plan and technical documentation and draft plan only show a 10% reduction by 2025. This does not meet the Ofwat's 15% reduction challenge that the government supported in the 25 Year Environment Plan. The company should take a more ambitious approach to reduce leakage by 2025 and explore how it can use innovative approaches to achieve longer term leakage reductions in line with leading companies and the findings of the recent National Infrastructure Commission report on England's Water Infrastructure Needs. Managing leakage and water use is a top priority for customers and the government. It is important for delivering a resilient network in the long term and reducing over abstraction. There is a risk that customers and stakeholders will not have confidence that the company is managing its water resources effectively and that any proposed resource developments are needed. We recommend that the company; explores its proposed leakage levels further with its customers and board to consider whether it can meet a more ambitious target. If this cannot be achieved, the company should clearly explain and justify why this is the case; shows the impact on the supply-demand balance and the options in its final plan, where the proposed level of leakage is changed; provides clarification as to the differences in leakage assessment between the previous plan and this current draft plan				The company has committed to aiming to meet Ofwat's leakage reduction target of 15% by the end of the next AMP (2024/25). In addition, following recommendations in the recently published National Infrastructure Commission report, that companies should seek to reduce leakage to 50% of current levels by 2050, Southern Water have also committed themselves to meeting this target. Our revised WRMP will therefore present a leakage reduction profile that meets these commitments.	Revised approach to leakage reduction to provide a profile of leakage reduction that meets the policy commitment of 15% reduction from the 2020 leakage level by the end of AMP7, and a 50% leakage reduction by 2050.
R3.1	Inconsistencies between leakage reduction in the technical documents in the plan and the summary WRMP document	Southern Water has stated in its non-technical summary of the plan that it will reduce leakage by 15% in the first 5 years of the plan. However, the technical reports and supporting tables are not consistent with this - they only demonstrate a 10% reduction in leakage before 2024/25.	It is unclear for customers and stakeholders what Southern Water's leakage forecasts are. There is also uncertainty about what the implications would be on the plan if the company included the 15% reduction in its supply-demand balance calculations.	Southern Water should clearly demonstrate the level of leakage reduction it forecasts for each of its zones. It should demonstrate how this has impacted the supply demand balance, and incorporate those changes within its decision making process, including customer willingness to pay. The company should complete this for its revised plan.	The degree of leakage reduction identified in the Draft WRMP was derived on a least cost economic basis using the investment model. However, the company has committed to aiming to meet Ofwat's leakage reduction target of 15% by the end of the next AMP (2024/25). In addition, following recommendations in the recently published National Infrastructure Commission report, that companies should seek to reduce leakage to 50% of current levels by 2050, Southern Water have also committed themselves to meeting this target. Our revised WRMP will therefore present a leakage reduction profile that meets these commitments.	Revised approach to leakage reduction to provide a profile of leakage reduction that meets the policy commitment of 15% reduction from the 2020 leakage level by the end of AMP7, and a 50% leakage reduction by 2050 - see Annex 6, Appendix C. Also presented in annexes 9-11 in section 3
	Recommendation 4: Demonstrate the reliability and environmental acceptability of options in the preferred plan for its Western supply area and consider alternatives					

	As part of its long-term solution to address the deficit in its Western supply area, the company is proposing a large-scale desalination plant at Fawley in the Solent estuary. The preferred plan sets out five variations to this desalination scheme, based on the deployable output that the scheme provides. The company has not yet completed its scoping of this scheme and we are concerned that if the desalination plant is not viable, there are no viable alternative options to maintain supplies in this supply area. This poses an unacceptable risk to the environment beyond 2027 through the continued use of drought permits and orders, and does not provide sufficient reassurance that the company will take action to develop alternatives to ensure the security of supplies. Southern Water has not demonstrated that it has sufficiently considered the uncertainties around delivery of the desalination plant options, or what contingency measures they would put in place to manage this uncertainty and when an alternative would be needed. The company should provide further information to provide confidence that the scheme will be delivered on time and address the existing deficit in supplies. We expect this to be addressed as a matter of urgency, given that the scheme is needed by 2027. The plan sets out that the company has briefly considered the possibility of a transfer from Thames Water as an alternative to the proposed desalination plant, but this option may not provide the volume of water required early enough to resolve the deficit in supplies. If the company considers the Thames Water transfer is viable as an alternative, it should evaluate the option more thoroughly. The company plans to construct a pipeline from the proposed desalination plant to the existing water treatment works at Testwood. The company should ensure that the design and routing of this pipeline minimises the potential of environmental impacts and fully mitigates anticipated impacts as far as possible. Further work is required to understand if a desalination plant at Fawley is environmentally acceptable, and there is potential for the environmental risks to restrict the scale of that option. This is further hindered by inconsistency between its Habitats Regulation Assessment (HRA) and Strategic Environment Assessment (SEA). The proposed desalination plant at Fawley has the potential to affect the environment in multiple ways. The company's environmental assessment of this scheme is incomplete. Until this has been more thoroughly assessed, this poses a risk to the environment and the overall viability of the scheme. The company's environmental assessment of options in its preferred plan has not been completed to satisfactory standard and does not show that the company will minimise its impact on the environment or will mitigate against known risks. In addition, the Habitats Regulation Assessments for some of its options are incomplete, posing a risk to the River Itchen Special Area of Conservation.				As set out below, Fawley Desalination was selected following a standard options appraisal process for WRMPs, in consultation with Environment Agency, Natural England and other stakeholders on the unconstrained and feasible options list. Once a plan is published, the company will need to undertake additional more detailed feasibility investigations and modelling, environmental assessment, preparation of planning documentation, and detailed design. This will be undertaken in due course, as with any option. This will be undertaken in parallel with investigation of alternatives. There are trade-offs with a number of the options in the Western Area, and the deliverability of a number of them presents a risk to having a solution in place by 2030, as mandated by the Section 20 agreement arising for the Inquiry. If the options cannot be delivered by the 2030, due to objections received, then the company will need to continue to use its drought permits and orders as an interim measure until schemes have been delivered. The company will welcome the support of the Environment Agency in ensuring that the deliverability of key schemes can progress as smoothly as possible, to try to avoid the need for continuation of the drought permits/orders on the Test and Itchen. Further work has been undertaken to assess the effects of the scheme on the environment in light of changes to the scheme design and pipeline routes have been updated.	Annex 9 of the revised draft WRMP will include an indicative timeline for implementing the Fawley desalination scheme, which will highlight some of the key milestones and decision points. Give the risks around delivery we will also present a timeline for delivering an alternative scheme to the desalination plant in Annex 9.
R4.1	Fawley desalination options	The company has included 5 options for desalination at Fawley. There is limited information provided within the plan to provide a detailed review of these options. Further technical feasibility and environmental assessment would be required before implementation of any of these options. There are concerns that there is uncertainty over the feasibility and deliverability of this option without further information. There are a lack of options of this scale outlined in the plan as alternatives.	The company has included the Fawley desalination option as a 100 Ml/d option to meet the supply demand deficit in the Western Area. If this option is not feasible or has significant environmental issues then the company will need to progress alternative options in parallel to ensure that an option is delivered within 10 years (as outlined and committed to through the recent public inquiry into the abstraction licence changes).	The company should provide further information on the Fawley desalination option. This should include plan programme of works to ensure timely implementation, detailing any risks to delivery and the alternative options that would be required if it cannot be progressed.	The WRMP follows a standard options appraisal process for WRMPs, and we consulted the Environment Agency, Natural England and other stakeholders on the unconstrained and feasible options lists, of which Fawley was a part, during the pre-draft consultation phase. Once a plan is published, the company will need to undertake additional more detailed feasibility investigations and modelling, environmental assessment, preparation of planning documentation, and detailed design. This will be undertaken in due course, as with any option. The company identified a range of alternative options in its Draft WRMP which will need to be investigated in parallel with the Fawley desalination option, due to the uncertainties involved with ultimate deliverability of this and other options to meet the significant supply demand balance deficit resulting from the sustainability reductions on the Lower Test and the Itchen. There are trade-offs with a number of the options in the Western Area, and the deliverability of a number of them presents a risk to having a solution in place by 2030, as mandated by the Section 20 agreement arising for the Inquiry. If the options cannot be delivered by the 2030, due to objections received, then the company will need to continue to use its drought permits and orders as an interim measure until schemes have been delivered. The company will welcome the support of the Environment Agency in ensuring that the deliverability of key schemes can progress as smoothly as possible, to try to avoid the need for continuation of the drought permits/orders on the Test and Itchen. As part of our assessment of the revised 75 Ml/d Fawley desalination scheme for the Western Area strategy of the revised WRMP19, we have carried out an Appropriate Assessment of the revised scheme taking account of Natural England's comments and our discussions with Natural England. Please see Response 43 (Natural England comments - Section 1.3) . We have also carried out an Appropriate Assessment of the strategic alternative option to the desalination scheme: the Portsmouth Harbour and Fareham WTWs indirect potable reuse scheme. Please see Response 43 (Natural England comments - Section 1.3)	Although not required by the WRP Guidance, the company will set out a programme of works for its key strategic schemes and alternatives (annexes 9-11, section 7.2) Full details of the Appropriate Assessment of the Fawley 75 Ml/d option in Strategy A of the revised draft WRMP19 is provided in Appendix B of Annex 15 (HRA Report) Appendix G of Annex 15 provides the Appropriate Assessment for the Portsmouth Harbour and Fareham WTWs indirect potable reuse scheme strategic alternative option.
R4.2		The option for the development of a desalination plant located at Fawley has the advantage of utilising existing infrastructure. The high-energy environment at the existing discharge point has the potential to efficiently dissipate the hyper-saline discharge. The hyper-saline plume is unlikely to have a negative effect on sensitive ecology as long as it does not extend into Southampton Water. Initial modelling shared by SWS with regulators and stakeholders in development of the draft plan suggested that the scale of the desalination plant is predicted to create a range of plume areas: a plant up to 100 Ml/d appears to produce a hyper-saline plume that is dissipated within the Solent. Further work is required to understand if a desalination plant at Fawley is environmentally acceptable, the environmental risks may restrict the scale of that option.	Further dispersion modelling of the discharge plume is required before determining the environmental acceptability of this option.	The company should complete further dispersion modelling to determine the environmental acceptability of this option.	As part of our assessment of the revised 75 Ml/d Fawley desalination scheme for the Western Area strategy ("Strategy A") of the revised WRMP19, we have carried out an Appropriate Assessment of the revised scheme taking account of the Environment Agency comments on the hyper-saline discharge. We have also assessed the strategic alternative option of a 100 Ml/d Fawley desalination plant. The design of this scheme has been revised since the draft WRMP19 and the changes have been set out in the revised draft WRMP19, including in the HRA, WFD and SEA Annexes. The intake and outfall are situated sufficiently distant from each other to ensure no adverse effects on abstraction from the hypersaline (brine) discharge. Both the intake and outfall utilise existing infrastructure from the former power station and are located in the Solent (and not in Southampton Water) and therefore the seaward end of each pipe are not located within any of the Solent or Southampton Water European sites. However, there may be construction effects on the Solent and Southampton Water SPA and Ramsar at the landward end of these pipes and operational effects arising from the brine discharge plume. An extensive package of mitigation will be required for construction as detailed in the Appropriate Assessment. In light of the revisions to the scheme design and comments made by EA and Natural England, together with discussions with Natural England on the draft WRMP19 Appropriate Assessment, we have updated the Appropriate Assessment of the Fawley desalination scheme to take account of the design changes and included assessment of the construction works required for the outfall and intake and effects of construction and operation on any sensitive marine habitats, impingement and entrainment issues. dispersion of the brine discharge in The Solent (and possible effects into the mouth of Southampton Water). The discharge will not include other chemicals from the desalination treatment process and these will be treated on-site to neutralise them prior to being discharged via the wastewater treatment works so as to avoid impacts on the Solent or the mouth of Southampton Water and associated European sites. An extension has been made to discharge outfall design by extending the pipe a further 500m to enable discharge into deeper water and therefore enabling better dispersion. The Appropriate Assessment has been carried out with reference to the Conservation Objectives of the European sites and supplementary advice to these objectives, although these do not contain any specific water quality objectives relating to the brine discharge and we have therefore continued to make use of the only available standards from the Shellfish Waters guidance against which the materiality of the brine discharge has been assessed. No adverse effects to site integrity have been identified using a worst case modelling scenario based on 150 Ml/d scheme (for the Near-field dispersion modelling) and 200 Ml/d scheme for the Far-Field dispersion modelling. Additional dispersion modelling will be carried out for the smaller capacity 75 Ml/d and 100 Ml/d as part of the next stage detailed planning and design of the scheme and to take account of the 500m extension to the discharge pipeline into deeper water. We have updated the HRA and/or SEA assessments accordingly. The Appropriate Assessment has concluded no adverse effects to site integrity of any of the European sites with the application of mitigation measures. We will continue to work with EA , Natural England and other parties as we take this option forward to detailed design through the proposed Steering and Working Groups (see response above) to enable close dialogue on the development of this option. Further investigations will be required including detailed site environmental surveys and additional dispersion modelling of the brine discharge as part of optimising the precise design and siting of the discharge, and to discuss the necessary approvals including Marine Licensing. With regard to the pipeline route, further work has been undertaken to assess the effects on designated sites in light of EA and Natural England's comments and we have made changes to the scheme design and modifications to the associated pipeline routes. Wherever possible, the pipelines have been re-routed to avoid designated sites and sensitive habitats, and justification for any sections that cannot be rerouted has been provided, along with mitigation measures to minimise adverse effects in line with the design principles of minimising environmental effects. The permanence of impacts from the pipelines has been further reviewed, including assessing any impacts to groundwater flows to wetland habitats, and the loss of irreplaceable habitats (e.g. chalk grassland, ancient woodland) which cannot be mitigated for. This has included a high level study of impacts to surface and groundwater flows as the pipeline to passes through the New Forest SAC, SPA and Ramsar between Buttsash and Applemore. Dialogue with the Highways Agency is ongoing to establish whether the pipeline can be laid within the road and therefore outside the designation boundary, but as a precautionary approach we have also assessed a revised route running through an existing dry heath wayleave on the other side of the road which avoids designated wet habitats of the New Forest SAC. An extensive package of mitigation is required to avoid adverse effects to the Solent Maritime SAC and within the New Forest SAC, SPA and Ramsar as detailed in the updated Appropriate Assessment. We have updated the HRA and/or SEA assessments accordingly. The Appropriate Assessment has concluded no adverse effects to site integrity with the application of mitigation measures. We will continue to work with EA, Natural England and other parties as we take this option forward to detailed design through the proposed Steering and Working Groups (see response above) to enable close dialogue on the development of this option. Further investigations will be required including detailed site environmental surveys and additional dispersion modelling of the brine discharge as part of optimising the precise design and siting of the discharge.	Appendix B of Annex 15 (HRA Report) provides the Appropriate Assessment of the 75 Ml/d and 100 Ml/d alternative option for Fawley desalination plant addressing these points raised by the EA.
R4.3	Pipeline route from desalination plant to treatment works	The pipeline from the desalination plant to the water treatment works would pass through the New Forest National Park, a Special Area of Conservation (SAC), Solent and Southampton Water Special Protection Area (SPA) and Ramsar. Although technology has advanced considerably, for example allowing soils to be sorted and returned in sequence, the starting point for planning should be to try to avoid sensitive sites. The plan suggests that the pipeline route cannot avoid the designated areas. The pipeline route should be considered in the Habitats Regulations Assessment (HRA) Stage 2 Appropriate Assessment test.	Further information is required to fully understand the environmental risks associated with the proposed pipeline route. There is a risk that the company may not be able to conclude no adverse effect on site integrity.	The company should consider all options before planning a route through sensitive designated sites. For example, the company should consider an option for the pipeline to be laid in or adjacent to roads for all of its length.		
R4.4	Inconsistency between the HRA and Strategic Environmental Assessment (SEA): Fawley 50 Ml/d desalination option	The HRA assesses two options for Fawley desalination plant, one at 100 Ml/d and one at 50 Ml/d. Neither are shown as having any risk to the River Itchen SAC. In the draft WRMP Strategic Environment Assessment (SEA), the option of Fawley at 50Mld is described (page 21) and says that with this option, the Portsmouth Harbour WWTW indirect potable water reuse scheme is also required to be included in the strategy to maintain water supplies. So the two options are linked and interdependent. Therefore it appears the 50 Ml/d option is part of two interdependent options. The SEA concludes that there is no risk to the River Itchen SAC from the Fawley desalination 50Mld option, as does the HRA. However, both assessments screen-out the Portsmouth Harbour WWTW option due to its negative risks on the SPA. If the Fawley 50 Ml/d option is reliant and linked to the Portsmouth Harbour WWTW scheme, both options in-combination may have negative impacts on the SPA.	The SEA has not assessed the in-combination effects of the Fawley desalination plant and the Portsmouth harbour WWTW options. There is a risk to the environment as the in-combination effects of these two options has not been considered.	The company should clarify in the plan: • Whether dependency exists between the 50 Ml/d Fawley desalination option and the Portsmouth Harbour WWTW indirect potable water reuse scheme. • If there is interdependency, how does that affect the Fawley desalination option? • What the assessment means in relation to the HRA	There is no inconsistency between the assessments in the SEA and HRA reports: they both state that the Fawley desalination scheme (50 to 100 Ml/d capacity) and the Portsmouth Harbour WTW options are mutually exclusive options - the Portsmouth Harbour WTW was an alternative option to the Fawley desalination option. We do not intend to develop both of these schemes - it is one or the other. Consequently, there is no dependency between these two options and no cumulative, in-combination effects arise in respect to any European site or on the environment generally. This position is the same for the revised draft WRMP19 where we have selected the Fawley 75 Ml/d option in our preferred strategy (Strategy "A") but should it not be possible to develop this scheme, our strategic alternative option is to develop the Portsmouth Harbour and Fareham WTW indirect potable reuse scheme instead. No cumulative effects on the Southampton Water or Solent European sites will therefore arise between these mutually exclusive options, nor on the River Itchen SAC.	The SEA Environmental Report (Annex 14) makes clear that the Portsmouth Harbour and Fareham WTW indirect potable water reuse scheme will only be developed in the event that the Fawley desalination plant is not developed. Consequently, no cumulative effects between these two options can arise. See Sections 8.1 & 9.3 of Annex 14 for details.
R4.5	HRA of strategies for Western Area	The plan is based on Strategy A for Western Area, in which all proposed licence changes are implemented in full and immediately. The plan also considers Strategies B to D for alternative outcomes of the licensing inquiry. There are concerns with the environmental implications of the other strategies. For example, Strategy D would accept the Itchen licence changes with immediate effect but not require any licence changes at all at Testwood. The consequence is that drought orders are required on the Itchen, a SAC, for 10 years more than Strategy A. That would result in a likely significant effect on the River Itchen SAC and should be assessed in the WRMP HRA. This is important because the Habitats Regulations require alternatives to be fully considered to avoid risks to Natura 2000 sites. Strategy D presents an increased risk to the SAC compared to Strategy A, in particular the increased period of reliance on drought orders.	The HRA does not adequately assess the risk to the environment associated with the alternate strategies outlined for the company's Western Area. It is not clear what the risks to the environment are if strategies B to D are progressed.	The HRA should consider the risks associated with the alternative strategies for the Western Area.	The revised draft WRMP19 no longer presents three alternative strategies - the plan is based on delivery of the revised, updated "Strategy A" as set out in the revised draft WRMP19. This has had regard to the Section 20 Agreement and our plan sets out to remove the need for the Lower Itchen and Candover drought orders on the River Itchen SAC by developing new water sources for the Western Area, recognising the adverse effects on the SAC of the drought order options. We have also set out strategic alternative options in our revised draft plan in case options in the preferred plan are found not to be deliverable during the planning stages - we will be progressing the necessary investigations and planning assessments for the strategic alternatives at the same time to avoid delivery delays should a preferred plan option not be deliverable.	Annex 9 sets out the revised strategy for the Western Area Strategy A.

R4.6	Inconsistency between the plan and the HRA regarding the transfer from Hampshire Southampton West to East zones	The plan includes an option to develop the Test to Lower Itchen pipeline scheme to transfer desalinated water from Southampton West WRZ to Southampton East WRZ. In the HRA the option assessed is a transfer of water abstracted from the River Test (raw or potable) to the Lower Itchen (as previously outlined in SWS WRMP14) as opposed to transferring desalinated water. This is inconsistent and the HRA should assess the correct scheme.	This is not consistent and an option of increasing abstraction from the River Test would pose a risk to the environment.	The company should clarify the scheme and include the correct assessment of the scheme in the HRA.	The HRA report did assess the same option as that presented in the draft WRMP19 which was for a pipeline only option to convey either treated or raw water (from the desalination plant). It did not assess any abstraction from the River Test. We have updated the description and name of this option to make it clearer what this option involves: it is now named Southampton Link Main reflecting the fact that it will be a bi-directional main carrying treated or partially treated water between the two Southampton water resources zones with water provided by the new schemes included in Strategy A for the Western Area. We have updated the Appropriate Assessment to reflect the updated design of this link main and confirm that the Appropriate Assessment concludes there will be no adverse effects on any European site.	Appendix F of Annex 15 (HRA Report) provides the Appropriate Assessment of the Southampton Link Main option.
R4.7	Transfer from Thames Water	The company has suggested that if it is not possible to implement the preferred schemes in Western Area (desalination or effluent reuse) then the main strategic option available would be the large-scale strategic transfer from Thames Water. There are concerns that this may not be a viable option, these concerns include; • The timing of the options does not align with Southern Water's commitment to implement a solution by 31 March 2030. • Pipeline transfer has an extensive length within Areas of Outstanding Natural Beauty (AONB) and crosses other designated features. Impacts dependent on specific construction techniques adopted along route. • High planning risks given designations and multiple Local Planning Authority areas.	The strategic transfer option from Thames Water has a 15 year lead-in time in Thames Water's plan and would not be developed in time to meet the commitment agreed during the public inquiry on the licence proposals in Western Area.	The company should clarify whether the Thames Water transfer option is a viable solution given the timing of the delivery of this option. If this is not a viable option the company should outline an alternative solution should there be a risk of Fawley not being delivered.	We have undertaken sensitivity testing of the proposed Western area strategy to enable us to identify potential alternative schemes that we will need to investigate and consider promoting, depending on the future challenges we experience and our success in implementing our planned schemes. dWRMP19 does indicate that if it is not possible to implement either desalination schemes in Hampshire then the main strategic option would be a large-scale strategic transfer from Thames Water to Hampshire WRZs, based on development of the upper Thames Reservoir. We will continue to review these alternatives as part of the work in the next AMP period. We acknowledge in Annex 9 that a key issue with this option is that a large-scale bulk supply is dependent on the development of a large scale resource by Thames Water, in addition to an 80km pipeline from the Thames Water supply area to Southern Water's Lower Itchen treatment works. We appreciate that this leads to some significant uncertainty around the deliverability of these schemes – in particular whether the bulk supply would be available in AMP8, when it is required by us. Our analysis for this plan has been based around an assumption that the deficit resulting from the Test and Itchen sustainability reductions are addressed by 2027, but we appreciate a bulk supply is very unlikely to be available by then. We have committed to undertake further work on this as a joint project with Thames Water and consider that this is still the most appropriate course of action. This is consistent with advice from the EA (Tim Sykes) that it is important to identify the right options, not the options simply available in time. We will also continue to investigate other alternative options such as water reuse schemes in parallel with the desalination plant in case our preferred strategy cannot be delivered If options cannot be delivered by 2030 then the company will need to continue to use its drought permits and orders as an interim measure until schemes have been delivered. The company will welcome the support of the Environment Agency in ensuring the deliverability of key schemes.	Updated information on options included in Annex 6, and information on strategies in Appendix 9, 10 and 11.
	Recommendation 5: Ensure its plan is legally compliant by adhering to the WRMP Directions					
R5.1	Direction 3(b) Describe the annual average risk of all restrictions as a percentage, and how they change through the planning period	The company has not provided a description of how the annual average risk of all restrictions changes through its planning period as required by Direction 3(b).	The company is not compliant with Direction 3(b).	The company should state how the annual risk will change over the planning period following the implementation of the measures (options) set out in its water resources management plan to meet Direction 3(b).	Query on LoS also forms part of I2.1. Check this response also addresses that query. *Our target levels of service will not change through our planning period. However, we have noted in the Level of Service section in annex one where we will be unable to meet out target levels of service in the central and western areas in the short term. We will formalise this explanation and provide a summary table illustrating our target level of service, forecast level of service and actual historic level of service for each supply area.*	We will Improve clarity of text in the Level of Service text in Annex 1 (section 6.2, and Section 6.3). We have provided summary tables (table 35, 36,37,38) illustrating our target, forecast and actual levels of service through the planning period in the same sections for the company and each of our areas.
R5.2	Direction 3(d) Describe the emission of greenhouse gases likely to arise as a result of each measure in its plan	The company has provided as assessment of greenhouse gas emissions for each measure in its future preferred plan. However, it has not included an assessment of greenhouse gas emissions for each measure in its current operations for the final planning scenario or stated where else this information is available, as required by Direction 3(d).	The company is not compliant with Direction 3(d).	The company must include an assessment of the greenhouse gas emissions for each measure from its current operations to meet Direction 3(d).	The EA has clarified (e-mail 29/06/18) that baseline greenhouse gas emissions need to be presented for each option to comply with this direction. Presenting the emissions for each scenario will not be enough to comply. Every line in the preferred options table needs to have greenhouse gas emissions. We don't specify whether you should include energy from renewable sources or not. You can include renewable energy at an option level but not at a programme level and you should explain where you have done this. SWS to present greenhouse gas emissions for all current operations and future schemes and will take account of renewable sources where possible.	Information will be included in annexes 9,10 and 11 - section 4.4
R5.3	Direction 3(e)(i) Describe the assumptions made regarding the implications of climate change, including in relation to the impact on each of its supply and demand measures	The company has provided an estimation of the impacts of climate change on its future demand and supply forecasts. However, it has not described the impacts of climate change on each of its options in the final planning scenario. This is required by Direction 3(e)(i).	The company is not compliant with Direction 3(e)(i)	The company must include an assessment of the impacts of climate change on each of its measures in the final planning scenario to meet Direction 3(e)(i).	Climate change sensitivity test to be undertaken for all options. Where there is a potential climate change impact which can be quantitively assessed, undertake assessment and present as additional information. Tables to present climate change sensitivity assessments of preferred plan and strategic alternatives have been added to Annexes 9, 10 and 11, section 4.3. See also issue M32 which requests clarity of impact of CC on options. This is issue is also addressed by this response	Tables to present climate change sensitivity assessments of preferred plan and strategic alternatives are have been added as Appendices to Annexes 9, 10 and 11 (sect 4.3)
R5.4	Direction 3(f) Describe its metering programme, including costs, approach, implementation and timing of the programme	The company has included an extension of its universal metering programme as part of its preferred programme. However, details of the planned implementation of this strategy over the planning period have not been provided. The costs of installing and operating these meters over the planning period has also not been provided. This is required by Direction 3(f).	The company is not compliant with Direction 3(f).	The company must include details of its selected metering strategy, including how it will implement this across its supply areas and also the costs of installing and operating the meters to meet Direction 3(f).	Southern Water already has high metering penetration as a result of the successful implementation of its universal metering programme in AMP5. The company has considered options to increase metering further through a continuation of its compulsory metering programme. The cost of extending the compulsory metering programme becomes more expensive as the level of meter penetration increases as those properties without a meter are likely to be technically more difficult to meter. However a continuation of the company's AMP5 compulsory metering is still likely to be the most cost effective approach to increasing meter penetration. Programme cost information was provided in the WRP Tables accompanying the draft WRMP, however, as for all options, detailed cost information is not included within the main body of the report due to commercial confidentiality issues (as permitted under section 37B(10) of the Water Industry Act 1991). Updated cost information will be provided in the same format for the metering options in the revised draft WRMP Tables, and more detail around how the costs have been built up will be provided in the text of Annex 6 of the revised draft WRMP.	Update text in Annex 8 to include more descriptive detail on all metering options. The intended programme for the implementation of the company's domestic metering programme will be described in Annexes 8-11.
R5.5	Direction 3 (h) Describe its assessment of the cost-effectiveness of domestic metering types	The company has not provided an individual assessment of the cost-effectiveness of each of the metering options, including compulsory, selective, change of occupier and optant to allow a comparison of each metering type. This is required by Direction 3(h).	The company is not compliant with Direction 3(h).	The company must provide an assessment of the cost-effectiveness of the following types of metering to meet Direction 3(h): • Compulsory • Selective • Change of occupier • Optant.	Southern Water already has high metering penetration as a result of its successful implementation of its universal metering programme in AMP5. The company has nevertheless considered options which could increase metering further through an extension of its compulsory metering programme. Due to this already high level of metering, the feasibility of some types of metering becomes an issue - as there may be insufficient customers from the remaining unmetered customer base to make some metering options to be viable. In addition, the company would want to implement a metering scheme in a timely manner, where it is selected to be a least cost option. Selective, change of occupier, and optant metering are not as effective as compulsory metering once a critical level of meter penetration has been reached, if meter penetration is to be increased significantly beyond the current high level. The cost-effectiveness of extending the company's compulsory metering programme is assessed through the investment modelling process, where it is compared to other measures which the company might take to meet its obligations under Part III of the Water Industry Act 1991.	Additional text to be provided in the Revised WRMP to explain the rationale for focusing on compulsory metering options

Table 2 : Evidence report for improvements

Area of issue	Issue and evidence	Implications	Information or changes required		
Improvement 1: Clarify the use of stochastics in the plan and the impact to the company's supplies					
I1.1: Stochastic weather generator and Risk Based Planning	The use of stochastic weather generator approaches has allowed Southern Water to explore the potential risk of more extreme droughts. It has considered droughts up to a return period of 1 in 500 years (annual probability of 0.2%). The work is consistent with Environment Agency and UKWIR guidance. There is a lack of clarity in the main report and Annex about the weather generator model, which makes it difficult for stakeholders to understand this work and its implications for the supply forecast.	Further information would provide clarity to the approach being used. This will give more confidence to the Deployable Output (DO) figures being produced with this method. There is a risk that the plan is not easy for customers and stakeholders to understand.	The company should clearly present the information on the weather generator so that it is easier for stakeholders to understand and outline the implications to the supply forecast. The company could using simple diagrams or schematics to explain the approach using the stochastic weather generator model.	The high level weather generator process is essentially unchanged from that employed for WRMP14, although the detailed internal coding and processes of the weather generator have been enhanced for this plan. We will adapt the high level schematic (Figure 2-1) included in Appendix C01 of WRMP14 to align with the updated weather generator. We will also look at presentation of similar weather generators for the recent UKWIR and WRSE work to see if any improvements to out description can be adapted.	Updated Figure added to Annex 3 Artificial Weather Generation Section 3.2.3, Weather Generator Modelling Process sub-section. Improve clarity of associated text.
I1.2: Peer review of the stochastic weather generator	The plan makes strong claims on the performance of the weather generator, which are backed up by additional Annexes. However, it is unclear whether this new work has been peer reviewed by independent experts.	Further clarity on the performance of the stochastic weather generator will provide confidence to regulators and stakeholders.	The company should provide further information on whether it has commissioned an independent expert peer review of the new work. If it has not done so, the company should consider doing so for the revised plan.	Our use of the stochastic weather generator has been externally reviewed by Doug Hunt of Atkins. Doug has provided training on the use of stochastic weather generators to the Environment agency and developed water resource forecasts using similar weather generators for other Water Companies and WRSE. We will provide a summary of the outcome of the peer review in Annex 3	Added summary of Peer review in Annex 3 (section 3.2.9).

I1.3: Stochastic analysis approach - Extreme Value Analysis	The company has used the rank and frequency for the stochastic analysis as opposed to a specific extreme value plotting formula (for examples Weibull, Cunnane or Gringorton). This seems appropriate for the stochastically generated data as the dataset ("N") is large but it may not be appropriate for the historical data (a much smaller dataset). The company should consider treating the 200 replicates of 100 years of data in individual Extreme Value Analyses rather than as a single long time series. Then the company could identify the uncertainty around some of these estimates.	An alternative approach may show uncertainty around some of the estimates and may produce a different estimate of the 1 in 200 and 1 in 500 year event.	The company should consider using an alternative approach for stochastic data analysis. This could be presented alongside the current approach to show any uncertainties that may exist.	We will clarify in the description of our weather generator(Annex 3 - Artificial Weather Generator Section) that it does not explicitly create 200 replicates of 100 year historic climate as interpreted by the EA. Instead it creates a single, temporally coherent time series ~100kyr in length that is conditioned on the historic climate. Consequently, to artificially and arbitrarily separate such a sequence out into ~100 year individual time series is inappropriate. We have previously commissioned the Met Office (2016) to carry out an analysis (using EVA type approaches) to consider reasonable droughts for water resource planning and to characterise the severity of historic droughts. We will present this analysis in Annex 3	Added further description of the weather generator process and uncertainty to Annex 3 - Our Weather Generator Section. Details on EVA analysis has been added to Annex 3 section 3.2.6, and section 4.5.3 and 4.5.5.
I1.4: Potential Evapotranspiration	The company does not provide sufficient information to assess Potential Evapotranspiration (PET) or hydrological effective rainfall produced by the weather generator. The plan does not include an explanation of how PET is derived for site and gridded data sets and is comparable with the PET used to calibrate the original models. The company has included an assessment of the sensitivity of the model and DO assessment to alternative PET data. This explored the differences between applying a MOSES and PENSE PET approach. The greatest impacts on deployable output are to the sources from the River Test and River Itchen in the Hampshire Southampton West and Hampshire Southampton East WRZs, which are presented in Table 10a and 10b (page 52-53). This data shows that there are differences of up to 46.30Ml/d (in a 1 in 100 return period on the River Test). This is a substantial difference between the data sets and the company should outline how it will use this data.	The use of different PET datasets could have a significant impact on the company's supply calculations. This is relevant in the South East where PET with climate change will have a significant impact on the water balance. The company's sensitivity testing identifies a significant difference between the MOSES and PENSE PET data sets. This could result in the company over or under-estimating the deployable output assessment for some sources.	The company should provide further explanation on how the PET data is derived for site and gridded data sets. The company should also provide justification of why it has chosen that PET formulation (for example MORECS, MOSES or PENSE) and how it has addressed the differences between it and the PET formulations used to calibrate the original model. The company should fully outline how this sensitivity testing has informed the plan and the final strategy.	We have already developed a more detailed description of the way PET is handled in the weather generator as part of our submission for the western area Public inquiry and this document formed part of Nigel Hepworth's Proof of evidence. We will use this document to provide a basis for further clarification of the PET generation process in Annex 3. Essentially the PET sequence generated is exactly consistent and sampled from the input PET data set such that if MOSES input data is used, equivalent MOSES output generated (via a nearest neighbour sampling process) is produced. Our baseline deployable output forecasts for the Western Area in the rWRMP are all based on the MOSES version of the Test and Itchen model, however we will provide further detail on the range of uncertainty	Enhance and expand discussion of the PET generation process in Annex 3 - "Disaggregation of Daily Rainfall and generation of PET data" section Describe the impact of different PET time series on Western Area Deployable output estimates and associated uncertainty in Annex 3 - "Test and Itchen Groundwater Model" Section Added text to Annex 3 section 3.2.8 (description of PET data generation) and 3.3.7 (Test and Itchen Model)
I1.5: Standardised Precipitation Index (SPI)	The company states that, as the Water Resources Act (1991) makes reference to "an exceptional shortage of rain' in applying for drought orders, "rainfall alone is therefore central to defining what be considered a legal definition of drought." Consequently the company considers Standardised Precipitation Index (SPI) as a useful metric in defining droughts. The company refers to SPIs above 4 and the quoted return periods do not match the return periods in standard SPI tables (for example, World Metrological Organisation WMO-No 1090). There are events with a minimum SPI of -4.6 having a return period of 1 in 20 years whilst there are others of -3.27 having a return period of 1 in 500 years. In addition, it is not clear as to whether the company has used annual deployable output estimates, using Aquator and the Scottish Method or SPI, or both to estimate drought severity. The company consider SPI as the most useful measure of drought severity, however, do not state clearly the metric used.	The use of SPIs could result in the company producing more severe droughts from its weather generator, skewing the data used to derive deployable outputs. It is not clear what implications this would have on the supply demand balance.	The company should provide further information on the use of SPI and how these have been derived, including an explanation of the different return periods for similar SPIs. The company should clarify whether SPI has been used to estimate drought severity. This should be made clearer in the plan and Table 10.	The estimates of deployable output return periods are based soley on frequency analysis of a time series of DO and are not directly related to the SPI. Our approach is consistent with the methodology set out in the 2016 UKWIR risk based planning guidance under Risk Composition 3 (Fully Risk based plan) (see Annex 1). Under this risk composition we need to undertake probabilistic drought analysis of system stress (effectively deployable output) in order to appropriately defined our level of service and drought resilience statements. The SPI is calculated for each drought event within that continuous time series as a means of comparing the relative severity of rainfall deficits but it is not used to select or sample droughts (as might be the case in a drought library type approach).	We will provide some further clarification in how the SPI and associated return periods are used to compare drought type and severity in Annex 3 - Our Design Droughts section 3.2.6
I1.6: Generating drought sequences	The company states that it generated"~1000 replicates of the input historic climate sequence" (Annex 3, page 31). The company has truncated the historic record to 1998 "to remove non-stationarity in the rainfall and climate indicator." The company then creates "a single time series for each rainfall site approximately 100,000 years in length." There are concerns this undermines the integrity of the replicates, and could breach the independence of the single time series.	The use of a truncated record could result in the company producing more severe droughts from its weather generator, skewing the data used to derive deployable outputs. It is not clear what implications this would have on the supply demand balance.	The company should provide further clarity and an explanation on why its approach to generating drought sequences is appropriate.	The Environment Agency has misunderstood how the stochastic climate sequence is generated. The ~100kyr stochastic record is created as a single, temporally coherent time series by the weather generator. There are not explicit ~100yr replicates of the "historic" climate within this output time series. This process has changed between the WRMP14 weather generator and the WRMP19 weather generator. However, to generate an extremely long input time series a monte carlo process with 100 replicates of the input forcing climate drivers, specifically the north Atlantic oscillation and sea surface temperature is used internally within the weather generator process. These are not available individually and are not rainfall data. The output rainfall data are generated from this long very long time series within the weather generator and the output is in the form of a single, coherent ~100kyr sequence.	We will further clarify our description of the weather generator process in Annex 3 "Our weather generator" section 3.2.6
I1.7: Generating drought sequences - sub-sampling	The company has used "bootstrap sampling [of the ~100,000 year data set] with replacement of 200 separate 2000 years long sequences" to select an appropriate 2000 years sample for use in its water resource model (Annex 3). This suggests that the 2000 year sample contains around 20 replicates of the historic climate, from which the company can replicate the overall characteristics of the synthetic data. The company then determined "the similarity between the subsample and the parent data. "The manipulation of the data in this way could result in generating more events with dry weather or droughts.	This approach could result in generating more droughts and thereby artificially suppressing the probability of the event. This would give the event a higher return period than it deserves (for example, 1 in 20 when it should be 1 in 10).	The company should provide further information on the sub-sampling of the data. The company should clarify whether this manipulation of the ~1000 replicates is intentionally or unintentionally generating more droughts and hence affecting the return period analysis results.	The 2000 year sub sampling process and some calibration of this process is described in Annex 3 in the "Sub-sampling for water resource model input". This section provides comparison of the cumulative distribution of annual rainfall between samples. The 2000 year rainfall sequence used for our baseline supply forecast was deliberately chosen as it was considered to provide a good statistical representation of the larger 100kyr parent data set. In addition we also considered two alternative semi random 2000 year sequences, of which one was considered to be deliberately "wetter" and the other deliberately "drier" on average. Both alternate sequences were run through a water resource model to determine the potentially magnitude of the impacts on Flow (DO). The resulting variation in modelled flow duration curves (especially at low flows) was very small. Consequently, we do not consider that the sampling process has introduced significant bias in the frequency or magnitude of drought events.	We will expand our discussion of the sampling process in Annex 3 "Sub-sampling for water resource model input" to provide some additional detail on the process (ection 3.2.7 of Annex 3).
I1.8: Integrated Risk Model – correlation coefficient	The plan states that, "In order to ensure that the output supply-demand balance profiles without uncertainty are equal to the difference between the input supply and demand values at each return period modelled, a coefficient of -0.6 was used for the correlation between supply and demand variability for those WRZs that used the fully integrated model. This was calculated empirically based on model results." It is not clear how this has been derived.	It is not clear on how the company has derived the correlation coefficient and how sensitive the plan is to it. Hence, what the implications are of selecting an alternative correlation coefficient.	The company should provide further commentary as to how this correlation value has been derived. The potential sensitivity of the resulting distributions to this choice should be provided to strengthen the reporting in relation to the model.	This correlation coefficient was calculated so that it would fulfil the central underlying assumption of WRMPs that has been used to date – namely that the worst historic supply side drought will also drive levels of demand that are equal to approximately a 1 in 10 year demand level – i.e. that DYAA demand occurs at the same time as the worst historic event. This ensures that the deterministic supply/demand balance and the stochastically generated supply demand balance are almost identical for the 1 in 100 year level of occurrence. This coefficient means that the supply/demand balance for the 1 in 200 year event is also similar for the stochastic and deterministic balances. The calculation was undertaken using iterative Monte-Carlo runs to generate the appropriate supply/demand balance from the baseline data.	No changes required. Annex 5, section 4.3.3 has been updated to provide additional explanation.
Improvement 2: Ensure the calculation of Deployable Output is accurate					
I2.1: Scottish Method Deployable Output analyser	The assessment of conjunctive-use and surface water deployable outputs (DO) used the in-built functionality of the 'Scottish Method DO' analyser. This analyser is a standard analyser module in the Aquator water resources modelling software. Further information is required on the use of the Scottish Method in the DO assessment. Specifically what constitutes a failure, how multi-year drought events have been accounted for and that the company Levels of Service are met under the different levels of DO.	There is a lack of clarity in exactly what assumptions underpin the deployable outputs in different drought events.	The company should provide greater information and evidence to demonstrate how the DOs have been calculated.	Failure years defined when demand at a demand centre cannot be met due to a lack of resources. Scottish method in Aquator assesses yield on an annual basis. Deployable output is therefore assessed for each year in the synthetic record. Deployable Output of multi year droughts is the worst on record. Key design droughts are discussed in Annex 3, Section 4.5.3	Failures and multi year droughts addressed in Annex 3, Section 3.5.11
I2.2: Test and Itchen Groundwater Model	The Test and Itchen groundwater model output used for groundwater DO assessment for Water Resources Zones (WRZ) in Hampshire was not based on the latest model runs. The DO assessment for surface water is based on the latest model runs (Run 163) and a comparison has been made between Runs 157 and Run 163 (Table 10, Annex 3). This leads to a reduction in flow and DO for the River Test and a gain in flow and DO for the River Itchen. This appears to make a large difference in DO, especially for the River Itchen in the 1 in 200 year scenario (+17.7 Ml/d Minimum DO and +19.7 Ml/d Peak DO) which has been used for baseline. The DO impact of basing groundwater DO on Run 157 relative to Run 163 is not explicitly stated. It would be useful to understand whether the groundwater DOs are overestimated in the Test and underestimated in the Itchen catchments similar to the surface water.	This could result in an underestimate of the deployable output assessment for these sources, resulting in the possibility of options being selected that may not be required or are required earlier than needed.	The company should state the likely significance of impact on groundwater DO values with a commitment to update the plan The implications of inconsistency between the surface water and groundwater DO assessment should be considered.	For the rWRMP both surface water (River Test and River Itchen) and groundwater deployable outputs in the Hampshire WRZ's are all estimated using the same groundwater model; specifically the Stochastic MOSES version of the Test and Itchen Groundwater Model. Consequently they are all now consistently calculated. However comparison with the previous data (both earlier versions of the groundwater model and between the PENSE and MOSES PET data) allows us to better consider the magnitude of uncertainty. Additionally, the majority of groundwater sites in Hampshire are infrastructure or licence constrained and consequently their deployable output does not vary as a result of water level variations and hence DO is unaffected by model version or the input climate data selected.	We will provide some further clarification on the version of the Test and Itchen Groundwater model used to derive groundwater Deployable Output and, where appropriate, some discussion of the impacts and uncertainty between model versions. This will be described in Annex 3, under the "Test and Itchen Groundwater model" section (expanded in Annex 3 Section 3.3.7)
I2.3: Time-limited licences	The Deployable Output estimates do not appear to consider the risks of non-renewal for time limited licences (TLL), some of which are due to expire during the period covered by the plan. Southern Water need to make this clear within the plan and supporting documentation.	There is a risk of non-renewal, or renewal with amended conditions applied, which could result in a reduction in deployable output.	The company should demonstrate it has considered the risks around non-renewal of time-limited licences.	Our sustainable catchments review which focuses on the WFD objective of preventing deterioration in status has considered all our abstraction licences including those which are time limited. The consequence of this review is that many of our abstraction licences will now be subject to investigation in AMP7 under the WINEP and this includes some of our time limited licences. Given the thoroughness of our sustainable catchments review and extent of planned abstraction licence investigations we believe this sufficiently covers the risk that time limited licences will not be renewed on the same terms.	We have added this explanation to section 5.4 of Annex 3.
I2.4: Baseline Deployable Output – demand side drought measures	It is not clear how demand side drought measures have been dealt with in the baseline deployable output scenario of the plan. The "Deployable Outputs - benefits of restrictions" section provides a general explanation regarding the inclusion of demand restrictions into the DO forecast for surface water and groundwater sources. It does not state which demand restrictions have been applied to each WRZ. The text refers to return periods but does not make it clear that the baseline DO is based on the 1 in 200 year scenario. In Table 10 the company states marginal benefit to WRMP DO from demand restrictions for some zones but not for others. It is not clear how this has been calculated – for example, model runs with and without demand restrictions enabled.	Clarification is required so that it is possible to identify which demand restrictions have been included in the baseline scenario DO. Information on DO restrictions is included in WRMP Table 10. This should be brought together in the WRMP narrative.	The company should clarify which demand restrictions have been included in the baseline deployable output scenario.	For the Draft WRMP, the benefits of TUBs on supplies was included with the deployable output assessment. The benefits of Non-Essential Use bans were included as options in the investment model. The benefits from both TUBS and NEU bans were calculated on the basis of comparison of with and without model runs. For the purposes of the Revised WRMP, the company is intending to separate out restriction benefits from deployable output. So both TUBS and NEU bans will be options in the investment model that are available for selection under different states of the world.	TUBS and NEU options to be included in the feasible options list for selection alongside other options. Clarified that the DO benefits of TUBs and NEU's are now excluded from our baseline DO forecast in Annex 3 section 4.1.2. Annexes 9-11 describe drought measures (sect 3)

I2.5: Baseline DO - supply side drought measures	It is not clear how supply side drought measures have been dealt with in the baseline deployable output scenario of the plan. There is a lack of clarity in the narrative regarding how deployable output will be affected by supply side drought measures. It is not clear whether the Company has excluded the contributions from any supply side drought measures (drought permits and drought orders) in the baseline deployable output scenario of the WRMP. It would be beneficial to state this clearly within the plan narrative and within Annex 3 description of approach.	The inclusion of supply side drought measures in the baseline DO scenario would increase the water available for use. These measures should be assessed through options appraisal and included only in the final planning scenario if selected as a preferred option.	The company should clarify whether the supply side measures have been included in the baseline deployable output assessment. If included, the company should provide an explanation and justification of why it has taken that approach	The supply side measures selected are clearly identified and discussed in detail in Annexes 9 to 11 of the Draft WRMP, where they were selected as part of investment modelling. Supply side drought measures where therefore not included as part of deployable output calculations. The company will adopt the same approach as in the DWRMP with regard to the supply side drought measures.	No change Clarified that supply side drought measures (e.g. Drought Permits and Orders) are excluded from our baseline DO forecast in Annex 3, Section 4.1.1 Annexes 9-11 describe drought measures (sect 3)
Improvement 3: Provide reassurance around the well field improvement for the Pulborough groundwater source					
I3.1: Sussex North WRZ – Pulborough well field development	The company has stated that the Pulborough groundwater source, located within the Pulborough Basin Groundwater Model, has well field improvement planned which is expected to increase Deployable Output (DO) from 13 Ml/d to 20 Ml/d based on model predictions. It is not clear whether an increase to 20 Ml/d will be realised given the unpredictable nature of groundwater development and whether this will be delivered before the start of the planning period.	The company may be overestimating the deployable output available from this source or the timing of the additional DO due to the planned well field improvement. If the company is not able to achieve the planned increases outlined, this could result in a risk to security of supply.	The company should outline the risks associated with not being able to achieve the expected deployable output of 20Ml/d or risks with delivery and whether there are alternative options available should there be a shortfall.	We have sought clarification on progress from the Hardham Wellfield reconfiguration team and will provide a summary of their response in the rWRMP. We remain confident that the scheme will be able to deliver the specified deployable outputs by the regulatory date and hence our baseline deployable output forecasts for Hardham groundwater are unchanged. However, to address any concerns and residual uncertainty we have considered the implications of failure of the redevelopment to generate sufficient groundwater yield.	Provide further detail on the progress of the Pulborough Wellfield reconfiguration scheme within Annex 3 ("Central Area - Sussex North Deployable Output" Section) Discussion in Annex 10, sect 7.1
Improvement 4: More fully describe its risk based planning and real options analysis approach and show how this affects the plan					
I4.1: States of the World	The company states that the plan solves all 'States of the World'. This relates to the different severity of drought events, in normal conditions, dry conditions and critical periods. This terminology could be confusing to customers and stakeholders. It is not clear whether the decision making method resolves all States of the World and whether the final plan may materially change if, for example, the 1 in 500 year scenario was omitted from the Real Options Investment Model. It is not clear how these different States of the World influence the plan in terms of the different options that are selected and the timing of intervention options.	It is not clear how the plan resolves the States of the World. The plan may be overly weighted towards provision for extreme droughts that stakeholders may not necessarily support.	The company should provide further clarity on how the States of the World are resolved. The company should consider sensitivity testing around inclusion of all States of the World. This would show what options would be required to be resilient to a variety of severe and extreme droughts. The company should also consider alternative terminology to ensure that customers and stakeholders understand the scenarios considered and tested.	The Real options model solves all seven states of the world simultaneously. The company has chosen its states of the world to carefully reflect its chosen levels of service and to understand the impacts of more extreme drought events, such as 1:500 year drought return periods. We believe this aligns with some of the latest thinking around the acceptability of supply shortfalls during droughts - for example the recent National Infrastructure Commission report which called for increased drought resilience, and demonstrated the significant economic impact of level 4 restrictions (e.g. rota cuts, standpipes). Drought permits and orders are available for the investment model to use in the extreme drought events throughout the planning period, so we feel this represents an appropriate and pragmatic way of exploring these extreme events. Only if we were to try to solve the extreme drought event without recourse to drought measures would it represent a significant change to levels of service for which customer support would be needed. The previous plan (WRMP14) was based around solving droughts up to a 1:200 year return period without drought restrictions in place and the states of the world used for the current WRMP continue with this as the basis.	No changes proposed. However, the company is intending to test what level of additional options may be required if it were t increase its level of service to meet an extreme (i.e. 1:500 year) drought without recourse to drought orders, and also to compare the plan to meet a new 1:1000 year drought with drought orders available. These will only be as sensitivity tests of the preferred plan using the states of the world as set out in the Draft WRMP. These are described in annexes 9-11, sect 5
I4.2: Scenario Generator Model	The plan does not discuss whether the uncertainties associated with the future (for example, climate change, demand growth and sustainability reductions) are treated as 'independent' in the ensemble sampling or whether there is any interdependencies considered (for example, a high demand, high climate change future may be expected to influence different future policies on the environment than a low demand, low climate change future). Quantifying such interdependencies is challenging and by ensuring branches in the Real Options Investment Model are not selected from the tails of the distributions provides some mitigation.	It is assumed that such interdependencies have not been considered which may result in a wider overall distribution than appropriate.	The company should provide clarification on the uncertainties associated with the futures and whether interdependencies have been considered. The company should also provide further information on how sustainability reductions have been treated in the supply-demand probability distributions used to inform the Real Options assessment.	The dependency between supply and demand variability has been included in the modelling using a negative correlation coefficient of -0.6 (see I1.8). The dependency between drought severity and yield uncertainty has been built into the modelling through the use of different distributions for each drought return period, where suitable data were available. This is also the case with the dependencies between: - drought severity and the uncertainty of the impact of climate change on supply, with the uncertainty distribution used being dependent on drought return period; and - drought severity and the magnitude of potential sustainability reductions, with the uncertainty distribution used being dependent on drought return period. We concur that there may be a relationship between the magnitude of potential future sustainability reductions and other elements of the supply-demand balance; however, as stated in the representation, quantifying such relationships is challenging and this area of dependency has not therefore been included in the plan. The supply-demand balance used prior to 2027 is based on the 50th percentile. Beyond this there is a greater degree of uncertainty in the supply-demand balance and therefore the 10th, 30th, 50th, 70th and 90th percentiles are used as inputs to the real options model. This ensures that a realistic range of plausible future deficits can be planned for. Annex 8 provides further detail on how the branches have been applied in the real options model.	No changes required. Annex 5, section 4.4.5 and 1.1 has been updated to provide additional explanation.
I4.3: Real Options Investment Model - future scenarios (branches)	The plan does not demonstrate how the 'branches' map to future conditions of climate, demand and sustainability reductions. A link back to investment drivers identified in the Problem Characterisation is required. In addition, there does not appear to be any sensitivity testing of the branching. Further justification as to the choice and weighting of branches should be provided and how exactly results are integrated across branches to inform the final strategies.	Key sources of future uncertainty may not be adequately explored and specific branches may disproportionately dominate development of the preferred solution.	The company should provide evidence to justify choices and clarity as to what types of future each branch represents. The company should consider sensitivity testing of branches and their associated probabilities to understand which are the most dominant on the final plan.	The branches do not map to specific future conditions of climate, demand and sustainability reductions, as explained in the annexes of the WRMP. The key point of the approach is that there is uncertainty around climate, demand and the scale of sustainability reduction. We have therefore incorporated these in a probabilistic way through Monte Carlo modelling and sampled a range of percentiles. This provides an understanding of the sorts of deficits that the company may be faced with through any combination of uncertainties with climate, demand and sustainability reductions. We have not chosen the most extreme combination of possible futures, but have curtailed the selection of "plausible futures" to be within the 10th and 90th percentiles.	Discussion added to Annex 8, sect 2.4.3. Also in Annexes 9-11, Sect 5.1
I4.4: Sustainability reductions and sensitivity testing	The plan is not clear as to how sustainability reductions (SR) have actually been considered across the approach to branching and sensitivity testing. For the Western Area the branches appear to be based on sustainability reductions. It is not clear whether this is justified and considered reasonable and does not underplay other sources of uncertainty. Western Area has an additional layer of scenarios to consider the different outcomes of the Test and Itchen sustainability reductions. It has been assumed that for each of these strategies the three original SR branches in the Scenario Generator Models (SGM) are retained but this is not clearly documented.	Stakeholders may not fully understand how the preferred plan has been arrived at and how to interpret the results from the different branches and sensitivity tests. There is a lack of clarity on whether the sustainability reductions have been taken account of adequately.	The company should provide further clarification on how sustainability reductions have been considered. The company should provide clarity on the branches used within the Scenario Generator Model for the Western Area strategies.	For the draft WRMP, three sustainability reduction scenarios were developed for each WRZ (Lower, Middle and Upper) based on the EA guidance issued in June 2017, and as described in Annex 3. The sustainability reductions were represented in the modelling using discrete distributions, with an assumption regarding the likelihood of each scenario. For the dWRMP in the Central and Eastern areas, a 25% likelihood was assigned to the Lower and Middle scenarios, and 50% to the Upper scenario. This uncertainty distribution is included in the Monte Carlo modelling to generate a predicted value for each of the branches used in the Real Options model for the Central and Eastern areas. For the Western area, the Test and Itchen sustainability reductions were included in the baseline DO value as these are confirmed. For the revised plan we will model a new scenario which includes an additional Hands Off Flow for the Itchen in 2024, as this was raised by the Environment Agency during the recent Hampshire Inquiry. In the dWRMP, in contrast to the Central and Eastern areas, other sustainability reduction scenarios were used to define the branches for the real options model. However, for consistency with the Central and Eastern areas and to ensure other sources of uncertainty are fully captured, for the revised WRMP we will use the same approach for the Western area as for the Central and Eastern areas.	Approach being updated for Revised WRMP: the same approach to be used for the Western area as has been used for the Central and Eastern areas for the revised WRMP. Annex 5 has been updated to reflect the revised approach. Also discussed in Annex 3 (Section 5) Annex 8 (sect 2), and annexes 9-11 (sect 2)
I4.5: Reviewing the future strategy and moving to alternative plan ('branch')	The company has provided little information on how it has considered different approaches to reviewing the future strategy and therefore moving to a different 'branch'. The company states it will review this as part of the company's preparations for its next plan. The company could consider other trigger points, such as annual reviews or key milestones. For example, the conclusion of Common Standards Monitoring Guidance (CSMG) investigations which may trigger a change to the options currently selected in the preferred plan.	The company may not have considered the different points to trigger a change to a different 'branch' to use the full potential of the Real Options adaptable approach.	The company should consider different options of when to trigger moving to a different branch depending on how the future is developing or when milestones are reached.	The company did not, as part of the Draft WRMP, consider trigger points to move from one branch to another. There was never any intention to undertake such adaptive planning approaches for this current WRMP, however, SWS did flag their intention to explore such a decision making approach for the next WRMP in AMP7. For the purposes of the Draft WRMP, the company committed to reviewing the supply demand balances in AMP7, particularly once there was greater certainty on the potentially large magnitude of possible sustainability reductions, as part of its preparations for WRMP24. Despite not developing an adaptive plan for the current WRMP, the company will investigate how and whether to present some of the key decision points associated with key strategic schemes in its Revised WRMP in a simple timeline.	We present some of the key decision points associated with key strategic schemes in its Revised WRMP in a simple timeline in Annexes 9-11, sect 7.2, and discuss this in annex 8, sect 3.4.1
I4.6: Climate change uncertainty	Southern Water's method for calculating uncertainty considers supply and demand variability and uncertainties in the components contributing to supply and demand in a combined way using Monte Carlo simulation techniques. Climate change is one element of uncertainty. This method is complex and not explained in a clear transparent way for the reader in the plan.	As the method for calculating target headroom is complex, without a clear and transparent explanation it is difficult to understand how climate change uncertainty has been considered in the headroom calculation.	The company should provide a clear and transparent explanation of the method for target headroom derivation, including how climate change has been calculated.	The uncertainty of the impact of climate change on supply has been included in the uncertainty and risk modelling using a triangular distribution. This is defined by the difference between the 'wet' and 'baseline' climate change forecasts, and the 'dry' and baseline climate change forecasts. These forecasts have been developed in line with the most recent WRMP climate change guidance. The uncertainty of the impact of climate change on demand has been incorporated within the future demand forecast uncertainty component used in the modelling, with the upper bound representing high population growth, high non-household demand, high climate change impact and low water efficiency, and the lower bound representing low population growth, low non-household demand, low climate change impact and high water efficiency within a triangular distribution. For the revised plan, uncertainty in water efficiency behaviour will be captured under scenario modelling, rather than within the baseline supply-demand balance branches. The uncertainty in the impact of climate change on demand has been calculated according to the South East England Climate Projections P10, P50 and P90 to define the low, medium and high impacts respectively. It should be noted that Target Headroom is <u>not</u> used in the investment modelling and is only used for reporting in the WRMP tables. Target Headroom is calculated by subtracting the SDB <u>with</u> variability and uncertainty from the SDB <u>without</u> variability and uncertainty for the correct drought return period. Further detail is given in Annex 5.	No changes required – additional explanation to be added to Annex 5
I4.7: Customer preferences	The company has indicated that customer preferences are taken into account but exactly how these have materially influenced the final plan is unclear. Customer preferences are outlined in Annex 1, however, they have not been summarised in a quantitative or monetary way allowing them to be used directly within Real Options appraisal. It is not clear how customer preferences have been included between the initial least cost plan and the preferred strategy.	It is not clear how customer preferences have been taken account in the plan. Customers may not be able to follow exactly how their choices have influenced the final plan.	The company should provide further detail to demonstrate how customer preferences have been used to inform the preferred strategy.	As set out in our WRMP process diagram the customer preferences has influenced the draft WRMP and the revised draft WRMP as the preferred plans were reviewed to reflect customer choices. In our statement of response we have set out where and how we have dealt with any clashes between customer views and regulatory / government policy and how we have resolved these.	Review of inclusion of customer preferences in discussed in Annex 8, sect 3, and in Annexes 9-11 (sect 3)

I4.8: Multi-Criteria Analysis	The company has not undertaken a formal quantitative Multi-Criteria Analysis and it is not clear in the narrative how Water Resources South East (WRSE), customer preferences and the Strategic Environmental Assessment (SEA) have been accounted for in the final preferred plan.	ere is a risk that the preferred strategy has not been informed by WRSE, customer preferences and SEA. This could result in options being progressed that do not consider the regional plans or customer preferences and the least environmentally sensitive options.	The company should fully explain and demonstrate how the plan has been informed by the WRSE programme, customer preferences and SEA.	The preferred plan has been informed by consideration of WRSE outputs, customer preferences and the SEA. Additional text around the approach in moving from a least cost plan to the company's preferred plan with be provided in the Revised WRMP	Additional text added to Annexes 8-11 to explain approach (annex 8, sect 3), and results (annexes 9-11, sect 3)
I4.9: Environmental and social cost methodology	The company has not provided justification for its environmental and social cost methodology, including why the chosen method was considered most appropriate and the qualitative and quantitative data used and any assumptions made. The company has not set out how it has tested the results of its environmental and social valuation, for example, what sensitivity tests it has carried out, what engagement it has done and how the engagement has influenced the appraisal. The plan does not demonstrate what impact the environmental valuation has had on option selection.	The company has increased flexibility to choose an environmental and social cost methodology that it considers most appropriate. Understanding exactly how and why it has chosen this methodology and the decisions it has made using the outcomes of this methodology is important. The current environmental and social cost appraisal and its impact on decision making and option selection is not transparent. There is a risk that the impact of options on relevant ecosystem services has not been adequately accounted for in the decision making.	Using the Environment Agency Environmental Valuation in Water Resources planning - additional information (October 2016), the company should provide justification for its environmental and social cost methodology. This should include why the chosen method was considered most appropriate and the qualitative and quantitative data used along with any assumptions made. The company should detail how it has tested the results of the environmental and social cost methodology, including what engagement it has done and how this influences option selection.	Our approach is explained in both Annex 6 and Annex 8 of the revised draft WRMP. In Annex 8 we state "The company has not quantified the environmental costs and benefits of options in monetary terms (this approach is in accordance with the EA supplementary guidance note on environmental valuation, Nov 2016). Instead, the potential environmental impacts of options have been assessed through the Strategic Environmental Assessment, Habitats Regulation Assessment screening, and Water Framework Directive assessments". We also describe that this approach avoids the potential for 'double counting' environmental costs/benefits, and the difficulties historically experienced in quantifying the costs of environmental impacts. The environmental and social performance of each alternative strategy (as informed by the SEA, HRA and WFD assessments) was used to help make decisions on which strategies to explore further through the Real Options modelling process and to finally determine the appropriate strategy for inclusion in the draft WRMP19. Where appropriate, modifications to the potential strategy were made as part of this process where environmental and social effects were considered challenging. We also describe, in section 8.5 of annex 14, how the SEA maps across to an ecosystem services approach. We have then used the SEA to provide the quantitative and qualitative assessment of our options and plan, and this has informed the decision making of the preferred plan (as we describe in annexes 9-11).	The description of environmental and social evaluation has been updated in Annex 6 and Annex 8 (sect 3.2.1), the outcome in terms of how this has impacted the strategies is presented in annexes 9-11 and the relationship with Ecosystem Services is covered in Annex 14 (section 8.5)
I4.10: Comparison of Real Options Appraisal and Economics of Balancing Supply and Demand	The company provided, in tabulated form, the differences between an Economics of Balancing Supply and Demand (EBSD) chosen plan and the Real Options Appraisal (ROA) chosen plan. The EBSD solution typically leads to a reduction or delay in the option selected. There is limited information on the differences and hence why the ROA should be adopted.	It is not clear whether the Real Options Appraisal plan provides the best solution for customers and the environment and why this should be adopted.	The company should include further information on its choice of options appraisal technique including cost implications and any other factors important to stakeholders (such as resilience and environmental implications).	The choice of decision making technique is described in Annex 1 of the Draft WRMP. The approach is compliant with the UKWIR decision making guidance (2016). The presentation of the EBSD approach will be presented in the WRMP Tables, and presented in Annexes 9-11. The benefit of using a Real Options approach as opposed to a simple EBSD approach is that it gives a better understanding of how the solution would change in face of uncertain futures, which is what is missed with a conventional EBSD approach.	No change to text. Discussed in Annexes 9-11 (sect 5), and in Annex 8 (sections 2 and 3)
Improvement 5: Demonstrate the company is resilient to a full range of droughts, including its design drought					
I5.1: Stochastically derived DO - drought characteristics	The stochastically derived deployable outputs (DO) do not appear to be linked to a specific drought event or period as the DO is derived from the Scottish Method. Consequently it is not clear what characteristic of drought is driving each of the 1 in 200 and 1 in 500 year DOs in each WRZ. Characteristics of drought might include duration, severity and geographical extent for example.	It is not clear what characteristic of drought is driving the severe and extreme drought scenarios. This could result in some droughts not being fully considered.	The company should outline what characteristics of drought is driving the 1 in 200 year and 1 in 500 year drought event.	Characteristics of design droughts are discussed in section 4.5.3 Our Design Droughts. Further information to be added to this section to set out the characteristics of the surface water systems as calculated by the Scottish Method in Aquator.	Updated Annex section 4.5.3 to set out more clearly the characteristics of the severe and extreme droughts in relation to the surface water systems of the Eastern and Central areas.
I5.2: Table 10 – Droughts with varying characteristics	The plan presents analysis on selecting drought events from the stochastic sequences which have different durations. It is not clear how these events have subsequently been used to inform the plan. The company only included 3 drought events in Table 10 and provided no evidence on what types of drought they have considered or the duration (in months) for both historic and synthetic scenarios presented. Given that these events have been identified it would seem appropriate to include these scenarios in Table 10 to provide a better understanding of how each WRZ performs during droughts with varying characteristics (as specified in the Environment Agency guidance note "Drought plan and WRMP links"). The plan suggests that zones in the Western Area are vulnerable to short, sharp droughts of 6 to 12 months duration like 1976. However, the company has not presented 1976 as a scenario in Table 10 for either of these zones. There is no explanation about why that is.	Droughts with different durations as well as severity should be included in Table 10. Consideration of different types of drought event could change the perceived resilience (and/or benefits from drought measures). By including further scenarios it would provide a better understanding of how each WRZ performs during droughts with varying characteristics.	The company should present a section on identifying named drought events. These should be included in Table 10 given the stochastic analysis of drought events that has been undertaken. The company should ensure it considers and presents information on resilience to the different types of drought that could affect its sources (for example, short sharp droughts through to long duration droughts).	A section describing named drought events at different return periods has already been presented in "Annex 3 - Our Design Droughts". This section describes the characteristics (severity, duration etc.) of drought events at each return period that constrain our DO. However, as our fully risk based plan has estimated probabilistic deployable outputs rather than an "event based" method we did not include the above named events in Table 10, just the equivalent return period deployable outputs and drought measures. We can extend Table 10 to include additional historic droughts where relevant (e.g. 1976) and provide the equivalent deployable outputs and drought measures for the droughts set out in Annex 3 - "Our Design Droughts" section.	We will provide additional sign posting to the existing "Our Design Droughts" section in Annex 3, section 4.5.7 We will also expand the text in this section so it relates more clearly to our estimates of deployable output and the drought events in Table 10. Table 10 will be extended to include additional named droughts described in this section.
I5.3: Time horizon presented in Table 10	The company has not clearly stated what time horizon is presented in Table 10. This should be made clear. Table 10 for the Western Area zones should be completed to 2027 when the supply system will have materially changed.	The resilience of the water supply system may be different part way through the planning horizon.	The company should consider submitting multiple versions of Table 10 for some of the Western Area zones where there are significant changes over the plan period. The table should be completed once for the base year scenario, and if seeking drought resilience investment, completed again for the critical year in the planning horizon.	If our preferred plan, as set out in the dWRMP, is delivered our supply system and reliance on drought permits and orders to maintain supplies in our western area will fundamentally change in 2027 when alternative supplies are in place. We agree that alternate versions of table 10 illustrating the supply availability and drought measures that will be required both pre and post 2027 will be beneficial in two water resource zones; Hampshire Southampton West and Hampshire Southampton East.	We will develop two versions of Table 10 for the HSW and HSE water resource zones illustrating the configuration of the supply system and drought measures both pre and post 2027.
Improvement 6: Provide further information on non-drought resilience					
I6.1: Resilience options	The plan does not include options that are promoted solely on a resilience basis. A number of options are highlighted as having resilience benefits, such as desalination and water re-use schemes. It is assumed these are for drought resilience. The company has not provided sufficient information to demonstrate that its plan is resilient to non-drought hazards, such as flooding and freeze-thaw incidents. We suggest that the company considers whether any non-drought hazards could affect its water supply resilience.	The company has not clearly outlined options to improve resilience. The company has committed to moving to a plan resilient to a 1 in 200 year drought event. It is not clear how the company has considered its resilience to non-drought hazards.	The company should provide further information to explain the resilience of the plan up to 2027 and beyond. The company should plan for non-drought hazards, such as flooding and freeze-thaw, in its WRMP. It should provide explicit assessment of non-drought resilience, including peak demand issues in the final plan.	The plan (annexes 9-11) does provide commentary around some options that provide increased resilience. Some additional analysis is being planned to allow commentary around non-drought events, such as the recent freeze-thaw event from last winter.	Text to be updated to include consideration of non-drought resilience aspects. See Annexes 9-11, sect 8
Improvement 7: More thoroughly assess the potential environmental impacts from options in the preferred plan and ensure the options do not adversely affect the environment					

I7.1: Sandown indirect effluent reuse scheme	There is currently some uncertainty as to the potential effect on WFD status of this option. This is due to the effects of additional flow discharges to the River Eastern Yar on top of the existing river flow augmentation scheme, thereby modifying the low flow regime of the river. This is also highlighted in the SEA that there are potential adverse effects on the Isle of Wight AONB and further investigation is required to assess the magnitude of the effects.	There is a risk that this option could have environmental implications to the Isle of Wight AONB and have an impact on the WFD status of the River Eastern Yar.	The company should ensure that it completes further investigation into the effects of this option on the environment, as referred to in the SEA.	The WFD assessment report (Annex 16) shows that there is a potential risk of WFD status deterioration related to significant increases in freshwater river flows during times of low flow when the scheme is in operation and the potential for adverse effects on aquatic ecology. Further assessment of the timing of the discharge and the sensitivity of the aquatic ecology to the changes in the environmental flow regime and potentially water temperature is required to confirm the scale of the risk and to identify the need for any required mitigation measures. It is noted that the scheme would only be required to be used infrequently during period of prolonged dry weather. We will work with the Environment Agency on the scope of the further investigations, the findings and the development of any required mitigation measures. The mitigation measures could include operational controls to reduce the volume of discharge relative to actual river flow and possibly treatment processes to manage the temperature of the effluent relative to the ambient river water temperature if required. Further work has been undertaken to assess the effects of the scheme on designated sites. Wherever possible, the pipeline has been re-routed to avoid designated sites and sensitive habitat Justification for any sections that cannot be rerouted has been provided, along with mitigation measures to minimise adverse effects. The pipeline has been re-routed to extend outside the Isle of Wight AONB, and where possible uses the existing road network. There is a constraint in that the pipeline needs to be within the AONB close to the existing Southenr Water asset that is within the AONB. The permanence of impacts from the pipeline has been further reviewed in light of the EA's concerns, including assessing any impacts to groundwater flows to wetland habitats, and the loss of irreplaceable habitats (e.g. chalk grassland, ancient woodland) which cannot be mitigated for. There are no effects of the pipeline on any European site. Southern Water has included in its revised draft WRMP its commitment in the SEA its committment to work with the Environment Agency, Natural England and other stakeholders as the detailed design of the scheme is progressed to optimise the pipeline routes to minimise environmental effects. A Working Group will be set up to faciliate dialogue on the design of this scheme. We have updated the WFD Report and/or SEA assessments accordingly.	Annex 16 (WFD Report) has been updated in Section 3 Section 8.2.1 of Annex 14 (SEA Report) sets out commitment to Working Group to facilitate dialogue on detailed design of the scheme.
I7.2: Raising of Bewl reservoir - risk of spreading Invasive Non-Native Species (INNS)	Raising Bewl reservoir by 0.4m in Kent Medway West WRZ is an option in the company's preferred plan. The increased area of influence of the reservoir would result in an increased risk of spreading Invasive Non Native Species (INNS) around reservoir margins. The company has not considered this risk in the plan.	The increased area of influence of the reservoir would result in an increased risk of spreading INNS around reservoir margins. It is not clear whether the company has considered this risk and identified potential mitigation - this poses a risk to the environment.	The company should demonstrate in the plan it has considered the risk of spreading INNS for this preferred option.	The SEA of this option (Appendix D) included assessment of the risks in respect of INNS: "the ancillary works on the perimeter of the reservoir have the potential to spread/introduce INNS through groundworks and the transportation of soils and construction waste. Mitigation measures will be in place to avoid the spread of terrestrial INNS during construction." However, we acknowledge that there is also the potential risk of spreading INNS with a slightly larger reservoir margin. We have updated the assessment of this option in Appendix D to reflect this risk and identified the need to develop appropriate mitigation measures to prevent any spread of INNS, including a detailed INNS survey to establish the current INNS risks to inform the specific mitigation measures. This may include removal in accordance wihth national INNS guidance and in agreement with the EA.	Appendix D of Annex 14 (SEA Report) assessment for the Bewl 0.4m reservoir raising option amended to include this additional INNS risk and to note the need for appropriate mitigation.
I7.3: Raising of Bewl reservoir – impact on the River Medway scheme	Southern Water has not considered the impact of raising Bewl reservoir on the operation of the River Medway scheme. Specifically; Whether this option needs additional abstraction from the Medway and Teise to fill the extra capacity. Whether there would be requirements for larger or more frequent releases for scour valve testing or use of spillway and discharges to the Bewl River and Teise. This could have geomorphological impacts above those seen from present operation and could undo the improvements from the Bewl National Environment Programme restoration scheme. Whether increased depth of the reservoir would affect stratification of the reservoir in winter and the associated spring overturn and consequently water quality.	The impact of this option on the River Medway scheme should be assessed fully as it is not clear whether the potential impacts cause unacceptable risk to the environment.	The company should demonstrate it has considered the impact of raising Bewl reservoir on the River Medway scheme.	This scheme is no longer included in the revised draft WRMP19. The scheme would not involve any increased discharge of water from the reservoir to the downstream watercourses or any additional or larger scour valve release testing. The extra storage capacity will enable the river regulation releases to be maintained for a longer period of time in drought conditions. The changes in maximum depth and storage volume from this option are minor and will not lead to any material changes to the operation of the reservoir in respect of its water quality and/or stratification processes. There is no change to the abstraction licence conditions governing abstraction from the River Medway System, with the additional capacity being filled by abstraction during high river flow conditions. If this scheme were to beincluded in any future WRMP, detailed surveys would be carried out as part of the design of the scheme to ascertain any specific risks to marginal macrophytes and where necessary compensatory measures will be agreed with the Environment Agency within the overall reservoir water body. With mitigation measures in place, there is no risk of WFD status deterioration as a result of this scheme.	This additional information is provided in Section 1.41 in Appendix C of Annex 16 (WFD Report)
I7.4: Raising Bewl reservoir - mitigation to address the potential environmental impacts	The raising of Bewl reservoir could cause damage to local wildlife sites, ancient woodlands and potentially harm protected or nationally rare species, which have been recorded around the margins of the reservoir. Mitigation is not possible for the loss of ancient woodland so compensatory habitat creation would be required. There are limited details in the draft WRMP about the mitigation measures that would be required in order to address these potential environmental impacts.	Southern Water has identified a risk of deterioration in WFD status, visual amenity of the High Weald AONB and ancient woodland. No mitigation or compensatory measures have been proposed in the plan to address the potential impacts. It is not possible to understand whether the potential impacts on the environment can be mitigated and compensated and hence whether this option is feasible or whether the potential impacts cause unacceptable risk to the environment.	The company must ensure that this option does not pose a risk to WFD status and cause deterioration, and that impacts are fully mitigated and compensated for. The company should demonstrate it has considered this in its plan.	This scheme is no longer included in the revised draft WRMP19. Additional information about this scheme, including the proposed footprint of Bewl reservoir, and the associated assessed effects on the AONB have been provided to the Environment Agency in the option Fact File. This confirms that there will be no loss of Ancient Woodland through the application of mitigation measures comprising the development of low level embankments to protect the Ancient Woodland. The changes are not material to the landscape setting of the AONB given the low level of the required embankment raising. As explained in response to comment I7.3 above, the option does not lead to any risks of WFD deterioration and the WFD Report has been updated to make this conclusion clearer.	Fact File updated on the Bewl footprint post 0.4m raising. Additional information is provided in Section 1.41 in Appendix C of Annex 16 (WFD Report).
I7.5: Aylesford WWTW Indirect Potable Water Reuse - Medway	The Aylesford WWTW Indirect Potable Water Reuse scheme on the River Medway may cause long term reduction in freshwater input to the estuary and may result in present intertidal areas eroding and shifting landwards. The SEA main report and the option factfile do not consider the impacts of erosion loss or movement of this habitat and those within designated areas (for example, the Medway RAMSAR).	Designated areas may be at risk if the impacts of erosion loss and movement to the estuary have not been considered for this option in the plan.	The company should demonstrate in its revised plan that it has assessed the risk of the impacts of erosion loss and movement to the estuary and designated areas.	We have updated the SEA, WFD and HRA Reports as well as the option Fact File to provide further information on the assessment of potential effects on the Medway estuary habitats and associated designated sites. The scheme would only operate intermittently during prolonged periods of dry weather and for most of the time there would be no adverse effects on the Medway Estuary. During operation, there would be a reduction in treated sewage effluent discharge from Aylesford WWTW to the Medway Estuary, which equates to 10.5% of freshwater flows. This is classed as a negligible hydrological impact and is not expected to lead to a significant decrease in wetted width or depth. The intertidal mudflats along the Medway estuary (and within the Medway Estuary Marine Conservation Zone) have a low sensitivity to changes in water levels and any increase in exposure during the operation of the scheme is expected to be within that experienced as part of the normal tidal range. The Medway Estuary and Marshes European sites (SPA and Ramsar) are not expected to be impacted since they are situated much further downstream in areas which are tidally dominated and would not be affected by a relatively small reduction in freshwater flow input at the Medway WTW. In conclusion, the implementation of the option during prolonged dry periods is not expected to lead to any material erosion loss and sediment movement, except possibly at a localised level in the immediate reaches downstream of the WTW under low flow conditions and low tide.	Section 10.3 (Marine Conservation Zone) of Annex 14 (SEA Report) has been updated to include further information relating to erosion risks associated with this option. The Fact File has also been updated.
I7.6: The impact of Aylesford WWTW effluent reuse scheme on the River Medway scheme	Southern Water has not considered the impact of the Aylesford WWTW water reuse scheme on the operation of the River Medway scheme. Specifically, whether there would be cumulative impacts with other abstractors whose licences are constrained by the Teston Minimum Residual Flow (MRF) by artificially increasing the gauged flow at Teston if the Wateringbury discharge point were used. This could result in additional abstraction upstream, depleting reaches that would not be supplemented by the effluent discharge.	It is not clear whether the Aylesford WWTW water reuse scheme would impact the existing River Medway scheme. This could result in depleted reaches and therefore poses a risk to the environment.	The company should demonstrate it has considered the impact of Aylesford WWTW option on the River Medway scheme.	We have updated the SEA and WFD Reports to make clear that this option involves the discharge of the highly treated effluent direct to Southern Water's Eccles Lake raw water storage facility and therefore there are no implications for flow or water quality in the River Medway, and would have no implications for the River Medway Scheme operation.	Section 1.1 of Appendix B Annex 16 (WFD Report) and Section Annex 14 (SEA Report) updated to make it clear option is to discharge to Eccles Lake and not to the River Medway, and therefore no impacts on operation of River Medway Scheme.
I7.7: West Chiltlington borehole - inconsistency between WFD assessment and option fact-file	There are inconsistencies between the WFD assessment and the option fact-file for the option to bring West Chiltlington borehole back into service. In the WFD assessment the option is outlined as having uncertain risks to WFD water body status relating to the hydrogeological connectivity between the groundwater source and dependent ecosystems (River Chilt and Hurston Warren SSSI). The fact-file for this option states there is no risk to WFD water body status.	The plan does not clearly conclude whether there is a risk to WFD water body status from this option and therefore it is not clear whether there is an unacceptable risk to the environment.	The company should ensure the WFD assessment and the fact-file are consistent. If there is a risk to WFD water body status the company should outline how it plans to investigate and mitigate this risk.	The Fact File has been updated to reflect the final conclusions of the WFD assessment, i.e. that the effects on WFD status are uncertain. Both the Fact File and the WFD Report (Annex 16) have been updated to include details as to the surveys required to address this uncertainty and the potential mitigation measures that might be required should the surveys indicate risks to WFD status deterioration. Mitigation measures could involve some additional volumetric and/or groundwater level constraints on the existing abstraction licence to protect surface water features or possibly some in-stream (River Chilt) or wetland (GWDTE) restoration measures to enhance the resilience of these water bodies to any identified effects of groundwater abstraction.	Fact File has been updated to reflect the conclusions set out in Annex 16 (WFD Report) Section 3 that there remains uncertainty as to the effect of the scheme on WFD status and the need for further investigations.
I7.8: Hardham Winter transfer	The Hardham Winter transfer option outlined in the fact-file refers to "using an extended winter licence.". It is not clear whether this involves using the volumes in the current abstraction licence or varying the current abstraction licence.	The company detail that this option will not impact WFD status or designations. There is a potential risk to the environment if the volumes on the abstraction licence are increased. The company has not presented any evidence to demonstrate it has investigated whether there is water available in this catchment should it wish to vary the abstraction licence.	The company should clarify what the meaning of "using an extended winter licence" is.	This scheme only involves use of the available spare capacity within the existing abstraction licence during the winter. The scheme does not require any abstraction licence variation to increase the authorised volume of abstraction or modify the Minimum Residual Flow condition. Reference to an "extended winter transfer licence" related to a second stage of this scheme which is not included in the Feasible Option list and we have now removed this reference from the scheme description in the Fact File and in Annex 16 (WFD Report).	Text updated to confirm that no changes required to the abstraction licence in Table 1 of Annex 16 (WFD Report). Fact File also updated accordingly.

I7.9: The baseline includes sustainability reductions in Water Industry NEP1 (WINEP1) but not those in WINEP2 and WINEP3	The company has not included the sustainability changes identified in the Water Industry National Environment Programme (WINEP) 2 and WINEP3 in its baseline supply forecast. The company has based much of its plan on information in WINEP 1 which has fewer green and amber implementation schemes than WINEP2. It has incorporated the uncertainties in to the planning scenarios.	Southern Water has not fully considered the sustainability changes required as part of WINEP3. Therefore there is a risk to the environment that these changes have not been appropriately considered in the company's plan.	The company should ensure that it includes the green and amber schemes from WINEP3 in its baseline supply forecast. It should then include red schemes as a scenario.	A review of the changes (especially where schemes have changed colour/certainty) between WINEP2 and WINEP3 has been undertaken and will be considered alongside our revised sustainability reduction forecast in Annex 3 . For the revised draft WMRP we have reviewed the changes from WINEP1 to WINEP3. In WINEP3 further details were specified for investigations on the River Test and River Itchen. In addition, there were changes in the level of certainty assigned to some investigations or completion dates. However, there were no new sustainability reductions and from our review, so no need to change the assumptions for the revised draft WRMP from those we had applied to the draft WRMP.	No change required. Annex 5, section 4.4.4, and annex 3, section 5.4 provides additional explanation.

Appendix 7.2: - Natural England

Respondent	Reference no.	Response comment	SWS' Consideration of Response	Changes Required to dWRMP
Natural England	43	**Summary of Natural England's comments** Significant additional agreement has been reached with regards to drought planning options in Hampshire as part of, and subsequent to, the Itchen, Candover and Testwood Water Abstraction Inquiry, in March 2018 (referred to throughout this response as 'the public inquiry'). This includes proposed material changes to the main Hampshire draft Drought Plan (dDP) options and their environmental assessment. These changes have implications for the options in the dWRMP. Natural England commends Southern Water for its extensive and ongoing dialogue with Natural England during and post the inquiry. The final agreement between the parties occurred after the publication of the dWRMP and therefore we have provided our comments on the consultation version of the dWRMP but recognise that many aspects will change as a result of the agreement. Nonetheless Natural England's comments on the dWRMP consultation, as published, are summarised below: - As highlighted in Natural England's response (30 April 2018) to the dDP, Southern Water's drought options have the potential to cause significant harm to the environment. The options in SWS dWRMP do not fully reduce the risk of harm to the environment from public water supply abstraction during a drought and in the face of climate change. - SWS have produced an adaptable plan that can be adjusted to meet the full scale of sustainability reductions, many of which are uncertain in particular in the central area. The dominance of coastal and desalination options on the supply side effectively transfers some of the impacts of public water supply, particularly in drought, from the freshwater to the marine environment. - SWS dWRMP includes significant and ambitious demand management options including leakage reduction and per capita consumption targets which Natural England both welcome and fully support. - Natural England welcomes Southern Water's extensive 'catchment first' programme of catchment schemes to protect raw water quality and improve asset resilience. Natural England recommends expanding the scope of these schemes to build in measures that improve environmental resilience to abstraction. - With significant modification, additional mitigation and alteration to a number of potentially damaging options, the dWRMP has the potential to result in a net gain in biodiversity and enhance the environmental resilience of landscapes (including freshwater habitats). There are some potential risks to the marine and coastal environment. - The information supplied within the Habitats Regulations Assessment (HRA) is insufficient to remove reasonable scientific doubt with regards to some of the conclusions within the HRA. Notably with respect to; Solent and Southampton Water Special Protection Area (SPA), Ramsar site and Solent Maritime Special Area of Conservation (SAC); NewForestSAC,SPAandRamsarSite; River Itchen SAC - The HRA does not have sufficient regard to the conservation objectives and the supporting conservation advice and/or favourable condition tables that underpins them. - The Strategic Environmental Assessment (SEA) has not fully identified all the significant adverse effects on the environment including those on Sites of Special Scientific Interest (SSSI) and biodiversity. Those environmental impacts that have been identified have not always been sufficiently mitigated including those on designated sites, marine protected areas, protected landscapes and priority biodiversity. - The information provided is insufficient to rule out the potential to hinder the achievement of the conservation objectives of Marine Conservation Zones (MCZ) of dWRMP options in combination with other plans or project including SWS draft Drought Plan (dDP).	Further work has been undertaken to review pipeline routes to avoid designated sites and sensitive habitats wherever possible, and justification for any sections that cannot be rerouted have been provided, together with proposed mitigation measures to minimise any adverse effects. Additional information has been provided in the HRA with regard to the relevant designated site conservation objectives, supporting advice and Favourable Condition Tables. We have provided additional evidence in respect of the assessments of potential effects of WRMP options on the following European sites: o Solent and Southampton Water Special Protection Area (SPA), Ramsar site and Solent Maritime Special Area of Conservation (SAC), o NewForestSAC,SPAandRamsarSite, o River Itchen SAC Where necessary, additional mitigation measures have been included to avoid adverse effects on site integrity. Further details are provided against the specific comments made by Natural England in this Statement of Response.	References to specific changes made within the updated Annex 15 (HRA Report) are provided against the specific more detailed comments below.
Natural England	43	We trust our comments provide you with effective advice on how the dWRMP can help to achieve statutory obligations on the natural environment and the Government's aims on sustainable development and aspirations set out in the Defra 25 Year Environment Plan2. A copy of this letter goes to Nicholas Price at Southern Water Services Ltd and Anna Bradley CCG Chair, David Howarth and Samantha Bunce at the Environment Agency. We would be happy to comment further should the need arise but if in the meantime you have any queries please do not hesitate to contact us.	Noted.	
Natural England	43	**Annex 1 Natural England's Response** The dWRMP, summaries, annexes and appendices are clearly set out and for the most part, use plain English. The summary document for the public consultation makes particularly good use of infographics. In Natural England's view, the full extent of environmental impacts from the supply side options in the public consultation summary, are not fully explained. The HRA and SEA are a significant improvement from the equivalent documents accompanying the dWRMP14.	Comments are noted and welcome. We consider that there are sufficient signposts within our public consultation summary and Technical Overview Document to indicate where further information on environmental impacts can be found. It is not the intention to prepare a public consultation summary for the rWRMP19 but we will consider whether additional explanation around environmental effects could be added to the fWRMP19 summary.	Inclusion of additional explanation of environmental effects of supply side options in the summary of the fWRMP19.
Natural England	43	**1: Habitats Regulations Assessment** **1.1. General HRA comments** Regulation 9 of the Conservation of Habitats and Species Regulations 2017 (S.I. 2017/1012) requires every competent authority, in the exercise of any of its functions, to have regard to the requirements of the Habitats Directive. Regulation 10 places a duty on a competent authority, in exercising any function, to use all reasonable endeavours to avoid any pollution or deterioration of habitats of wild birds. In addition, regulation 63 places obligations on competent authorities in respect of plans or projects likely to have a significant effect on a protected site. Water Companies have a statutory duty to prepare WRMPs and so they are the Competent Authority for Habitats Regulations Assessment (HRA) of the dWRMP. In England, as a matter of policy, sites listed or proposed under the "Ramsar Convention on Wetlands of International Importance" receive the same level of protection as European sites. The HRA is presented as a separate recognisable document and the process of the assessment is simply and correctly set out in the dWRMP19. The presentation of the screening is clear and each stage of the HRA is set out in separate documents. Natural England commends Southern Water on their extensive HRA screening and attempts to assess some very complex and difficult impacts. Despite the documents helpful structure and design, and methodology there are some significant deficiencies in the content of the HRA which are summarised below: - There must be an appropriate assessment of a plan or project unless, on the basis of objective information, a likely significant effect can be excluded. The HRA has not correctly identified all likely significant effects in the screening of options, therefore there are missing appropriate assessments. Natural England would be happy to discuss further with Southern Water on the aspects which we believe are missing or incorrect. - Mitigation has been used to avoid likely significant effects in some cases. The use of mitigation to remove a likely significant effect and avoid undertaking an appropriate assessment has been the subject to recent case law. Natural England recommends that the HRA is reviewed in light of this recent case law and that Southern Water seeks its own legal advice on the implications of this for their HRA. - Natural England recommends appropriate assessments are undertaken where doubt remains as to the effectiveness of the mitigation proposed in removing the significant effects. - Not all appropriate assessments are sufficiently evidenced to support the conclusions, even at the plan level, and therefore not all adverse effects and uncertainties are sufficiently identified. The language in some appropriate assessments is unclear and is not always linked to the legislative tests, making the documents appear unsound. - Some mitigation is insufficient and is not therefore certain to remove all adverse effects. - Some assumptions on the relative permanence of impacts are incorrect in Natural England's view and not supported by evidence. The influence the HRA has had on the dWRMP is described in Figures 2 and 3 (HRA main report) which provide diagrams for the process of how the HRA has influenced the options selection within the dWRMP. Figure 2 states there are a list of options that have been rejected on environmental grounds and that the HRA has influenced the design of options. However the HRA has failed to influence the outcome (options selections and design) fully and sufficiently, this is a result of the deficiencies in the HRA described above. Natural England has already provided some initial feedback on our significant concerns regarding Scenario A for the Western Area which the company are attempting to address. We will continue to work with Southern Water to help them address the remaining deficiencies in their HRA.	The HRA has been reviewed and updated taking account of Natural England's comments on screening for likely significant effects - the specific changes are referenced against each of the specific Natural England comments in this Statement of Response. The HRA screening has also been updated to reflect the 2018 "People over Wind" CJEU judgment , with each option having been reviewed to ensure that mitigation measures are excluded from the screening assessment. This has resulted in more options being identified in the Stage 1 screening as requiring Appropriate Assessment if they were to be selected for inclusion in the Preferred Programme or as strategic alternative options. Appropriate assessments have been undertaken for seven options included in the Preferred Programme or strategic alternative options where Stage 1 screening identified the risk of likely significant effects and the need to consider mitigation measures to remove these effects. The following Appropriate Assessments have been produced: Fawley desalination (75 and 100Mld/), Bournemouth Water import, Portsmouth Water import (Havant Thicket Reservoir Development, Test Industrial Water Reuse, Southampton Link Main (all in the Preferred Programme) plus Portsmouth Harbour and Fareham WTWs indirect potable reuse and Sittingbourne Industrial Water Reuse (both strategic alternative options). In light of Natural England's comments and our subsequent discussions with Natural England, we have: a) Where feasible, modified scheme designs to avoid adverse effects on European sites. In particular, further work has been undertaken to determine where pipelines can be re-routed to avoid designated sites and sensitive habitats wherever possible, and justification for any sections that cannot be rerouted has been provided, along with specific mitigation measures to minimise adverse effects. The HRA Stage 1 screening (Appendix A) and, where required the Appropriate Assessments, have been updated to reflect these revised routes. The permanence of impacts from the pipelines has also been further reviewed in light of Natural England's concerns, including revising the pipeline routes where feasible to avoid any impacts to groundwater flows to wetland habitats, and avoid the loss of irreplaceable habitats (e.g. chalk grassland, ancient woodland) which cannot be mitigated for. We have updated the HRA (and/or SEA) assessments accordingly based on the revised pipeline routes. Further details for specific schemes are provided in this Statement of Response to the specific concerns raised by Natural England. b) Included additional evidence in the Appropriate Assessments to support our conclusions of no adverse effects and provided Natural England with technical evidence relating to the desalination scheme brine dispersion modelling c) Provided more specific information on mitigation measures in the Appropriate Assessments that are required to avoid adverse effects. Further details are provided in the specific comments made by Natural England on specific sites/options in this Statement of Response.	Appendix A Stage 1 Screening of Annex 15 has been updated to take account of the People over Wind judgment and Natural England's screening comments. Appropriate Assessments (Appendices B to B to H of Annex 15) have been updated where applicable or new assessments provided taking account of Natural England's comments, in particular providing more information and evidence to support the conclusions of no adverse effects. HRA Report (Annex 15) has been updated to reflect Natural England's comments. Fact Files for each option have been updated to reflect the revisions to schemes made in light of Natural England's comments. These changes are reflected in the HRA screening and Appropriate Assessment as applicable (Appendices A to H of Annex 11).
Natural England	43	**1.2 Cumulative and in combination assessment (HRA)** The cumulative and in combination assessments of options are not sufficient. In particular large numbers of pipelines/transfers with multiple river crossings, crossing of wetland and chalk grassland priority habitats have been dismissed as mitigatable without in combination assessments. These must be considered, in combination and the number of crossing points of European sites minimised and pipelines should be rerouted outside of European sites.	In-combination assessments have been carried out and presented in the HRA and SEA Environmental Report for the revised WRMP strategies, including taking account of potential cumulative effects of various pipelines associated with our plan and those of other water companies. These take account of the latest available information (August 2018) on proposed schemes of neighbouring water companies (including work commissioned on cumulative effects by the Water Resources South East Group in August 2018), as well as other relevant plans and projects. In-combination effects assessments have concluded that there are no adverse effects to site integrity following adoption of mitigation measures and when considering the different timing of construction activities.	HRA Main Report (Annex 15) Sections 6.11 to 6.15 plus Section 6.2 set out the cumulative, in-combination effects between options included in the preferred programme and strategic alternative options as well as with other plans and projects (including drought plans and other water company WRMPs).
Natural England	43	**1.3 Western Area (HRA)** The dWRMP strategy for the western area includes the following options that present a number of significant environmental risks, particularly to internationally and nationally designated sites, protected landscapes, and priority biodiversity.		
Natural England	43	**Import from Bournemouth Water (pipeline transfer) (Post 2030)** This options transfers treated water from the River Avon at Christchurch (within extant licence) to network distribution near Fawley Both rivers are Special Areas of Conservation (SAC) and have adjacent high value (SSSI or/and SPA) wetland habitat. The 31.9 km pipeline current proposed route crosses the River Avon, Beulieu River and Test Estuary with more than 20 km in the New Forest National Park (NFNP) and between 4 and 5 km in the New Forest SAC/SPA/Ramsar site.	A revised Bournemouth Water import scheme has now been included in the revised draft WRMP. The revised scheme involves using a number of existing licensed sources in the River Hampshire Avon catchment and a revised pipeline route that avoids the New Forest National Park and New Forest SAC, SPA and Ramsar sites. We have revised our environmental assessments in the SEA, HRA and WFD Reports (Annexes 14-16, respectively) to reflect the revised scheme. The revised pipeline route was re-screened and subject to a Stage 2 Appropriate Assessment. The Appropriate Assessment indicates there would be no adverse effects on designated European sites but that further revisions to the precise route of the pipeline may be required to avoid adverse effects on a number of Priority Habitats in a small number of locations along the pipeline route, or otherwise agree detailed mitigation and compensatory measures with Natural England during the detailed design phase. This will need to be informed by detailed environmental surveys along the pipeline route and ongoing dialogue with Natural England (and the Environment Agency where applicable). Southern Water is committed to the principles of net biodiversity gain in respect of the development of specific schemes in line with the policy set out in the National Planning Policy Framework 2018 and will work with Natural England, planners and other relevant parties to develop the specific details for each scheme as they are brought forward for detailed planning and design as well as site environmental surveys and investigations. We will also be establishing a Steering Group and scheme-specific Working Groups for regulators and stakeholders to enable close dialogue on the detailed design, environmental investigations, development of mitigation measures and delivery of net biodiversity gain. In line with other pipeline route options that have the potential to affect sensitive environments, Southern Water has sought to minimise the environmental effects of pipelines by revising scheme designs and adopting the following key design principles: - Avoiding adverse effects wherever feasible taking account of other constraints on pipeline routing - Avoiding adverse effects on SACs, SPAs and Ramsar sites through application of mitigation measures where these sites cannot be avoided - Avoiding any loss of Ancient Woodland, chalk grassland habitat or NERC Act Priority wetland habitats or other Priority habitat where these cannot be replaced or compensated for - Minimising adverse effects on National Parks, in particular features of principal importance to their designation - Minimising adverse effects on AONBs, in particular features of principal importance to their designation - Minimising the number of river crossings We will continue dialogue with regulators, statutory bodies and interested stakeholders through the Steering Group and scheme-specific Working Groups in developing the detailed designs and carrying out the detailed environmental investigations that will inform the final decisions on the precise pipeline routes and the precise details of any required mitigation measures. The HRA screening assessment of the abstraction effects have been carried out by South West Water and concluded that the raw water abstraction will remain within existing abstraction licence limits which have been reviewed as part of the Environment Agency's Review of Consents process. This review concluded that the abstraction licence conditions were sufficient to avoid adverse effects on the SAC. However, work is required to address the effect of in-river structures on fish migration in the River Avon and there is an investigation planned (and included in WINEP3) to address this issue.	Annex 15 (HRA Report) Appendix C provides full details of the Appropriate Assessment of this revised option. The Fact File has also been updated to reflect the changes made to this option. The Technical Overview of the revised draft WRMP19 sets out more details on the proposed Steering Group and scheme-specific Working Groups.

Natural England	43	**Additional Import from Portsmouth Water (of up to 30Ml/d).** This option is split into two phases, with water taken from Portsmouth Waters additional surplus provided by 2025 and additional water provided though development of new surface water reservoir in south Hampshire by Portsmouth Water by 2030. This pipeline is routed through the Itchen valley and crosses the SAC river five times (data from option fact file).	The HRA has been updated to reflect the People over Wind CJEU judgement, with an Appropriate Assessment included as a consequence for the Portsmouth Water import (Havant Thicket Reservoir) 23 Ml/d option. The initial 9Ml/d option import option from Portsmouth Water utilises capacity within an existing main and therefore there are no HRA issues. The 23Ml/d Havant Thicket Reservoir option requires a new pipeline to be routed to the Lower Itchen WSW requiring the crossing of the River Itchen. The number of pipeline crossings, and locations for the crossings was reviewed in light of Natural England's comments, although constrained by the need to connect to existing infrastructure which alternates between the left and right bank of the river. We have sought to re-route the pipeline to avoid designated sites and sensitive habitats wherever possible in line with our design principles set out in the response above. However, due to engineering constraints and the need to connect to existing infrastructure on either side of the River Itchen, there is limited potential to re-route. A single directional drill is however now proposed under the river at Chickenhall WTW rather than three separate crossings. The permanence of impacts from the pipeline has been further reviewed in light of Natural England's concerns, including assessing any impacts to groundwater flows to wetland habitats, and the loss of irreplaceable habitats (e.g. chalk grassland, ancient woodland) which cannot be mitigated for. We have updated the HRA and/or SEA assessments accordingly. No adverse effects on site integrity have been identified, however additional site environmental surveys and assessment work will need to be completed as part of the detailed design, in dialogue with Natural England and Environment Agency, including a noise and vibration assessment to ensure no adverse effects on fish.	Appendix E of Annex 15 (HRA Report) includes the Appropriate Assessment of this option setting out the revised route and mitigation measures necessary to avoid adverse effects on European sites. The Fact File has been updated with the revised scheme details.
Natural England	43	**Fawley Desalination (50 or 100 Ml/d sub-options) by 2030** This is a large desalination plant with an abstraction of between 100 and 200 Ml/d from the Solent estuary and discharging between 50 and 100 Ml/d into the main Solent via an existing, now defunct former power station pipeline. However it is noted that the HRA assessed a 200Ml/d discharge into the Solent. The treated water is then re-mineralised and transferred to the Lower Test WwTW through a pipeline via the New Forest designated sites. The associated water transfers for this option include up to 11 river crossings (data from option fact file).	The revised draft WRMP19 now incorporates a 75 Ml/d Fawley desalination scheme (increasing to 100 Ml/d as a strategic alternative option if required). Further work has been undertaken to assess the effects of the scheme on designated sites in light of Natural England's comments and we have made changes to the scheme design and modifications to the associated pipeline routes. Wherever possible, the pipelines have been re-routed to avoid designated sites and sensitive habitats, and justification for any sections that cannot be rerouted has been provided, along with mitigation measures to minimise adverse effects in line with the design principles outlined in the early response above . The permanence of impacts from the pipelines has been further reviewed in light of Natural England's concerns, including assessing any impacts to groundwater flows to wetland habitats, and the loss of irreplaceable habitats (e.g. chalk grassland, ancient woodland) which cannot be mitigated for. This has included a high level study of impacts to surface and groundwater flows as the pipeline to passes through the New Forest SAC, SPA and Ramsar between Buttsash and Applemore. Dialogue with the Highways Agency is ongoing to establish whether the pipeline can be laid within the road and therefore outside the designation boundary, but as a precautionary approach we have also assessed a revised route running through an existing dry heath wayleave on the other side of the road which avoids designated wet habitats of the New Forest SAC. We have extended the discharge outfall pipeline for the brine discharge by 500m to deeper water and to enable improved dispersion. An extensive package of mitigation is required to avoid adverse effects to the Solent Maritime SAC and within the New Forest SAC, SPA and Ramsar as detailed in the updated Appropriate Assessment. We have updated the HRA and/or SEA assessments accordingly. The Appropriate Assessment has concluded no adverse effects to site integrity with the application of mitigation measures. We will continue to work with Natural England and other parties as we take this option forward to detailed design through the proposed Steering and Working Groups (see response above) to enable close dialogue on the development of this option. Further investigations will be required including detailed site environmental surveys and additional dispersion modelling of the brine discharge as part of optimising the precise design and siting of the discharge.	Appendix B of Annex 15 (HRA Report) provides the updated Appropriate Assessment. The Fact File has been updated to reflect the revised design of the scheme for the different capacity options.
Natural England	43	**Water Indirect WwTW potable Reuse (or/ and desalination) at Sandown by 2030** This option is a small reuse plant from Sandown WwTW to support flow in the Eastern River Yar. An alternative (or sub option) goes to a water supply works near High Alvington. Potential pipeline related construction impacts include five crossings of the Eastern Yar and Medina Rivers. This is in the context and setting of Isle of Wight Area of Outstanding Natural Beauty (AONB) and also adjacent to Alverstone Marshes SSSI. The Eastern Yar discharge point is upstream of the Brading Marshes to St. Helen's Ledges SSSI (part of Solent and Southampton Waters SPA and Ramsar site).	The HRA Screening assessment has been updated to provide additional evidence to support the conclusion of no likely significant effects on the European sites. The screening assessment concluded that the discharge of highly treated wastewater effluent to the Eastern Yar would not result in adverse effects on water quality in the designated estuary and there would be no adverse effects on the integrity of either of these sites. This information is contained in the updated HRA Stage 1 Screening Assessment. The sites are located downstream of the abstraction intake and treatment of the effluent will be to a high standard to meet drinking water quality requirements. No changes in nutrient levels will arise as a consequence of this scheme in the estuary. Further work has been undertaken to assess the effects of the scheme on designated sites. Wherever possible, the pipeline has been re-routed to avoid designated sites and sensitive habitat in line with our design principles set out in the earlier response above. Justification for any sections that cannot be rerouted has been provided, along with mitigation measures to minimise adverse effects. The pipeline has been re-routed to extend outside the Isle of Wight AONB, and where possible uses the existing road network. There is a constraint in that the pipeline needs to be within the AONB close to High Alvington due to the location of the reservoir. The permanence of impacts from the pipeline has been further reviewed in light of Natural England's concerns, including assessing any impacts to groundwater flows to wetland habitats, and the loss of irreplaceable habitats (e.g. chalk grassland, ancient woodland) which cannot be mitigated for. There are no effects of the pipeline on any European site. Southern Water has included in its revised draft WRMP its commitment in the SEA its commitment to work with Natural England, Environment Agency and other stakeholders as the detailed design of the scheme is progressed to optimise the pipeline routes to minimise environmental effects. A Working Group will be set up to facilitate dialogue on the design of this scheme. We have updated the HRA and/or SEA assessments accordingly.	Appendix A of Annex 15 (HRA Report) has been updated and provides further evidence to support the conclusion of no likely significant effects on any European site (see Sections 1.29 and 2.8). Section 8.2.1 of Annex 14 (SEA Report) sets out commitment to Working Group to facilitate dialogue on detailed design of the scheme.
Natural England	43	**Test to lower Itchen potable (or raw water) pipeline transfer** This option is a new 18.7 km pipe between the WSW on the Itchen and River Test of up to 45Ml/d and passes through the River Itchen SAC, crosses the River Test and crosses the nearby Solent and Southampton Waters SPA and Ramsar sites and Lower Test Valley SSSI. A section of the pipe is within the South Downs National Park (SDNP).	The pipeline for this Southampton Link Main (new name for this bi-directional pipeline in the revised draft WRMP19) does not cross any part of the River Itchen SAC but does cross part of the Solent and Southampton SPA and Ramsar site. The Appropriate Assessment of this option has been updated to reflect the discussions held on site with Natural England in 2016 for a variant of this pipeline route which was previously being considered and to take account of Natural England's representation on the draft WRMP19. The proposed pipeline route has been reviewed in line with the design principles set out earlier in this Statement of Response but unfortunately it does still pass through part of the Solent and Southampton Water SPA and Ramsar site - the route cannot be modified further due to a number of engineering constraints including listed buildings, overhead power cables and other existing pipeline routes. However, detailed mitigation for the loss of a small area of designated habitat was discussed and agreed with Natural England in 2016, including follow up assessments, and this has been included in the Appropriate Assessment to ensure no adverse effects on the integrity of these European sites. The permanence of impacts from the pipeline has been further reviewed in light of Natural England's concerns, including assessing any impacts to groundwater flows to wetland habitats, however further hydrological assessment will be required at the detailed design stage to confirm the mitigation measures proposed will not interrupt flows. We have updated the HRA and/or SEA assessments accordingly. The Appropriate Assessment has concluded no adverse effects to site integrity with the application of mitigation measures. We will continue to work with Natural England and other parties as we take this option forward to detailed design through the proposed Steering and Working Groups (see response above) to enable close dialogue on the development of this option. Further investigations will be required including detailed site environmental surveys of the pipeline route and groundwater investigations to enable optimisation of the precise route to avoid any adverse effects on wetland habitat.	Appendix F of Annex 15 (HRA Report) provides the updated Appropriate Assessment for this option and includes details of the required mitigation measures. The Fact File has been updated to reflect changes to the scheme since the draft WRMP19.
Natural England	43	**Test Estuary WwTW indirect reuse (9Mld)** This is reuse of effluent from a WwTW to provide an industrial supply but no information on the route of the pipeline or this option has been provided to Natural England.	The HRA Report has been updated to include more information on the scheme design and to reflect the People over Wind CJEU judgement, with an Appropriate Assessment included as a consequence. The scheme details have also been updated and includes a new pipeline. We have applied our design principles set out in the earlier response to this pipeline route but it has not been possible to completely avoid European sites - the Appropriate Assessment therefore addresses the potential effects of the part of the pipeline route that extends through the New Forest SAC, SPA and Ramsar. This is the same route alignment as may also be required for the Fawley desalination scheme (see above response) . The permanence of impacts from the pipelines has been further reviewed in light of Natural England's concerns, including assessing any impacts to groundwater flows to wetland habitats, and the loss of irreplaceable habitats (e.g. chalk grassland, ancient woodland) which cannot be mitigated for. The Appropriate Assessment has included a high level study of impacts to surface and groundwater flows as the pipeline to passes through the New Forest SAC, SPA and Ramsar between Buttsash and Applemore. The pipeline route has been optimised to avoid any adverse effects on the European sites by running the pipeline route through an existing dry heath wayleave on the other side of the road which avoids designated wet habitats of the European sites. We have updated the HRA and/or SEA assessments accordingly. No adverse effects to site integrity have been identified however an extensive package of mitigation will be required for construction close to the Solent Maritime SAC and within the New Forest SAC, SPA and Ramsar as detailed in the HRA Appropriate Assessment. This scheme would not be required for development until the 2060s but we will take account of the pipeline routing that will be required in the design of the Fawley desalination scheme.	Appendix D of Annex 15 (HRA Report) provides the Appropriate Assessment of this option and sets out the mitigation measures required to avoid adverse effects on European sites. The Fact File has also been updated to reflect revisions to scheme design.
Natural England	43	**IZT_OAN Hampshire water grid transfers** These a very long series of pipelines to connect the water supply zones across Hampshire. They pass through a number of ancient woodland sites, cross the River Test SSSI and have an extensive length in the North Wessex Downs AONB.	The pipeline route has been reviewed in response to Natural England's representations on the draft WRMP19 regarding landscape impacts, loss of irreplaceable priority habitats and impacts to the River Test SSSI. Commitment has been made to avoid areas of ancient woodland. However, approximately 10km of pipeline will be required within the North Downs AONB given the destination of the pipeline at the existing Southern Water supply asset. This cannot be avoided and therefore route optimisation will be required at the planning stage to minimise impacts to the character of the area by utilising the local road networks and areas of poorer quality habitat. The pipeline will cross the River Test SSSI between Chilbolton and Wherwell. To minimise impacts, the crossing will be directionally drilled. The launch and receptor pits will be set up in the least impactful locations e.g. not lowland fens, and where possible not coastal and floodplain grazing marsh assuming this does not compromise the ability to directionally drill. The booster station will be located out of the flood plain. No landtake is proposed within the River Test SSSI, or the adjoining Chilbolton Common SSSI and Bransbury Common SSSI. However, mitigation will be required during construction to ensure there is no habitat degradation e.g. pollution prevention measures, dust control measures, control measures to avoid the spread of INNS, avoidance of sediment laden runoff, use of ground protection matting to minimise compaction of habitats, and reducing topsoil strip to just that required for the pipeline trench to minimise impact to localised surface water flows. Longer term impacts from impedance of surface and groundwater flows will need to considered further at the detailed design stage with use of clay stanks and suitable backfill material to prevent lateral flow of water along the pipeline and potentially away from the river. A hydrology assessment will be required to confirm that suitable mitigation measures are available to avoid impedance, or identify alternative crossing points to avoid impacts.	Summary details are provided in Section 8.1.2 of Annex 14 (SEA Report) and further detail is set out in Section 1.3 of Appendix G (SSSI assessment), Annex 14 (SEA Report).
Natural England	43	**Broadlands Lake Reservoir** Late on in the plan, an option is selected to use the existing or extend the size of the Broadlands Lake near the River Test for abstraction.	This option is not selected in the preferred strategy for Western area in the revised draft WRMP nor is it a strategic alternative option.	Annex 9 has been updated to reflect the preferred Western area strategy and strategic alternatives

Natural England	43	**1.3.1 River Itchen Special Area of Conservation (SAC)** Please refer to Natural England's response to SWS draft Drought Plan (30 April 2018) with regards to impacts of proposed drought orders options on the River Itchen SAC including both the Lower Itchen Sources and Candover drought order options. The information on these options is not repeated here. The solution proposed in the dWRMP to removing these risks of adverse effects on the integrity of the River Itchen in drought is to implement strategy A options in western area. Natural England welcome the river restoration proposals for the Itchen in the western area strategy. We recommend that SWS clarifies the relationship between these dWRMP river restoration proposals and the mitigation and compensatory habitat measures agreed as part of the recent public inquiry. Natural England advises that the western area strategy and accompanying SEA and HRA is updated to include any material changes agreed at and subsequent to the public inquiry, subject to any changes required to these agreements by the Secretary of State. In addition to the drought options there are a number of pipelines in the dWRMP, for delivery by 2030, that will cross the River Itchen, some pipelines crossing the river on multiple occasions; for example the Portsmouth water transfer zigzags across the SAC five times. Crossing a groundwater fed river surrounded by groundwater fed SSSI wetlands (like the River Itchen) could cause impacts to hydrogeology or hydro-ecology even with directionally drilling techniques. Natural England recommends that the effects of all the pipelines in the dWRMP including those in the Hampshire grid and water transfers, are assessed. Pipeline routes should be amended to significantly reduce the number of crossings of the River Itchen SAC to as few as possible and to avoid all wetland habitat associated with the river valley and to avoid all designated wetland habitat.	The revised draft WRMP has been updated to reflect the outcomes of the Public Inquiry and the revised Western Area programme (Strategy A) has been subject to updated HRA, SEA and WFD assessment. We have clarified in the revised draft WRMP19 that the mitigation measures agreed for the Drought Orders on the River Itchen (as set out in our revised draft Drought Plan 2018) are additional to the river restoration measures proposed for the River Itchen and River Test in the revised draft WRMP19. The HRA has been updated to reflect the People over Wind CJEU judgement, with an Appropriate Assessment included as a consequence for both the Portsmouth Water import (Havant Thicket Reservoir Development) and the Portsmouth Harbour and Fareham WTW indirect potable reuse scheme (as a strategic alternative option to the Fawley desalination option). These are the only two WRMP options included in the revised plan that might affect the River Itchen SAC due to pipeline construction. We have carried out a cumulative effects assessment of these two options in respect of the potential for concurrent construction periods on a precautionary basis noting that the reuse option is only a strategic alternative option and may well not be required to be developed. Further work has been undertaken to assess the effects of the scheme on designated sites in light of Natural England's comments on multiple pipelines and river crossings, and changes to the scheme design and modifications to the associated pipeline routes have been made as a consequence in line with our design principles set out earlier in this Statement of Response. As set out above in respect of options with pipelines crossing the River Itchen SAC we have reduced the number of river crossings where possible and will work with Natural England further as we carry out the detailed design of the pipeline routes to ensure an integrated approach across the various options involving pipelines in the SAC. The permanence of impacts from the pipelines has been further reviewed in light of Natural England's concerns, including assessing any impacts to groundwater flows to wetland habitats, and the loss of irreplaceable habitats (e.g. chalk grassland, ancient woodland) which cannot be mitigated for. We have set out in the relevant Appropriate Assessments the mitigation measures we propose to avoid adverse effects on the SAC, including siting of directional drill pits away from sensitive habitats. The Appropriate Assessments have concluded no adverse effects to site integrity with the application of mitigation measures. We will continue to work with Natural England and other parties as we take the options forward to detailed design (noting the reuse option is a strategic alternative option) through the proposed Steering and Working Groups (see earlier response above) to enable close dialogue on the development of the option(s). Further investigations will be required including detailed site environmental surveys of the pipeline route and groundwater investigations to enable optimisation of the precise pipeline route to avoid any adverse effects on wetland habitat. Detailed investigations will also include a noise and vibration assessment to ensure no adverse effects on fish.	Appendices E and G of Annex 15 (HRA Report) provide the Appropriate Assessment of the two schemes that may affect the Itchen SAC. Section 4.4.2 pages 33-34 of Annex 15 (HRA Main Report) provides details of the HRA conclusions for the Western Area "Strategy A". Section 6.1.5 Page 45 provides a summary of the cumulative effects on the River Itchen SAC between the two options in Strategy A that may affect the River Itchen SAC.
Natural England	43	**1.3.2 New Forest Special Protection Area (Special Protection Area (SPA and SAC)** The New Forest SAC, Ramsar and SPA each an extensive list of features for which it was notified which can be found on the JNCC website . Of particular relevance to the proposals in the dWRMP are the terrestrial wetlands - a number of these features are priority habitats under the Habitats Regulations. The wet heaths and valley mires are also Ramsar features along with the diverse invertebrate and wetland plant assemblages. The SPA is classified for its breeding birds: nightjar, woodlark, Dartford warbler and honey buzzard and its overwintering hen harrier populations. The HRA screen only identifies the Bournemouth water import and the Fawley desalination (enabling pipeline) as having a likely significant effect and requiring an appropriate assessment for the New Forest SAC. It is proposed that 9 km of the Fawley transfer pipeline is through the New Forest SAC/SPA and Ramsar site with an additional section of approximate 5 km through the SAC/SPA and Ramsar from the Bournemouth bulk supply transfer pipeline. The Bournemouth transfer is not selected until very late on in the plan giving plenty of time to reroute and redirect the pipeline to a more acceptable location. The loss of the SAC habitat to the Bournemouth pipeline would combine with the loss of the habitat to the Fawley pipeline proposal. Both pipelines go through significant lengths of SAC habitat including (from the very high level maps provided) priority habitat valley mire and wet heath. The appropriate assessments for the SAC for both options states for all wetland habitats construction works may temporarily affect drainage locally however the pipeline trench and backfill material will be designed to maintain favourable hydrological conditions. The same text is used regardless of the habitat or of the distance from the proposed pipeline route of the habitat type. The SPA appropriate assessment states "wetland, woodland and heathland habitats should be avoided. However the pipeline route goes through significant areas of these habitats in the New Forest SAC, Ramsar (and SPA) boundary. No resolution of these two statements is made. The proposal to avoid stag beetle habitat if possible is also unsatisfactory - all stag beetle habitat should be avoided. In addition impacts on the nesting birds will be mitigated 'by avoiding the nesting season of the SPA species" (i.e. avoiding March to August). Impacts on the wintering hen harrier will be avoided by working outside the wintering period where possible (i.e. avoiding October to March). This leaves one month when the pipeline may be constructed. Avoiding both nesting and wintering is recognised as probably not possible in the appropriate assessment which goes on to state the construction will use silencers and visual screening for any works within 1km of the wintering roosts of hen harrier. The practical unlikelihood of this mitigation being possible, in particular on common land inside a National Park, where screening, which is effectively fencing, requires special permission, is not recognised.	Further to Natural England's comments and subsequent discussions, we have reviewed and revised the HRA in relation to revisions made to the Fawley desalination scheme, the Bournemouth Water import and Test Industrial Reuse scheme. As set out in earlier responses above, in line with our design principles (see above also) the pipelines for these schemes have been re-routed wherever possible to avoid the New Forest designated sites and sensitive habitats, and justification for any sections that cannot be rerouted has been provided, along with mitigation measures to minimise adverse effects, in the Appropriate Assessments. The permanence of impacts from the pipelines has been further reviewed in light of Natural England's concerns, including assessing any impacts to groundwater flows to wetland habitats, and the loss of irreplaceable habitats (e.g. chalk grassland, ancient woodland) which cannot be mitigated for. As set out in an earlier response above, the Bournemouth Water import pipeline no longer extends through the New Forest SAC, SPA and Ramsar: the pipeline has been specifically routed to avoid Whiteparish Common SSSI, a component of the SAC. The Fawley desalination (75 Ml/d and 100Ml/d) and Test Industrial Reuse options potentially both require a pipeline link from Hardley to Applemore and this has been assumed for the HRA on a precautionary basis. As set out above in earlier responses, it has not been possible to avoid the European sites but instead the Test Industrial Reuse pipeline will utilise an existing wayleave to the south of the Hythe bypass, cleared for overhead power cables and comprising dry heath habitat. On a precautionary basis, we have also assumed the Fawley desalination pipeline will also need to be laid along this wayleave but we have also considered an alternative route following the road which would require approval from the highways authority - the current position is that approval would not necessarily be given but further dialogue will take place with both Natural England and the highways authority as we progress the Fawley desalination scheme to detailed planning and design (the proposed Steering and Working Groups (see earlier response above) will enable close dialogue on the development of this option, noting that the Test Industrial Reuse Option will not require development until the 2060s. The changes made to the schemes have also re-routed the pipelines away from sensitive designated SPA and Ramsar nesting bird habitat and SAC stag beetle habitat. Cumulative, in-combination assessments have also been carried out in respect of these schemes which concluded no cumulative adverse effects on the New Forest European sites. The HRA screening assessment of the abstraction effects of the Bournemouth Water import option have been carried out by South West Water and concluded that the raw water abstraction will remain within existing abstraction licence limits which have been reviewed as part of the Environment Agency's Review of Consents process. This review concluded that the abstraction licence conditions were sufficient to avoid adverse effects on the SAC. However, work is required to address the effect of in-river structures on fish migration in the River Avon and there is an investigation planned (and included in WINEP3) to address this issue. We will continue to work with South West Water and Natural England to ensure the abstraction has no adverse effects on the SAC as part of the proposed Steering Group and scheme-specific Working Group as set out in an earlier response above.	Appendices B, C and D of Annex 15 (HRA Report) provide the Appropriate Assessments of the three schemes that may affect the New Forest European sites. Section 4.4.2 pages 33-34 of Annex 15 (HRA Main Report) provides details of the HRA conclusions for the Western Area "Strategy A". Sections 6.1.1 and 6.1.2 Pages 42-43 provides a summary of the cumulative effects on the New Forest European sites between the three options in Strategy A that may affect them.
Natural England	43	Natural England does not agree that the impacts of the pipelines through the wet heath or valley mire or on any New Forest wetland SAC and Ramsar habitats, can be considered temporary. Natural England advises it is not aware of any examples of infrastructure pipeline though these lowland wetland habitat types without permanent impacts and no evidence is presented to support the statements in the HRA. Natural England does not consider the mitigation proposed likely to be adequate to be certain to avoid adverse effect on the SPA birds features and mitigation for Stag beetles is also not adequate. The Fawley desalination option fact file states 'it is unlikely that a pipeline route to avoid this designation will be possible'. Natural England does not agree with this assumption and no evidence of alternative pipeline routes has been presented. Since the assumptions of the recoverability of the wetland habitats and interest features are incorrect the appropriate assessment cannot be certain that there is no adverse effect. Natural England advises that the pipeline routes must be rerouted outside of the New forest SAC/ (SPA and Ramsar site). Given the long lead-in time for the Bournemouth water transfer Natural England would accept an intention to re-examine the route with an intention to find a transfer route outside the SAC that avoids adverse effects during AMP7 in the updated plan appropriate assessment. Since the Fawley Desalination is required to be delivered by 2030 a route avoiding adverse effects on the SAC must be identified as soon as possible and ideally before the final plan is published to allow for costing of the rerouted pipelines. It is unclear if the Test Estuary industrial reuse involves pipelines through the New Forest. Natural England's requests further information on this option. We note the bulk supply from Bournemouth Water is within licence however Natural England has concerns about the impacts of within licence increases in abstraction on the River Avon on migratory fish and any knock-on effects on increased abstraction elsewhere which we have previously raised with Southern Water. Though the HRA assesses the impacts of directionally drilling under the River on fish migration (acoustic affects) concerns with regards increases within licenced abstraction and knock-on effects of increased abstraction elsewhere remain unaddressed. Though this is a matter for Bournemouth Water, the combined effects of other water companies plans should be examined.		
Natural England	43	**1.3.3 Solent and Southampton Waters SPA, Ramsar and Solent Maritime SAC** The Solent and Southampton Water European site features are listed on the JNCC website. Natural England notes the Test to Lower Itchen pipeline crosses a small area of the Solent and Southampton Water SPA and Ramsar site at the top of the Lower Test Valley SSSI, Natural England advises that a change to the route is considered, that crosses the river Test near the M27 or another single crossing that is outside the SPA. The impacts of Broadlands lake on the Lower Test Valley parts of the SPA and Ramsar site are unclear. It is unclear if the pipelines for the Test Estuary industrial reuse will affect the Solent sites. It is unclear if the discharge of treated effluent into the Eastern Yar from water Indirect WwTW potable reuse at Sandown will impact the Brading Marshes to St. Helens ledges part of the Solent and Southampton Waters SPA and Ramsar site. Freshwater flows are important to the Ramsar features at this part of the site in particular. Natural England requests further information on all these options.	The Test Lake scheme is not included in the revised draft WRMP19 Strategy A for the Western Area. We have provided a response above in relation to the Southampton Link Main scheme (previously the Test to Lower Itchen pipeline but revised scheme as now a bi-directional main to link the two Southampton Water Resource Zones and enable the transfer of water between each zone from the new strategic water sources being developed). The effects on the Solent and Southampton Water European sites are provided in the Appropriate Assessment which concluded that there would be no adverse effects on site integrity with the application of mitigation measures. We have provided a response above in relation to the Sandown WTW Indirect Potable Water Reuse option and its effects on the Solent European sites. HRA Screening of this option has been updated and concluded that there would be no likely significant effects on the European sites from construction or operation of the scheme, including on the Brading Marshes to St. Helens ledges part of the Solent and Southampton Waters SPA and Ramsar site.	Appendices D and E of Annex 15 (HRA Report) provide the Appropriate Assessments of the Test Industrial Reuse and Southampton Link Main options respectively and set out the mitigation measures required to avoid adverse effects on the Solent and Southampton Water European sites. Appendix A of Annex 15 (HRA Report) provides the screening decision on the Sandown WTW Indirect Potable Reuse option (see Sections 1.29 and 2.8). The Fact Files have also been updated to reflect revisions to scheme designs.
Natural England	43	**Fawley Desalination** This large desalination plant appears to have both its intake and discharge '90 m to the west' of Solent and Southampton Waters SPA, Ramsar and near to Solent Maritime SAC. Natural England notes that the intake is mapped at same location (option fact files) but this is not usually the best operational design for a desalination plant, in that the hypersaline discharge can interact with the intake. Clarification that the intake can be operated so close to the discharge for a desalination plant and likely impacts (if any) if a new intake is required to determine if any direct loss of SPA/Ramsar, SAC and or SSSI habitat is likely for this option. An intake of this size (100 to 200 Ml/d) will cause both entrainment and impingement of marine biota. Desalination discharges are significantly more saline than the ambient conditions and can have a range of other impacts (see section 2 below). This large desalination would utilise the existing outfall from the disused power station for hypersaline discharge which is sufficient in size. Reviews of desalination impacts4 on the marine environment vary and empirical quality of studies varies however two general consensus points are made; firstly intakes and outfalls should be sited in areas of the lowest marine and coastal sensitivity and secondly impacts depend strongly on the precise design and location of the intake and outfall pipe and dispersive capacity of the water body. The existing discharge pipe was not designed for a desalination plant and therefore may not minimise the impacts. The impacts of anti-scaling and other chemicals essential for pipe maintenance on marine biota is largely unknown and is unassessed in the HRA. Significant further work on how to optimise the design and operation of the desalination plant to minimise the impacts is required. Natural England has now received information on dispersion modelling of this and other desalination options in the dWRMP but not in sufficient time to review for this response. The HRA notes that a 3.4% uplift in ambient salinity will occur but does not state the extent over this will occur. This is compared with the shellfish directive threshold which advises that discharges shall not cause the salinity to exceed more than 10% above ambient. However this threshold is not acknowledged for Habitats Regulations assessments and it is not recognised in the supplementary advice to the conservation objectives against which the appropriate assessment should have been assessed. In any case the appropriate assessment was only applied to the SPA feature. Natural England will continue to work with the company on the development of mitigation and potential engineering solutions for this option with regards to the Solent sites. At this stage, however Natural England advises there is insufficient information within the appropriate assessment for this option to be certain there will be no adverse effect on integrity of the Solent sites. In addition there are significant risks of in combination effects, if the drought plan options on the Isle of Wight that also impact the Solent and Southampton Water SPA, Ramsar and Solent Maritime SAC habitats, remain as drought options by 2030. It is unclear if the Hampshire strategy A will remove the risk of these damaging drought options.	The design of this scheme has been revised since the draft WRMP19 and the changes have been set out in the revised draft WRMP19, including in the HRA, WFD and SEA Annexes. The intake and outfall are situated sufficiently distant from each other to ensure no adverse effects on abstraction from the hypersaline (brine) discharge. Both the intake and outfall utilise existing infrastructure from the former power station and are located in the Solent (and not in Southampton Water) and therefore the seaward end of each pipe are not located within any of the Solent or Southampton Water European sites. However, there may be construction effects on the Solent and Southampton Water SPA and Ramsar at the landward end of these pipes and operational effects arising from the brine discharge plume. An extensive package of mitigation will be required for construction as detailed in the Appropriate Assessment. In light of the revisions to the scheme design and comments made by Natural England, together with discussions with Natural England on the draft WRMP19 Appropriate Assessment, we have updated the Appropriate Assessment of the Fawley desalination scheme to take account of the design changes and included assessment of the construction works required for the outfall and intake and effects of construction and operation on any sensitive marine habitats, impingement and entrainment issues. dispersion of the brine discharge in The Solent (and possible effects into the mouth of Southampton Water). The discharge will not include other chemicals from the desalination treatment process and these will be treated on-site to neutralise them prior to being discharged via the wastewater treatment works so as to avoid impacts on the Solent or the mouth of Southampton Water and associated European sites. An extension has been made to discharge outfall design by extending the pipe a further 500m to enable discharge into deeper water and therefore enabling better dispersion. The Appropriate Assessment has been carried out with reference to the Conservation Objectives of the European sites and supplementary advice to these objectives, although these do not contain any specific water quality objectives relating to the brine discharge and we have therefore continued to make use of the only available standards from the Shellfish Waters guidance against which the materiality of the brine discharge has been assessed. No adverse effects to site integrity have been identified using a worst case modelling scenario based on 150 Ml/d scheme (for the Near-field dispersion modelling) and 200 Ml/d scheme for the Far-Field dispersion modelling. Additional dispersion modelling will be carried out for the smaller capacity 75 Ml/d and 100 Ml/d as part of the next stage detailed planning and design of the scheme and to take account of the 500m extension to the discharge pipeline into deeper water. We have updated the HRA and/or SEA assessments accordingly. The Appropriate Assessment has concluded no adverse effects to site integrity of any of the European sites with the application of mitigation measures. We will continue to work with Natural England and other parties as we take this option forward to detailed design through the proposed Steering and Working Groups (see response above) to enable close dialogue on the development of this option. Further investigations will be required including detailed site environmental surveys and additional dispersion modelling of the brine discharge as part of optimising the precise design and siting of the discharge, and to discuss the necessary approvals including Marine Licensing. The revised draft Drought Plan 2018 includes options on the Isle of Wight that may impact the Solent and Southampton Water SPA, Ramsar and Solent Maritime SAC habitats although with mitigation measures applied we have concluded that there will be no adverse effects on these European sites. The Fawley desalination option and other options for the Western Area in Strategy A of the revised draft WRMP19 are required to remove the need for these Drought Plan measures by reinforcing the resilience of water supplies for the Isle of Wight. As a result, no in-combination effects will arise during operation of the Fawley desalination plant. The cumulative, in-combination effects assessment of Strategy A and the revised draft Drought Plan is set out in the HRA Report and concludes no adverse effects on the European sites during the construction phase of the Fawley desalination scheme.	Appendix B of Annex 15 (HRA Report) provides the updated Appropriate Assessment. Section 6.2.2 page 46 of Annex 15 (HRA Report) summarises the conclusions of the cumulative, in-combination effects of the Fawley desalination scheme with the Southern Water revised draft Drought Plan 2018. The Fact File has been updated to reflect the revised design of the scheme for the different capacity options.

Natural England	43	**1.4 Central Area** The dWRMP strategy for the central area includes the following options that present a number of significant environmental risks, particularly to internationally and nationally designated sites, protected landscapes, and priority biodiversity. **Water reuse scheme from Littlehampton WwTW by AMP8 (20Ml/d)** This option transfers waste water from a treatment works near the lower Arun at Ford to the River Rother for abstraction near Pulborough, crossing the Arun four times and with 12-15km of the pipeline in the SDNP. Construction is planned for 2027. **Water reuse scheme from the Brighton WwTW (10Ml/d)by AMP8** This option has two sub options of 40 and 78 Ml/d from the WwTW at Brighton to the River Ouse upstream of the South East Water abstraction. There is a second pipeline from the discharge point to supply works in Falmer. Both pipelines are very long and pass through the SDNP and one passes through Clayton to Offham Escarpment SSSI for 700m and immediately adjacent to Lewes Downs SAC. **Desalination scheme on the tidal River Arun (20Ml/d) by AMP 8** This option involves building a desalination plant near an existing WwTW and abstracting saline water from the tidal River Arun and discharging at the existing long sea outfall (from Ford WwTW). Mitigation is proposed by mixing the discharge with the existing effluent stream. The abstraction point is upstream of Climping Beach SSSI. **Coastal desalination scheme at Shoreham by AMP8** This has an intake and discharge adjacent to existing power infrastructure. It discharges into Sussex transitional waterbody. The nearest SSSI is some distance away (Adur Estuary SSSI). **Pulborough winter transfer scheme (stages 1 to 3)** This pipeline allows additional water to be taken from the Rother at Pulborough in Winter. It includes a two staged transfer pipeline that crosses River Adur via the Adur Estuary SSSI. Natural England recognises that these options are uncertain as they are driven principally by currently uncertain sustainability reductions to meet the requirements of the Water Framework Directive and the scale of uncertain reductions in the central area is very large. All options were screened out of the HRA as having no likely significant effects. Natural England do not concur with the screening view in all cases as set out below.	We have reviewed and updated the HRA in light of Natural England's comments and changes to the scheme designs made since the draft WRMP19. We have reviewed the Littlehampton water reuse scheme and confirm it is located at sufficient distance from Ebernoe Common SAC so as not t result in any likely significant effects to the Barbastelle and Bechstein bat populations. The screening conclusions had regard to the bat species foraging distances and habitat preferences as detailed in the HRA Stage 1 Screening Assessment. The Brighton WTW water reuse pipeline (now only a strategic alternative scheme sized at 10 Ml/d) has been completely re-routed to avoid the Lewes Downs SAC and the offsite functional habitat, following discussions with Natural England. The revised pipeline route has been assessed as part of the updated HRA Stage 1 screening assessment which concluded that there would be no likely significant effects on any European site. The desalination scheme on the tidal River Arun is no longer included in the preferred programme or as a strategic alternative option in the revised draft WRMP19. The desalination scheme at Shoreham is located at sufficient distance from any European sites, and therefore no likely significant effects will occur to any European site as set out in the updated HRA Stage 1 screening assessment. The Pulborough Winter Transfer Option 2 does not pose any risks to any European site given the distance of the pipeline from any European site - no likely significant effects were identified in the updated HRA Stage 1 screening assessment.	Appendix A to Annex 15 (HRA Report) sets out the HRA Stage 1 screening assessment decisions for these schemes against the relevant European sites.
Natural England	43	**1.4.1 Arun Valley SAC, SPA and Ramsar site** The Arun Valley sites are extensive areas of alluvial grazing marsh intersected by drainage ditches supporting a rich flora and fauna and their wintering birds. The SAC is notified for populations of Anisus vorticulus. The HRA screened all the dWRMP options as having no likely significant effect on the Arun Valley sites. Littlehampton indirect effluent reuse will discharge treated effluent upstream of the Amberley Wild Brooks and Waltham Brooks parts of the European sites. Provided the water quality and chemistry for this options can be made to approximate unimpacted water quality from the discharge location, Natural England concurs with the screening of this option as having no likely significant effect on the Arun Valley sites. Further work on the effects of the discharge on the downstream sites will be needed at the project stage.	Natural England's comments are noted. The water quality of the water discharged from Littlehampton WTW to the River Arun will be treated to a high standard that will comply with relevant WFD and CSMG water quality requirements that will be enshrined in the discharge permit for the scheme. More information on the water quality has been included in the updated HRA Stage 1 Screening Assessment for this option. Further detailed design will take place as the scheme is progressed, including water quality sampling, to determine the precise treatment process and operational controls to ensure the water quality can meet the agreed discharge permit conditions. We will continue to discuss the detailed design of this scheme with Natural England as we take if forward for detailed planning, and this will include optimising the design of the tertiary treatment process to meet the required water quality standards.	Appendix A to Annex 15 (HRA Report) sets out the HRA Stage 1 screening assessment for this scheme against the relevant European sites.
Natural England	43	**1.4.2 Lewes Downs SAC** The Lewes Downs SAC and underpinning SSSI is notified for its orchid rich chalk grassland consisting largely of CG2 and CG3 calcareous grasslands. The site contains an important assemblage of rare and scarce orchids, including early spider-orchid, burnt orchid and musk orchid. Though it does not pass within it, the route of the Brighton indirect potable water reuse pipeline passes immediately adjacent to a small portion of the Lewes Downs SAC. The chalk grassland (NERC priority habitat) has been restored to surround the SAC boundary through which the pipeline will pass. This orchid-rich chalk downland is extremely sensitive to pollution, disturbance and any soil perturbation. The SAC requires the surrounding land to act as part of its wider population source. Natural England advises likely significant effect from damage to the land immediately adjacent to the SAC cannot be excluded on the basis of objective evidence.	We discussed these concerns with Natural England who provided a habitat map of the important offsite supporting land. These discussions informed a review of the pipeline routes so as to avoid where possible and otherwise minimise effects on designated sites and sensitive habitats in line with the design principles set out in an earlier response above. This review considered the permanence of impacts from the pipelines, including assessing any impacts to groundwater flows to wetland habitats, and the loss of irreplaceable habitats (e.g. chalk grassland, ancient woodland) which cannot be mitigated for. As a result of this review, we have redesigned the scheme so that the pipeline has been re-routed completely so as to avoid impacting the Lewes Downs SAC and offsite supporting habitat. The HRA Appendix A Screening has been updated accordingly, and concluded that there would be no likely significant effects on any European site.	Appendix A to Annex 15 (HRA Report) sets out the HRA Stage 1 screening assessment for this scheme against the relevant European sites.
Natural England	43	**1.5 Eastern Area** The dWRMP strategy for the eastern area includes the following options that present a number of significant environmental risks, particularly to nationally designated sites, protected landscapes, and priority biodiversity. **Medway WwTW indirect potable reuse scheme:** This option transfer approximately 18Ml/d of treated effluent to the River Medway upstream of Springfield. The European sites are some way downstream of the discharge points however in combination effects with other plans or projects have not been ruled out. **Sittingbourne licence trade:** This option is a purchase of a licence from an existing industrial use. A pipeline to a water supply reservoir and treatment of the water are required. The extant abstraction is very close to the Swale Estuary SPA/ Ramsar site and SSSI. The last section of the pipeline appears to go through the Cromers Wood ancient woodland. **Raising of Bewl Reservoir by 0.4m:** This raises the bank height of the existing Bewl Reservoir by 40cm. The SEA notes the need for detailed mitigation measures will be required to protect this woodland during construction. All of these options were screened out as having no likely significant effect in the HRA, Natural England concurs with this decision for the above options alone. There are options within Southern Waters draft Drought Plan that have been unable to exclude on the basis of objective evidence a likely significant effect on the European sites in the Medway. The combined effects of the eastern area options should be considered further in the updated HRA, as well as combined effects of other companies plan options. Natural England welcomes the removal of certain schemes with high risk of adverse effects on integrity of European sites from the eastern area strategy including desalination options on the Isle of Sheppey discharging into the Medway and desalination proposals discharging into Pegwell Bay.	The Medway WTW indirect potable water reuse scheme has been assessed both alone and in combination with other projects and plans. There are no fewer schemes being promoted by water companies in relation to the Medway estuary and as a result no cumulative in-combination effects have been identified. No likely significant effects have been identified to the downstream European sites in the HRA Stage 1 Screening Assessment. Sittingbourne industrial water reuse is being considered as a strategic alternative option for the Eastern Area strategy in the revised draft WRMP19. Given the proximity of The Swale SPA and Ramsar, and in light of the "People over Wind" judgment, an Appropriate Assessment has been completed for the scheme. The percentage of treated effluent to be redirected away from the Milton Creek for the reuse scheme has been assessed against the dry weather flow conditions for the WTW and in relation to the overall freshwater flows to the Creek, which is a small part of the Swale estuary system. Given the relative scale of the reduction in freshwater flows and the tidal dominated processes of the estuary system (and associated European sites) as a whole , no adverse effects on site integrity are anticipated. Raising Bewl Reservoir is no longer included in the Preferred Programme or as a strategic alternative option in the revised draft WRMP19.	Appendix A to Annex 15 (HRA Report) includes the screening decision in relation to the Medway WTW indirect potable reuse scheme, confirming no likely significant effects on any European site. The HRA cumulative effects assessment as summarised in Section 6 of Annex 15 (HRA Main Report) concludes there would be no adverse effects on any European sites of the Medway WTW indirect potable reuse scheme in combination with any other plans or projects. Appendix H of Annex 15 (HRA Report) provides the Appropriate Assessment for the Sittingbourne WTW indirect potable reuse scheme.
Natural England	43	**2: Strategic Environmental Assessment** The European Commission Directive 2001/42/EC "on the assessment of the effects of certain plans and programmes on the environment" is known as the 'SEA Directive'. It requires "an environmental assessment is carried out of certain plans and programmes which are likely to have significant effects on the environment" (EC, 2001; Article 1). The provision is explicitly applied to plans made for "water management". **2.1 Baseline** The baseline list of plans, policies and programmes is relatively comprehensive, and we welcome the inclusion of Natural England's Conservation 21 strategy, relevant protected landscape plans and the other company plans. Please update the baseline plans or policies listed to include: - Defra 25 Year Environment Plan. - Amend reference to Conservation of Habitats and Species Regulations to include the updated 2017 legislation which replaced the 2010 version of the legislation (Pg 8 SEA). - Countryside and Rights of Way Act 2000 - Marine and Coastal Access Act 2009	The SEA has been updated to include these additional Acts, updated Regulations and the Government's 25 Year Environment Plan. Our assessments have taken account of the 25 Year Plan as appropriate. We had already carried out assessments in respect of the provisions of the Habitats Regulations (but which changed to the 2017 Regulations after completion of the draft WRMP19 - but the new Regulations do not affect the HRA conclusions), as well as the Countryside and Rights of Way Act and the Marine and Coastal Access Act. In respect of the latter two Acts, we have added additional assessment information in relation to SSSIs and Marine Conservation Zones, respectively (see later comments from Natural England) although these do not materially change the assessment conclusions reached for the draft WRMP19 and are provided to aid transparency of the assessments carried out.	Section 2.2. in Annex 14 (SEA Report) and Appendix B of Annex 14
Natural England	43	**2.2 Desalination Impact Assessment** The impacts of desalination options have not been adequately assessed in the SEA. A 20175 paper on desalination listed the environmental considerations (in addition to impacts on energy use, carbon and air quality) that should be made of desalination proposals as: - Habitat alteration and changes in sediment transport - Entrainment and impingement of marine biota - Debris pollution (from intake screening) - Biological effects of residual chemical additives (e.g. chlorine, pH modifiers) and their by-products - Brine discharges (outfall) and impact on marine habitat: salinity. pH, dissolved oxygen, CO2, nitrogen, temperature, density, residual chemicals (iron-hydroxide, metals, polymers, antiscalants, biocides, anti-foamants, acids, coagulants, cleaning chemicals, coliform and other organics, TOC, floatables and suspended solids, turbidity) and particulate matter in the concentrate (biological & aesthetic impacts) - Intake/outfall velocity and buoyancy effects, incl. those on natural currents and waves, volumetric flow rates - Sea level changes, coloration - Product water Recovery Ratio - Protection of wildlife and biological diversity, rare and endangered species, sensitive habitats The SEA appears to have dismissed most of the above impacts focusing mainly on the high energy consumption as the main residual impact of the desalination proposals with very little consideration of the above issues.	The desalination plant options will utilise best available technologies to minimise identified potential environmental effects, and relevant discharge standards for the waste streams will be set to protect the marine environment and ensure WFD and Habitats Directive compliance. We have provided further details on the mitigation measures considered in the SEA in identifying the residual effects on the environment The paper helpfully cited by Natural England has been reviewed, and we have provided more information in the SEA on the mitigation measures associated with the various potential effects listed by Natural England that have been considered in assessing the residual effects noted in the SEA. This has also been used to update the Appropriate Assessment for the option in the HRA Report and the WFD assessment. The SEA text has been updated to include the range of risks to the marine environment listed in the paper which we have considered at a strategic level and the necessary mitigation measures that may be required to protect the marine environment. Since the draft WRMP19, and in light of discussion with Natural England, we have further reviewed the design of the scheme and the mitigation measures that are likely to be required such that the assessed residual effect is reduced to no greater than moderate adverse effects on the marine environment. For example, we have: a) changed the outfall design so that the discharge is made to deeper water to give more effective dispersion taking account of brine dispersion modelling results and to move the discharge further away from sensitive marine habitats b) included for on-site treatment to deal with non-brine chemical waste products from the treatment process. This waste steam will be neutralised on site and then discharged via an existing wastewater treatment works. c) ensured provision of screening of the intake and outfall structures to avoid entrainment of aquatic fauna More specific assessment information is provided in Annex 15 (HRA – Appendix B) and Annex 16 (WFD – Appendix B Section 1.9-1.10). We have set out at a strategic level in both the HRA Appropriate Assessment (Annex 15 Appendix B) and the WFD Assessment (Annex 15 Appendix B) the mitigation measures required to protect the marine ecology and environment in respect of the Fawley desalination scheme, both during construction and operation. These will need to be developed in greater detail and informed by site specific environmental investigations as part of the next stage of detailed planning and design which in turn will inform the EIA and other statutory permitting processes. These will need to cover the range of potential risks outlined earlier in Section 6.3.3 and those set out in the HRA and WFD assessments in respect of the pipeline routes. We will work closely with Natural England and the Environment Agency to develop the detailed surveys to inform the detailed design of mitigation measures through the proposed Steering Work and scheme-specific Working Groups referenced in Section 8.1.2. of the SEA Report (Annex 14) and in the Technical Overview Report. We have already revised the strategic outline design to reduce the risks of adverse effects (see Section 8.1.2) and have considered mitigation measures including: a) best practice pollution control measures during construction of the outfall and abstraction pipelines to protect sensitive habitats at the landward side of the construction activities b) noise, vibration and dust suppression measures to protect designated bird species during construction of the intake and outfall c) optimising the precise location of the outfall pipe and design/configuration of the dispersers to maximise mixing of the brine discharge – this will require further dispersion modelling to be carried out to inform the design d) if required, consider operational control rules to optimise the dispersion of brine discharges if adverse effects are not addressed by the design of the outfall infrastructure.	Section 6.3.3 of Annex 14 (SEA Report) updated to include the wider range of risks to the environment referenced by Natural England. Section 8.1.2 of Annex 14 (SEA Report) updated to provide more information on the assessment of moderate adverse effects on the marine environment and the changes made to the scheme design since the draft WRMP19 to reduce the magnitude of such effects. This section also commits Southern Water to setting up a Working Group with Natural England and Environment Agency plus other stakeholders to drive forward the detailed investigations needed to inform the EIA of the scheme and other statutory permitting processes. Section 11.3.1 of Annex 14 (SEA Report) updated to discuss in more detail the monitoring and mitigation measures that will need to be carried out for the Fawley desalination scheme. Annex 15 (HRA Report) Appendix B provides the detailed Appropriate Assessment of the Fawley desalination scheme. Annex 16 (WFD Report) Appendix B Section 1.9 - 1,.10 provides the more detailed WFD assessment of
			We recognise the particular environmental concerns raised by Natural England in respect of the Fawley desalination scheme. Detailed investigations and surveys will be carried out, in agreement with the environmental regulators, to ensure that the scheme design and mitigation measures are optimised to minimise effects on the marine and terrestrial environments. This includes ensuring detailed studies to further evaluate the various risks to the marine environment set out in the paper cited by Natural England. We will discuss these investigations with Natural England and Environment Agency through the proposed Steering Group and Working Group for the scheme. The SEA is a strategic assessment of the option and more detailed assessment will be carried out in support of EIA and other statutory permitting processes as the scheme is taken forward to the planning and design stage.	

Natural England	43	**2.3 Sites of Special Scientific Interest (SSSIs)** Section 28G of the Wildlife and Countryside Act 1981, as inserted by section 75 of and Schedule 9 to the Countryside and Rights of Way Act 2000, places a duty on public authorities, including water companies, to take reasonable steps consistent with the proper exercise of their functions to further the conservation and enhancement of SSSIs. These duties are mirrored in the general recreational and environmental duties placed on relevant undertakers in the Water Industry Act (1991) as amended. The Water Industry Strategic Environmental Requirements6 (WISER, page 29) sets out the expectations for delivery of these obligations. Companies are expected "to contribute to maintaining or achieving SSSI favourable condition both on [companies'] own land and in the catchments [companies] manage or impact on". The rate of improvement going forwards is set out in the Defra 25 Year Environment Plan which aims to restore "75% of our one million hectares of terrestrial and freshwater protected sites to favourable condition, securing their wildlife value for the long term". The demand reduction and implementation of sustainability reductions (in particular in the western area) have the potential to contribute to restoration of favourable condition on SSSI rivers (not least the River Test and River Itchen SSSIs). These improvements may not achieve revised Common Standards Monitoring targets for favourable flow in these SSSI rivers. There are supply side options which have residual potential to harm SSSIs across the supply area, some examples are given below (those SSSIs that are also European sites are covered in the HRA above).	We have noted Natural England's general comments in respect of SSSIs and, following discussion with Natural England, we have included a specific SSSI assessment appendix (Appendix G) in the updated SEA Report (Annex 14) to provide details on the potential effects of the revised draft WRMP19 options on SSSIs, including the requirement for any mitigation measures. In carrying out these assessments, regard has been given to the statutory duties on Southern Water and the expectations for SSSIs as summarised in WISER. The Appendix provides greater transparency as to how we have assessed the effects on SSSIs in the SEA for each option which are considered in the broader SEA topic area objective 1.1 on biodiversity, flora and fauna for each option. The Appendix will help readers make linkages between SEA objective assessments and the effects implied in these broader assessments on specific SSSIs (in a similar manner that the HRA Annex 15 provides this transparency for European sites).	Annex 14 (SEA Report) has been updated to include Appendix G which provides details of the SSSI assessments for each option included in the preferred strategies (programmes) and strategic alternative options
Natural England	43	**2.3.1 River Test SSSI** The impacts of drought plan options on the River Test, and it's interest features, and how Natural England believes they should be assessed is already before the Secretary of State as part of the public inquiry documentation in our statement of case7 and proofs of evidence8. The drought plan option (which is referred to in the dWRMP) will cause very significant failure of flows required to achieve favourable condition with a resultant impact on the SSSI river habitat, fish, aquatic macrophytes and invertebrates. We have not repeated that information here, but are happy to provide a separate note, if requested. The western area strategy includes reference to river restoration on the River Test instead of changing the abstraction licence. This pre-dates the public inquiry and Southern Water's agreements to the licence changes and the use of river restoration as mitigation for the drought plan permit and order options on the River Test, up to 2027. Natural England recommends the plan is updated to explain the relationship between the river restoration proposed within the plan and that secured in mitigation agreements. The dWRMP must be updated to include all material changes as a result of, and subsequent to the public inquiry, subject to any changes made by the Secretary of State. Natural England note that the main pipeline for the IZT_OAN crosses two branches of the River Test SSSI and the Test to Lower Itchen transfer also crosses the River Test SSSI (and Lower Test Valley SSSI). Natural England recommends that where river crossings are unavoidable the pipelines should be routed to minimise the number of crossings and minimise the number of channels crossed, should use existing infrastructure (like the M27) and areas that already have a compromised bank structure. Consideration should be given to restoring the river geomorphology as part of all river crossings in line with the relevant reach options within river restoration plans.	The revised draft WRMP19 t has been updated to incorporate the outcomes of the Public Inquiry for the Test and Itchen, with the revised Strategy A adopted as the preferred plan that delivers on the objectives agreed as part of the Public Inquiry. The revised draft Drought Plan 2018 (submitted to the Secretary of State in June 2018) incorporates the relevant findings of the Public Inquiry in respect of the Test Drought Order and effects on the River Test SSSI. We have provided clarity in the updated SEA Annex 14 that the river restoration measures for the River Test and River Itchen contained in the draft and also the revised draft WRMP19 Western Area Strategy A are ADDITIONAL measures over and above the mitigation and compensation measures agreed with Natural England and Environment Agency in respect of the Test Drought Permit/Order, Candover and Lower Itchen Drought Orders. The IZT_OAN pipeline (the Southampton Link Main option) will cross the River Test SSSI between Chilbolton and Wherwell. To minimise impacts, the crossing will be directionally drilled. The launch and receptor pits will be set up in the least impactful locations e.g. not lowland fens, and where possible not coastal and floodplain grazing marsh assuming this does not compromise the ability to directionally drill. The booster station will be located out of the flood plain. No landtake is proposed within the River Test SSSI, or the adjoining Chilbolton Common SSSI and Bransbury Common SSSI. However, mitigation will be required during construction to ensure there is no habitat degradation e.g. pollution prevention measures, dust control measures, control measures to avoid the spread of INNS, avoidance of sediment laden runoff, use of ground protection matting to minimise compaction of habitats, and reducing topsoil strip to just that required for the pipeline trench to minimise impact to localised surface water flows. Longer term impacts from impedance of surface and groundwater flows will need to considered further at the detailed design stage with use of clay stanks and suitable backfill material to prevent lateral flow of water along the pipeline and potentially away from the river. A hydrology assessment will be required to confirm that suitable mitigation measures are available to avoid impedance, or identify alternative crossing points to avoid impacts. The WTW_TOt pipeline will cross the River Test SSSI and Lower Test Valley SSSI. Considerable work was undertaken in recent years including a site visit with Natural England in 2016 to understand the implications of the pipeline route, the constraints of re-routing between Testwood WSW and Station Road, and therefore the resulting impacts to the Solent and Southampton Water SPA and Ramsar, River Test SSSI and Lower Test Valley SSSI. Considerable infrastructure already exists in the water meadows surrounding the Testwood WSW including critical strategic water mains and National Grid infrastructure (power cables), bridges and sluices and the Grade II Manor House Farm. The route selected has sought to minimise the overall length of pipeline required in the water meadows, avoid the infrastructure discussed above, and minimise the closure of Mill Lane which could impact local businesses and residents. A suite of mitigation and compensation measures have been developed to avoid adverse effects to the Solent and Southampton Water SPA and Ramsar, and River Test SSSI and Lower Test Valley SSSI. This includes the avoidance of trenchless technologies due to compaction of the water meadow habitats, significant dewatering required and percussive nature of some technologies (e.g. pipe jacking) and therefore existing pipe bridges will be used at the river crossings and an open cut installation method across the water meadows. The construction corridor will be limited to a 12m working width, timing restrictions will be implemented to avoid disturbance of the qualifying bird species, and S1 backfill and puddle clay stanks used to avoid preferential flow along the pipeline. Further detailed assessment, including a hydrology assessment, will be required at the detailed design stage to confirm the mitigation proposed is sufficient to avoid adverse effects.	Section 8.1.2 of Annex 14 (SEA Report) confirms that the river Test and Itchen measures in the revised draft WRMP19 are ADDITIONAL to those measures agreed in relation to the Drought Permits/Orders as part of the Public Inquiry. Section 8.1.2 of Annex 14 (SEA Report) summarises the assessment of the Southampton Link Main option. Appendix G (SSSI assessment) of Annex 14 (SEA Report) provides further detail (Section 1.3). Appendix F of Annex 15 (HRA Report) also provides more details in respect of this scheme from a Habitats Regulations perspective.
Natural England	43	**2.3.2 Fawley Desalination plant** In addition to impacts on the New Forest SSSI and the Solent and Southampton Water SPA and Ramsar features (described above) the associated infrastructure for this option has the potential to impact Hythe to Calshot Marshes SSSI, Dibden Bay SSSI, North Solent SSSI, Eling and Bury Marshes SSSI and Lower Test Valley SSSI (which all overlap in part with the Solent European sites) and River Test SSSI. Despite the number of SSSIs potentially affected, the size of the proposed discharge and abstraction, the pipeline impacts and the acknowledged likely significant effect on New Forest (see HRA above), the SEA assesses this option as a moderate adverse effects on biodiversity flora and fauna. Natural England does not agree with the SEA assessment and Natural England advises this conclusion is not consistent with the assessment methodology set out of the SEA. Potential pipeline related impacts alone are significantly adverse, with 11 river crossings in addition to the significant impacts of the discharge and intake close to the European sites on marine and coastal biodiversity (see HRA above). Natural England advises that the SEA is amended in terms of its likely residual impacts of this option on biodiversity flora and fauna. The pipeline route should be changed to reduce the number of river crossings and must be rerouted outside of the New Forest designated sites (see HRA above). In addition further information on the following is required to understand the full potential impacts and mitigation opportunities for this option: - Location of the intake pipeline? - Information on engineering techniques that will be used to reduce entrainment and impingement and information on the likely extent of residual impacted area?. - Operational use of chemicals and mitigation of their impacts. - Temperature, salinity and other chemical component of the likely discharge and what impacts these are likely to have. - Options to improve the dispersion from the existing pipeline. - Baseline information on the biota around the discharge. - Information available against all the list of considerations in section 2.2, clearly identifying the evidence gaps in the plan level information. Based on the information reviewed to-date, Natural England advises the construction and/or operation of the Fawley desalination option in the dWRMP and its associated pipeline is likely to result in significant harm to a number of SSSIs. It is unclear to what extent this harm can be mitigated by construction, engineering and operational techniques. In addition the route of the accompanying pipeline must be changed to avoid the wetland habitats in the New Forest SSSI.	As described above, the design of this scheme has been revised and the changes have been set out in the revised draft WRMP19. In light of the revisions to the scheme design and comments made by Natural England, we have updated the SEA and its conclusions in respect of the SSSIs and set out in more detail the mitigation measures that will be necessary for this scheme to minimise adverse effects on these SSSIs. A pipeline is potentially required between the Fawley desalination plant and the Test WSW to aid distribution of water within the Western resource zone. This pipeline will only be required for the 100Ml/d option (currently a strategic alternative). A section of the pipeline between Buttsash and Applemore will need to be routed either within or close to the New Forest SAC, SPA and Ramsar. Discussions are ongoing with the Highways Agency to challenge the initial response that construction within the A326 would not be permitted and develop a working arrangement that might be suitable. However, if construction in the road is not permitted, the pipeline will utilise a less favourable area of habitat within the designation boundary; an existing wayleave for overhead power cables just to the south of the A326. Construction activities will already have occurred along this length therefore disturbing the habitats and localised surface water drainage patterns. From Google Earth imagery the wayleave appears to be managed with vegetation cleared, therefore making it less suitable as nesting habitat for the qualifying bird species. Pipeline connections to a pumping station and Esso refinery have not changed and are outside the New Forest SAC, SPA and Ramsar boundaries, but are within the New Forest National Park. Use of existing infrastructure has been identified to minimise impacts to the Solent and Southampton Water SPA and Ramsar, and Solent Maritime SAC. This includes use of the two existing disused long-sea outfalls from Fawley power station. One will be used for the intake, and the other for the outfall with the new pipe being slip-lined within the existing 3m diameter pipe and extended for a further 500m, and laid on the sea bed and weighted down. Natural England's representation on the Fawley option commented on the suitability of using this infrastructure and whether it would impact highly sensitive marine habitats. From a review of the WFD low and high sensitivity habitat mapping (priority habitat mapping does not extend offshore), it can be confirmed that the area off the coast of Calshot is considered to be a low sensitivity environment with intertidal and subtidal sediments. The closest areas of higher sensitivity habitats are the saltmarshes at Hythe to Calshot Marshes and intertidal seagrass beds off the coast at Stubbington, the other side of Southampton Water. Brine dispersion modelling has been completed for 200Ml/d (far field modelling) and 150Ml/d (near field modelling) schemes and indicates that an increase in ambient salinity will be within ~60m of the outfall. The worst case scenario far field modelling has shown only a slight increase in salinity in Southampton Water, below the Hamble estuary. However, the modelling has shown that this stays within the central area of the waterbody and does not disperse to the intertidal areas. Other impacts associated with the desalination plant have been considered including; impingement, entrainment and entrapment and the potential for the detailed design to utilise best available technologies to reduce these impacts (e.g. deflection measures, capping of intake). The onsite treatment of noxious chemicals prior to discharge via a WwTW will ensure no toxic contamination of the environment. There will be no direct impacts on the North Solent SSSI, Hythe to Calshot Marshes SSSI, Dibden Bay SSSI or Eling and Bury Marshes SSSI. Some are within close proximity of parts of the construction phase and therefore mitigation will be required to avoid issues such as smothering with dust, sediment laden runoff and oil spills.	Further assessment details included in Section 6.3.3 and 8.1.2 of Annex 14 (SEA Report) report to discuss overall impacts of desalination option, and mitigation measures are discussed in Section 11.3.1. Appendix G provides SSSI assessment details (Section 1.1) The Fact File provides the updated scheme design details.
			Depending on the location of the launch pit for the slip-lining of the outfall a small area of coastal and floodplain grazing marsh may be temporarily lost. In addition, a small amount of deciduous woodland may need to be lost to accommodate the desalination plant at the Ashlett Creek WTW site. Further refinement of the design of the plant at the planning stage will aim to avoid this loss, however if this it not possible, suitable compensation will be provided and where achievable a net gain in biodiversity (e.g. green roof on plant). As discussed above, efforts are being made to reroute the largest proportion of pipeline through the New Forest National Park in the A326 bypass. However, if this is not achievable, use of lower sensitivity habitat immediately adjacent to this will be used. A small length of the connection to Esso will be required in the National Park given the location of Ashlett Creek WTW where the desalination plant will be sited. Similarly, the connection to Mopley booster station will also be within the National Park boundaries given the location of existing infrastructure. Impacts will be temporary and limited to the construction phase only, plus short-medium term recovery of habitats. Further route optimisation will be carried out at the planning stage to utilise the existing road network where possible and minimise impacts. Southern Water has included in its revised draft WRMP its commitment to a number of design principles as set out in Annex 6 of the revised draft WRMP (and in the SEA, HRA and WFD Reports) that will inform the detailed design of the scheme (as set out above). We have agreed with the Environment Agency and Natural England to establish a technical working group to enable ongoing dialogue as the detailed development of the scheme design and associated environmental protection mitigation measures are progressed in advance of the formal applications for the necessary permissions and approvals.	
Natural England	43	**2.3.3 Climping Beach SSSI** Climping Beach SSSI is a stretch of coast with a vegetated shingle beach, behind which is a sand dune system. The intertidal zone supports important populations of wintering birds and the numbers of wintering sanderling, in particular, are of European significance. The tidal desalination plant on the lower River Arun abstracts approximately 3 km upstream and the discharge of the hypersaline effluent is on the east of the estuary in the existing long sea outfall for the water treatment works. Natural England did not receive the dispersion modelling from the desalination proposals in time to review for this plan but the potential impacts that need consideration are listed in section 2.2 above. Natural England will write separately to the company to discuss any likely impacts on the SSSI and how to mitigate those proposals.	The desalination plant on the tidal River Arun is no longer being considered in the Preferred Programme or as a strategic alternative (as confirmed in Section 8.2 of Annex 14). Further assessment would be required if this option were to be selected in the future, including the potential impacts from the dispersion of the brine discharge.	No updates to SEA report required aside from Section 8.2.2 of Annex 14 (SEA Report) noting that this option is not included in the Preferred Programme.
Natural England	43	**2.3.4 Adur Estuary SSSI** The Adur Estuary is narrow estuarine site with intertidal mud and sand fringed by saltmarsh dominated by sea purslane Halimione portulacoides. Cord grass (Spartina spp.) is notably absent from most of the estuary. Of the wading birds that use the intertidal area, the Ringed plover is the most important (regularly 1% of British population). An adjacent reed-bed has breeding Reed and Sedge warblers. There is a colony of viviparous lizards Lacerta vivipara on the south-facing estuary embankment. The map provided to Natural England is unclear, but the Pulborough winter transfer pipeline appears to cross the river through the top of the SSSI. Since the pipeline will have to be directionally drilled under the estuary the compounds ends may be within the SSSI, unnecessarily destroying small areas of this SSSI. Given the relatively small length of extra pipeline required to avoid this SSSI, Natural England advises that the pipeline route should be moved outside of the SSSI to avoid impacts. Natural England has provided this advice to Southern Water previously. In addition the Shoreham desalination proposal discharges into the same water body as the Adur Estuary. Natural England has not yet reviewed the discharge plume modelling for this site. Should any unexpected impacts on this site or other important marine flora and fauna become apparent during our review Natural England will write separately with the company.	The proposed sub-option for the Pulborough Winter Transfer scheme (IZT_Har2) in the Preferred Programme of the revised draft WRMP19 (and as included for the draft WRMP19) is for a pipeline between Shoreham WSW/Mossy Bottom WSW and Patcham WSR to the east. Therefore no crossing of the Adur Estuary SSSI will be required with construction works situated approximately 400m to the east. Given the small scale of construction works required for the pipeline installation air quality impacts are considered unlikely, however best practice construction methods and use of hoarding will be used where necessary. The revised draft WRMP19 also includes as a strategic alternative option the first stage of the Pulborough Winter Transfer scheme (IZT_Har1) but this has no requirements for a pipeline. In respect of the Shoreham desalination option (10 Ml/d) the Near Field dispersion modelling of the brine discharge has been completed and the results show that for a 10 Ml/d capacity plant, the hypersaline plume reaches equilibrium (10% above ambient salinity) within 20.53 m from the outfall under worst case scenario. The option will make use of the existing long-sea outfall from Shoreham power station, and therefore at sufficient distance from the SSSI. The breakwaters at the mouth of the estuary will also deflect the plume away from the mouth of the estuary. This information is provided in Appendix G of Annex 14 (SEA Report) and also in Appendix B of Annex 16 (WFD Report).	Exclusion of pipeline within Adur Estuary SSSI confirmed in Section 8.2.2. of Annex 14 (SEA Report) Annex 14 (SEA Report) Appendix G and Section 8.2.2 updated with brine dispersion modelling results for Shoreham desalination scheme. Annex 16 (WFD Report) Appendix B also provides information on the brine dispersion modelling.
Natural England	43	**2.3.5 Fairmile Bottom SSSI** Fairmile Bottom lies on a north-west facing scarp slope of the South Downs where the Upper Chalk is covered by a thin layer of clay-with-flints. The site contains yew woodland and scrub as well as chalk grassland, which are all nationally rare communities. The site lies within the heart of the South Downs National Park. The Littlehampton indirect potable water reuse involves a very long pipeline that is routed immediately adjacent to this SSSI. If this route can stay under the road then impacts on the SSSI may be restricted to air quality from increased congestion. Natural England advises there must be no loss of any are of this SSSI and the works, support materials access and all other construction activities must not impinge on this SSSI.	The pipeline route has been reviewed and revised to avoid adverse effects on the nationally rare ecological communities of the SSSI and minimise effects on other nearby sensitive habitats within the National Park. This review has considered the permanence of impacts from the pipeline, including assessing the risk of loss of irreplaceable habitats (e.g. chalk grassland) which cannot be mitigated for. The pipeline will be installed within the road (A29), or verge, to the north of Fairmile Bottom SSSI, and therefore there will be no direct habitat loss. Air quality impacts, including dust from the break up of the road and the potential for increased NOx loading due to plant movements and stationary traffic will need to be considered. An air quality assessment will be completed once details of the construction programme and methods have been finalised, using the Air Pollution Information System data, onsite monitoring where necessary, and the methodology contained in DMRB Air Quality "Appendix F".	Section 8.2.2 of Annex 14 (SEA Report) updated to include this additional detail

Natural England	43	**2.3.6 Clayton to Offham Escarpment SSSI** The site comprises the north facing scarp of the South Downs between Lewes and the A23 (C. 10km). This comprises chalk grassland and a mixed chalk scrub in some sections. Chalk woodland on the dip slope which is of special interest for its bird and butterfly community is also included and the whole site is notable for its many species of orchid. The pipeline to support the water reuse from Brighton passes through 700m of this site. Orchid rich chalk grassland is an irreplaceable habitat. Natural England advises that this pipeline is likely to cause significant harm to this SSSI and should be rerouted to avoid this important site and the rerouted pipeline costed.	In light of these comments and discussions with Natural England, the pipeline that would affect this SSSI has been removed from the option so as to avoid any impacts to the Clayton to Offham Escarpment SSSI.	Section 8.2.3 of Annex 14 (SEA Report) updated with this detail
Natural England	43	**2.4 Impacts on landscape** Relevant Authorities (including water companies as a Statutory Undertaker) are to have regard to the purposes of National Parks (Section 11A (2) of the 1949 Act) and the similar duties towards Areas of Outstanding Natural Beauty (AONBs) (Section 85 of the Countryside and Rights of Way Act 2000) and the Broads (Section 17A of the Norfolk and Suffolk Broads Act 1988). Duties to further the natural beauty and rural amenity are also included within the general recreational and environmental duties placed on relevant undertakers in the Water Industry Act (1991) (as amended).Protected landscapes are central to the delivery of aspirations in the Defra 25 Year Environment Plan to enhance the beauty, heritage and engagement with the natural environment. There are many option in Southern Water's dWRMP and in other companies' plans which have the potential to impact protected landscapes should they go forward. Cumulative landscape impacts should be assessed before the final plan is submitted to ensure mitigation is possible, and mitigation should not be left to a piecemeal approach at the project stage. Natural England recommends that Southern Water works with neighbouring companies, with Protected Landscape Officers and Natural England to produce a cohesive Protected Landscape Mitigation Strategy for each AONB and National Park which could be affected by multiple schemes in the lifetime of the WRMP. These should be completed before implementation of the plans, and should address any cumulative landscape impacts which could occur with the aim to secure net landscape improvements for each protected landscape.	A new table (Table 14, Section 9.3) has been added to the SEA providing an assessment of the cumulative landscape issues of the Preferred Programme (predominantly relating to pipelines). This also considers the latest available information relating to other water company revised draft WRMP preferred programmes, as well as other projects and plans that may overlap with the WRMP schemes. As part of the further development and detailed design of the WRMP19 preferred strategy schemes, we will discuss identified potential cumulative landscape effects with other water companies through the WRSE group and propose the development of a combined Protected Landscape Mitigation Strategy that can be discussed with Natural England and relevant Protected Landscape Officers.	Table 14 Section 9.3 of Annex 14 (SEA Report) provides cumulative landscape assessment information Section 9.4.1 of Annex 14 (SEA Report) sets out proposal to seek agreement from WRSE for a joint WRSE cumulative Protected Landscape Mitigation Strategy.
Natural England	43	**2.4.1 New Forest National Park** Opportunities to avoid impacts on protected landscapes by routing infrastructure, in particular pipelines, outside their boundaries do not seem to have been explored. There are two pipelines through the middle of important habitat in the New Forest National Park (NFNP) where alternative (albeit longer) routes seem possible. 20km of the Bournemouth water bulk supply transfer option is within the NFNP and the Fawley Desalination enabling transfer has a further 9 km inside the National Park. Natural England advises the routes around the NFNP should be explored and information provided as to why these less damaging routes were not chosen.	In light of Natural England's comments, we have revised the pipeline routes to minimise adverse effects on the New Forest National Park. The SEA has been updated to reflect the revised Fawley desalination scheme pipeline and Bournemouth Water import scheme pipeline. The revised Bournemouth Water import pipeline route has been routed to avoid the New Forest SAC, SPA and Ramsar sites, and Whiteparish Common SSSI (a component of the SAC), as well as avoiding potential impacts to offsite habitat use of woodlands by woodlark. The route is outside the Cranborne Chase and West Wilshire Downs AONB and the New Forest National Park. A pipeline is potentially required for the Fawley desalination plant to move water northwards to the distribution system of Southampton. On a precautionary basis we have assumed this pipeline will be required for both the 75 Ml/d option in the preferred strategy (Strategy A) and for the 100Ml/d desalination plant option (currently a strategic alternative option). A section of the pipeline will need to be routed either within or close to the New Forest SAC, SPA and Ramsar and the National Park. Discussions are ongoing with the Highways Agency about the viability of construction within the A326. However, if construction in the road is not permitted, we have also assessed a pipeline route that will utilise a less favourable area of habitat within the European site and National Park boundary which is already an existing wayleave for overhead power cables just to the south of the A326. This wayleave is also the proposed routing for the Test Estuary Industrial Reuse pipeline. Further route optimisation will be carried out at the detailed planning stage to utilise the existing road network if possible for the Fawley desalination scheme pipeline and minimise environmental impacts.	Section 8.1.2 of Annex 14 (SEA Report) updated to summarise changes to pipeline routes and revised assessments.
Natural England	43	**2.4.2 South Downs National Park** Six of the water supply options in the central area are within the South Downs National Park (SDNP) including but not limited to: the pipelines associated with the Littlehampton and Brighton reuse schemes and the Pulborough winter transfer schemes. This is added to short lengths of pipeline in the Hampshire sections of the SDNP. There appear to be additional significant lengths of pipeline in the SDNP from transfers of effluent reuse to other water companies but this combined effect is less clear. The mitigation for the very extensive length of Pulborough winter transfer on the SDNP landscape (approximately 24km) is to direct the pipeline along the A27. Though this would mitigate the impacts on the SDNP it would be good to understand how realistic this is as a mitigation option. Of particular concern are the pipelines associated with the Brighton reuse scheme. Both pipelines cross over the downs going through very large tracts of semi-natural habitat including significant sections in priority habitat. Assumptions made that these effects will be mitigatable are not certain. Natural England's view is these priority habitats should be avoided. In addition sections of the proposed routes are routed through some of the most important heritage land forms in the National park including three scheduled ancient monuments (SAMS)– these include three round barrows East of Cabum Bottom, Bowl barrow near Glyndebourne Pit and Medieval settlement site on east of Saxon down. The pipeline also passes within 100m of three other SAMS. These iconic landforms are an essential part of the SDNP landscape designation and Natural England is not aware of how impacts on such sites could be mitigated. The pipeline routes also seem to cross a section of the South Downs Way National Trail having potentially very significant impacts on the recreational enjoyment of the park. The Brighton reuse options is also only assessed as moderately adverse in the SEA. Natural England does not agree with this conclusion with respect to the landscape impacts on the SDNP which appear to be majorly adverse, in combination. Natural England recommends that the pipeline routes for the Brighton effluent reuse scheme is rerouted to avoid the SAMs, SSSIs, priority habitat and where possible uses roads and pathways that already exist to route the pipe. Natural England recognise that SWS have attempted to avoid the most serious impacts on the SDNP by forcing the proposed reservoir at Hardham (within the SDNP boundary) not to be selected until after 2035. This option would be a major development within the SDNP and would need to meet the stringent test for such development set out in the National Planning Policy Framework.	The proposed Pulborough winter transfer scheme Stage 2 pipeline has been routed to minimise impacts to the South Downs National Park by extending alongside or within the A27 where possible. Sections of pipeline will be required within the South Downs National Park as existing water supply infrastructure are located within the Park and the pipeline needs to connect to these assets. Further route optimisation will be required at the detailed planning stage to minimise impacts to priority habitats including avoiding the lowland calcareous grassland at Slonk Hill and Southwick Hill. Lowland calcareous grassland also extends around Patcham and therefore long-term habitat loss will occur along this section of the pipeline route where existing access tracks cannot be used. Habitats alongside the A27 include semi-improved grassland and deciduous woodland, with a large area of deciduous woodland along Greenridge, close to Patcham Recreation Ground. Route optimisation will be required at the detailed planning stage to avoid extensive loss of trees. In light of Natural England's comments and following subsequent discussions with Natural England, a review of the pipeline route for the Brighton Water Reuse Scheme has been carried out to avoid where possible and otherwise minimise effects on the South Downs National Park, other designated sites and sensitive habitats. This review has considered the permanence of impacts from the pipelines, including assessing any impacts to groundwater flows to wetland habitats, and the loss of irreplaceable habitats (e.g. chalk grassland, ancient woodland) which cannot be mitigated for, as well as the landform features that are an important component of the National Park designation. Considerable re-routing of the pipeline has taken place to avoid impacts to Lewes Downs SAC, the Scheduled Monuments, and irreplaceable priority habitats (chalk grassland and ancient woodland) thereby minimising impacts to key features of the South Downs National Park. However, it has not been possible to avoid construction within the SDNP or priority habitats entirely. The revised route also avoids any impacts to the Clayton to Offham Escarpment SSSI. It will ensure there is only one construction corridor required within the South Downs National Park, thereby minimising impacts. We have further reviewed the potential landscape effects of the Pulborough Reservoir option and its setting within the South Downs National Park. As a result, we concluded that the scheme was not a feasible option that could be successfully promoted and as a result we removed the option from the Feasible options list. Consequently, the reservoir does not feature at all in our preferred strategy for our Central Area nor is it considered a strategic alternative option. A specific cumulative effects assessment on the South Downs National Park is now included in Table 14 of Section 9.3 of Annex 14 (SEA Report).	Section Table 14 in Section 9.3 of Annex 14 (SEA Report) has been included to summarise cumulative effects on the South Downs National Park.
Natural England	43	**2.4.3 AONBs** Bewl reservoir is a very large reservoir within the High Weald AONB. Raising of Bewl by 0.4m was chosen in the plan and the SEA states "it has been designed to avoid the most significant impact on designated ancient woodland close to the existing reservoir but detailed mitigation measures will be required to protect this woodland during construction". Natural England has not yet seen the footprint of the likely flooded area by this small-scale raising which, despite the small embankment addition, is likely to flood a significant area (due to the shape and topography of the existing reservoir). The impacts on recreation are likely to be significant as the proposal requires restructuring of the existing trail around the reservoir. Natural England advises significant further information on the likely footprint of the flooded area is needed to confirm the assumptions made that significant areas of ancient woodland will not be lost and confirm whether this would constitute a major development within a protected landscape. The northern part of the pipeline transfers to form the Hampshire water grid (IZT_OAN) is within the North Wessex Downs AONB. Other elements of the pipeline cross through historic parks and gardens. Pipeline impacts on the Kent Downs AONB appear to be less certain as options with the longest routes may only involve refurbishment of existing pipelines (e.g. Selling fleete main). The Bulk water import from SEW to Kent Thanet (Birchington) may be located in the Kent Downs AONB but no information was provided to Natural England on this option. In summary Natural England advises the impacts on protected landscapes of the dWRMP options, and pipelines in particular, have not been adequately assessed in the SEA nor are mitigation proposals addressed. Natural England recommends that significant further work on amelioration of landscape impacts is undertaken.	Raising Bewl reservoir is no longer in the Preferred Programme or as a strategic alternative option in the revised draft WRMP19. A short length of pipeline is required for the inter-zonal transfer from the Faversham area of approximately 5km within the Kent Downs AONB to connect to existing assets located in the AONB. Part of the SEW to Canterbury import pipeline is also located in the Kent Downs AONB to connect to existing assets in the AONB. Further route optimisation will be required at the detailed planning stage to minimise landscape impacts of these pipelines by routing through roads and existing access tracks where feasible. The pipelines have already been routed to avoid ancient woodland, and areas of woodland and parkland. With regards IZT_OAN, , we have routed the pipeline to avoid areas of ancient woodland and other irreplaceable priority habitat (e.g. chalk grassland). However, approximately 10km of pipeline will be required within the North Downs AONB given the destination of the pipeline. This cannot be avoided as the existing water supply asset is located within the AONB and therefore detailed route optimisation will be required at the planning stage to minimise impacts to the character of the area by utilising the local road networks and areas of poorer quality habitat. We added in a new Table 14 in Section 9.3 of Annex 14 (SEA Report) to summarise impacts to landscape designations including AONBs and National Parks.	Section 8.3.1 of Annex 14 (SEA Report) confirms that Bewl Raising option is no longer an option in the revised draft WRMP19. Section 8.3.2 of Annex 14 (SEA Report) provides details on pipelines in Kent Downs AONB. Section 8.1.2 of Annex 14 (SEA Report) provides details on pipelines in the North Downs AONB, New Table 14 in Section 9.3 included to summarise impacts to landscape designations including AONBs and National Parks.
Natural England	43	**2.5 Marine Conservation Zones** Section 125 of the Marine and Coastal Access Act (MCAA) (2009) applies a general duty to public authorities to exercise their functions in a way that best furthers the conservation objectives of a Marine Conservation Zone (MCZ) or, where that is not possible, least hinders them. There is also an obligation to notify Natural England where a public authority's function might significantly hinder the MCZ's conservation objectives or significantly affect an MCZ. The relevant public authorities must take account of this duty in the assessment of the water company statutory plans including the draft WRMP. The Defra 25 Year Environment Plan states "We will achieve a growing and resilient network of land, water and sea that is richer in plants and wildlife this includes [...] - Reversing the loss of marine biodiversity and, where practicable, restoring it, [....] - Increasing the proportion of protected and well-managed seas, and better managing existing protected sites." The marine and coastal environment is disproportionately impacted by the proposed dWRMP supply options, in combination with the draft drought plan options, in particular the desalination options but also the reduction of freshwater flows to estuaries, saltmarshes and mudflats (see draft drought plan for impacts). Several options have the potential to impact marine protected areas both inside European sites (see section 1 above) and outside. Natural England previously advised water companies that we expect to see a separate assessment of impacts on Marine Conservation Zones. There is no such assessment in the SEA and we repeat our previous advice that such an assessment should be included in an amended SEA. There is very little mitigation proposed for the marine environment and there is no separate or distinctive marine or coastal monitoring strategy. The option fact files do not have the MCZs or recommended MCZs marked on the maps. The impacts of the emergency desalination draft drought options on Marine Conservation Zones are covered in our response to the dDP and are not repeated here. Natural England's advice is the dWRMP should be updated to improve the assessment, mitigation and monitoring on the marine and coastal environment.	A separate section (Section 10.3) was included in the SEA Report of the draft WRMP19 to provide an assessment of the relevant Marine Conservation Zones in accordance with Natural England's advice note. Further information has been added to this same Section 10.3 of the updated SEA Report for the revised draft WRMP19. We have also added further details on the mitigation measures we have considered in each of the relevant option-specific assessments in the SEA Report (Annex 14 - Section 11) in relation to potential effects on MCZs and the wider marine and coastal environment. We have updated the Fact Files to include the MCZ information where applicable.	Section 10.3 of Annex 14 (SEA Report) has been updated, and where necessary mitigation measures for MCZs included in Section 11. Fact Files updated where applicable to indicate possible effects on MCZs.
Natural England	43	**2.5.1 Tidal River Arun Desalination** Kingmere MCZ is between 5 and 10 km off the coast of Littlehampton. Kingmere MCZ contains excellent examples of rocky habitat and subtidal chalk outcropping reef systems. These rocky habitats support a wide range of marine life. This site is one of the most well-known for spawning black seabream and may be one of the most important spawning sites within UK waters. Natural England has assumed this is too far away from the long sea outfall of the tidal river Arun desalination plant to be impacted by this dWRMP option, however Natural England has not yet reviewed the recently received dispersion plume information. Considerable uncertainty remains on the design and mitigation of this option with regards to wider marine and coastal biodiversity (outside the MCZ). The discharge point will be located approximately near mussel beds and there are other subtidal marine habitats near the discharge. Natural England requires further information to fully understand the potential impacts of this option on the marine environment. Natural England did not receive the dispersion modelling from the desalination proposals in time to review for this plan but the potential impacts that need consideration are listed in section 2.2 above. Natural England will write separately to the company to discuss any likely impacts on the SSSI and discuss how to mitigate those proposals.	This desalination option is no longer in the Preferred Programme or as a strategic alternative option. No impacts will arise from any other option on this MCZ.	No updates as option not within preferred programme or strategic alternative aside from Section 8.3.2 of Annex 14 (SEA Report) confirming the option is no longer included in the revised draft WRMP19.

Natural England	43	**2.5.2 Bembridge recommended MCZ** Bembridge recommended Marine Conservation Zone (rMCZ) lies adjacent to the east coast of the Isle of Wight including Sandown Bay and Bembridge Harbour. The site was recommended for designation for maerl beds, sea pens and burrowing megafauna and stalked jellyfish. The site has an exceptionally diverse range of habitats and species including both long-snouted and short- snouted seahorse the reef-building ross worm, native oysters and seagrass beds. The emergency desalination proposal in the dDP is mixed with the effluent stream to mitigate the effects of the discharge. However the Sandown indirect potable reuse scheme in the dWRMP would redirect the waste stream from the discharge. It would be helpful if the company could assess the reduction in mitigation from the removal (or reduction) in the effluent waste stream for the dDP emergency desalination option if it were to be used simultaneously with the reuse option at Sandown. The dDP desalination plant also affects the South Wight SAC.	The Drought Plan temporary emergency desalination scheme at Sandown is mutually exclusive with the permanent Sandown water reuse scheme and consequently there is no risk of adverse cumulative effects. Similarly the proposed strategic alternative of a permanent desalination plant at Sandown will also be mutually exclusive to the Sandown water reuse scheme. We have made this clearer in the SEA (Annex 14) and HRA (Annex 15) reports. Once the Sandown water reuse scheme is available there will no longer be a requirement for the Drought Plan measure at Sandown.	Section 9.4.2 of Annex 14 (SEA Report) confirms these schemes are mutually exclusive at Sandown.
Natural England	43	**2.6 Biodiversity** Under Section 40 of the Natural Environment and Rural Communities Act 2006 every public authority, including water companies, must in the exercise of its functions have regard so far as is consistent with the proper exercise of those functions to the purpose of conserving biodiversity. Conserving biodiversity in this context includes restoring or enhancing a population or habitat. WISER (page 30) states water companies are expected "to develop measures during the price review to contribute to biodiversity priorities and obligations on [companies'] own land or in the catchments [companies] influence and operate in". The Defra 25 Year Environment Plan states "We will achieve a growing and resilient network of land, water and sea that is richer in plants and wildlife this includes: - [...] Creating or restoring 500,000 hectares of wildlife-rich habitat outside the protected site network, focusing on priority habitats as part of a wider set of land management changes providing extensive benefits and - [...] Taking action to recover threatened, iconic or economically important species of animals, plants and fungi, and where possible to prevent human-induced extinction or loss of known threatened species in England and the Overseas Territories. Not all impacts on wider biodiversity (outside of designated sites) have been identified and no attempt to secure a net gain in biodiversity has been made. Natural England recommends that a commitment should be made in the document that all new supply options will seek to provide a net gain in biodiversity. Even the smallest schemes can be improved for example, on the Isle of Wight the renewal of boreholes near Cowes is likely to result in loss of two small areas of priority habitat (reedbed and willow carr) which are relatively uncommon on the Isle of Wight. Though not of national significance this is still a loss of small area of biodiverse habitat that has developed in the defunct service reservoir. The option should include a commitment to seek areas on the Isle of Wight to recreate these habitats to offset this loss of biodiversity. The offsetting area should be larger than the area lost to secure a net gain.	We are committed to delivering the principles set out within the Government's 25 Year Plan and the 2018 NPPF as we develop each supply scheme included in our revised draft WRMP19, working in dialogue with regulators	Section 8.4 of Annex 14 (SEA Report) includes this commitment,
Natural England	43	**2.6.1 Chalk Streams** England has the majority of the worlds chalk streams and those in Southern Water's supply area are an important global resource and a number of the small schemes will potentially adversely affect a number of small chalk streams throughout the supply area. For example recommissioning of the Test Valley bore holes could potentially have moderate adverse effects on the aquatic ecology of the Wallop brook.	Comments noted. As described above in respect of options that may affect chalk streams, we have assessed the potential effects on these internationally important habitats as part of the HRA and SEA as applicable. Mitigation measures have been proposed to avoid adverse effects on internationally designated chalk stream habitats and to seek to avoid adverse effects on nationally designated or Priority Habitat chalk streams, in line with our design principles set out above. These are described in the updated SEA and HRA Reports as appropriate. The Test Valley boreholes option is a Drought Plan option for a drought permit to temporarily allow abstraction from these boreholes. Mitigation measures to minimise potential adverse effects on the chalk stream have been set out in the revised draft Drought Plan 2018 and these measures are currently being agreed with Natural England and the Environment Agency. There are no plans to reinstate the Test Valley boreholes on a permanent basis - the abstraction licence has been revoked by Southern Water in order to avoid potential adverse effects on the Wallop Brook.	Please see revised draft Drought Plan 2018
Natural England	43	**2.6.2 Aylesford Effluent reuse – Priority Habitat and Ancient Woodland** This option pipeline is in close proximity to Aylesford Pit and Holborough to Burham Marshes SSSIs. The pipeline crosses the Medway once and is close proximity to Oaken wood SSSI and through the adjacent ancient woodland. The alternate longer route also appears to pass through wood pasture parkland priority habitat at Barham Court. In addition there appears to be another pipeline through the ancient woodland that is linked to Bewl Reservoir but it is unclear if this is part of the option. Natural England advises that all pipelines routes are examined and moved so that they do not impact irreplaceable ancient woodland or priority habitats including wood pasture and parkland.	We have considered the potential effects of this option on these habitats and added further information in the SEA Report. The option within the Preferred Programme only involves a short section of pipeline with no crossing of the River Medway required. The pipeline has been routed within existing access roads or arable fields to avoid woodland priority habitat. Arboricultural implication assessments will need to be carried out at the detailed planning stage to ensure any use of verges does not impinge the root protection zone. Mitigation will be required during construction to avoid impacts to Holborough and Burham Marshes SSSI (e.g. dust suppression measures, strategy for dewatering) however permanent disruption to surface water drainage will be avoided by constructing in the existing road network and disturbed arable land.	Section 8.3.2 of Annex 14 (SEA Report) sets out these details.
Natural England	43	**2.6.3 Brighton Effluent reuse – Priority Habitat** As mentioned in chalk grassland and high quality semi improved grassland as well as SSSI habitats are impacted by the route of both pipelines for the Brighton effluent reuse scheme. Not only should this scheme be rerouted to avoid the chalk grassland and any important woodland habitats but opportunities to enhance biodiversity should be examined.	As described above, a review of the pipeline route for the Brighton Water Reuse Scheme has been carried out to avoid where possible and otherwise minimise effects on designated sites and sensitive Priority habitats. The pipeline has been completely rerouted to avoid impacts to the chalk habitats at Clayton to Offham Escarpment SSSI.	Section 8.2.3 of Annex 14 (SEA Report) sets out these details
Natural England	43	**2.6.4 Cumulative and in combination assessments** There are options in the Stour catchment both for dWRMP and in the draft Drought Plan that affect the East Kent Chalk – Stour WFD Groundwater body or the Stour itself. Though individually most do not have significant negative impacts, combined effects of SWS options and those in other companies plans are currently unclear and could be significantly adverse. Natural England recommend that companies work together to undertake catchment or river restoration to remove other (none flow related) impacts to help the River and its associated wetlands become more resilient to the impacts of drought and prolonged dry weather. This will in turn make companies assets more resilient.	We have updated the cumulative effects assessment of the WFD and SEA Reports to take account of the revised draft WRMP19 strategy for the Eastern Area (and strategic alternative options) and the latest available information from other water company revised draft WRMPs in relation to potential cumulative effects on the Stour catchment and the East Kent Chalk WFD Groundwater Body. This concluded that there would be no adverse cumulative effects on these WFD water bodies given the scale of the abstraction changes proposed by Southern Water and Affinity Water in the respective revised draft WRMP19s. The scale of change is very small compared to the existing abstraction regime and the overall water balance of the WFD groundwater body. Consequently, no deterioration in WFD groundwater body status is anticipated. However, recognising that there could be localised effects on surface water streams (the Birchington and Little Stour WFD surface water body) due to the rebalancing of abstraction between existing borehole sources. Southern Water will be carrying out detailed investigations of its West Sandwich and Sandwich option as part of the WINEP3 investigations of its existing abstraction licences that affect this water body during 2020-2025. This may indicate the need for localised mitigation measures for nearby surface water streams to improve resilience to abstraction in dry weather. We will work closely with Natural England and the Environment Agency on the investigations and the development of any required mitigation measures, as well as with other neighbouring water companies as may be applicable. No cumulative adverse effects or WFD compliance risks have been identified on the Stour WFD transitional water body from the concurrent operation of the Southern Water, South East Water and Affinity Water schemes affecting this water body.	Annex 16 (WFD Report) updated to reflect these conclusions - see WFD Main Report Section 5. Annex 16 (WFD Report) Appendix B Section 1.2 provides details on the option-specific WFD assessment. Section 9.3 of Annex 14 (SEA Report) cumulative effects assessment in relation to the Stour catchment has also been updated to take account of the revised Eastern Area Strategy and information on other Water Company revised draft WRMP programmes
Natural England	43	**2.7 Protected Species** There will be protected species in most of the habitats affected by the supply side options. Natural England Standing Advice for Protected Species is available on our website to help local planning authorities and others including water companies better understand the impact of development on protected or BAP species should they be identified as an issue at particular developments or plans. This also sets out when, following receipt of survey information, the authority (or the undertaker in regards of the exercise of permitted development rights) should undertake further consultation with Natural England.	Comments noted. As schemes move into the detailed design stage, Protected Species surveys will be carried out to confirm the presence or absence of Protected Species. Where Protected Species are identified, we will follow Natural England's Standing Advice for Protected Species and consult further with Natural England to discuss how the scheme design and operation can be optimised to avoid adverse effects on the relevant species. We have added a statement to this effect in the Monitoring and Mitigation section of the updated SEA Report.	Section 11.4 of Annex 14 (SEA Report) includes reference to need for Protected Species survey and NE dialogue in accordance its Standing Advice as part of the future monitoring and mitigation section.
Natural England	43	**2.8 Water Framework Directive** The Water Framework Directive sets specific objectives for the protection of the water environment which include for surface water bodies the prevention of deterioration and achievement of good ecological status/potential. For groundwater bodies the objectives are to prevent deterioration and achieve good chemical and quantitative status. The Defra 25 Year Environment Plan has ambitions to achieve a clean and plentiful water supply including "improving at least three quarters of our waters to be close to their natural state as soon as is practicable by: - Reducing the damaging abstraction of water from rivers and groundwater, ensuring that by 2021 the proportion of water bodies with enough water to support environmental standards increases from 82% to 90% for surface water bodies and from 72% to 77% for groundwater bodies. - Reaching or exceeding objectives for rivers, lakes, coastal and ground waters that are specially protected, whether for biodiversity or drinking water as per our River Basin Management Plans. Natural England recognise many of the supply options are coming forward to meet sustainability reductions, some of which remain uncertain. This should improve the status of the surface water bodies though many of the underlying chalk aquifers remain at poor quantitative status impacting small chalk streams throughout the supply area.	Comments noted. Full details of the potential effects of the revised draft WRMP19 on WFD objectives is set out in the updated WFD Assessment Report.	Annex 16 (WFD Report) has been updated to reflect the revised draft WRMP19 changes.
Natural England	43	**2.9 Invasive non-native species (INNS)** Long pipelines through semi-natural habitat have the potential to transfer none native invasive species during their construction. This is particularly true of wetland habitats like the New Forest and the Ouse Valley. Southern Water must ensure that all vehicles, equipment, and staff boots are checked before moving forward between wet habitats to ensure that the route construction does not become a conduit for INNS transfer. Most proposals are for transfer of treated water so cross catchment transfer of raw water is limited and this limits the risk of spread of invasive species through operation.	Noted. The SEA Report already included consideration of INNS for the Preferred Programme and all feasible options as part of a specific SEA objective (Objective 1.2: To avoid introducing or spreading INNS). Southern Water operates strict biosecurity measures during construction of new assets and in the operation of its water supply assets to prevent the spread of invasive non-native species.	NNS assessments for each option are provided in Annex 14 (SEA Report) in Appendix D matrices updated, and reference to INNS SEA objective provided in Annex 14 (SEA Report) Section 4.3.2.
Natural England	43	**3: Draft Water Resources Management Plan 2019 (dWRMP)** Natural England welcome the overall approach to multi-criteria analysis and the simple presentation of the quite complex decision making tools used. The plan emphasis on demand management and catchment first is welcome.	Comments noted.	No changes required.

Natural England	43	**3.1 Putting People at the Heart of Decision Making** **3.1.1 Demand management** Natural England's Conservation 21 seeks to drive a fundamental change in mind-set, to make a healthy natural environment a central part of health, wealth and prosperity. This includes encouraging the public to value the water they use. Ofwat has set ambitious leakage targets for all companies to strive to minimise the amount of water lost through leakage year on year, with water companies expected to reduce leakage by at least an average of 15% by 2025. This target is supported in the Defra 25 Year Environment Plan. Defra's 25 Year Environment Plan aspires to reduce the risks of drought to the public by; Ensuring interruptions to water supplies are minimised during prolonged dry weather and drought; and Boosting the long-term resilience of our homes, businesses and infrastructure. Section 82 of the Water Act 2003 places an environmental duty on the water undertakers 'to further water conservation', in addition to duties in the Water Industry Act (section 3(2)(a) 1991) to promote efficient use of water by its customers. The plan demonstrates evidence that this duty has been taken fully into account and that this has been pursued as far as possible through demand management within the plan rather than increasing supply. Per capita consumption in Southern Water 's area is below the national average of around 147 litres per day reflecting their long term metering campaign. The demand management options in the dWRMP will deliver a downward trend in per capita consumption over the life of the plan. The company will meet Ofwat's annual water efficiency target of reduction of water. We strongly support the following demand management options in the dWRMP : - Leakage reduction of 15% - Enhance meter reading frequency - Media and education and water efficiency campaign for first phase of the company's Target 100l/h/d The target of 100 litres per head per day by 2040 is ambitious and Natural England fully support this target. However we note that only the 'first phase' of the company's campaign has been selected. In order to achieve this target more than media will be required. Previously the company has offered free water audits to some of its customers in particularly water stressed parts of its supply area. These water audits gave customers direct advice on wise use of water and free water saving devices (such as tap aerators and shower timers). This was an excellent programme with proven results. Natural England encourages and supports further such customer focused work which empowers people to make wise use of water, offering bespoke solutions in their own homes, in addition to more general awareness raising and water efficiency campaigns.	Demand management is a key component of our strategy to manage the supply demand balance and we will continue to explore all options to reduce demand. In particular we have selected a Target 100 option which will reduce average per capita consumption to 100 l/h/d by 2040, and we have selected an ambitious leakage reduction profile which will reduce current leakage levels by 15% by 2025 and 50% by 2050. Further work has been undertaken since the dWRMP consultation to develop a programme of activities to deliver these options and this is set out in our revised draft WRMP19 (and in our Business Plan submission to Ofwat). Whilst the draft WRMP options appraisal assessed discrete water efficiency and metering options, the company recently launched its 'Target 100' initiative, which aims to achieve a per capita consumption (pcc) of 100l/h/d by 2040 (for clarity, this relates to average household pcc under normal year annual average conditions – the options developed for the WRMP show the savings under dry year annual average or dry year critical period conditions). We feel that this is well-aligned with Defra's 25 Year Environment Plan (Defra, 2018) which states that "We will work with the industry to set an ambitious personal consumption target and agree cost effective measures to meet it". The Target 100 option developed for the revised draft WRMP supersedes many of the discrete demand management options that were included in the draft WRMP and comprises a basket of measures that Southern Water will need to adopt in order to deliver the highly ambitious reduction in pcc it is aiming for. The overall reduction in pcc required to achieve 100l/h/d by 2040 in normal climatic conditions will rely upon a basket of measures, including continuing our home visits programme to promote water efficiency. The programme has a high uptake rate and can result in up to 10% further savings on top the savings achieved through metering. We plan to continue with this programme and combine it with leak detection so that while we offer help and advice on water efficiency, we can also help detect any plumbing losses or supply-pipe leaks.	Section 2.4.2 of Annex 6 sets out our Target 100 programme of activities.
Natural England	43	**3.1.2 Shared Plans for Places** Water companies should ensure that the WRMP is used to influence options in the relevant local plans including those on the quantum of growth and its location. Paragraph 109 of the National Planning Policy Framework (which local plans must be consistent with) requires that local plans should contribute to and enhance the natural environment. The Defra 25 Year Environment Plans sets strong new aspirations for sustainable planning: "New development will happen in the right places, delivering maximum economic benefit while taking into account the need to avoid environmental damage. We will protect ancient woodlands and grasslands, high flood risk areas and our best agricultural land. High environmental standards for all new builds. New homes will be built in a way that reduces demands for water, energy and material resources, improves flood resilience, minimises overheating and encourages walking and cycling. Resilient buildings and infrastructure will more readily adapt to a changing climate." In order to achieve its ambitious demand management targets in its supply area which is subject to significant population growth, Southern Water will need to increase its influence on, and dialogue with, the local authorities and local communities to ensure water efficiency is at the heart of planning policies in its supply area.	We are working on this as part of our AMP6 water efficiency programme already and plan to continue working with local authorities and local communities to promote water efficiency. We are incentivising communities to reduce their consumption and working with Local Authorities to promote water efficiency in the social housing sector. We have offered up to £50,000 for community projects to selected villages around the rive Itchen in Hampshire if they can reduce their consumption by 25% and are working with Brighton and Hove City Council to visit 1,000 social housing homes in order to help some of our most vulnerable customers save on their water bills. We are also working with developers building 15,000 homes in Ebbsfleet (Kent) and 1,500 homes at Fawley (Hampshire) to build more sustainable homes, influencing them on water efficiency aspects of sustainability. We are aiming to boost the long-term resilience of our homes, businesses and infrastructure in accordance with Defra's 25 Year Environment Plan (Defra, 2018). Southern Water has introduced a free connection charge for water efficient new properties and we have also agreed to work with key developments within our region to ensure that water efficiency is promoted. We are planning to fund any additional expenditure through the developer services part of our business.	Section 2.4.2 of Annex 6 provides information on how we plan to continue working with local authorities and local communities on water efficiency.
Natural England	43	**3.2 Resilient Landscapes and Seas** **3.2.1 Natural Capital and Ecosystem servic**es Conservation 21: Natural England's conservation strategy for the 21st century and Defra's 25 Year Environment Plan encourage growth in natural capital and measurement of ecosystem services. WISER recommends that companies consider how natural capital accounting can inform water industry planning. WISER recommends that companies trial natural capital asset accounts (including quantity and condition) and ecosystem service assessments (including qualitative and quantitative assessments) to help companies better understand the flow of benefits. The Government's stated ambition in the 25 Year Environment Plan is to 'deliver an environmental net gain through the development of infrastructure'. "We will seek to embed a 'net environmental gain' principle for development to deliver environmental improvements locally and nationally." There is no natural capital assessment presented in the SEA or the plan and given the significant impact on biodiversity, landscape and cultural heritage it is difficult to see how the plan can result in a net gain in Natural Capital in its current form. However pipelines can be rerouted and there are many opportunities to provide a net gain associated not only with building infrastructure but also with catchment schemes. Natural England recommends the company seeks to realise these opportunities.	We are committed to delivering the principles set out within the Government's 25 Year Plan and the 2018 NPPF as we develop each supply scheme included in our revised draft WRMP19, working in dialogue with regulators.	Section 8.4 of Annex 14 (SEA Report) includes this commitment. Section 8.5 of Annex 14 (SEA Report) discusses natural capital and links between SEA and ecosystem services.
Natural England	43	**3.2.2 Enhancing Resilience** Conservation 21: Natural England's conservation strategy for the 21st century focuses on the importance of natural processes to build long term resilience in our wildlife, landscapes and seas. This ecosystem services approach at a landscape scale supports the Defra 25 Year Environment Plan objectives set out above for clean and plentiful water and thriving plants and wildlife and aspirations for using resources from nature more sustainably and efficiently. Natural England want to see an approach to new water company infrastructure and demand side measures that reduces damaging abstraction, protects raw water quality and reduces the dependency on permits located in sensitive locations to manage drought. Ofwat also stresses the importance of improving environmental resilience in its methodology guidance to companies for PR1910 which states companies should take account of [Ofwat's] seven principles for resilience planning, including a naturally resilient sector reflecting the importance of ecosystems and biodiversity. The dWRMP has extensive options for protecting raw water quality (see catchment schemes below) and in the medium term (by 2030) seeks to reduce both damaging abstractions in rivers and reduce dependency on orders and permits. In the process of these improvements some of the risk of damage from abstractions, in particular in drought is transferred from freshwater ecosystems to marine and coastal environments. In the short term (up to 2020) reliance on environmentally damaging permits located in sensitive (nationally and internationally important) freshwaters remains.	The draft WRMP19 and the revised draft WRMP19 both set out the importance of enhancing resilience to drought events, including environmental resilience. We have committed to a range of measures to enhance environmental resilience as noted by Natural England. As described above, where potential adverse effects on the environment have been identified in respect of our WRMP strategy, we have committed to implementation of mitigation (and in some case compensatory) measures to minimise the effects and seek overall net environmental gain from implementation of our WRMP. As noted by Natural England there is a short term reliance on Drought Permits and Orders while the permanent solutions are developed and implemented, but in the longer term (2030s onwards) our customers and the environment in which we operate will benefit from our planned resilience investment, which includes continued measures to reduce demand for water as well as physical environmental enhancement measures. Any effects on marine environments have been identified and mitigation measures outlined for further detailed design as schemes are brought forward for planning and environmental permitting processes, in dialogue with Natural England, Environment Agency and other stakeholders through the proposed Steering Group and scheme-specific Working Groups outlined above.	Annex 14 (SEA Report) Sections 8 to 11 summarise how the revised WRMP19 reduces overall impact on freshwater resources - and particularly in drought by substantially reducing the frequency and scale of drought orders - whilst minimising adverse effects on marine environments through appropriate mitigation measures.
Natural England	43	**3.2.3 Enhancing Resilience by Catchment schemes** WISER advises companies that they should "consider whether [their] abstractions are truly sustainable, looking across a catchment as a whole and consider investment in integrated catchment schemes to improve drought resilience and water quality". Natural England strongly supports Southern Waters catchment first approach to work with landowners, farmer and river trusts to improve the health of rivers and groundwater sources before investing in new supply side options. There are: - 4 catchments schemes in western area to tackle nutrients and 2 to tackle pesticides in western area. - 12 catchment schemes in to tackle nutrients and 3 to tackle pesticides in central area - 13 catchment schemes to tackle nutrients and 1 to tackle pesticides in Eastern area The number of catchment schemes to tackle raw water quality issues by reducing pollution at sources is in line with the WISER and Governments ambitions. However the scope of the schemes is limited to specific extant identified raw water issues and Natural England encourages the water company to consider whether these catchment schemes can be expanded in scope to look at emerging water quality issues and also improve the resilience of surface and groundwater sources by storing and retaining water and improving groundwater infiltration rates. Such schemes could be expanded in scope to include the creation and restoration of semi-natural habitats including chalk grassland, wetland habitats, appropriate woodland planting and sustainable drainage systems within a wider catchment taking a more integrated view to catchment management across Southern Water's business. Such schemes can have wider benefits for biodiversity and society as a whole, including through flood risk management and provision of green infrastructure in addition to protecting the long term future of the company's assets. This integrated approach would more fully realise the Governments ambitions set out in the 25 year Environment Plan.	Comments noted. Southern Water is keen to work with Natural England and our catchment partners to identify the wider potential co-benefits of our catchment management schemes which have a primary focus on improving drinking water quality and/or enhancing environmental resilience of water bodies from which we abstract. As part of our commitment to achieving overall net gain from implementation of our WRMP in line with the NPPF, we will actively work with Natural England and our catchment partners to maximise benefits for biodiversity and society as a whole from our catchment management investment, adopting ecosystem services and Natural Capital assessment approaches as advocated in the Government's 25 year plan for the environment and Southern Water's wider Integrated Water Cycle Management approach.	No specific changes made to the revised draft WRMP19 but overall commitment to net gain principles of NPPF in Annex 14 (SEA Report) Section 8.4 and discussion of natural capital in Section 8.5.
Natural England	43	**3.2.4 Enhancing Resilience by Habitat Creation** Natural England encourages Southern Water to consider the contribution that the creation and restoration of semi-natural habitats, in particular wetland habitats, appropriate woodland planting and the rewetting of peatlands (if present) within a wider catchment would make on protecting existing assets, reducing diffuse pollution, thereby contributing to water purification (protecting companies assets) and also on storing and retaining water, reducing peak floods further downstream in the catchment. Local Nature Partnerships (LNP) and Biodiversity Action Plan (BAP) partnerships and local catchment partnerships will be able to give advice on which priority habitat creation and restoration would be appropriate in which location. We would welcome if you could share any such plans and eventual progress with implementation with Natural England and if any habitat creation was also logged on the Biodiversity Action Recording System (BARS: http://ukbars.defra.gov.uk). Some effluent reuse options were excluded since the options were designed to discharge them into flow sensitive rivers, resulting in potential environmental impacts on those rivers. Consideration should be given to multiple potential benefit of creation of a large wetland habitat, which treated effluent could then be used to fill, and which could then be abstracted from in drought.	As set out above, Southern Water has included in its revised draft WRMP its commitment to the principles of net gain in developing each scheme as far as possible, working in close dialogue with Natural England, Environment Agency and other stakeholders. This includes considering opportunities for habitat creation as part of the implementation of the WRMP at the detailed design stage. We will liaise as appropriate with Local Nature Partnerships (LNP) and Biodiversity Action Plan (BAP) partnerships and local catchment partnerships as well as with Natural England. We will continue to log any habitat creation on the Biodiversity Action Recording System (BARS). We will discuss further the effluent reuse schemes included in the revised draft WRMP19 strategies or as strategic alternative options, and ways in which these may be able to deliver overall environmental benefit.	No specific changes made to the revised draft WRMP19 but overall commitment to net gain principles of NPPF in Annex 14 (SEA Report) Section 8.4 and discussion of natural capital in Section 8.5.

Natural England	43	**3.2.5 Adaptation to Climate Change** The Climate Change Act 2008 sets the legal framework for adaptation policy in the UK, preparing for the likely impacts of climate change. The 2nd Climate Change Risk Assessment (2017), identifies risks to water supply, and natural capital, including coastal communities, marine and freshwater ecosystems and biodiversity, as among the highest future risks for the UK relevant to the water industry. In addition to improving the natural capital including enhancing biodiversity (covered in the SEA and HRA above) the Defra 25 Year Environment Plan aspires to "take all possible action to mitigate climate change, while adapting to reduce its impact". WISER (page 54) states "a priority for all should be to work together to build an evidence-based understanding of the likely effects of climate change and identifying and implementing low carbon solutions that address any negative environmental impacts that may arise". The company has used a 'states of the world' approach and has included both a 1 in 200 year drought (severe) and 1 in 500 year drought (extreme), as well as a 1 in 20 year drought in its modelling . Natural England welcomes this approach, though it has necessitated the selection of some potentially extremely damaging water resource options (see above); in our view this reflects the real risks of a changing climate to both public water supply and the environment. We encourage the Southern Water to work with Natural England, the Environment Agency, local communities and other stakeholder to try to find more sustainable solutions to the challenges they face in their supply area. The options chosen in the dWRMP and accompanying draft Drought Plan are very resilient in terms of ensuring water supply in drought. There is insufficient action in terms of improving the environment's resilience to drought and helping flora and fauna adapt to climate change. The measures to help improve resilience (described above) are strongly synergistic with helping environmental climate change adaptation.	Our revised draft WRMP seeks to improve the overall resilience of the water environment to future climate change effects, including continuing to drive down leakage and water consumption to industry-leading low levels. We have also included a substantial number of catchment management schemes along with some targetted river restoration schemes to improve environmental resilience and we are seeking to achieve overall net environmental gain from implementing our WRMP. We will continue to work closely with Natural England, Environment Agency and stakeholders to maximise benefits and minimise adverse effects, working to deliver a more sustainable water supply system that is more resilient to the potential risks presented by future climate change.	No specific changes made to the revised draft WRMP19 in light of these comments but details of the schemes included in the revised draft plan are provided in Annexes 9 to 11
Natural England	43	**3.3 Relationship to Water Resources South East (WRSE)** The plans have had regards to WRSE but considerably further work is required to maximise the collaborative benefits and opportunities with other companies. Further work should include: - More joint scheme delivery - Cumulative impact assessment and strategic mitigation in particular of landscape impacts - Joint programmes on awareness and education raising, - Joint water efficiency work	Southern Water will continue to actively work with its neighbouring water companies through the Water Resources South East group to further enhance the benefits of joint working on all aspects of water resources management and strategic planning for the South East region, including promotion of water efficiency, the development of joint schemes or trading options as applicable and facilitating cumulative environmental assessment (for example in respect of cumulative landscape effects). Our plan demonstrates the benefits of the WRSE group with several water trading and/or joint water resource scheme developments included in our strategies for each of our operating areas. We are also engaging with the West Country Water Resources Group as evidenced by the inclusion of the South West Water/Wessex Water bulk import scheme for our Western Area strategy.	No specific changes made to the revised draft WRMP19 in light of these comments but details of the water trading schemes included in the revised draft plan are provided in Annexes 9 to 11
Natural England	43	**Annex 2** Role of Natural England in Advice to the Water Sector Natural England was established under the Natural Environment and Rural Communities Act 2006. It is a non-departmental public body. Our statutory purpose is to ensure that the natural environment is conserved, enhanced, and managed for the benefit of present and future generations, thereby contributing to sustainable development. Natural England has responsibility for ensuring that landowners and public bodies deliver objectives for European protected sites (Natura 2000 sites), Ramsar sites (internationally important wetland sites) and the requirements for achieving and managing favourable or recovering condition for Sites of Special Scientific Interest (SSSI). Of particular note to water companies are the objectives introduced through the Water Framework Directive for Natura 2000 protected areas, to achieve compliance with the standards and objectives (conservation objectives) of the water-dependent features of those sites by December 2015 (Article 4.2 WFD). Natural England is also charged with helping to deliver the Government's Biodiversity 2020 strategy which set out a bold ambition to "halt overall biodiversity loss, support healthy well- functioning ecosystems and establish coherent ecological networks, with more and better places for nature for the benefit of wildlife and people". Delivery of objectives towards Biodiversity 2020 outcomes is complementary to, and in addition to the statutory duties toward biodiversity under the NERC Act (2006). More recently Defra published its 25 Year Environment Plan with themes relevant to water throughout the key objectives. Complementary to these objectives Natural England published 'Conservation 21: Natural England's conservation strategy for the 21st century', setting out how to support the government's ambition for a healthy natural environment on land and at sea that benefits people and the economy. Underpinned by our focus on delivering better long term outcomes for the environment by working towards shared visions with partners, Conservation 21's three guiding principles are: 1) creating resilient landscapes and seas; 2) putting people at the heart of the environment; and 3) growing natural capital. In support of this, our response therefore provides advice, where appropriate, on how the plan can embrace an ecosystem approach, enhance natural capital and can support the conservation of biodiversity at a landscape scale. Natural England continues to aim to work with the water sector to ensure that requirements for the protection and enhancement of the natural environment are met and that there is adequate opportunity for the development of more sustainable solutions. Protection and enhancement of the natural environment including biodiversity depend critically on delivering improved, integrated and sustainable land and water management.	N/A	N/A
Natural England	43	**Annex 3** **Southern Water Questionnaire - NE responses** **1) Do you think we should plan for a wide range of possible futures and how much water we may need to supply in each?** Yes. – Natural England agree that planning for climate change, sustainability reductions and demand changes are important to address future uncertainties. See section 4, Annex 1 for further information **2) Do you think it's a good idea to plan for future changes [...]?** Yes – see Annex 1 for further information on sustainability reductions in particular those in the Western Area. **3) Do you agree with our plan to start investigating new options for water recycling, desalination and reservoirs now in case they are needed in future?** Yes – investigation should begin as soon as possible to allow time to identify and mitigate any environmental impacts and to select the most sustainable alternatives. See Annex 1 for information on environmental risk. **4) This plan includes using water restrictions (hosepipe bans) [..]Do you support this?** Yes for 1 in 10. Natural England notes the frequency in Hampshire may change in light of the changes the recent public inquiry. See Annex 1 above and our response to SWS dDP consultation for further details. **5) Do you think water recycling [..] has a role to play in securing water supplies for the future?** Yes – provided low carbon energy sources are selected and the receiving water body is not environmentally sensitive to the flow impacts and water chemistry changes of the additional discharges. **6) Do you think desalination has a role to play in securing water supplies for the future?** See Annex 1 above. Yes – provided low carbon energy sources are selected and the abstraction is from, and discharges to, areas of low environmental sensitivity. Ideally marine protected areas should be avoided for both intakes and discharge points. **7) After we've introduced options to save water, such as reducing leaks and Target 100, which would you prefer us to develop first – water recycling or desalination?** Whichever is the least environmentally damaging of the two options. This will differ depending on location and sensitivity of both source and receptor water bodies. **8) Do you support our Target 100 to reduce personal water use to 100 litres per person per day by 2040?** Yes – Natural England strongly supports this ambitious target. **9) Should we do more to reduce leaks, even if it pushes your bills higher?** Natural England supports the plans to achieve the 15% reduction in leakage by 2025. **10) Do you think it's a good idea to trade water with neighbouring water companies in a 'regional grid' as part of the Water Resources in the South East group?** Provided that the environmental impacts of creating the grid, including those on protected landscapes are mitigated then Natural England in principle support the greater resilience and flexibility such a grid would offer. **11) Do you support our Catchment First approach, [..] before investing in new solutions such as water recycling or desalination?** Yes – Natural England strongly supports this approach. **12) , 13), 14) Do you think our approach to provide water in Hampshire and the Isle of Wight, Sussex and Kent is the right one?** Not as set out in the dWRMP, but in principle with significant modification of some of the proposed options and very significant additional mitigation then this approach could be acceptable. (See Annex 1). **15) How important is it to you that we use renewable energy by buying to developing it) to power our water network?** Use of renewable energy is important; see Annex 1 above. **16) Would you like to get involved in developing our solutions [...]?** Natural England would like to work with southern Water to provide advice on expanding water efficiency, developing sustainable solutions, assessing impacts of all schemes and advising on how to mitigate those impacts and in particular on all aspects of the catchment first work. **17) and 18)** N/A	(1) Support for our approach is welcome (2) Support for our approach is welcome and comments are noted. (3) Noted, including comments on environmental risk in Annex 1. (4) Comments are noted. Support for the Levels of Service set out in our dWRMP14 are welcome. (5) Comments are noted. The selection of low carbon energy sources and the environmental sensitivity of receiving water will be a consideration in taking forward water recycling options. (6) Comments are noted. The selection of low carbon energy sources and avoidance of marine protected areas will be a consideration going forward. (7) Comments are noted and this reflects our approach. (8) Support for our Target 100 initiative is welcome. (9) Support for proposed reductions in leakage is welcome. (10) Comments are noted. The impact on protected landscapes of pipeline schemes is considered as part of the WRMP process. (11) Support for our Catchment First approach is welcome. (12- 14) See comments in response to comments above. (15) Support for use of renewable energy is noted. (16) We welcome the opportunity to continue working with Natural England in developing and delivering our WRMP.	None

Appendix 7.3 - Ofwat

Reference no. 51 (OFWAT)	Response comment	SWS' Consideration of Response	Changes Required to dWRMP
0.1	Southern Water published its draft water resources management plan 2019 on 5 March 2018 for consultation. This letter provides a summary of our assessment of the draft plan. It is our statutory consultation response, produced in accordance with our statutory duties and the Government's strategic policies and objectives for Ofwat. These views are without prejudice to any subsequent decisions that we may make at the next price review (PR19) in connection with the business plan that the company is scheduled to provide to us in September. Our assessment has considered: • how adequately the draft plan follows the requirements of the water resources planning guideline and Defra's guiding principles for water resources planning; and • how the draft plan helps achieve our vision of ensuring trust and confidence in the sector through the delivery of our key themes for PR19 of great customer service, affordable bills, resilience in the round and innovation.	Noted	None
0.2	Long term water resources planning is a key part of company business activities. We expect companies to integrate the development of their water resources management plans into their business plans which they submit to Ofwat. We also expect them to adopt the 'twin track' approach to improve water supply resilience through both increased supply and reduced demand. We will continue to work closely with Government and the other regulators in both England and Wales to ensure that a long term secure and sustainable supply of water is achieved.	Noted and welcomed	None
0.3	Southern Water supplies water to a population of approximately 2.6 million people across the south and south east of England. Its water resources are planned on the basis of 14 water resources zones grouped into three supply areas: Western; Central; and Eastern.	Noted	None
0.4	Southern Water forecasts that the majority of its water resource zones will be in deficit in the future, without additional action to reduce demand or increase supplies. This means there would be insufficient water to maintain supply to customers in some severe drought conditions. Many of its zones are forecast to enter a deficit in the early 2020s primarily driven by abstraction licence reductions. The scale of the challenge and complexity of the issues means that effective action is required urgently to deliver for customers and the environment.	Noted	None
0.5	The Southern Water plan sets out a range of demand-side and supply-side options to meet future demands for water and ensure that customers receive a sustainable and resilient service. We welcome the development of a regional trading solution with Portsmouth Water and the focus on drought resilience, as well as the adoption of a 15% leakage reduction by 2025. However, we are concerned that the plan fails to deliver in the best interest of customers in a number of important areas. In particular:	Noted. Comments provided below.	None
0.6	* The Southern Water plan relies on an adaptive pathway with triggers that define the actions to be taken to mitigate the risks of unconfirmed abstraction licence reductions. However, from the draft plan, it is unclear if these have been identified appropriately and whether sufficient time is allowed to enable timely decisions on options to be made. The adaptive pathway approach was also taken in the previous plan in 2014, but it does not appear to have been followed appropriately and greater clarity needs to be provided that the company has learnt lessons from this	This consultation response is not correct: our plan does not rely on an adaptive pathway with triggers; our plan is actually based on a real options decision making approach. The consultation response also incorrectly states that the previous plan (WRMP14) was based on an adaptive pathway approach; it was not, but was based on a conventional EBSD decision making approach. Nevertheless, the company is intending to present some timelines for key strategic options as part of its revised WRMP.	Investigate how and whether to present some of the key decision points associated with key strategic schemes in its Revised WRMP in a simple timeline. See responses to comments 8.1 and 8.2
0.7	•The plan does not provide sufficient evidence that the proposed supply-side options are appropriate: o There is a lack of clarity on the assumptions made in the development of the plan, such as potential risks in deliverability, environmental impacts and future uncertainties. This includes the short-term delivery of desalination projects on which the company is reliant on to reduce the supply-demand deficit. o Given the company is in the early stage of option analysis for major new supplies, we also expect active work to continue on regional transfer solutions which could potentially displace or delay other in-house supply-side options, reduce the environmental impacts of new supply and enhance resilience. There is the potential for these to be delivered through the Water Resources South East (WRSE) regional group or through engagement with individual companies.	We have reviewed the level of information and details set out in the draft WRMP, and have included additional clarification and explanation around our commitment to the investigation and promotion of our preferred Strategies together with alternatives, to a sufficient stage in their development so as to de-risk the delivery of new infrastructure. We have also reviewed and updated our factfile information on supply side options as set out in Annex 6, including updating the risk and programme information for these options. We are committed to working closely with other water companies in the WRSE group, and more widely with our neighbouring companies in the South West and also nationally, to ensure that opportunities for sharing resources are identified and incorporated in the WRMP, and thereafter delivered. We have included additional sharing of resources within our Western Area since the draft WRMP, and are also committed to developing further our own transfer infrastructure within our supply areas that can increasingly be used in the future to facilitate future sharing of resources.	Annex 6 (Options appraisal), Annex 9, 10 and 11 (the Area Strategies) and the Technical Overview have all been updated to provide additional explanation and information.
0.8	•We have concerns around the customer engagement process and the quality of customer participation in the development of the plan. There is limited evidence provided to give confidence that customers have been fully engaged on levels of service or on bill impacts. We expect Southern Water in its final plan to clarify how the level of resilience and its links to cost, deliverability, licence reductions and affordability were positioned for customers.	The draft water resources management plan was based on two areas of customer and stakeholder engagement: 1) The first consisted of undertaking bespoke customer panel sessions across the region and for different demographics. This work was supplemented with a bespoke You Gov survey of over 1000 customers to derive their own plans to solve a deficit of approximately 200 Ml/d. This work demonstrated not only the bill impact of their choices but also the costs associated with building and running the schemes. This information, coupled with the customer and stakeholder work, presented us with an insight into customer preferences for solving future supply whilst taking account of bill impacts; 2) The second piece of work helped us determine what outcomes customers were expecting in terms of levels of service, bill impacts, etc. This was derived from specific willingness to pay surveys with customers as well as a specific customer panel sessions to determine customer views on resilience. We will review and update the text in the annex and plans to reflect these points more clearly and in particular to draw out the points on levels of service and bill impacts.	Annex 1 (sections 5.4 and 6.1) has been updated to provide additional information on how customers' views on levels of service, bill impacts and option preferences have been taken into account
0.9	• Board assurance was part of Defra's guiding principles for water resources planning. However, the draft plan does not provide any evidence of Board assurance and this raises concern about the robustness of plan development. This concern is compounded as there is limited description of the quality assurance of the plan and as there are internal inconsistencies within the draft plan, such as the presentation of the leakage reduction target of 15%. The plans are key publications provided to stakeholders and we would expect to meet the same high assurance standards of other information and evidence of this should be provided in the final plan.	The development of the Water Resources Management Plan has been shared with the board on several occasions. This has included specific presentations on what a WRMP is; how it is derived; what are the challenges to Southern Water and how we derive the final plan. In addition to these board presentations we have also met a non-executive director on a regular basis to go through how a plan is derived and the steps we have undertaken. We have also commissioned specific assurance work by Addleshaw Goddard LLP and Goddard to check on legal compliance; and Jacobs to undertake a technical audit of the draft Water Resources Management Plan. We will summarise the engagement we have had with the board on the develop of this dWRMP, which picks up from the last plan. This will be an additional piece of text to the plan.	An explanation of the board assurance process has been added to the Technical Report and Statement of Response
0.1	Further details on these points are outlined in the annex to this letter alongside more detailed comments on different areas of the draft plan. I look forward to seeing these points addressed in Southern Water's statement of response and final plan.		
1. Plan building blocks			

1.1	Southern Water has used methods and data appropriate to the scale and complexity of the problem that it needs to address and adopted a 50 year planning horizon, rather than the 25 years adopted for the previous plan. However, there are significant changes from the approach used and the previous plan which are not fully articulated. We are also concerned about the approach to level of service and non-drought resilience. Further specific comments: • There are significant differences in the data, methods and assumptions used for the draft plan compared with the previous plan published in 2014. As this is not fully articulated in the narrative it is hard to track the delivery of the previous plan and understand the extent of the changes. Further considerations: -With the impact of licence reductions four additional water resources are being created. However, it is unclear how these updates have impacted the baseline supply forecasts and drought resilience. Also, as discussed in sections 3 and 4, there are significant changes to some components of the demand and supply forecasts. These issues need to be clarified in the final plan. -The company adopted an adaptive pathway approach for the previous plan but the scale of the deficits early in the planning period suggest it did not update its programme based on this approach. Southern Water should clarify how its updated programme relates to the pathway identified in the previous plan.	We have adopted new approaches for WRMP19 compared to WRMP14 following the problem characterisation step of the WRMP process and these are aligned with best practice guidance. A key difference is that we must plan for a greater scale of sustainability reductions some of which are likely to be implemented immediately, and others are uncertain pending the completion of investigations. The need for the additional WRZs (splitting the old Hampshire South WRZ into 4, and splitting the old Kent Medway WRZ into 2) follows the WRZ integrity assessment described in Annex 1, Appendix A. The purpose of this is to comply with the definition of a WRZ, as being "the largest possible zone in which all resources, including external transfers, can be shared and hence the zone in which all customers will experience the same risk of supply failure from a resource shortfall". What this means in practice is that we need to focus on the inter-WRZ connectivity. The company did not adopt an adaptive pathways approach for the previous plan. Nevertheless there have been some significant reasons for differences from the previous plan - for example, in WRMP14 we were instructed not to allow for a sustainability reduction at Testwood; but the EA have now proposed a sustainability reduction which results in the Testwood source having a significantly reduced deployable output in drought years. This has meant that the solution to the Western area has needed to change significantly. Note that in Annexes 9, 10 and 11 we do provide a comparison of the solution compared to WRMP14 for each of the three supply areas (section 5)	Have provided additional commentary where the solutions from WRMP14 have not been implemented, or around the key changes from WRMP14, adding to what is already in Annexes 9, 10 and 11. An explanation of the decision making process is provided in Annex 8 and has been reviewed and updated to make it easier to understand.
1.2	• We welcome the consideration of aiming to achieve a 1-in-500 year level of drought resilience with respect to level 4 restrictions (such as standpipes). We note that in the previous plan this was reported as only in civil emergencies and that this plan provides more transparency on this frequency. However, there are elements of this approach that need further explanation: -Although the company plans high service levels for the most severe restrictions the less severe customer restrictions are planned to be imposed relatively frequently. This includes non-essential use bans expected at a 1-in-20 year frequency and we note that these can have a large impact on business customers. The final plan should further clarify the chosen range of resilience. -We expect the final plan to include quantification of the impact of the chosen level of service in terms of the supply-demand balance, the scheduling of options, additional costs and bill impact in comparison to adopting alternative levels of resilience.	Our levels of resilience to rota cuts and has only changed in our western area where it has increased from 1 in 125 years to 1 in 200 years for our baseline preferred planning scenario. However, inclusion of a 1 in 500 year drought events without our planning scenarios has indicated that we can be resilient to such an event with Drought Permits and Orders in place. The increase in resilience (already included in WRMP14) was supported by customers in our preconsultation. The increase in resilience in our western area also allows us to provide greater protection to environment, specifically the River Test and River Itchen by allowing us to be less reliant on drought orders and permits. Our levels of service for less severe demand restrictions (Temporary use bans - TUBs, and non-essential use bans - NEUs) are lower because the conditions that indicate a severe (e.g. 1 in 200 or 1 in 500 year) drought event may occur happen much more frequently than the drought event itself. In order to ensure that there is time to prepare drought permit and order applications and have such permits and orders in place when required to safeguard supplies, we will need to apply more frequently than they are likely to be implemented. In most cases rainfall will occur in the interim period and the drought event will not materialise but we cannot risk not being in position to be able to supply water. This issue is discussed in detail in Appendix C02 of our 2014 WRMP and is also discussed, with examples in the 2016 UKWIR Risk based planning guidance. If they are required, NEUs will be implemented in a phased approach, to minimise impact on businesses; and our research has shown it isn't likely to have a significant impact on business. The plan will include alternative levels of environmental resilience as we explore the impact of allowing Drought Permits and Orders in different states of the world. We are not planning to explore different levels of service for restrictions because the current levels are strongly supported and there wouldn't be much impact if we did.	Add some addition discussion (as per our consideration) on the rationale for our target levels of service in Annex 1 - "Levels of Service"
1.3	• There is limited evidence of non-drought resilience to the full range of potential hazards and threats, like flood risk or freeze-thaw events, being assessed in the draft plan. Greater clarity on the approach to non-drought resilience should be presented in the final plan.	Some additional analysis has been undertaken to allow commentary around non-drought events, such as the recent freeze-thaw event from last winter. Commentary strengthened to show how various aspects of resilience have been considered in the plan.	Text to be updated to include consideration of non-drought resilience aspects - Annex 8, and annexes 9-11 (sect 8)
2. Customer participation			
2.1	There is evidence of customer participation in the development of the plan through a range of approaches, including workshops, online surveys and interviews. However, insufficient evidence is presented to give confidence that customers have been fully engaged on levels of service or on bill impacts. This is a significant concern given the scale of the supply-demand balance challenge and we would expect to see further clarity on this in the final plan. Further specific comments: The draft plan is reasonably clear and accessible and includes a non-technical overview which is written in easily understandable language. However, further detail, particularly on decision making, is not easily accessible given the complex methods adopted and this reduces transparency.	We will include additional text and graphics in the final plan to provide additional information on the decision making process. This additional information will be incorporated into the development of the revised draft WRMP. The additional information will include graphics depicting the branches which show how the plan changes and what is causing these differences, which is typically due to uncertainties in sustainability reductions being resolved. Other uncertainties that have been included are population growth, climate change, sustainability reductions and government policies. An explanation of the decision making process is provided in annex 8 and has been reviewed and updated to make it easier to understand	Annex 1 (section 5.4 and 6.1) has been updated to provide further details of how customers have been engaged and their views and preferences sought. Annexes 8, 9, 10 and 11 have been updated to make the decision making process clearer.
2.2	• Limited evidence of engagement is provided on levels of service but Southern Water reports that its customers consider current levels are satisfactory. However, as the chosen level of service is a key plan driver, further evidence should be provided in the final plan on the extent of this engagement and on customer support for levels of service. Further considerations: - It is unclear if customers have been engaged on the impact of the high level of service planned for, in terms of the supply-demand balance, the scheduling of options or the bill impact. The plan is also unclear whether alternative levels of service were presented to customers. - It is also unclear whether comparative drought resilience levels, with other companies or at a regional level, were discussed with customers.	We will enhance the text in Annex 1 to address the points raised. Specifically we will draw out the information from the willingness to pay; resilience; dWRMP and drought plan surveys to improve the descriptive text of how this information was collated and used in the derivation of the draft WRMP. We will also go on to describe how the consultation on the draft plan will influence the final plan. The high levels of resilience in the plan will be described but this change in the level of service was derived as part of the previous plan in WRMP14. This plan builds on that work and, importantly, it does not allow the previously agreed levels of service with customers to degrade. This was specifically highlighted in the willingness to pay work and the customers reaction to a degradation of services. We will submit further evidence to show this in the revised draft WRMP.	Annex 1 (section 6.1) has been updated to provide more details of the customer willingness to pay surveys undertaken and specifically their willingness to pay for an increased or reduced level of drought resilience compared to WRMP14.
2.3	• Customers appear to have been consulted regarding the selection and identification of options and customer preference surveys tested options for maintaining a supply-demand balance, supported by scheme cost and environmental impact. However, it is unclear how the options were presented including if each of the elements, such as leakage reduction, were discussed independently, rather than as a package. This should be clarified in the final plan.	The customer surveys took two forms: panel sessions and a You Gov survey. All the material for this customer engagement was presented to our CCG before it was tested on customers. The final set of material was further checked with the CCG before it was used. This material was used for both the individual panel sessions, which provided qualitative information, and the You Gov survey, which provided quantitative information. Customers had a choice how much of a particular scheme they could use when deriving their own plans. The only limit that was imposed on them was the scale of the solution which is possible. e.g. an aquifer storage and recovery system cannot produce more than 8 Ml/d and therefore this limitation was incorporated into the survey work to ensure that the solutions that were derived were realistic.	Annex 1 (section 5.4) has been updated to provide further information on how the qualitative and quantitative customer surveys were undertaken.
2.4	• Linked to the above point, there is no evidence of bill impacts being presented in the draft plan. This is a significant omission given the likely magnitude of these given the supply-demand balance challenge the company faces. Southern Water should provide details of its engagement with customers on bill impact in the final plan.	Bill impact information for the pre-consultation and consultation survey exercises to elicit views on scheme preferences was made available to customers when they undertook the surveys. The pre-consultation customer surveys are described in Annex 1 and the outcome of the consultation customer surveys are summarised in the statement of response along with the willingness to pay work. This information has been used to derive / influence the revised draft plan.	Annex 1 (section 5.4 and 6.1) has been updated to explain how bill impacts were considered during the pre-consultation You Gov and willingness to pay customer surveys.

2.5	• Southern Water has engaged with its Customer Challenge Group (CCG) although it is not clear how this engagement has shaped the draft plan and this should be clarified in the final plan.	Throughout the development of this and the previous WRMP the CCG have been engaged. This engagement has taken the form of a series of presentations and papers to ask the CCG views and opinions on the proposed customer surveys. This has resulted in surveys being modified before we have then used the material in customer panel sessions and the You Gov survey information. For the revised draft WRMP we will incorporate a chronology of CCG engagement. This text will also summarise how the CCG were engaged and how the final customer surveys were involved in the derivation of the draft and revised draft WRMP	Annex 1 (section 5.4) has been updated to provide further details of the customer surveys undertaken during pre-consultation and the involvement of the CCG in this.
3. Demand Forecast			
3.1	The demand forecast is well documented, reference to the industry guidance has been made and it appears to have been followed. This includes the use of local authority plan-based projections. However, we have concerns on the clarity of the approach to both household and non-household forecasts. In particular: • For household demand forecasting Southern Water has segmented its customers into three property types, rather than by the usual measured and unmeasured classification. However, it is unclear if this approach is comparable with the previous plan and with other companies, and how customers who are still not metered are included. These points require further explanation in the final plan.	This was explained in Annex 2 (demand forecast) and is further expanded on in the revised Annex 2. We conduced customer surveys using Mosaic socio-economic segmentation by Experian. When we linked actual consumption to Mosaic groupings, we could not see any definitive pattern. On the other hand, using property type provided a much clearer link between occupancy and consumption. We therefore used segmentation based on property type and used it for both unmeasured and measured customers.	See section 5.1 (pages 28-30) of the revised Annex 2 (demand forecast).
3.2	• Non-household demand increases over the planning period in both the baseline and final plan scenarios, driven by the growth of the financial and business services sectors. It is a key plan driver in the short term and greater clarity is required for the forecasts. Further points: - The large increase in baseline non-household demand of 14% by 2045 is unusually high compared to forecasts of other companies in the south east and this should be further justified in the final plan. - The draft plan notes that engagement with specific larger users or retailers to enhance and validate this forecast has not yet taken place. Southern Water should consider the steps it could take to achieve this, and reflect the outcome of such consideration in its final plan.	Since the opening of the non-household sector to market competition on 1 April 2017, a number of retailers have entered the market. We hosted two conferences with the retailers in 2017 and 2018 and have reviewed the services being offered by the retailers. All retailers are offering water savings as part of their offering to incentivise customers. The market has been operating for just over a year and we have not seen any reductions in demand as yet but we anticipate that over time, we will begin to the see the impact of water efficiency measures on demand in the non-household sector as well. However, it is as yet difficult to estimate what the potential decrease in demand may be, either in different regions or different sectors. In developing their plan for south east England, the Water Resources in the South East (WRSE) group have assumed a 5% increase in non-household demand by 2080 (Water Resources in the South East, 2018). For the revised draft plan we have assumed 10% growth by 2069-70 which midway between the 15% growth forecast in our draft plan and the 5% growth in Water Resources in the South East (2018).	See Section 6.2 (pages 45-46) of the revised Annex 2 (demand forecast).
4. Supply forecast			
4.1	Licence changes to supply are one of the key drivers of the company's planning problem. Southern Water has calculated available supply in line with guidance and statistical approaches have been used to help determine low frequency drought yields with higher levels of confidence which is an example of good practice. However, greater clarity is required on the approach taken to forecast licence reduction impacts, climate change, water quality, operational losses and outage. In particular: •Abstraction licence changes for sustainability reductions are a significant driver of the draft plan and could result in a loss of 105 Ml/d (16%) of available supply by 2020, although we note these are of a similar scale as was presented in the previous plan (94 Ml/d). Further considerations: - To address the uncertainties of the licence reductions the draft plan included four strategies for the Western area. However, there is limited detail provided as to what is driving these reductions, how frequently they would impact water availability from the sources affected, and consideration of any alternative mitigations to overcome the losses. Greater clarity on these points is required in the final plan. - We understand that agreement on the reductions was reached with the Environment Agency. The final plan should set out clearly the results of this agreement and their consequences for short and long term planning. This should include the forecast frequency and impact on the future implementation of drought permits.	Our preferred plan in the revised draft WRMP assumes the immediate implementation of abstraction licence changes on the River Test and Itchen that we agreed to following the Hampshire Abstraction Licences Public Inquiry in March 2018. This sustainability reduction scenario results in immediate sustainability reductions in PDO of 125Ml/d and immediate MDO impacts of 166Ml/d across the Hampshire Southampton East and Hampshire Southampton West water resources zones. In our previous plan, WRMP14, we had planned for the sustainability reductions on the River Itchen but not the River Test so the scale of sustainability reductions has increased significantly for WRMP19. We have considered four sustainability reduction scenarios in the revised draft WRMP for Western area (akin to the four strategies that we referenced in the draft WRMP). Our preferred strategy (Strategy A) assumes the immediate implementation of the River Test, Itchen and Candover abstraction licence changes as was agreed between Southern Water and the Environment Agency at the Hampshire Abstraction Licences Public Inquiry. This agreement awaits Secretary of State approval and to ensure we have considered an alternative outcome we have considered three alternative sustainability reduction scenarios (these were referenced as strategies B, C and D in the draft WRMP). The revise draft WRMP details the reasons for these sustainability reductions and outlines the outcome and implications of the Hampshire abstraction Licences Public Inquiry.	The revised draft WRMP (Section 5.4, Annex 3) will be updated to reflect the outcome of the Hampshire Abstraction Licences public inquiry which concluded in March 2018. The preferred strategy in the revised draft plan (Annex 9) will be based on the assumption that the Secretary of State will endorse the agreement reached by the Environment Agency and Southern Water whereby the River Test, Candover and Itchen abstraction licences are changed immediately. The revised draft plan will also show alternative scenarios to cover the possibility that the Secretary of State might make a different decision. The revised draft plan will clearly set out the implications of the licence changes including the frequency of needing to implement drought permits and orders and impacts upon customer levels of service (Section 6.3, Annex 1).
4.2	Southern Water's approach to statistical supply forecasting is not currently compatible with the industry standard methods used to account for climate change within the supply-demand balance. This is acknowledged and the company is working to expand its approach for the next round of plans. However, climate change could be materially important to the supply-demand balance and therefore we expect to see greater clarity on how it is being taken into account in the final plan.	Although we have used a stochastic method for our supply forecasting we consider that our climate change approach is consistent with industry standard methods. Our climate change vulnerability assessment (Annex 1) was developed following the methodology set out in Environment Agency (2013) Climate change approaches in water resources planning – Overview of new methods. Of our 14 resource zones, four were identified to be of low vulnerability, eight of medium vulnerability, and two of high vulnerability. Given this classification and that runoff-recharge, surface water or groundwater models also exist for all of our resource zones the planning guidance requires us, as a minimum to undertake a Tier 2 analysis using the UKCP09 for low and medium vulnerability zones. The high vulnerability zones require assessment via a Tier 3 approach using the UKCP09 probabilistic projections and our own methodology, based on that employed for WRMP14. For consistency, we have applied this approach in all zones, going beyond the minimum requirement. Our sampling methodology from the UKCP09 probabilistic datasets followed method 2.2 of the "future practice" as set out in Environment Agency (2013). All 10,000 UKCP09 replicates for each emissions scenario were processed through a rapid recharge model (Following FAO 56 methodology) to determine drought indicator (effective rainfall) response for climate change perturbation of the worst historic droughts in each area. These responses were then sub-sampled to derive a suite of Latin-Hypercube smart samples of monthly perturbation factors for rainfall and potential evapotranspiration. The principal limitation of our approach is that owing to the computational run-time of our groundwater models and associated system simulation (Aquator) models we cannot run a large number of climate change replicates. This limitation, particular for zones dominated by groundwater, such as many of our zones, is recognised in our plan, by the 2013 Environment Agency guidance and the 2017 UKWIR project on climate change for the WRMP. However, we consider that the samples we have selected reflect the wide range in climate change response. We have further accounted for climate uncertainty in our integrated risk modelling of the supply demand balance. We will further refine our climate change modelling approach for WRMP24, once the outcomes of UKCP18 are available.	We will improve the clarity of text in Annex 3 – Sampling of climate change perturbations to illustrate the limitations and uncertainty of the approach

		Consistent with s 3(e)(i) of the WRMP Direction 2017, the estimated range of impacts from climate change on each existing supply source are set out in Annex 3 Section 6. The estimated range of impacts of climate change on our demand forecast are set out in Annex 2, section 5.4. Uncertainty in our supply and demand forecast due to the impacts of climate change is also incorporated in our integrated risk model (Annex 5, section 4). We have discussed the potential implications of climate change on our proposed feasible options in Annex 6 and where applicable we have estimated the potential change in yield as a consequence of climate change.	
4.3	•Water quality impacts significantly affect the supply forecast accounting for a loss of around 80 Ml/d by 2020 due to revised modelling. This is a significant change since the previous plan. There is also uncertainty around future water quality reductions as these are combined with unknown abstraction licence changes in the planning tables. In the final plan Southern Water should provide greater clarity on both short and long term water quality losses to ensure there is improved transparency.	It is assumed that this comment is in reference to the reductions in DO due to WQ drivers. These reductions are associated with a catchment management option (with associated treatment if necessary) to recover the lost deployable output. This approach is identical to what was developed for WRMP14.	In annex 3 we have set out the water quality challenges that we face in the region at our sources and the actions that are required.
		We have carried out further assessment of the impacts of deterioration in water quality on our supply forecast and these have been incorporated into our business plan and revised supply forecasts.	Update and amend Annex 3 - "Water quality impacts on Deployable Output" subsection to provide further detail ensure consistency with the supply forecast modelling
4.4	• Operational losses (including treatment process losses) at 21 Ml/d (3% of supply) are much higher than in the previous plan (6 Ml/d) and approximately double the national average (1.6%). There is a lack of clarity on the drivers behind these changes and whether Southern Water has investigated ways of reducing losses. This should be clarified in the final plan.	We have further reviewed the process loss data with our operational team to confirm that these are the best estimates for the revised draft WRMP. They have confirmed the figures are based upon best currently available data though it is recognised further work is needed to improve data collection to inform estimates for WRMP24. The main reason why process losses have increased is due to the use of better quality data, the difference between abstraction and DI flow meters is on average 5% causing an increase in variable losses from WRMP14. Another reason for process losses increase is the implementation of new processes, for example triple validation to improve drinking water control at our water supply works. Further details are provided in Annex 3.	Section 7 of Annex 3 has been updated.
4.5	• Outage has increased from around 5% in the previous plan to 8%, and is now higher than the industry average. The plan does explain that this results from more recent data and is linked to increased raw water quality deterioration. However, while options are proposed, such as treatment upgrades and connectivity improvements, outage is unchanged between baseline and final preferred planning tables. These points should be clarified in the final plan.	The short term effects of outage reduction resulting from schemes are covered within the outage recovery plan. This is incorporated into the baseline figures. The long term effects of schemes are reflected in the long term outage levels in the baseline.	Updated text in Annex 3 section 1.7, 2.6, 8 and appendix F
5. Forecast uncertainty			
5.1	Uncertainty in Southern Water's plan is not incorporated through the target headroom approach, but instead as an output of the Scenario Generator Model. While we recognise this approach is innovative we have concerns around its transparency. In particular: •The target headroom values presented in the planning tables range from 0.5% in 2025 to 15% by 2045. The large range raises concerns about the application of individual uncertainty components in the Scenario Generator Model and the transparency around this. For example, no other company has such a wide range of headroom, and the company should further justify the range and trend over the planning period in the final plan.	The wide range of target headroom results reflects the fact that with the integrated risk approach used for both WRMP14 and WRMP19, there is no requirement to select an arbitrary 'glidepath' of risk (e.g. 95th percentile dropping to 80th percentile over the course of the Plan). The target headroom values generated therefore better reflect the individual supply and demand risk characteristics of each water resource zone (WRZ). For example, in the Isle of Wight all sources are predominantly licence constrained, resulting in a supply profile which does not change significantly by return period and a low degree of uncertainty due to the impact of climate change on supply. This corresponds to a relatively low target headroom uncertainty. By contrast, in Sussex North there is a change in predicted yield by drought return period, and a relatively large degree of uncertainty regarding the impacts of climate change on supply at MDO in particular, resulting in a relatively high target headroom uncertainty. The trends in target headroom uncertainty across the planning period are driven by the increase in uncertainty relating to the impact of climate change on supply and demand and in the demand forecast.	No changes required. Annex 5, section 4.3.4 has been updated to provide additional explanation.
5.2	• The modelling assigns a weighting of 50% to the upper sustainability reduction scenario for Central and Eastern areas for the preferred planning scenario. This results in significant deficits beyond 2027 relating to unconfirmed sustainability reductions. It is unclear whether this is in line with planning guidance and further justification for this assumption is needed in the final plan.	There is no planning guidance on this; however, given the companies recent experiences with the Western area, it cannot assume that these possible large scale sustainability reduction volumes will not occur. It has therefore had to include the potential for a range of uncertain sustainability reductions to be included in the branches, to present a prudent and resilient plan. The higher deficit branches include not just sustainability reduction uncertainty, but also demand growth and climate uncertainty. These are combined together in a Monte Carlo model to develop a range of possible futures which the company may face. Until there is some certainty with regard to the scale of sustainability reductions, the company must have a plausible plan for meeting the deficits that could result. This means that the company must undertake feasibility investigation and planning and promotion activity in AMP7 for a range of options which may or may not end up being needed.	As a cap to the level of sustainability reductions cannot be confirmed we have maintained the some likelihood of occurrence of the lower, middle and upper sustainability reduction cases as explained in section 4.4.4 of Annex 5.
6. Supply-demand balance			
6.1	The supply-demand balance profile presented is in line with the assumptions of the individual components of supply and demand, although we have noted concerns about some of these components above, which need further clarification. In the short term the key drivers of supply-demand balance are reductions in abstraction licences and losses due to water quality deterioration. In the longer term, population and non-household demand growth also play a role.	We agree with Ofwat's description of the baseline supply demand balance and which components are the key drivers.	Annex 3 provides a detailed explanation of how potential sustainability reductions (section 5) and water quality impacts (section 3.7) on the supply forecast have been assessed. Annex 2 provides further details of population and non-household demand growth.
7. Options			
7.1	Reflecting the scale of the challenge, Southern Water has considered an extensive range of supply and demand options and has included a 15% leakage reduction by 2025. However, further work is required around a number of elements, such as the range of supply-side options and costing assumptions. There also appears to be a lack of clarity on the long-term ambition in demand management, for example around leakage reduction. Further specific comments: •Southern Water has used what appears to be appropriate screening criteria and processes for developing lists of options. However, there is a lack of clarity on the process adopted, which appears to be largely subjective, and further evidence should be presented in the final plan to demonstrate that the criteria have been applied consistently.	The approach to demand management and leakage reduction will be updated for the Revised WRMP. The level of detail for some options at the unconstrained options screening stage was relatively high level and/or uncertain. A conservative approach was therefore taken to retain options in cases where the justification to exclude was uncertain. Where there was sufficient justification to exclude an option the reason for rejection has been summarised and reported in Annex 7. To ensure consistent screening each option within a given option group was reviewed by one technical lead. The summary table of feasible options (Annex 6, Table 8) presents the screening results for all feasible options, with these decisions being supported by further information contained in the fact files for the feasible options, which are presented in Annex 6 and also include a discussion of the rationale for including the options.	Review and update fact files for decisions on inclusion of options, where appropriate

7.2	• Southern Water used several methods, including making use of an Official Journal or OJEU and a statement of need on the company website, in order to generate third party interest. This resulted in six third party supply options on the unconstrained list but only one being considered feasible. Further considerations: - The third party option, a licence trade, is selected late in the planning process after 2050 with its timing requiring further explanation. Given the focus on supply options the company should also consider what it could do in order to promote further third party demand options. - We expect Southern Water to demonstrate equal vigour in gathering data on third party options as with in-house options and to ensure equal treatment and consideration of these options. It should be careful to ensure that its in-house options are not unfairly or unduly favoured and that the principles for company bid assessment frameworks are followed.	We included a licence trading option in our draft plan, relating to an industrial abstraction near Sittingbourne in our Eastern area. This was selected in our preferred plan in 2027. Later in the planning period we also selected a water reuse scheme to supply the same industrial customer in order to facilitate a further licence trade. This scheme was selected in 2045 but it was only needed in one of the more challenging future scenarios that we modelled. As we develop our implementation plans for the company's Target 100 initiative in more detail we will give due consideration to third party demand side interventions. We follow a transparent options appraisal process that gives equal weight to third party options as well as in house options. The same screening criteria are applied and costs will be compared on a consistent basis to ensure there is no bias towards a particular set of options.	Annex 6 will be updated to explain the approach we take to identify and appraise third party options. We will also summarise the third party options we have appraised as for WRMP19.
7.3	• We welcome that Southern Water has included water trading options in its preferred plan and used the WRSE regional group scenarios to identify opportunities for regional transfers, however, there is the question of whether more can be done in the short term. We expect further discussions with all parties involved on trading options to progress prior to the final plan publication. Further specific comments: - While we welcome the trade with Portsmouth Water, it is not consistently presented in both company plans. Each company makes different assumptions as to the timing, volume and type of water. This needs to be addressed and further clarified in the final plan. - A possible import from South West Water's Bournemouth zone is preferred under certain scenarios, but potentially has environmental risks of delivery. We expect that the mitigations are further investigated for this option and it is continued to be actively developed with further details provided in the final plan.	Southern Water is continuing its dialogue with neighbouring water companies to confirm volumes, timings and reliability of bulk supply options and identifying new additional options where possible. For example we have received new information from the South West Water Resources group which provides more details of bulk supplies available from South West Water (Bournemouth) and Wessex Water. We recognise there was some differences in how we and Portsmouth Water represented the proposed bulk supply options in our respective draft WRMPs and so we have had further discussions to ensure they are consistently represented in both our revised draft WRMPs. For example we have agreed the 21 Ml/d import that depends on the development of Havant Thicket reservoir will be available from 2029/30. As mentioned above we have had more details of the volumes, timings and reliability of imports from Bournemouth Water and Wessex Water. They have also set out the risks relating to WFD risk of deterioration and we will work with them to fully assess and mitigate these (if possible) in order to confirm the environmental sustainability of the bulk supplies.	Updated assumptions will be reflected in option fact files and preferred strategies (annexes 9, 10 and 11)
7.4	• We welcome that the draft plan narrative states an ambition to reduce leakage by 15% by 2025 and we note the starting leakage position in 2020 at 76 l/prop/d compares favourably with other companies. However, the company needs to provide further detail regarding the development and justification of its preferred leakage reduction strategy in the final plan. Further considerations: - The 15% target by 2025 does not match the information presented in the majority of the draft plan, for example a reduction of 10% is incorporated into the planning tables. - This discrepancy means there is an incomplete representation of the leakage target in the draft plan, for example, how it will be achieved, the cost, the impact it has on the supply-demand balance and the potential impact on the phasing of other options. - The change in leakage target means there is a lack of clarity on long term leakage ambition. For example, the planning tables suggest that the 15% target would originally have been met later in the planning period by 2045. The narrative does not suggest what the leakage targets will be after 2025 just that further reductions are planned.	The company has committed to aiming to meet Ofwat's leakage reduction target of 15% by the end of the next AMP (2024/25). In addition, following recommendations in the recently published National Infrastructure Commission report, that companies should seek to reduce leakage to 50% of current levels by 2050, Southern Water have also committed themselves to meeting this target. Our revised WRMP will therefore present a leakage reduction profile that meets these commitments.	Revised approach to leakage reduction to provide a profile of leakage reduction that meets the policy commitment of 15% reduction from the 2020 leakage level by the end of AMP7, and a 50% leakage reduction by 2050. Described in annex 6 (appendix C), and annexes 9-11
7.5	• Southern Water has high metering penetration as a result of compulsory metering programme over previous periods. No further metering programmes are proposed beyond those for new builds and a small amount of optants. The level of metering penetration rises from 85% in 2025 to 90% by 2045.	Options to extend metering beyond the current high meter penetration level have been included within the model, and will be applied where it is economic to do so as part of the preferred plan.	The text in revised plan will be updated to reflect this - see Annex 6 for option description, and annexes 9 and 10 for implications
7.6	Southern Water has forecast a baseline average per capita consumption (PCC) of 137 l/h/d by 2020, slightly higher than the industry average of 136 l/h/d. Further specific considerations: - The long term target for average PCC at 121 l/h/d by 2045 is in line with the average for other companies nationally (122 l/h/d). Given the proposed metering levels and Southern Water's needs, it may be appropriate for the company to consider an even more ambitious target for reducing PCC. - Linked to the above point, Southern Water's 'Target 100' (l/h/d) vision is welcome, but its preferred plan does not achieve this. No scenario to achieve this is presented in the plan and greater clarity on how the 'Target 100' vision has influenced the water efficiency programme should be presented in the final plan.	The company are updating the presentation of the Target 100 scheme in the Revised WRMP. The target 100 scheme will aim to meet a per capita consumption of 100 l/h/d in a normal year by 2040. During a dry year, when demand may be expected to be higher because of increased demand (e.g. garden watering) during very dry conditions, the per capita consumption may be higher than the 100l/h/d figure. The WRMP Tables are based on dry year demands. An additional description of the target 100 option, and the forecast profile of PCC in a normal year will be added to the revised WRMP.	Plan and text updated to better reflect the company's target 100 policy. Full description in Annex 6. Selection of Target 100 described in annexes 9-11
7.7	• A large number of supply-side options are presented in the preferred plan, however, the plan does not provide sufficient evidence that the proposed supply-side options are appropriate. Further considerations: - It is unclear from the draft plan if deliverability of the individual options and combined programme has been fully considered. The final plan should include greater detail on the potential risks in deliverability and uncertainty in timing for the preferred programme. - Two desalination plants feature in Southern Waters preferred plan in the short term. This raises concerns over the deliverability and wider environmental impacts of these schemes and whether they represent best value for the region as a whole. The final plan needs to present much more explanation on how these concerns will be mitigated. - We welcome that Southern Water has discussed joint development of effluent reuse schemes with South East Water and it should continue to explore such options. The companies should ensure these schemes are represented consistently within the plans and that the delivery timescales accurately reflect the constraints of both parties. - A number of the options within the preferred plan require detailed further investigation to justify the benefits and determine their viability. For example a scheme to reline 40 km of sewer and provide 13 Ml/d of additional supply is selected in the Central area, but it is unclear from the information provided how this will provide a supply-demand balance benefit.	The WRMP follows a standard options appraisal process for WRMPs. The approach that is being applied for WRMP19 is consistent with the Water Resource Planning Guidelines, and with the EBSD and WR27 options appraisal processes, and with the recent UKWIR Decision Making Processes guidance. The process of options appraisal can also be seen in terms of the gradual screening of a wide options set to reach an optimum solution with a basket of robust options. We consulted the Environment Agency, Natural England and other stakeholders on the unconstrained and feasible options lists, of which the desalination options were a part, during the pre-draft consultation phase. Once a plan is published, the company will need to undertake additional more detailed feasibility investigations and modelling, environmental assessment, preparation of planning documentation, and detailed design. This will be undertaken in due course, as with any option. The company identified a range of alternative options in its Draft WRMP which will need to be investigated in parallel with the desalination options, due to the uncertainties involved with ultimate deliverability of these and other options to meet the significant supply demand balance deficits. Each option has a fact file, which includes sections on planning and environmental risk, and which therefore demonstrably do provide detail on risks to deliverability. With regard to the joint schemes with South East Water, the company will work with SEW to try to standardize the joint schemes, however, it should be noted that SEW has indicated they do not now need either of these schemes, which may not fit with Southern Water's needs. SEW may therefore need to consider whether they will include the earlier need for the schemes in their plan or not. The scheme described in the last bullet relates to part of a catchment management scheme. The benefit of this scheme as a whole is that it prevent the source from being written down to zero deployable output.	Although not required by the WRP Guidance, the company have set out a programme of works for its key strategic schemes and alternatives (annexes 9-11, sect 7.2)
7.8	• General statements are provided on the cost estimating methodologies used but it has not been possible to assess the robustness of the cost estimates from the information contained in the draft plan. Further considerations: - Southern Water should provide further explanation of its option costing process, including cost assumptions and their application to different scheme types and how methods will be consistently applied to PR19 business planning. -The costs in the planning tables were originally presented incorrectly as flat profiles of annualised costs without further breakdown. Improved cost profiles were only made available in April 2018 and this limited our scope to review the options.	The text on option costing will be reviewed, but aims to describe the process applied. It is not appropriate to go into more detail about specific option costs in the WRMP text. Table 5 in the WRMP tables, contains the feasible options cost information. This will be updated, along with the other WRMP Tables and presented alongside the Revised WRMP. This will include a breakdown of the capital costs. Note that the Guidelines do not clearly express this need. An Annuitised capex value implicitly takes account of renewals costs, by taking into account the asset lives of each component of the capital cost.	Review the text on options costing provided in Annex 6 and update where necessary. Table 5 will be updated and re-issued alongside the Revised WRMP.
8. Decision Making			

8.1	Southern Water has adopted an enhanced Real Options approach to develop its preferred programme consistent with its problem characterisation. However, we have concerns around the transparency of the decision making approach, the drivers behind the preferred programme and assurance. Further specific comments: • The draft plan appears to be reliant on supply-side options despite the company stating that it has adopted a twin track approach. The final plan should clarify why this mix of options represents the best outcome for customers and how the decision making process led to this result.	The approach is in line with the UKWIR decision making guidance. The plan does clarify the mix of options - it contains both supply side and demand side option (building on Southern Water's already very high metering levels, for example). However, the company faces some very significant deficits that cannot be met by demand management options alone - they require development of large scale supply side schemes. The company is revising its presentation of the target 100 option, and has also committed to adopting the NIC recommendation of achieving 50% leakage reduction from AMP6 levels by 2050. This will be presented in the Revised WRMP	No change to the decision making approach, however, we will try to update the text around the selection of the preferred programme (annex 8) Additional commentary and options around target 100 and leakage reduction will be included in the Revised WRMP (annexes 9-11)
8.2	• The Southern Water plan relies on an adaptive pathway to mitigate the risks of unconfirmed abstraction licence reductions impacting the supply-demand balance. However, it is unclear if the trigger points for decision making have been identified appropriately. Further specific considerations: - As noted in section 1 this approach was also taken for the previous plan but the triggers identified appear to have either been inappropriately defined or insufficiently acted upon to explain the scale of the immediate deficits the company now reports. Greater clarity needs to be provided that the company has learnt the lessons from its previous plan. - While the scenarios, pathway branches and sensitivity testing are comprehensive, it is unclear if the uncertainty around licence reductions will be addressed in the preferred strategy. This is because there may not be sufficient time allowed in the plan prior to the triggers to complete the required investigations and enable timely decisions on options to be made. - Linked to this point is it is unclear how the scenarios tested have influenced the preferred plan. This includes whether the options selected are the low regret options and if the trigger points on the adaptive pathway have been appropriately defined. This should be clarified in the final plan. It is not clear how deliverability has been considered in the decision making process and this needs to be clarified in the final plan. For example we would expect to see more detail on the proposed delivery paths for each preferred option alongside trigger points and investigation timelines, to enable more confidence to be placed in the preferred strategy.	This consultation response is not correct: our plan does not rely on an adaptive pathway with triggers; our plan is actually based on a real options decision making approach. Nor was the previous plan (WRMP14) based on an adaptive pathway approach; it was not, but was based on a conventional EBSD decision making approach. There have been some significant differences from the previous plan - for example, in WRMP14 we were instructed not to allow for a sustainability reduction at Testwood; but through AMP6 the EA have now imposed a sustainability reduction which results in the Testwood source having a significantly reduced deployable output in drought years. This has meant that the solution to the Western area, for example, has needed to change significantly from the portfolio of options identified that were identified in WRMP14. Because there is large uncertainty around the potential licence reductions, we have tried to ensure that our plans cover a wide yet appropriate range of futures to ensure that all the key strategic options are identified. It is precisely because there may not be sufficient time to from when the sustainability reductions are completed to developing appropriate schemes that we have adopted the Real Options approach - so that key schemes and alternatives which address these uncertainties can be investigated and progressed in parallel. Should the magnitude of the uncertainties be less severe then some of the schemes would not need to proceed past feasible investigation and planning promotion. But the company has little choice but to conduct these investigations in AMP7, given the scale of uncertainties we face in the next 10 years. The company is intending to present some timelines for key strategic options as part of its revised WRMP. This should help in the assessment of deliverability, although it should be noted that all feasible options have a fact file which has identified potential environmental and planning risks. However, there will always be some deliverability risk where large scale resource development options may need to be developed.	Present some of the key decision points associated with key strategic schemes in its Revised WRMP in a simple timeline (annexes 9-11 (sect 7.2)
8.3	• While there is a large amount of material provided on the decision support tools it is unclear how the final preferred portfolio was selected. In the final plan, for clarity, we would expect to see a clear summary that concisely explains how and by whom the preferred portfolio was decided on.	Additional text around the approach in moving from a least costplan to the company's preferred plan with be provided in the Revised WRMP.	Additional explanatory text in Annexes 8-11
8.4	• Board assurance was part of Defra's guiding principles for water resources planning. However, the draft plan does not provide any evidence of Board assurance and this raises concern about the robustness of plan development. This concern is compounded as there is limited description of the quality assurance of the plan and as there are internal inconsistencies within the draft plan, such as the presentation of the leakage reduction target of 15%. For the final plan we expect to see assurance that the company Board are satisfied the plan represents the most cost effective and sustainable long term solution.	The development of the Water Resources Management Plan has been shared with the board on several occasions. This has included specific presentations on what a WRMP is; how it is derived; what are the challenges to Southern Water and how we derive the final plan. In addition to these board presentations we have also met a non-executive director on a regular basis to go through how a plan is derived and the steps we have undertaken. We have also commissioned specific assurance work by Addleshaws and Goddard to check on legal compliance; and Jacobs to undertake a technical audit of the draft Water Resources Management Plan. We will summarise the engagement we have had with the board on the develop of this dWRMP, which picks up from the last plan. This will be an additional piece of text to the plan.	An explanation of the board assurance process has been added to the Technical Report and Statement of Response
9. National and regional considerations			
9.1	Southern Water presents evidence that it has worked closely with the WRSE regional group. However, there is significant uncertainty around the assessment of regional options and resulting reliance on in-house solutions, and whether more can be done in the short term. Further specific comments: • The plan makes reference to the Water UK national project and includes the consideration of the transfer from South West Water's Bournemouth zone which was identified in this study. As noted in section 7 above we expect the companies involved to continue to actively engage on this trade.	Southern Water will continue to actively engage with the WRSE group and is proposing to join the Water Resources South West group to ensure regional solutions are identified and developed to support the company's needs particularly in Western area where it faces a large immediate supply-demand deficit. The company fully supports a regional planning approach to make best use of available resources and improve the resilience of neighbouring companies to a range of risks (not just drought). In Western area the company will continue to investigate alternative options alongside schemes in its preferred strategy to mitigate the risks of delivery surrounding regional (water trading) as well as 'in house' options. In order to progress the investigation of potential transfers from South West Water (Bournemouth Water) and Wessex Water the company is proposing to join the Water Resources South West group. We have already received further information from this group on the volume, timings, reliability and risks around potential transfers which we welcome and will reflect in our revised draft WRMP.	We will update Annex 6 to reflect further discussions with water companies around regional solutions. The outcomes of these discussions will be reflected in updated fact files, WRP tables and final strategy annexes (9, 10 and 11)
9.2	• The draft plan references WRSE outputs and appears to be consistent with its findings. The company specifies where differences may occur and explains the reasons for this. Further considerations: - We welcome the trade with Portsmouth Water, supported by the construction of Havant Thicket reservoir, in line with most WRSE scenarios. It has been identified as the best value option to solve a regional problem and this has been reflected in the draft plan. - However, the plan is still highly dependent on supply options developed by Southern Water. Further transfers have the potential to impact upon the delivery of major supply options within Southern Water's plan. Therefore, the company should actively pursue alternative trading opportunities with other companies.	A key issue is the earliest timing by which transfers may be supplied, whether the supplies of companies providing the traded water are secure and not themselves at risk of sustainability reductions, and the extent to which the supplying company can provide some guarantee that the water will be available at the level of drought return period that we are planning to. In addition, the options clearly need to be economic in comparison to our own resource development options; it would not benefit our customers if trading options were significantly more expensive than our resource development options (i.e. because the supplying company was charging us for the development of a new option plus we had to bear the costs of the pipeline from the neighbouring company's supply area, and also pay relatively high charges per volume of water supplied). Of course, there are other factors to consider in addition to cost, such as if the trading options provided greater resilience and this was something that customers were particularly supportive of. We have help further discussions with neighbouring water companies since the publication of the draft WRMP to understand the opportunities for and constraints associated with trading options. We have received mode detailed information from the South West Water Resources group about potential bulk imports from Bournemouth Water and Wessex Water, and this has enabled us to select an import from Bournemouth Water in our preferred strategy for Western area reducing the scale of the desalination plant needed to remove the deficit in this area.	Annexes 9, 10 and 11 have been updated to show how trading options that have been modelled as part of the WRSE group work have been considered for the Western, Central and Eastern area strategies. Fact files have been updated for trading options following further discussions with neighbouring water companies, in particular Bournemouth Water (South West Water), Thames Water and Wessex Water.

Appendix 7.4 - Historic England

Respondent	Reference no.	Response comment	SWS' Consideration of Response	Changes Required to dWRMP
Historic England - Alan Byrne, Historic Environment Planning Advisor	45	As the Government's adviser on the historic environment Historic England is keen to ensure that the protection of the historic environment is fully taken into account at all stages and levels of the water planning process, and welcomes the opportunity to comment upon this key planning document. Historic England has no comments to make on the contents of the draft WRMP at this stage, as it appears not to raise any issues that will directly impact upon the historic environment in a strategic way. We welcome the opportunity for continuing dialogue in the preparation of the draft WRMP and we look forward to receiving future invitations to consider the management of the Southern Water's water resources particularly if this involves the implementation of physical measures that may have effects on archaeological or other heritage assets, such as the laying of pipelines, new reservoirs or abstraction points. These comments are based on the information provided by you at this time and for the avoidance of doubt does not reflect our obligation to advise you on, and potentially object to, any specific development proposal which may subsequently arise from this or later versions of the plan and which may, in our view, have adverse effects on the historic environment.	The comments are noted and welcomed. We will need to undertake additional more detailed feasibility investigations and modelling, environmental assessment, preparation of planning documentation, and detailed design. Where there are proposals with the potential to interact with or affect historic environment interest, we will liaise and engage with Historic England.	None.

Appendix 7.5 - West Sussex County Council

Respondent	Reference no.	Response comment	SWS' Consideration of Response	Changes Required to dWRMP
West Sussex County Council	31	**This plan includes the use of water restrictions (hosepipe bans) during a drought once in every 10 years on average. (In Hampshire and the Isle of Wight this is likely to be once every two or three years on average until at least 2027). Do you support this?** Water restrictions should be applied as and when required in a strategic and sensitive way. If say, every 10 years formed part of a wider 'recharge programme' then this should be supported. Restrictions need to be managed on a needs basis and not constrained to seasonality or temporal conditions. Water efficiency measures should always be effectively deployed. If water is available for abstraction then storage should be considered although it may not be in line with an existing permit. Our residents would like the reassurance that Southern Water is doing all it can to minimise the need to introduce restrictions and that action would have been taken considerably earlier before this would be needed. It is noted that, due to the investments that have been made since then, if even if similar conditions to those experienced in 1976 were to occur again, there would not actually be the need for such drought actions.	The Council's comments are welcome. We recognise the need to ensure that we manage our resources to protect the environment and supplies to customers, only needing to use restrictions when absolutely required. The significant investment in our universal metering programme, combined with water efficiency and leakage reductions programmes has reduced the volume of water going into supply from its peak in the 1980s, despite a growing population and household base. We work closely with the Environment Agency, other water companies and our wider stakeholders in monitoring and managing resources, and in co-ordinating action when we approach the period when restrictions may be required. This includes increasing our media awareness and water saving campaigns ahead of and during any period of restrictions.	No change.
West Sussex County Council	31	**Do you think it's a good idea to plan for future changes to our abstraction licences which could mean we need to invest in new sources?** Yes, a 'dynamic' licensing system is required and a contingency fund would be a useful for future water resource requirements and investment strategy.	The support and comments are welcomed. Changes to our supplies as a result of sustainability reductions normally involve a period of focused investigation and then either immediate or very short term proposed licence changes. These can be very significant in scale, making them hard to plan and accommodate within our WRMP. However, our modelling techniques allow us to explore this variability and identify' several states of the world' that we should plan to accommodate within our WRMP. We are then able to weigh up the risks associated with these, and to identify the 'least regret' set of options for us to implement to ensure we have resilient supplies for customers.	No change.
West Sussex County Council	31	**Do you think it's a good idea to trade water with neighbouring water companies in a 'regional grid' as part of the Water Resources in the South East group?** Yes in principle, to ease demand constraints. This would need to be tightly controlled and independently regulated. The commercial aspect could present issues and over inflate pricing etc. in the process of keeping shareholders happy.	We will continue to actively work with neighbouring water companies through the Water Resources South East group to further enhance the benefits of joint working on all aspects of water resources management and strategic planning for the South East region, including promotion of water efficiency, the development of joint schemes or trading options as applicable and facilitating cumulative environmental assessment (for example in respect of cumulative landscape effects). Our plan demonstrates the benefits of the WRSE group with several water trading and/or joint water resource scheme developments included in our strategies for each of our operating areas. Water trading options need to be economic in comparison to our own resources supply options and we agree that it would not benefit customers if trading options were significantly more expensive that our resource development options. (i.e. because the supplying company was charging us for the development of a new option plus we had to bear the costs of the pipeline from the neighbouring company's supply area, and also pay relatively high charges per volume of water supplied). Of course, there are other factors to consider in addition to cost, such as if the trading options provided greater resilience and this was something that customers were particularly supportive of. That being said, we continue to discuss and explore these options with neighbouring companies	No change.
West Sussex County Council	31	**Do you support our Target 100 to reduce personal water use to 100 litres per day by 2040?** Yes. This is beyond what neighbouring water companies are aiming for (Portsmouth Water for example have a stated target of 132 by 2040 and beyond the National Infrastructure Commission report 'Preparing for a Drier Future' (April 2018) which suggests water companies could reduce demand to 118 litres. Is 100 litres ambitious enough – would you consider 75? The Target 100 information presented in 'Southern Water Futures' states that part of this campaign will encourage new homes to be even more water efficient through the planning system. This is something we support. The push for Universal Metering (regardless of water-stressed status) is identified in the National Infrastructure Commission recent report 'Preparing for a Drier Future' (April 2018), which recommends that Defra should enable companies to implement compulsory metering beyond water stressed areas.	The Environment Agency has welcomed our Target 100 initiative and it is considered to be ambitious in comparison to other water company targets. The Target 100 extends across all homes, not just new homes. It is agreed that there is potential with new homes to deliver lower pcc in new homes and have a number of initiatives seeking to achieve this. Our universal metering programme has been incredibly successful and will continue to contribute towards us reducing overall per capita consumption to 100 l/h/d by 2040. Our revised draft WRMP now includes significant additional leakage reduction commitments, which are combined with a slight reduction in the proposed metering programme from that proposed in the draft WRMP. We are now proposing to implement additional household meters to take us from 88% to 92% fully metered properties. This combination of demand management, leakage reduction, and metering is considered to represent the most economic solution set for our customers and the environment.	We have changed our metering proposals from that shown in the draft WRMP. We are now proposing to implement metering to increase from 88% to 92% of households in the Central Area, and not to the 100% as proposed in the draft WRMP. The updated preferred strategy for the Central Area is set out in Section 7.4 of the Technical Overview, and in Annex 10 of the revised draft WRMP.

West Sussex County Council	31	**Do you agree with our plan to start investigating new options for water recycling, desalination and reservoirs now, in case they are needed in the future?** Yes, future planning is required and these technologies could only get more expensive in future. The information presented in 'Southern Water Futures' on Resource Hubs is relevant. The options presented for returning water to rivers protects the environment, increases the resilience of our county and positions us as a forward thinking innovative place. The presentation we've seen 'Delivering a resilient water future: Resource Hubs' highlights some of those options to us, and has broad strategic support, as it aligns with the aims in our West Sussex Plan, to be a Strong, Safe and Sustainable Place.	Support for our strategy is welcome, and we look forward to working with the Council and other partners as we investigate and seek the necessary consents to implement these solutions.	No change.
West Sussex County Council	31	**Do you think water recycling (from wastewater) has a role to play in securing water supplies for the future?** Yes, and in addition to those highlighted above, it has added benefits in managing flood risk, improving community resilience and helping people to be more water conscious.	The comments and support for water recycling is welcomed.	No change.
West Sussex County Council	31	**Do you think desalination has a role to play in securing water supplies for the future?** Yes, however approached with caution. Desalination is an energy intensive process therefore the demand and the environmental economics need to stack up. Many countries have successfully implemented desalination technologies and this would further contribute to the UK mix of sources and future security of supply.	Our plan contains both supply side and demand side options (building on our already very high metering levels, for example). However, the company faces some significant deficits that require us to look towards a mix of options in order to ensure resilience within our water supply network. Our modelling undertaken on the draft WRMP indicates that a number of desalination plants may be required. Our further investigations and revised modelling for the revised draft WRMP continues to identify the need for a desalination plant in West Sussex, with the preference at this stage being for a plant in the Shoreham Harbour area. We will investigate this option in more detail, considering alternative sizes for this plant and also whether an alternative location on the Tidal Arun could represent any economic, social or environmental advantages. We look forward to working closely with the Council through our more detailed feasibility investigations and modelling, environmental assessment, preparation of planning documentation, and detailed design.	No change as a result of these comments, however the preferred strategy for the Central Area has been updated to reflect additional investigations and modelling. A desalination plant is retained in the preferred strategy, with the preferred location being in the Shoreham Harbour area, as set out in section 7.2 of the Technical Overview and Annex 10.
West Sussex County Council	31	**Do you support our Catchment First approach, to work with landowners, farmers and river trusts to improve the health of rivers and groundwater sources, before investing in new solutions such as water recycling or desalination?** Yes, obviously there is a sensible hierarchy to the approaches however a combination of all the above interventions will be required as future demand inevitably increases. The information presented in 'Southern Water Futures' emphasises the importance of collaboration. We are keen to work together to understand the value of our natural capital and to build on the good work already underway with the Local Nature Partnership. We will be keen to learn more about the studies in the Arun and Western Streams to understand the potential and effectiveness of catchment interventions.	The comments are noted and the support is welcomed. We are keen to work with Natural England, the Council and our catchment partners to identify the wider potential co-benefits of our catchment management schemes which have a primary focus on improving drinking water quality and/or enhancing environmental resilience of water bodies from which we abstract. As part of our commitment to achieving overall net environmental gain from implementation of our WRMP, we will actively work with Natural England and our catchment partners to maximise benefits for biodiversity and society as a whole from our catchment management investment, adopting ecosystem services and Natural Capital assessment approaches in line with the Government's 25 year plan for the environment and Southern Water's wider Integrated Water Cycle Management approach.	None as a result of this comment, however the text relating to our commitment to catchment first has been updated in the revised draft WRMP, as set out in Section 4 of the Technical Overview and Annex 6 of the revised draft WRMP.
West Sussex County Council	31	**How important is it to you that we use renewable energy (by buying or developing it) to power our water network?** Extremely important and this should be an embedded commitment to a sustainable future as with any other utility provider. The Energy Overview we received from the Southern Water Energy manager was insightful and stated that renewable generation currently meets 17% of Southern Water energy needs. With the opportunities provided by the estate, we'd like to see this increase significantly. Of interest is the suggestion of Community invested projects. WSCC has developed an enviable track record for delivering successful low-carbon projects, and are exploring where we might be able to work together. Our Energy Strategy sets ambitious and long-term targets which establish West Sussex as the key location for investment in the low-carbon and renewable energy sector.	The Councils comments on the importance of renewable energy are welcomed. We will be actively looking to innovate in the way we secure power for our water supply network, potentially increasing our reliance on renewable sources of energy through our own schemes and through working with partners such as the Council. We look forward to investigating these further together.	No change.

West Sussex County Council	31	**Should we do more to reduce leaks, even if it pushes your bills higher? (We plan to reduce leaks by 15% by 2025)** Yes, but with very careful consideration. A wholesale attempt of 'sealing' of networks from all sources is never fully practical on a wide scale and generally pushes issues further away. Appropriate infrastructure (incl. development planning), upgrade and regular maintenance should in itself reduce the potential for leaks. If there is a representative rise in cost for security of supply then this should be fully supported. The impact of an increase in bills on our more vulnerable residents should be carefully considered.	Managing leakage is an important part of our water resources strategy. A low level of leakage is desirable, both for the environment, and because it defers the need to invest in new resources which would otherwise be required to meet increases in demand over time. However, as noted, it is not necessary economic to reduce leakage to very low levels, because to do so could involve very large additional costs for relatively small savings of water. Our approach, and that of our regulators, is to set leakage at a level that is optimal for our customers and society as a whole. Our draft WRMP set out a combined strategy of further active leakage control in the short term followed by mains replacement programmes in the medium to longer term to ensure that we continue our drive down on leakage by 15% by 2025. We have now increased this commitment in the revised draft WRMP, to seek to achieve a 40% reduction in our current leakage levels by 2040 and a 50% reduction by 2050. This will require a significant investment to achieve, and we are very aware of the potential impacts on customer bills. We are exploring this with our financial regulator Ofwat, and are committed to ensuring that vulnerable groups and customers are protected. Southern Water also has existing social tariffs in place for relevant customer groups.	No change as a result of these comments, however the preferred strategy for the Central Area has been updated to reflect additional investigations and modelling. A desalination plant is retained in the preferred strategy, with the preferred location being in the Shoreham Harbour area, as set out in section 7.2 of the Technical Overview and Annex 10.
West Sussex County Council	31	**Do you think we should plan for a wide range of possible 'futures' and how much water we may need to supply in each?** Yes, future scenario planning should be very much embedded within the risk management & assessment process.	The Council's support for our approach is welcomed.	No change.
West Sussex County Council	31	**We have developed a long-term environmental forecast. Do you agree with how we have taken this forecast into account in our plan?** The forecast is sufficient for this 50 year plan. More could be done to look at the 75 and 100 year plan scenarios to give increased sustainable outlook.	The WRMP process currently only requires us to look ahead over the next 50 years, however we need to consider longer term trends and the Council's support for this is welcomed.	No change.
West Sussex County Council	31	**Do you support the fact we have selected some water recycling options in preference to desalination to align with the preferences of our customers?** These options should be looked into 'in combination' to desalination with the benefits and potential dis-benefits communicated to customers. Water recycling, both direct and indirect re-use, has the advantage of increasing the resilience of our region and supporting the environment.	Support for achieving resilience in our strategy is welcome and an 'in-combination' approach.	No change.
West Sussex County Council	31	**After we've introduced options to save water, such as reducing leaks and Target 100, which would you prefer us to develop first - water recycling or desalination?** It is likely both these options would need to be developed on various scales. Water recycling, both direct and indirect re-use, has the advantage of increasing the resilience of our region and supporting the environment.	Comments are noted and we will be looking to develop both desalination and water recycling options.	No change.
West Sussex County Council	31	**Do you think our approach to provide water in Kent is the right one?** On balance the plan presents a reasonable case and strategy.	Support welcome.	No change.
West Sussex County Council	31	**Do you think our approach to provide water in Sussex is the right one?** On balance the plan presents a reasonable case and strategy.	Support welcome.	No change.
West Sussex County Council	31	**Do you support our policy to introduce Drought Permits and Orders more frequently until at least 2027 in Hampshire and the Isle of Wight to secure supplies while new options are developed following the proposed changes to our abstraction licences?** Drought permits and orders are tools available to be used in combination with softer approaches such as awareness campaigns and educating the public. They should not be used as a first port of call and used sparingly to remain effective. Our residents would like the reassurance that Southern Water is doing all it can to minimise the need to introduce restrictions and that action would have been taken considerably earlier before this would be needed.	Our draft Drought Plan, published for consultation in 2018, introduces a new way of planning for droughts, which means we will need to act to tackle them less often. We plan to introduce Temporary Use Bans no more than once every 10 years on average, restrictions under drought orders no more than once every 20 years, and apply for drought orders and permits to take more water from the environment no more than once every 20 years (on average). However, these may need to be more frequent in Hampshire and the Isle of Wight until at least 2027, as we develop new water sources following changes to our licences to abstract water. Our drought plan sets out what we will do to keep supplying water during a drought. It shows: • the range and timing of actions we could take to keep providing tap water while droughts develop and worsen; and • the steps we'll take to protect the environment. The plan includes the triggers and actions we will take should there be an impending drought to reduce the amount of water being used.	No change.
West Sussex County Council	31	**A large scale new desalination plant in Hampshire is needed to balance the supply and demand for water. We could reduce our reliance on desalination by combining this with water recycling (water re-use) scheme, where treated wastewater would be released into the Lower Itchen for re-abstraction. Which approach do you prefer?** The 'in combination' approach is always likely to yield wider benefits if executed correctly.	The Council's comments are noted. We plan to explore potential "high tech" solutions in tandem over the next few years, to ensure that we plan to deliver the right combination of schemes.	No change.

West Sussex County Council	31	**Do you think we should continue to investigate the potential of river restoration in Hampshire to help delay the need to invest in new sources such as desalination and water recycling?** River restoration is a significant part of the future however should not be compromised at the expense of future investment in efficient technologies. Again in combination interventions are more likely to yield better future benefits than putting all your eggs in one basket with a commitment to one particular technology.	The Council's comments are noted and welcomed. Our preferred strategy is to deliver a combination of new schemes, including river restoration, demand management and new resource developments.	No change.
West Sussex County Council	31	**Do you think our approach to provide water in Hampshire and the Isle of Wight is the right one?** It is a significant step in the right direction however the proof will be in the operation of the early years of this plan.	The Council's comments are noted. We have committed through the s20 Agreement signed at the close of the Hampshire Licence Inquiry to deliver a long term water resource solution for Hampshire and the Isle of Wight. This will require significant investment and effort over the next few years to ensure that a timely solution is delivered.	No change.
West Sussex County Council	31	**Do you support the increased level of resilience to drought which our plan provides in the longer term? (We have assumed that in the long term, drought permits and orders would only be implemented in droughts more severe than a one in 200-year event).** Yes, in principle but this plan will need to be closely monitored for its effectiveness.	Comments noted. Following a drought, we will undertake a post drought review and would work with the Environment Agency and neighbouring water companies to inform this. This includes environmental monitoring to determine any adverse effects arising from implementation of drought management measures.	No change.
West Sussex County Council	31	**Would you like to get involved in developing our solutions to provide water, for example, community schemes to save water, developing water recycling and desalination options or in any other way?** West Sussex County Council, with its remit as Lead Local Flood Authority, views itself as a key stakeholder in supporting solutions to water resource issues and will always embrace a collaborative working approach. Our elected Members support this approach.	The Council's support for collaborative working is welcomed, and we look forward to continuing to work with the Council in delivering our plans..	No change.
West Sussex County Council	31	**Did you find the information you needed in our consultation? What else would you like to know?** The information was presented well and in sufficient technical detail.	Comments welcome.	No change.

Appendix 7.6 - Kent County Council

Respondent	Reference no.	Response comment	SWS' Consideration of Response	Changes Required to dWRMP
Kent County Council - Mike Whiting - Cabinet member for Planning, Highways, Transport and Waste	32	Kent County Council (KCC) is grateful for this opportunity to comment on draft Water Resources Management Plan (dWRMP) of Southern Water (SW). SW provides water supply services to more than 15% of the land area of Kent within its Eastern Area that covers all of Gravesham and Thanet districts as well as parts of Swale, Canterbury and Dover districts. The company therefore plays a key role for Kent's businesses and communities. Water supply is vitally important to the local economy and environment and we look to SW to ensure secure supplies into the future at an affordable price and taking full account of Kent's growing population and changing climate and the pressures these put on the local environment.	Comments noted.	No change
Kent County Council	32	KCC welcomes the approach that SW has followed in engaging KCC during the development of this dWRMP and is grateful for the opportunity to have taken part in workshops that the company set up. We also appreciate the increasing collaboration at the regional level that has been evident and the role that SW has played in the Water Resources in South East Group (WRSE) which has helped to ensure the optimisation of strategic water supply solutions. This cycle of WRMPs is the first time that the time horizon has been extended beyond 25 years. There obviously remains a greater emphasis on that first 25 year period within the plan, but we think the extension to include a 50 year outlook is valuable and it chimes with KCC's Kent and Medway Growth and Infrastructure Framework which takes a similar approach. See http://www.kent.gov.uk/about-the-council/strategies-and-policies/environment-waste-and-planning-policies/growth-and-infrastructure-framework-gif. However, this long term outlook does appear to make the headline costs of the WRMPs less meaningful as they tend to be strongly influenced by very uncertain and costly infrastructure requirements that, at this point, appear to be needed late in the plan. This also makes it more difficult to meaningfully compare the total cost of the plans across different water companies, and this is compounded by some companies planning for 50 years and some for 60 years. Incorporating drought management activities within the dWRMP and presenting it as resilient to a 1 in 200 year drought provides an additional level of clarity and simplicity. However, with each company using a different approach and a different planning horizon, this also makes it a little more difficult for stakeholders to understand the plans and make comparisons between companies.	The Council's comments and support for the approach taken in the WRMP is noted and welcomed. The difficulties comparing costs of different water company plans over differing time horizons are noted, as well as differences in how drought resilience is presented. Looking ahead over 50 years invariably involves looking at infrastructure schemes that may or may not be needed, depending on the future that evolves. Our approach has been to determine what may be required depending upon how challenging a future may be experienced, and then following a 'real options' approach to ensure that infrastructure is developed on a 'no regrets' basis.	No change.
Kent County Council	32	**Key objectives** KCC strongly supports the following key objectives as set out in Section 4.2: • reduce the amount of water we need on a daily basis and the amount of water we lose to leaks; • adapt to risks and uncertainties surrounding sustainability reductions, drought and climate change • to achieve a resilient natural environment; • harness technology to secure new supplies from wastewater seawater, particularly for agriculture and industry; • recycle used water as a valuable resource; • collaborate with business and agriculture to achieve sustainable economic growth. Based on discussions and on-going collaboration with SW, KCC is very supportive of the high level of ambition of the Target 100 and the Catchment First initiative. The focus on innovation is especially welcome but details on what some of these initiatives will deliver is a little lacking.	The Council's support for the key objectives is welcomed. We have included additional explanation in our revised draft WRMP on the catchment first and Target 100 initiatives. Each will incorporate a number of individual schemes in different parts of our supply area. The detail of these schemes is included within the options appraisal for the WRMP **(see Annex XXX of the revised draft WRMP),** and we will now look to work with partner organisations over the next few years in developing our detailed programmes of work for implementation in AMP7 and beyond.	No change.

Kent County Council	32	**Water demand** Housing growth is clearly exerting a major upward pressure on water demand. SW expects this to mean that the company will need to serve an additional 3 million people by 2044/45 and that household occupancy rates will decline to 2.21 persons per household over this period. In 2016 KCC provided Experian with housing growth projections for Kent & Medway that could be used by all the local water companies in preparing their dWRMP. However, because the local authority planning areas do not align with water company supply zones, it is difficult for us to check that we agree with the final figures used in each company's dWRMP. In Annex 2 Table 5 SW helpfully presents the housing growth figures used for its supply zones but direct comparison is only possible for the Thanet District Council area which falls 100% within SW's Kent Thanet Water Resource Zone (WRZ). Here we find very close agreement between KCC's 2016 data and Experian figures for 'household connections' up to 2029/30. This gives some confidence regarding the figures used for the rest of SW's supply zones. It would be helpful if Annex 2 Table 5 could present both the district total figures as well as share of the totals that fall within SW's WRZs. Also, given that local planning authorities' housing growth projections are frequently being revised, it might also be helpful to indicate when the data was obtained.	We have included additional information in the revised draft WRMP (Annex 2 - Demand Forecast) and included the Experian report as Appendix A to Annex 2. This provides more explanation of how the information provided by the local authorities is used by Experian. At the current time, however, the data is tabulated by Southern Water WRZ and supply area, and not sub-divided into local authority boundaries. We will continue to work with the Council and other partners and share data and forecasts, and consider for future WRMPs whether the data we share can be interrogated by them using their own GIS data and systems.	We have included additional information in the revised draft WRMP (Annex 2 - Demand Forecast) and included the Experian report as Appendix A to Annex 2.
Kent County Council	32	**Per capita water use** In 2013, KCC commented on SW's previous dWRMP saying: "SW's forecast levels of per capita consumption (pcc) decline from 152 to 129 l/person/day by 2040, bringing pcc to just below the government aspiration of 130 l/person/day. KCC is very pleased to see this level of commitment to managing pcc." It is testament to SW's vision and commitment on demand management that the company has exceeded that objective within the first five years of that 25 year plan and is now planning to build on this further with the 'Target 100' programme which aims to drive down per capita consumption to 100 litres/person/day by 2040. We say more about this in the following paragraphs.	The Council's support is welcomed.	No change.
Kent County Council	32	**Water Futures** The Water Futures document that SW produced in 2017 is very helpful in clearly presenting the long-term challenges and insights into what these might mean for sustainable water management in future. The dWRMP presents some new work programmes that we understand stem from that excellent work. *Target 100* KCC is very pleased to see SW's exceptional performance on managing per capita water use and the continuing, industry-leading commitment of the Target 100 programme. KCC has long promoted this approach and we are pleased to see it ranking highly on the priorities of customers and other stakeholders as detailed in Section 2.6. Effective management of demand clearly allows the most costly and energy intensive water supply options to be deferred until later in the planning period and gives more time for technological advances to help overcome some of the problems associated with options such as desalination. The downside of demand management is the uncertainty around how customers will respond to various water efficiency initiatives and the perceived lack of control that this gives water companies. We are therefore happy to see these risks explicitly accommodated in Section 7 through the identification of key decision points within the strategies that have been developed.	The Council's comments and support are noted and welcomed. We are committed to achieving our Target 100 ambitions. Acknowledging and tackling the risks head on will give us greater certainty that the ambitious targets can be achieved.	No change.
Kent County Council	32	We believe SW's excellent Target 100 initiative has the potential to also change public attitudes and social norms regarding water use beyond the boundaries of its own water supply zones and to contribute to changes across the Southeast as a whole, particularly if it is supported by similar commitment from the other water companies. SW's leadership in this is immensely important and we will encourage other local water companies to show similar ambition. With this in mind, we also believe there would be great benefit if the WRSE Group were to provide greater ownership and resourcing of strategic approaches to demand management in the same way it has done with the optimisation of strategic supply side solutions. This should build considerably on the initial work of the Save Water South East programme.	Southern Water will continue to actively work with neighbouring water companies through the Water Resources South East group to further enhance the benefits of joint working on all aspects of water resources management and strategic planning for the South East region, including promotion of water efficiency, the development of joint schemes or trading options as applicable and facilitating cumulative environmental assessment (for example in respect of cumulative landscape effects). Our plan demonstrates the benefits of the WRSE group with several water trading and/or joint water resource scheme developments included in our strategies for each of our operating areas.	No change.

Kent County Council	32	***Catchment First*** The inter-connectivity of the water cycle means that the way land is managed has profound effects on the water environment including effects on aquatic habitats and species that help to maintain the high quality water resources that we need. KCC is aware that concentrations of some commonly used pesticides in river water often render the water unusable by local water companies. On top of this, new chemical pollutants are continually appearing, and we are increasingly relying on the water companies to even develop the tests to detect these pollutants. It is vitally important that we better manage the causes of these problems rather than spending increasing sums on treatment technologies to address the effects. This approach is embodied in the Government's new 25 year Environment Plan, and we strongly welcome SW's new Catchment First initiative. KCC has a long history of countryside management programmes that have mainly been organised on the basis of river catchments, and in the case of the Kent Downs AONB, one that covers the full extent of the recharge area of the chalk aquifers on which we mainly depend. We therefore wish to collaborate with SW's Catchment First initiative and the similar initiatives of the other Kent water companies and to encourage a joined-up approach that maximises the environmental, social and economic benefits for the County.	The Council's comments and support for our Catchment First approach are welcomed, as it the Council's willingness to work with us on identifying and delivering catchment solutions, building on its own work in this sector. We are keen to work with Natural England and our catchment partners to identify the wider potential co-benefits of our catchment management schemes which have a primary focus on improving drinking water quality and/or enhancing environmental resilience of water bodies from which we abstract. As part of our commitment to achieving overall net environmental gain from implementation of our WRMP, we will actively work with Natural England and our catchment partners to maximise benefits for biodiversity and society as a whole from our catchment management investment, adopting ecosystem services and Natural Capital assessment approaches in line with the Government's 25 year plan for the environment and Southern Water's wider Integrated Water Cycle Management approach.	No change.
Kent County Council	32	**Developing strategies for the future** *Balancing future supply and demand* SW's long-term record on managing demand and supply is exemplary, having decreased the amount of water the company takes from the environment by about 30% over the last three decades at the same time as accommodating major population growth and economic development across their entire network. However, KCC understands that sustainability reductions are forcing SW and other water companies to maintain this trend in the face of even greater demographic change that is now forecast. This will be very challenging, and it is pushing the companies towards more energy intensive and potentially unsustainable supply options such as desalination. Where water company abstractions are shown to be causing environmental damage, reductions are obviously desirable, but KCC believes there is a growing need for open debate and joined-up thinking about what a sustainable water industry in the SE should look like in a future with an estimated 25% more people and a changing climate. On page 39, we note that SW is planning to develop a long term environmental forecast that "…will consider future scenarios taking into account climate change and its impacts on sustainability abstraction as well as other drivers such as behaviour change", and KCC would like to be kept informed about this work.	The Council's comments clearly identify a number of the challenges that we face in seeking to maintain supplies to customers whilst accommodating growth and environmental constraints on our existing supplies. Changes to our supplies as a result of sustainability reductions are either immediate or very short term, and can be very significant in scale, making them harder to plan and accommodate within our WRMP. Our modelling techniques allow us to explore this variability and identify' several states of the world' that we should plan to accommodate within our WRMP. We are then able to weigh up the risks associated with these, and to identify the 'least regret' set of options for use to implement to ensure we have resilient supplies for customers. We would be very pleased to share more information on our Environmental Forecast approach with the Council, and to engage with it as we take this work forward in more detail into our next WRMP.	No change.
Kent County Council	32	*Leakage* SW explains that their approach, and that of the regulators, is "to set leakage at a level that is optimal for our customers and for society as a whole". KCC supports this approach and takes the view that there is further to go with reducing leakage; it still remains preferable to many alternative supply-side options when the full lifetime environmental costs of those alternatives are considered. It is a 'low regret' measure for addressing the chronic pressures on water resources in the region. We note that SW's customers also rank further leakage reductions relatively highly in their 'willingness to pay' and we think this is a well informed and astute judgement. However, determining whether SW is planning to deliver an "optimal level of leakage" is difficult with the information presented: We believe it would be more helpful to also present the level of leakage in m3 per km of main so that comparisons can also be made with other companies using the Discover Water website and each company's starting position and post-investment position in the league tables can be clearly seen.	The Council's support for the leakage reduction measures set out in the draft WRMP are welcomed. Our draft WRMP set out a combined strategy of further active leakage control in the short term followed by mains replacement programmes in the medium to longer term to ensure that we continue our drive down on leakage by 15% by 2025. We have now increased this commitment in the revised draft WRMP, to seek to achieve a 40% reduction in our current leakage levels by 2040 and a 50% reduction by 2050. We will provide updated information to enable comparisons to be made with other companies through the website.	No change as a result of these comments, however an increased commitment to leakage reduction is included within the revised draft WRMP as set out in Section 5.3 of the Technical Overview and WRMP Annex 2.
Kent County Council	32	*Supply forecasts* We note the supply forecast for SW's Eastern Area that covers parts of North and Northeast Kent and SW's expectation that nitrate pollution of groundwater in the Kent Thanet WRZ will reduce the deployable output there.	The Council's comments on the risk of reduced supplies due to nitrate pollution.	No change.

Kent County Council	32	*Planning for future scenarios* KCC strongly supports the scenario approach used by SW to plan for future scenarios. Considering a wide range of possible future scenarios is a sensible way to deal with the significant uncertainties that arise with planning for a 50 year time horizon. It allows the identification of 'low regret' options that can deliver results under a wide range of scenarios and allows value to be attributed to this in the selection of options, resulting in a more resilient plan.	The Council's strong support for our scenario based approach is welcomed.	No change.
Kent County Council	32	*Options appraisal and strategy development* The process for appraising options appears to be sound and KCC is supportive of way in which the list of feasible options has been derived.	The Council's support for our approach to optioneering is welcomed.	No change.
Kent County Council	32	**The strategy for the Eastern Area** KCC is supportive of the strategy developed for the Eastern Area which covers Kent. We are pleased to see the focus on: • Leakage reduction that runs throughout the 50 year period. • Water use efficiency in the first 5 years to further drive down per capita consumption (although we question whether this will require further ongoing work beyond the first five years if it is to achieve 100 litres per person per day by 2040). • Catchment management in the period up to 2030 at a number of locations including Thanet and the Medway catchment. • The focus on enhancing and upgrading existing assets in the period 2025 to 2030 including the Selling – Fleet pipeline, licenced sources at Sittingbourne and Bewl Water Reservoir where there would be a minor increase to the maximum reservoir water level. • The development of a water reuse scheme on the lower Medway in the late 2020's with the potential for similar schemes at Sandwich and Sittingbourne from 2030 onwards if the need arises.	The Council's support for the Eastern area strategy in our draft WRMP is welcomed. Since the draft WRMP was prepared, we have undertaken additional technical work and updated our modelling to reflect this. This has also taken into account updated information from our neighbouring water companies on their future needs, updated information on other company's plans provided through the WRSE, and our increased commitments to leakage reduction. As a result of this, South East Water has indicated that it no longer needs some of the supplies that we had anticipated providing to it in the future, and so the number and nature of the schemes in our preferred strategy has changed in the revised draft WRMP. The updated preferred strategy for the Eastern Area is set out in section 7.1 in the Technical Overview and in Annex 11 of the revised draft WRMP.	None as a result of this comment, however our preferred plan for the Eastern Area has been updated in the revised draft WRMP, as set out in section 7.1 in the Technical Overview and **Annex 11 of the revised draft WRMP.**
Kent County Council	32	Overall, we believe this strategy provides a high level of resilience by focusing in the early years on low regret options that come with some uncertainty regarding their impacts, in combination with the greater certainty that comes from enhancing existing assets. This is backed up with a number of water reuse schemes that lend themselves to modular development and could be accelerated if the need arises.	The Council's support for the draft WRMP strategy for the Eastern Area is welcomed. Whilst the preferred strategy in the revised draft WRMP has changed (see answer above), the approach of delivering least regret options and modular schemes has not.	No change.
Kent County Council	32	We are also pleased to note that: • The Environmental Assessment has concluded that this strategy has "potentially negligible to minor adverse effects and negligible to minor beneficial effects"; • It meets the required level of drought resilience of 1:200 years; • At the cost of "up to £90million" we believe it offers good value for customers.	The Council's comments are noted and welcomed. The SEA, HRA and WFD assessments have been updated for the revised draft WRMP.	No change.
Kent County Council	32	**Engagement with customers and stakeholders** KCC has been engaged in the development of the dWRMP from an early stage through the Kent Stakeholder Panel, the Regional Stakeholder Panel, our programme of regular liaison meetings with SW and a number of helpful workshop sessions at intervals during the process. This engagement has been informative, timely and well managed by SW. However, the timing of this consultation period was subject to unexpected delays (which we understand were beyond the control of SW) and this has made it difficult to respond as fully as we would wish to the large amount of information presented. This problem is, to some extent, compounded by the differing approach taken by each water company which adds to the complexity and the challenge of responding to several water companies' dWRMPs simultaneously. However, KCC notes the impressive level of engagement that SW has also managed to achieve with their customers as described in Section 2.6 and the preferences expressed by customers clearly demonstrate that they have been very well informed across a wide range of issues. We look forward to working with SW over the next AMP period and building on the close liaison that has been established.	The Council's comments and support are noted and welcomed. We welcome further opportunity to work with the Council in implementing our Plan.	No change.

Appendix 7.7 - Hampshire County Council

Respondent	Reference no.	Response comment	SWS' Consideration of Response	Changes Required to dWRMP
Hampshire County Council - Chris Murray (Head of Strategic Planning)	44	As the consultation plan indicates, the area in which Southern Water operates is officially classed as seriously 'water stressed'. Accordingly, it is welcomed that the plan takes a long term assessment with a time horizon extending to 2070, and plans for a range of possible scenarios.	The Council's support for the approach being adopted in the WRMP is welcomed.	None.
Hampshire County Council	44	Whilst the need for new sustainable water supplies is acknowledged, in the council's view every effort should be taken to reduce demand. In the short term (2020 to 2025) the plan's initial focus is on existing resources, accordingly, this approach is supported. It is noted that it is proposed to increase the number of homes with meters from 88% to 92% to encourage savings and find more leaks. In regard to the former it is of interest to note that metered water use per person per day in Hampshire is 122 litres, compared to 144 litres in unmetered households. Related to this, the ambitious Target 100 to reduce water use to 100 litres per person per day by 2040 through means such fitting water efficiency devices and working with developers to creature sustainable homes is supported.	Our plan contains both supply side and demand side options (building on Southern Water's already very high metering levels, for example). Since the publication of the draft WRMP we have significantly increased our proposals to reduce leakage and reviewed and updated our metering and water efficiency measures. These will contribute towards meeting our future challenges, however, we face some very significant deficits that cannot be met by demand management options alone - they require development of large scale supply side schemes.	None as a result of this comment, but the proposals in the revised draft WRMP have been updated since the publication of the draft WRMP.
Hampshire County Council	44	Leakage, however, is a key area. Of concern for many. In relation to this it was encouraging to note that surveys have indicated that reducing leaks is a high priority that customers are willing to pay more for to address. The plan to reduce the existing leakage rate of 80 litres per property per day by 15 % by 2025 is therefore welcomed as such leakage levels are unsustainable given the future challenges in the region. Failure to do so could undermine attempts to raise awareness among customers of the need to reduce water use and promote water efficiency.	We are committed to meeting Ofwat's leakage reduction target of 15% by the end of the next AMP (2024/25). In addition, and since the publication of the draft WRMP, following recommendations in the recently published National Infrastructure Commission report, we have now increased this commitment in the revised draft WRMP. We will seek to achieve a 40% reduction in our current leakage levels by 2040 and a 50% reduction by 2050.	We have updated our WRMP to include the commitment to 50% reduction in current levels of leakage by 2050. This is contained within the Technical Overview document, and WRMP Annex 2.
Hampshire County Council	44	Finally, between 2025 and 2070 several infrastructure options are identified in Hampshire including new pipelines, a desalination plant as well as an additional reservoir, for, which only broad locations are indicated In such cases early discussions with the local planning authorities is encouraged.	The strategy presented in our dWRMP comprises a mix of options that are considered to provide a secure supply of water, protect the environment and represent best value for customers. The optioneering process takes into account a range of financial, environmental and social considerations in determining both the range of options but also when these options are needed. The longer term forecasts for the draft WRMP identified that we may need to create a reservoir in the Lower Test Valley through the conversion of an existing lake but this would not be needed until after 2045, with other options being preferable in cost and environmental terms in supplying water. We have revised this modelling for the revised Draft WRMP, and with the increased commitment to leakage reduction and other demand management measures, the proposed reservoir is not now identified as being required during the Plan period. However, we recognise that water storage within south Hampshire may have a role to play in protecting supplies to customers during different potential drought events, and that storage could increase the overall resilience of our water resources in this area. As a result, we are committing to investigating all potential storage options within south Hampshire during the initial part of AMP7 (the 2020-2025) period), to enable feasible options to be potentially incorporated within our next WRMP.	None.

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Appendix 7.8 - Worthing & Adur Councils

Respondent	Reference no.	Response comment	SWS' Consideration of Response	Changes Required to dWRMP
Worthing and Adur Councils - Ian Moody (Planning Policy Manager)	40	We appreciate the opportunity to comment and note a number of proposals that are within or have the potential to impact on Adur and Worthing. We look forward to working with Southern Water on these.	The Council's comments and willingness to work with us on our proposals is noted and welcomed.	No change.
Worthing and Adur Councils	40	We support Southern Waters Target 100 scheme. However, at present the result of the Government's Housing Standards Review and national technical standards limits the level of water efficiency measures that we can require through planning policy. We are currently drafting the Worthing Local Plan and hope to work with Southern Water on these matters as the Plan progresses. We are expecting to publish a Reg 18 version of the Plan for consultation in the autumn.	We have set ourselves the target of reducing water use to 100 litres per day by 2040 - a reduction of 25% by 2040. Some of our metered households achieve this level of water use already. To achieve this across the board, we will need Local Plan policy support. We will need to innovate and lead the way in ensuring that we can achieve this target, and look forward to working closely with the Council in this regard.	No change.
Worthing and Adur Councils	40	We note the water supply options for 2025 to 2030 include '9. Building a desalination plant in Shoreham Harbour' (pg 25). The Shoreham Harbour Joint Area Action Plan is due to shortly be submitted to government and work on a heat network is underway. We would wish to highlight that there may be opportunities for the desalination plant to link into the proposed heat network.	The Council's comments are noted, as is the stated potential for any desalination plant to link with a heat network. Our revised draft WRMP retains the proposal for a desalination plant in the Shoreham Harbour Area, and we will wish to explore the potential relationship with the heat network further, building on discussions to date. We will need to undertake additional more detailed feasibility investigations and modelling, environmental assessment, preparation of planning documentation, and detailed design. We will do this in collaboration with local planning authorities.	No change.

Appendix 7.9 - Test Valley Borough Council

Respondent	Reference no.	Response comment	SWS' Consideration of Response	Changes Required to dWRMP
Test Valley Borough Council - Karen Eastley (on behalf of Councilor Adams-King)	46	The local water environment is an important resource within Test Valley, including in relation to its biodiversity, economic and leisure roles. It also is a defining landscape feature of the Borough. The Council is keen to ensure that its quality is retained and where possible enhanced, as well as making sure that water resources are sustainably managed.	The Council's comments are noted and welcomed.	No change.
Test Valley Borough Council	46	The Council supports Southern Water's proposals to continue to promote the efficient use of water resources and further reduction in leakage. It would be important to ensure that these are done hand in hand, and that residents are aware that they are contributing to reductions in the need for water resources alongside other proposals to reduce wastage	The Council's support for the Target 100 and leakage reduction measures set out in the draft WRMP are welcomed. Our draft WRMP set out a combined strategy of further active leakage control in the short term followed by mains replacement programmes in the medium to longer term to ensure that we continue our drive down on leakage by 15% by 2025. We have now increased this commitment in the revised draft WRMP, to seek to achieve a 40% reduction in our current leakage levels by 2040 and a 50% reduction by 2050.	No change as a result of these comments, however an increased commitment to leakage reduction is included within the revised draft WRMP as set out in Section 5.3 of the Technical Overview and in WRMP Annex 2.
Test Valley Borough Council	46	Through the planning system, the Council is already securing the higher levels of water efficiency for new residential developments through Building Regulations. We would welcome working with Southern Water as part of the review of the local plan in terms of ways we can continue to support more water efficient development and ensure appropriate infrastructure can be in place to support such development.	We have set ourselves the target of reducing water use to 100 litres per day by 2040 - a reduction of 25% by 2040. Some of our metered households achieve this level of water use already. To achieve this across the board, we will need Building Regulations and Local Plan policy support. We will need to innovate and lead the way in ensuring that we can achieve this target. We welcome the opportunity to work collaboratively on this.	No change.
Test Valley Borough Council	46	As noted above, the Council considers it to be vital that abstraction levels from water resources within the Borough are sustainable in the long term. This should account for the needs of the environment and the demands for a variety of users. In this context, we are aware of the proceedings of the recent abstraction license inquiry, which will have implications for the amount of water available for abstraction in this area. In this context, whilst recognising the lead in times for the provision of new water supply infrastructure to offset anticipated license variations, there is disappointment that residents may face restrictions on water use or that temporarily higher levels of abstraction may be necessary in the interim. Therefore, it is requested that best endeavours are made to progress appropriate water supply schemes as quickly as possibly and seek to ensure that customers' bills remain affordable.	Following the Inquiry, a Section 20 Agreement is now in place between the Environment Agency and Southern Water. The outcome of the Inquiry means that some sustainability reductions will be brought in with immediate effect. This means that we will have insufficient supplies of water available in our Western area to supply our customers in all but normal environmental conditions. As soon as conditions become drier than normal, we will in the short term, have to impose temporary use bans and apply for Drought Orders to allow us to continue to abstract water below the conditions imposed in the new licences. Where Drought Orders are applied for, we will implement river restoration and habitat mitigation measures in potentially affected rivers in combination with Drought Orders. Our supplies to customers will remain at risk during the AMP7 period and into AMP8 until sufficient supplies are delivered. The extent of the deficit is such that we need to deliver large new resources and these will take time to deliver. We will seek to deliver these in a timely manner and in consultation with key stakeholders.	Revised draft WRMP has been updated to reflect the outcomes of the Inquiry, and to set out the preferred strategy for the Western Area, as set out in Section 7.5 of the Technical Overview, and in WRMP Annex 9.
Test Valley Borough Council	46	The Council supports the proposals to increase the connectivity of the Water Resource Zones, such as through the proposed bi-directional link between Andover and Southampton East. It is requested that further opportunities to enhance the resilience of network are pursued where feasible. We look forward to continuing to work with Southern Water in the future.	Southern Water will continue to actively work with neighbouring water companies through the WRSE group to further enhance the benefits of joint working on all aspects of water resources management and strategic planning for the South East region, including promotion of water efficiency, the development of joint schemes or trading options. Our plan demonstrates the benefits of the WRSE group with several water trading and/or joint water resource scheme developments included in our strategies for each of our operating areas. We continue to discuss and explore these options with neighbouring companies, and the preferred strategy in the revised draft WRMP includes transfers from the West into Hampshire Southampton West WRZ, and from the East into the Hampshire Southampton East WRZ, as well as the Hampshire grid interzonal transfer system. We welcome the opportunity to work with Test Valley Borough Council in the future.	No change.

Test Valley Borough Council	46	In relation to the consultation questions, the Council also provides the below comments: Question 1 – the Council agrees that it is important to investigate the implications of a range of possible 'futures' to understand how much water may be needed. Question 2 – it is agreed that it is a good idea to plan for likely future changes in abstraction licenses and this needs to be done in a timely way. Question 3 – the Council would support early investigation of new options for water supply in case they are needed in the future. A balance would need to be struck in terms of ensuring that such investigations are progressed early enough but without undue increases in customer prices for work that may not be necessary. Question 8 – the Council supports Target 100 as an initiative to reduce water use. As noted above, this should be promoted alongside proposed leakage reduction. Question 10 – the joint working between water companies to facilitate sustainable use of water resources, including in relation to trading water with neighbouring water companies, is supported. Question 11 - the Council supports the Catchment First initiative. We have made similar comments directly to Southern Water in relation to its emerging Business Plan, including reference the proposal for the River Test to be an initial area of focus.	Support and comments noted. Changes to our supplies as a result of sustainability reductions are either immediate or very short term, and can be very significant in scale, making them harder to plan and accommodate within our WRMP. Our modelling techniques allow us to explore this variability and identify' several states of the world' that we should plan to accommodate within our WRMP. We are then able to weigh up the risks associated with these, and to identify the 'least regret' set of options for use to implement to ensure we have resilient supplies for customers.	No change.

Appendix 7.10 - New Forest National Park Authority

Respondent	Reference no.	Response comment	SWS' Consideration of Response	Changes Required to dWRMP
New Forest National Park Authority - Paul Walton (Head of Environment and Rural Economy)	71	The NFNPA welcomes Southern Water's approach of a long-term plan to ensure reliable water supplies over the coming decades, whilst recognising that more needs to be done to tackle water leaks and to incentivise customers to reduce their water use. We also welcome Southern Water's commitment to become a delivery partner in the next iteration of the New Forest Partnership Plan 2020-2025.	The NFNPA's support is welcomed and we look forward to continuing to working with it in the future.	None.
New Forest National Park Authority	71	Target 100 (WRMP p12) The NFNPA has recently submitted its Local Plan to the Secretary of State for independent examination. In recognition of the pressures on water supply within the National Park the Plan includes a policy on safeguarding and improving water resources, including the commitment that "all new residential development within the Southern Water company supply area of the National Park should be designed to achieve a required level of 110 litres maximum daily allowable usage per person".	We have set ourselves the target of reducing water use to 100 litres per day by 2040 - a reduction of 25% by 2040. Some of our metered households achieve this level of water use already. To achieve this across the board, we will need Building Regulations and Local Plan policy support. We will need to innovate and lead the way in ensuring that we can achieve this target. We welcome the opportunity to work collaboratively on this, and support the NFNPA's emerging policy on water use.	None.
New Forest National Park Authority	71	Introduce catchment schemes and take action to remove nitrates and pesticides (WRMP p. 22; paragraph 5) Improving the condition of river catchments is an important objective in the current New Forest Partnership Plan 2015-2020 and specific actions are defined under LH7: 'Promote an integrated approach to river catchment (…)' and LH8: 'Improve the water quality and ecological value of river catchments (…)'. Both actions are led by the New Forest Catchment Partnership with support from the NFNPA, Freshwater Habitats Trust and the Hampshire and Isle of Wight Wildlife Trust. Southern Water is already part of that group. The Partnership has carried out catchment based solutions to nutrient problems and water efficiency related to agri-business over many years and has established strong links to the local landowner/manager community. It would therefore be ideally placed to help implement catchment based solutions in line with the proposed schemes and actions in the WRMP and the partnership would welcome continued support from Southern Water to do this, similar to its support for some of Natural England's projects in the Itchen Valley.	Southern Water is keen to work with Natural England and our catchment partners to identify the wider potential co-benefits of our catchment management schemes which have a primary focus on improving drinking water quality and/or enhancing environmental resilience of water bodies from which we abstract. As part of our commitment to achieving overall net environmental gain from implementation of our WRMP, we will actively work with Natural England and our catchment partners to maximise benefits for biodiversity and society as a whole from our catchment management investment, adopting ecosystem services and Natural Capital assessment approaches in line with the Government's 25 year plan for the environment and Southern Water's wider Integrated Water Cycle Management approach.	None.
New Forest National Park Authority	71	Water supply options (WRMP p20 – 29) We acknowledge the pressures facing Southern Water in maintaining reliable water supplies to Hampshire and the Isle of Wight. The WRMP identifies different water supply options that may be required from 2025, all of which will require investment in large infrastructure. Options such as new pipelines, desalination plant and storage reservoir are likely to have significant environmental impact as most areas of the New Forest and surrounding landscape are protected by national and international legislation. Southern Water is a key member of the Green Halo Partnership which is working to understand how natural capital can help tackle the big environmental, economic and social challenges faced by our communities. We look to Southern Water to fully examine a "natural capital approach" to determining future water supplies. The Green Halo Partnership provides a platform from which to influence businesses and landowners regarding future water demand and supply management and we urge Southern Water to consider how they can support the Partnership to help address the challenges identified in the WRMP.	Since publication of the draft WRMP, and following these and other comments, further work has been undertaken to review pipeline routes to avoid designated sites and sensitive habitats wherever possible, and justification for any sections that cannot be rerouted have been provided, together with proposed mitigation measures to minimise any adverse effects. This has been discussed with Natural England. Southern Water has included in its revised draft WRMP its commitment to a number of design principles for its supply enhancement options as set out in Annex 6 of the revised draft WRMP (and in the SEA, HRA and WFD Reports) that will inform the detailed design of schemes which includes seeking an overall net biodiversity gain in developing each scheme as far as possible, working in close dialogue with Natural England, Environment Agency and other stakeholders. Southern Water will be producing a policy document to guide its future planning, which will incorporate natural capital accounting and we will work closely with our partners as we develop our policies and approaches, including through the Green Halo Partnership.	We have amended a number of the proposed pipeline routes, including in relation to the New Forest National Park and designated sites, and these are reflected in the revised draft WRMP, including the SEA and HRA. We have committed to design principles to protect the environment in line with discussions with Natural England, and these are set out in Annex 6 plus SEA Report.
New Forest National Park Authority	71	Resource Hubs and educational activities (WRMP p. 12) We support the idea of creating stronger links with local communities and providing educational opportunities at water treatment works. When setting up such community centres it is important to take account of existing community centres and educational networks nearby and to work with them to add to the local offer. The NPA employs educational officers who work with schools and the public to teach them about the special qualities of the New Forest. With appropriate funding we would be ideally placed to support Southern Water with this proposal in the New Forest and surrounding area due to our existing links with the local communities and educational delivery mechanisms. There are several actions in the New Forest Partnership Plan related to this idea, e.g. in chapters 'Planning for climate change', 'Understanding and enjoying the special qualities of the National Park' and 'Supporting local communities'. We recently worked together to help raise awareness of waste pipe blockages amongst New Forest communities and would welcome the opportunity to continue this work if resources allow.	We have been pleased to be able to work with the Authority on initiatives to date and would be happy to explore further opportunities for joint working.	None.

New Forest National Park Authority	71	Producing energy from renewable sources (WRMP p. 19) Southern Water's commitment to "Look to a greener future" is supported and the fact that 17% of the energy currently produced is from renewable sources is considered as a step in the right direction. We do however think there should be a measurable future target in the WRMP specifying Southern Water's commitment to produce a significantly higher percentage from renewables, similar to 'Target 100'.	Southern Water is targeting its use of renewable energy and has included proposals within its emerging Business Plan on this area. Southern Water has also published it carbon policy on its website.	None.
New Forest National Park Authority	71	Reducing plastics in the environment (not yet mentioned in the WRMP but highlighted during the stakeholder panel meeting) We welcome Southern Water's recognition that it plays an important role in minimising plastic waste and strongly support its three-stage approach of developing a plastics policy, sponsoring academic studies and influencing behaviours. None of these stages feature in the WRMP yet and we look forward to seeing a measurable commitment in the next iteration of the draft plan.	Southern Water is committed to tackling plastics and is developing measures to address this through its emerging Business Plan. This is a wider issue than the WRMP, and best addressed through the Business Plan process. It has published details of its plastics policy on its website.	None.

Appendix 7.11 - Dover District Council

Respondent	Reference no.	Response comment	SWS' Consideration of Response	Changes Required to dWRMP
Dover District Council -Emma-Jane Allen, Principal Infrastructure and Delivery Officer	60	**1 Do you think we should plan for a wide range of possible futures and how much water we may need to supply in each?** Yes – The District Council is very keen to work with Southern Water on this issue and to work closely with Southern Water on the Local Plan Review.	We welcome the comments and the opportunity to work with Dover District Council on the Local Plan Review.	None.
Dover District Council	60	**2 Do you think it's a good idea to plan for future changes to our abstraction licences which could mean we need to invest in new sources** Yes	The Council's support for our approach is welcomed.	None.
Dover District Council	60	**3 Do you agree with our plan to start investigating new options for water recycling, desalination and reservoirs now, in case they are needed in the future?** Yes - particularly as there is long lead in time for these major projects and they are likely to be pursued as National Significant Infrastructure Project (NSIP). If Southern Water is considering any of these options in DDC area it would be helpful if Southern Water could enter into a planning performance agreement with DDC so that we can allocate the necessary resources that will be required to support a NSIP.	We will need to undertake additional more detailed feasibility investigations and modelling, environmental assessment, preparation of planning documentation, and detailed design for the options we intend to implement. This will involve engagement with Local Planning Authorities. Based on current NSIP thresholds it is unlikely that any of our resource schemes would fall within the regime, however Defra is consulting on the thresholds and on a Water NPS, so this may be a possibility in the future. We will liaise closely with DDC over any options within its area.	None.
Dover District Council	60	**4 This plan includes using water restrictions (hosepipe bans) during a drought once every 10 years on average. Do you support this?** Yes	The Council's support is welcomed.	None.
Dover District Council	60	**5 Do you think water recycling (from wastewater) has a role to play in securing water supplies for the future?** Yes – this option needs to be actively looked at as part of the design and development of new development and be linked back to proposed changes to the Building Regulations.	The question related more to larger scale water recycling, using treated effluent from our wastewater treatment works. However, the potential for the use of recycled water in the domestic setting, e.g. for toilet flushing, will be investigated as part of our Target 100 initiative.	None.
Dover District Council	60	**6 Do you think desalination has a role to play in securing water supplies for the future?** Not sure (the supporting documentation does not provide much information on this option, so perhaps further research is required, as implied by question 3 above)	There is additional information on our desalination proposals within the WRMP Technical Overview and supporting annexes. There are signposts to these in our Non-Technical Summary. Our plan contains both supply side and demand side options (building on our already very high metering levels, for example). However, the company faces some significant deficits that require us to look towards a mix of options in order to ensure resilience within our water supply network. Our modelling undertaken on the draft WRMP indicated that a number of desalination plants will be required. Our updated modelling for the revised draft WRMP is now indicating that it is unlikely we will need a desalination plant within our Eastern Area during the plan period (to 2070), based on our assessment of likely future environmental conditions and available water supplies. We will keep this under review and update our forecasts in our next WRMP.	None.
Dover District Council	60	**7 After we've introduced options to save water, such as reducing leaks and Target 100, which would you prefer us to develop first – water recycling or desalination?** Not sure as there isn't any information on this presented in the consultation documents.	There is additional information on our desalination and water re-use proposals within the WRMP Technical Overview and supporting annexes. There are signposts to these in our Non-Technical Summary.	None.
Dover District Council	60	**8 Do you support our Target 100 to reduce personal water use to 100 litres per person per day by 2040** Yes – we understand that a number of other local planning authorities have identified Target 100 in their Local Plans so this is something that we need to consider as part of the Local Plan review.	We have set ourselves the target of reducing water use to 100 litres per day by 2040 - a reduction of 25% by 2040. Some of our metered households achieve this level of water use already. To achieve this across the board, we will need Building Regulations and Local Plan policy support. We will need to innovate and lead the way in ensuring that we can achieve this target. We welcome the opportunity to work collaboratively on this.	None.
Dover District Council	60	**9 Should we do more to reduce leaks, even if it pushes your bills higher?** Ensuring that Southern Water investigates and uses a wide range of measures to reduce leaks has got to be major priority. However, this needs to closely linked to investment in replacing old infrastructure which in turn can reduce the number of pipes that leak. If it is Southern Water's intention to increase consumer bills to tackle this issue it will be important that this needs to be a transparent with clear measurable performance related targets as otherwise there will be complaints about higher bills.	Managing leakage is an important part of our water resources strategy. A low level of leakage is desirable, both for the environment, and because it defers the need to invest in new resources which would otherwise be required to meet increases in demand over time. However, as noted, it is not necessary economic to reduce leakage to very low levels, because to do so could involve very large additional costs for relatively small savings of water. Our approach, and that of our regulators, is to set leakage at a level that is optimal for our customers and society as a whole. Our draft WRMP set out a combined strategy of further active leakage control in the short term followed by mains replacement programmes in the medium to longer term to ensure that we continue our drive down on leakage by 15% by 2025. We have now increased this commitment in the revised draft WRMP, to seek to achieve a 40% reduction in our current leakage levels by 2040 and a 50% reduction by 2050. This will require a significant investment to achieve, and we are very aware of the potential impacts on customer bills. We are exploring this with our financial regulator Ofwat, and are committed to ensuring that vulnerable groups and customers are protected.	No change as a result of these comments, however the preferred strategy for the Eastern Area has been updated to reflect additional investigations and modelling. An increased commitment to leakage reduction is included within the revised draft WRMP as set out in Section 5.3 of the Technical Overview and WRMP Annex 2.
Dover District Council	60	**10 Do you think it's a good idea to trade water with neighbouring water companies in a 'regional grid' as part of the Water Resources in the South East Group?** Yes – especially as our District has two water authorities.	The Council's comments and support are noted and welcomed. We work closely with our neighbouring water companies in preparing our plans for the future, and in our ongoing operation of water resources in the region.	None.
Dover District Council	60	**11 Do you support our Catchment First approach, to work with landowners, farmers and river trusts to improve the health of rivers and groundwater sources before investing in new solutions such as water recycling or desalination?** Yes	The Council's support for our Catchment First approach is welcomed.	None.

Dover District Council	60	**14 Do you think our approach to provide water in Kent is the right one?** Yes ; it appears to strike a sensible balance between a range of different possible measures.	The Council's support for the Eastern area strategy in our draft WRMP is welcomed. Since the draft WRMP was prepared, we have undertaken additional technical work and updated our modelling to reflect this. This has also taken into account updated information from our neighbouring water companies on their future needs. As a result of this, South East Water has indicated that it no longer needs some of the supplies that we had anticipated providing to it in the future, and so the number and nature of the schemes in our preferred strategy has changed in the revised draft WRMP. The updated preferred strategy for the Eastern Area is set out in Section 7.3 of the Technical	None as a result of this comment, however our preferred plan for the Eastern Area has been updated in the revised draft WRMP, as set out in Section 7.3 of the Technical Overview and Annex 11 of the revised draft WRMP.
Dover District Council	60	**15 How important is it to you that we use renewable energy (by buying or developing it) to power our water network?** Not sure how we would answer this as we don't seem to have any planning policies on this topic.	Noted.	None.
Dover District Council	60	**16 How would you like to get involved in developing our solutions to provide water, for example community schemes to save water, developing water recycling and desalination options or in any other way?** Any schemes that involve development within the Dover District are of interest to the Council, and if possible should be referenced and considered within the Local Plan. The Council is already involved in catchment improvement schemes with Affinity Water and would welcome the opportunity to work in partnership with Southern Water. Wherever possible Parks & Open Spaces will use grey water for watering planting schemes rather than using mains water or water abstracted from local rivers and streams. With significant landscaping taking pace at both Kearsney parks and the new leisure centre in the coming year the use of grey water will be a great demonstration of the authorities commitment to saving this valuable natural resource.	We are very keen to work with the Council on our initiatives for water efficiency and leakage reduction, and with our wider partners through our Catchment First approach. We recognise the strong leadership and awareness raising role that the Council does and can play in promoting water efficiency and reducing customer demand. We look forward to working together on these approaches.	None.
Dover District Council	60	**17 Did you find the information you needed in our consultation? What else would you like to know**? In the main yes, but it appears that further investigation is required into desalination options vs other approaches (e.g. water recycling) before the benefits and disadvantages of each can be explained clearly.	There is additional information on our desalination proposals within the WRMP Technical Overview and supporting annexes. There are signposts to these n our Non-Technical Summary. Our plan contains both supply side and demand side options (building on our already very high metering levels, for example). However, the company faces some significant deficits that require us to look towards a mix of options in order to ensure resilience within our water supply network. Once a plan is published, we will need to undertake additional more detailed feasibility investigations and modelling, environmental assessment, preparation of planning documentation, and detailed design.	None.

Appendix 7.12 - Canterbury City Council

Respondent	Reference no.	Response comment	SWS' Consideration of Response	Changes Required to dWRMP
Canterbury City Council - Andrew Thompson	64	Long term planning for the water supply needs of current and future residents of Canterbury District is to be welcomed and we recognise the need for significant infrastructure investment over this period to support planned growth. Canterbury District Local Plan (2017) Policy CC13 Water Resources sets out that the Council will work with water companies to ensure the need for new water services infrastructure is understood and planned for. Although the Local Plan does not identify land for the development of a reservoir at Broad Oak, paragraph 7.69 sets out the Council's expectations in the event that a planning application is submitted for such a scheme. It remains the case that the Council would wish to agree the scope and timetable of environmental assessment and the assessment of impact on communities, and that any application should be supported by robust justification of the need, location and supply options. Similarly, proposals for significant new infrastructure at Reculver, and any development within the District to facilitate the Weatherlees scheme, would require detailed assessment and adequate justification. At this stage there is little detailed information available in respect of these future schemes and we would welcome the opportunity to engage further to better understand the selection process and detail of the preferred proposals. In accordance with Policy CC13 of the Local Plan, the Council will continue to work collaboratively with water suppliers to ensure that necessary, appropriate infrastructure can be planned for and provided in	The Council's comments, and planning policy support for new water resources infrastructure is noted and welcomed. Whilst the Broad Oak reservoir is a South East Water scheme, we will look to work closely with the Council over any proposals that we look to bring forward within the City Council's area. We will need to undertake additional more detailed feasibility investigations and modelling, environmental assessment, preparation of planning documentation, and detailed design. This will involve engagement with Local Planning Authorities. We welcome collaborative working that will ensure that appropriate infrastructure can be planned and delivered in a timely manner to support growth.	None.

Appendix 7.13 - New Forest District Council

Respondent	Respondent no.	Response comment	SWS' Consideration of Response	Changes Required to dWRMP
New Forest District Council	67	**Do you think we should plan for a wide range of possible 'futures' and how much water we may need to supply in each?** It is appropriate for Southern Water to responsibly plan for a range of possible futures and how much water we need to supply in each.	The support for the approach being taken by Southern Water to long term planning is welcomed.	None
New Forest District Council	67	**Do you think it's a good idea to plan for future changes to our abstraction licences which could mean we need to invest in new sources?** It is appropriate for Southern Water to responsibly plan for future changes to abstraction licences to ensure that residents in the district have sufficient water supply.	The support for the approach being taken by Southern Water to taking account of licence changes in securing supplies for customers is welcomed.	None
New Forest District Council	67	**Do you agree with our plan to start investigating new options for water recycling, desalination and reservoirs now, in case they are needed in the future?** New options for water recycling and reservoirs should be prioritised with desalination investigated as a last resort. We note from your customer survey feedback conducted during the pre-draft consultation that desalination was least favoured by customers, yet they recognised that it may be needed to meet a large scale deficit.	Our plan contains both supply side and demand side options (building on our already very high metering levels, for example). However, we face some significant deficits that require us to look towards a mix of options. Our modelling undertaken on the draft WRMP indicates that under all potential futures we need to investigate in AMP 7, and then build in AMP8 a large desalination plant or other high tech solution (e.g. water re-use). Our re-modelling for the revised draft WRMP confirms that a high tech solution will be required, in addition to increased metering, improved sharing of water both with neighbouring companies and within our own supply areas, and other solutions. Our plans now include detailed investigations of solutions, to ensure they can be consented and delivered rapidly to meet the challenges proposed by licence changes in Hampshire. We have identified in our revised draft WRMP both our preferred solution, but also alternatives that will be progressed should our preferred plan not be deliverable. We will investigate and promote our preferred and alternative schemes in parallel.	None as a result of this comment, however our preferred plan for the Hampshire area has been updated in the revised draft WRMP, in response to the Hampshire licence inquiry and other factors, including updated modelling or leakage and other priorities. See Annex 9 of the revised draft WRMP.
New Forest District Council	67	**Do you support our Target 100 to reduce personal water use to 100 litres per day by 2040?** The Council support this approach in principle, but in line with government approach following the Housing Standards Review it should be implemented through the Building Regulations over time, and/or identified as an optional higher water efficiency standard to be applied through local plans where there is local evidence to justify applying it.	We have set ourselves the target of reducing water use to 100 litres per day by 2040 - a reduction of 25% by 2040. Some of our metered households achieve this level of water use already. To achieve this across the board, we will need Building Regulations and Local Plan policy support, and we look to work closely with the Council and other partners in innovating and leading the way in ensuring that we can achieve this target.	None
New Forest District Council	67	**Do you think it's a good idea to trade water with neighbouring water companies in a 'regional grid' as part of the Water Resources in the South East group?** There are in principle benefits to a water grid approach, provided that habitat considerations are adequately addressed. Abstraction from one catchment to serve another should only be from a point on the donor watercourse, and under flow level controls if necessary, where that level of abstraction can be accommodated without adverse environmental impact. The impact of routing pipelines through sensitive locations would need careful consideration. The Council is aware of water supply and water quality constraints affecting the Wiltshire/Hampshire River Avon and western parts of New Forest District, and the use of River Avon water to help address these matters in a manner that is sustainable in the long term should be the first priority.	Environmental impacts of schemes to share water with neighbouring companies is considered within the SEA and HRA that supports our plan. This includes impacts from abstraction of water and the routeing of pipelines. Further work has been undertaken to review pipeline routes to avoid designated sites and sensitive habitats wherever possible, and justification for any sections that cannot be rerouted have been provided in the documents supporting our revised draft WRMP, together with proposed mitigation measures to minimise any adverse effects. A revised scheme has now been included in the revised draft WRMP, which is a joint scheme proposed by South West Water and Wessex Water as part of the West Country Water Resources Group work. The revised scheme involves a different source of water and a revised pipeline route that avoids the New Forest National Park and New Forest SAC, SPA and Ramsar sites. We have revised our environmental assessments in the SEA and HRA (and WFD) Reports to reflect the revised scheme. This indicates there would be no adverse effects on designated sites but that further revisions to the precise route of the pipeline may be required to avoid adverse effects on a number of Priority Habitats in a small number of locations along the pipeline route, or otherwise agree detailed mitigation and compensatory measures with Natural England during the detailed design phase. This will need to be informed by detailed environmental surveys along the pipeline route and ongoing dialogue with Natural England (and the Environment Agency where applicable). In line with other pipeline route options that have the potential to affect sensitive environments, Southern Water has included in its revised draft WRMP its commitment to a number of design principles as set out in Annex 6 of the revised draft WRMP (and in the SEA, HRA and WFD Reports) that will inform the detailed design of the scheme (see Options Appraisal Annex 6).	The details of the schemes have been amended to reflect the new approach put forward by South West Water and Wessex Water, and the relevant parts of the SEA, HRA and WFD all updated as a result. See Annexes 14, 15 and 16 of the revised draft WRMP.
New Forest District Council	67	**Do you support our Catchment First approach, to work with landowners, farmers and river trusts to improve the health of rivers and groundwater sources, before investing in new solutions such as water recycling or desalination?** The Council supports this approach; it is essential for long term sustainability and would help to address the objectives of the Water Framework Directive to improve the ecological status of water bodies.	The Council's support for our Catchment First Approach is welcomed.	None.
New Forest District Council	67	**Do you think our approach to provide water in Hampshire and the Isle of Wight is the right one? Do you think water recycling (from wastewater) has a role to play in securing water supplies for the future? Do you think desalination has a role to play in securing water supplies for the future? After we've introduced options to save water, such as reducing leaks and Target 100, which would you prefer us to develop first – water recycling or desalination?** This question is addressed by commenting on specific proposals. There are several schemes or options proposed within or adjacent to New Forest District, as set out below with a recommended response to the options.	Please see comments below.	None
New Forest District Council	67	**Water Recycling Plant in Marchwood** Proposal for the 2020-2025 period to 'recycle cleaned water from our wastewater treatment works in Marchwood to supply an oil refinery'. The Council support this proposal whilst noting that development is proposed in Marchwood, so any odour or other amenity implications will need to be appropriately managed.	The Council's support for the principle of the scheme is welcomed. We will undertake additional more detailed feasibility investigations and modelling, environmental assessment, preparation of planning documentation, and detailed design. This will include identifying any mitigation measures that may be necessary to address odour and amenity impacts, if they are predicted to arise during construction or operation of the plant.	None.

New Forest District Council	67	**Desalination plant in Fawley and associated pipeline** Proposal for the 2020-2025 period to 'build a desalination plant on the Solent to clean seawater for drinking water'. The Technical document (page 71) identifies the location as Fawley. A number of pipelines could be needed depending on the final strategy and size of strategic supply options. That a location in Fawley is only considered as a last resort as other locations closer to Southampton and on the Isle of Wight itself would seem to be more appropriate to consider.	The preferred location for a desalination plant in the draft WRMP was identified as being within the site of the now disused Fawley Power Station, which is identified for a mixed use redevelopment. The location was chosen because of the potential to utilise (subject to landowner agreements) the Fawley Power station's existing discharge structure, and the site's location within close proximity of both Southampton Water and the Western Solent. As part of the preparation of the draft WRMP alternative desalination plant locations and scales were investigated, including at Marchwood, Sholing, and on the Isle of Wight. The options at Fawley were selected as being the most appropriate for inclusion within the draft WRMP. In our revised draft WRMP we have revised our Fawley desalination scheme, taking into account consultation responses including from Natural England and Fawley Waterside, and reflecting ongoing engineering investigations and assessments of the potential scheme. The revised draft WRMP now proposes a location for the desalination plant that is not dependent on land forming part of the former power station, reflecting concerns raised by Fawley Waterside, but still with the potential (subject to agreements) to utilise the discharge infrastructure. The indicated location is south of Ashlett Creek, and comprises land that lies within the New Forest National Park. The statutory tests relating to need and alternatives for such a development in this location are acknowledged, and we will continue to develop the case for this location in tandem with exploring options with nearby landowners. The transfer pipelines have also been amended to reduce the potential impact on designated sites, in response to Natural England comments. Wherever possible, the pipeline has been re-routed to avoid designated sites and sensitive habitats, and justification for any sections that cannot be rerouted has been provided, along with mitigation measures to minimise adverse effects. These have been discussed with Natural England. We have also included in our revised draft WRMP its commitment to a number of design principles as set out in Annex 6 of the revised draft WRMP (and in the SEA, HRA and WFD Reports) that will inform the detailed design of the scheme (as set out above). We have updated the HRA and/or SEA assessments accordingly.	In response to comments received, we have amended the location of the proposed desalination plant, and the proposed transfer pipeline routings. The relevant sections of the Technical Overview, and detailed annexes (Options Appraisal - Annex 6, SEA - Annex 13, HRA - Annex 14, WFD - Annex 15) have all been updated.
New Forest District Council	67	**Application of Drought Order for River Test** Application of drought orders on the River Test and Itchen are proposed to be able to breach abstraction limits if necessary (supply period 2025-2030). This is subject to a current public inquiry and Southern Water, the Environment Agency and Natural England appear to have reached an agreement in principle that would agree abstraction reductions but could allow additional abstraction to be considered under a drought order, although a decision is still to be made by ministers. The Council support this approach as a last resort where in the public interest to maintain essential drinking water supply, but a drought order should not be relied upon in preference to the provision of more secure and less environmentally impactful sources of water supply where there is scope to provide them at reasonable cost to consumers.	Following the Inquiry, a Section 20 Operating Agreement is now in place between the Environment Agency and Southern Water. The outcome of the Inquiry means that some sustainability reductions will be brought in with immediate effect once approved by the Secretary of State. This means that we will have insufficient supplies of water available in our Western area to supply our customers in all but normal environmental conditions, until alternative long term secure supplies are provided. As soon as conditions become drier than normal, we will in the short term, have to impose temporary use bans and apply for Drought Orders to allow us to continue to abstract water below the conditions imposed in the new licences. Where Drought Orders are applied for, we will implement river restoration and habitat mitigation measures in potentially affected rivers in combination with Drought Orders. Our supplies to customers will remain at risk during the AMP7 period and into AMP8 until sufficient supplies are delivered. The extent of the deficit is such that we need to deliver large new resources and these will take time to deliver. We will seek to deliver these in a timely manner and in consultation with key stakeholders, such as New Forest District Council.	The revised draft WRMP has been updated to reflect the outcomes of the Inquiry, the s20 agreement, and to set out the long term water resources solution for the Western Area.
New Forest District Council	67	**Provide a new supply of water from River Avon through the New Forest** For the 2030-2045 period Southern Water propose to import water from the River Avon (in the Bournemouth area) by extending the regional water grid. Further discussions are needed to confirm this is sustainable in the long term and does not conflict with environmental obligations (for example this supply may be needed to reduce abstraction in the upper Avon catchment and thus not available for export). There is an existing pipeline across the New Forest serving the Oil Refinery, although a new pipeline may be needed. The Council would only support this approach as a last resort. There would be significant ecological implications as it appears that a new pipeline would have to be routed through the National Park and European designated sites. We are also aware of water supply and water quality constraints affecting the River Avon and western parts of New Forest District, and the use of River Avon water to help address these matters in a manner that is sustainable in the long term should be the first priority.	Environmental impacts of schemes to share water with neighbouring companies is considered within the SEA and HRA that supports our plan. This includes impacts from abstraction of water and the routeing of pipelines. Further work has been undertaken to review pipeline routes to avoid designated sites and sensitive habitats wherever possible, and justification for any sections that cannot be rerouted have been provided in the documents supporting our revised draft WRMP, together with proposed mitigation measures to minimise any adverse effects. A revised scheme has now been included in the revised draft WRMP, which is a joint scheme proposed by South West Water and Wessex Water as part of the West Country Water Resources Group work. The revised scheme involves a different source of water and a revised pipeline route that avoids the New Forest National Park and New Forest SAC, SPA and Ramsar sites. We have revised our environmental assessments in the SEA and HRA (and WFD) Reports to reflect the revised scheme. This indicates there would be no adverse effects on designated sites but that further revisions to the precise route of the pipeline may be required to avoid adverse effects on a number of Priority Habitats in a small number of locations along the pipeline route, or otherwise agree detailed mitigation and compensatory measures with Natural England during the detailed design phase. This will need to be informed by detailed environmental surveys along the pipeline route and ongoing dialogue with Natural England (and the Environment Agency where applicable). In line with other pipeline route options that have the potential to affect sensitive environments, Southern Water has included in its revised draft WRMP its commitment to a number of design principles as set out in Annex 6 of the revised draft WRMP (and in the SEA, HRA and WFD Reports) that will inform the detailed design of the scheme (see Options Appraisal Annex 6). We have investigated the reliability of the water that could be supplied through this scheme with the providing water companies and they have provided assurances that water would be available in environmental conditions up to a 1:200 year event. This also takes account of known potential licence changes or environmental constraints on sources within the providing water companies.	The details of the schemes have been amended to reflect the new approach put forward by South West Water and Wessex Water. The relevant sections of the Technical Overview, and detailed annexes (Options Appraisal - Annex 6, SEA - Annex 13, HRA - Annex 14, WFD - Annex 15) have all been updated.
New Forest District Council	67	**Creation of a new storage reservoir at a lake near the River Test in the Southampton East Zone** For the 2030-2045 period Southern Water options include using a lake as a small reservoir. This is identified as a contingency option that could be needed post 2060 under higher growth, higher climate change impact scenario. This proposal be given more serious consideration as a core water supply option, and in the medium term rather than longer term. Capture and storage of excess flows for use in times of lower flow has obvious advantages in terms of overall resilience of supply, as groundwater levels and rivers are usually low at the same time. In principle it would appear likely to be much less impactful that relying on abstraction especially in drought periods (although potential local impacts of the particulars of any scheme would need to be assessed against the wider potential benefits). With appropriate management, such as that applied at Testwood Lake, a reservoir could have benefits for wildlife or for leisure purposes.	The strategy presented in our dWRMP comprises a mix of options that are considered to provide a secure supply of water, protect the environment and represent best value for customers. The optioneering process takes into account a range of financial, environmental and social considerations in determining both the range of options but also when these options are needed. The longer term forecasts for the draft WRMP identified that we may need to create a reservoir in the Lower Test Valley through the conversion of an existing lake but this would not be needed until after 2045, with other options being preferable in cost and environmental terms in supplying water. We have revised this modelling for the revised Draft WRMP, and with the increased commitment to leakage reduction and other demand management measures, the proposed reservoir is not now identified as being required during the Plan period. However, we recognise that water storage within south Hampshire may have a role to play in protecting supplies to customers during different potential drought events, and that storage could increase the overall resilience of our water resources in this area. As a result, we are committing to investigating all potential storage options within south Hampshire during the initial part of AMP7 (the 2020-2025) period), to enable feasible options to be potentially incorporated within our next WRMP.	None.

Appendix 7.14 - Partnership for Urban South Hampshire (PUSH)

Respondent	Reference no.	Response comment	SWS' Consideration of Response	Changes Required to dWRMP
Partnership for Urban Southampton (PUSH) - Claire Upton-Brown - Assistant Director of City Development & Chair of PUSH Planning Officers Group	68	The Partnership for Urban South Hampshire (PUSH) is a longstanding group of Local Authorities working together to support the sustainable economic growth of the sub region and to facilitate the strategic planning functions to support that growth. The partnership welcomes the opportunity to respond to the Southern Water Resources Management Plan as part of the current consultation. PUSH is a partnership of Hampshire County Council, the unitary authorities of Portsmouth, Southampton and the Isle of Wight, and the district authorities of Eastleigh, East Hampshire, Fareham, Gosport, Havant, New Forest, Test Valley and Winchester. Our response is outlined below. We welcome the robust approach taken to ensure future water supply with the aim of reducing drought risk. We also welcome the long-term timeframe of the document stretching to 2070, which extends beyond the period of existing or emerging Local Plans in the PUSH region. Please note our response should not be interpreted as support for specific schemes mentioned in the Management Plan as these would need to be considered on a case by case basis.	The Partnership's support for the long term approach adopted in the draft WRMP is noted and welcomed.	None.
Partnership for Urban Southampton (PUSH	68	**Water Use/Water Efficiency** We welcome the approach of the Target 100 to reduce personal water use to 100 litres per day. Whilst ambitious, this responds to the supply issues Southern Water face as a consequence of the new abstraction licence restrictions. Such an approach would also respond positively to the existing NPPF (Paragraph 7) and Draft NPPF (Paragraph 8) to use natural resources prudently. We also welcome the included reference to encouraging developers to build more sustainable homes which use less water and work towards Target 100 to reduce the amount of extra water Southern Water needs to find. The reference to plans to recycle wastewater for industry to free up fresh water supplies is also strongly welcomed as an opportunity. In addition to the above noted measures, it is also suggested that Southern Water consider adding a reference to working with Local Planning Authorities to ensure water efficiency policies are included in emerging local plans. This would be reflective of the Draft NPPF which states that plans should take a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for water supply along with other matters (Paragraph 148).	We have set ourselves the target of reducing water use to 100 litres per day by 2040 - a reduction of 25% by 2040. Some of our metered households achieve this level of water use already. To achieve this across the board, we will need Building Regulations and Local Plan policy support, and we will engage with individual local authorities in both their local plan preparation and development management decision making to seek to achieve this. We already work closely with LPA planning officers, and will continue to do this both in relation to the evolution of planning policy, and also through the investigation and promotion of individual water resources schemes.	None.
Partnership for Urban Southampton (PUSH	68	**Other Matters** One area that would benefit from further understanding is that of any further pipeline routes (or pipeline improvements) relating to water supply provision sourced from Havant Thicket Reservoir (Portsmouth Water) or supplies from the River Avon (Bournemouth Water). We would welcome clarification on whether any additional pipeline routes would have any safeguarding of land implications beyond the safeguarded route already identified in Havant Borough (Portsmouth Water). These should ideally be reflected in emerging and future Local Plans. The avoidance or at least minimisation of potential impacts on European nature Conservation sites would too be welcomed. It is noted that Southern Water has identified broad locations for additional reservoirs and desalination plants with timescales indicating these could be introduced between 2025 – 2030 and 2030 – 2045 respectively. The provision of such major infrastructure is welcomed in principle, particularly due to the wider water supply challenges faced in Southern Water's region of coverage. On observing the Resources Management Plan it appears opportunities have been identified near the River Test and on the Isle of Wight. Early discussion should take place with any Local Planning Authorities potentially affected by this type of infrastructure requirement so that any issues can be discussed. We are concerned that the Resources Management Plan is silent on some matters, for example the Peel Common Waste Water Treatment Works (WwTW) (Fareham Borough) where potential improvements may be required. The PUSH Integrated Water Management Study (currently confidential), notes that although no significant impact or deterioration is predicted due to future housing growth, the future Peel Common WwTW may require improvements by 2025 to increase capacity in the WwTW, which will be subject to review in 2022. It further states that sewer capacity upgrades are also likely to be required at this WwTW and that the catchment has nitrate problems and catchment level nitrate measures are required now. This is an example of an important issue which should be referenced against the backdrop of potential housing requirements arising from the Government's proposed standard method for calculating local housing need. Finally, it would be helpful if the Resources Management Plan provides an indication of costs and how it is anticipated the noted projects will be funded, particularly for significant infrastructure items. This will help to provide certainty to both bill payers, local authorities and developers. As one example, if developers are required to fund these future proposals, the Government's proposed Strategic Infrastructure Tariff (if introduced) could be used as a mechanism but there may be viability considerations that will need to be considered and discussed.	Environmental impacts of schemes to share water with neighbouring companies is considered within the SEA and HRA that supports our plan. This includes impacts from abstraction of water and the routeing of pipelines. Since publication of the draft WRMP, further work has been undertaken to review pipeline routes to avoid designated sites and sensitive habitats wherever possible, and justification for any sections that cannot be rerouted have been provided, together with proposed mitigation measures to minimise any adverse effects. In respect of our proposed resource options, we will need to undertake additional more detailed feasibility investigations and modelling, environmental assessment, preparation of planning documentation, and detailed design. We will also engage widely with Local Planning Authorities and consider the need for any safeguarding of land. The potential cost of securing water for the next 50 years across the whole of our water supply area (Eastern, Central and Western) is £1.6 billion. Our aim is to balance bills paid by customers with timely investment in the future. Our Business Plan, approved by Ofwat, sets out how much we need to spend to maintain and improve services for customers for the first fiver years of options in our WRMP. Our next Business Plan is due to be published in September 2018. Our WRMP does not consider improvements at Peel Common WwTW as this is a wastewater matter and therefore not a consideration within a WRMP. Necessary investment in new wastewater treatment infrastructure is secured through our Business Planning process, which is separate from but on a similar timescale to our WRMP preparation.	None.
Partnership for Urban Southampton (PUSH	68	We trust that this response is useful. PUSH would welcome further discussion on any related matters and/or discussions with those individual authorities impacted by specific proposals.	We welcome the opportunity to work with PUSH.	None.

Appendix 7.15 - Royal Society for the Protection of Birds (RSPB)

Respondent	Reference no.	Response comment	SWS' Consideration of Response	Changes Required to dWRMP
Royal Society for the Protection of Birds (RSPB) - Nathan Richardson	37	**Introduction** The RSPB's vision is of a world richer in nature, where wild birds and other wildlife will no longer be declining. Nature is being restored, enriching and sustaining the lives of people as a result. Such a world would guarantee future generations have clean air and water, a stable climate, abundant and diverse wildlife, and a robust, diverse and sustainable economy. Over a million members share that vision. As part of the Blueprint for Water coalition of environmental NGOs (http://blueprintforwater.org.uk) the RSPB identified a number of high level outcomes and associated priorities we would like to see delivered in PR19 through the water company's water resource management plans and business plans. Those priorities were discussed with and shared with the water sector through 2017 and into 2018. Those most relevant to water resource management plans are listed in Annex 1 below and are on this link http://blueprintforwater.org.uk/2016/11/ensuring-water-companies-deliver-for-nature/. Through Blueprint for Water we have also undertaken a comparative piece of work looking across the sector's draft water resources plans which our response draws upon. Our comments on your draft plan are set out below with specific requests provided in bulleted italics.	The Blueprint for Water has set out a number of priorities for the water sector and we have sought to incorporate these within our WRMP schemes, and align with our WRMP priorities and proposals.	None.
RSPB	37	**Comments on the Draft WRMP** We would like to thank Southern Water for their efforts to engage with stakeholders in the preparation of your draft WRMP through technical panels, stakeholder events and bespoke meetings with RSPB and Blueprint for Water. This engagement has helped convey both the challenges faced by the company and the range of solutions being considered.	The comments are noted and welcomed	None.
RSPB	37	Multisector, pan-regional water resource planning We believe that there is a lack of a clear line of sight in water resource planning from the national scale to regional to company and that this risk may lead to solutions that may work in the interest of one company but not for a region or nationally. It also leads to the risk of neighbouring plans not aligning adequately in what they propose. We welcome efforts by the industry to address this gap through groups such as Water Resources South East (WRSE) and Water Resources East (WRE) and we want to see these initiatives further developed in AMP7. We also expect the Environment Agency and National Resources Wales to take action to ensure that there a better approach in place for WRMP24 • We want Southern Water to commit in your final plan to playing a full role in promoting and participating in national and regional scale water resource planning initiatives in AMP7 We have been pleased to be a part of multi-sector water resource planning through the Water Resources East (WRE) initiative led by Anglian Water. This process has provided invaluable shared insight into the future water resource challenges shared across multiple sectors and had started to explore the potential for solutions that benefit multiple sectors. • We want Southern Water to commit in your final plan to working with other sectors in AMP7, potentially through WRSE, to both assess the scale of future challenge across sectors and to develop solutions that work for multiple sectors using the information to inform WRMP24.	Southern Water is committed to playing a full role in regional and national water resource planning initiatives, continuing its current work with other water companies.	None.
RSPB	37	Resilience We are pleased to see government, regulators and the water companies increased consideration of resilience in this current round of water resource and business plans. When water companies are not resilient it is often the environment that pays the price through over-abstraction and an increased reliance on drought permits and orders. We therefore welcome efforts by the sector to plan based on being more resilient to a 1 in 200 year drought. We believe Southern Water's current level of drought resilience is poor with a significant reliance on drought permits and orders to take more water out of the environment during dry periods (e.g. once or twice every 10 years in Hampshire and the Isle of Wight). Much of this risk appears to be the result of the extremely protracted debate around over-abstraction from the Hampshire chalk rivers, during which time appropriate investment has not been made in alternatives. The draft plan highlights this resilience shortfall and proposes solutions, however many of them are nearly 10 years away. So we will see a decade when the company will have to rely on relatively frequent drought permits and orders to enable it to continue to supply water. The plan recognises that these permits and orders may lead to temporary deterioration in WFD status. • We want Southern Water to commit to take proactive measures to reduce the risks of adverse environmental impacts and any deterioration in WFD status arising from an increased reliance on drought permits and orders over the next decade. For example, proactive mitigation and enhancement work to improve the dry weather resilience of affected water courses and water dependant habitats & species. We also expect the company to monitor the affected sites through the next decade and to commit to address any adverse impacts resulting from their use of drought permits and orders that are observed. We are pleased to see the company proposing an Abstraction Incentive Mechanism (AIM) scheme in connection with the above. • We are pleased to see Southern Water collaborating with Portsmouth Water to share valuable resources. However, given the limited resources in the South East we would also like to see the two companies collaborating more on demand side measures where currently Southern Water are at the leading edge and Portsmouth Water are not. This could free up additional valuable resources. We believe a resilient natural environment underpins a resilient water industry and were pleased to see investing in the resilience of the natural environment highlighted by Defra and Welsh Government in their strategic guidance to the sector. The Environment Agency/Natural England in the WISER document state that "We expect business plans to detail the steps you plan to take to build resilience in water infrastructure and the natural environment" whilst OFWAT have included a Resilience Planning Principle (No. 2) for the companies that stated "Promoting ecosystem resilience and biodiversity is a key part of the decision-making process for ensuring resilient services" • We want Southern Water to clearly set out in your final plan what steps you are taking to understand, promote and build the resilience of the natural environment in line with OFWAT's Resilience Planning Principle 2.	The draft WRMP19 and the revised draft WRMP19 set out the importance of enhancing resilience to and during drought events, including environmental resilience. We have committed to a range of measures to enhance environmental resilience. Where potential adverse effects on the environment have been identified in respect of our WRMP strategy, we have committed to implementation of mitigation (and in some case compensatory) measures to minimise the effects and seek overall net environmental gain from implementation of our WRMP. There is a short term reliance, particularly in the Western Area where licence changes bring significant reductions in licenced quantities during other than normal environmental conditions, on Drought Permits and Orders while the permanent solutions are developed and implemented. However in the longer term (2030s onwards) our customers and the environment in which we operate will benefit from our planned resilience investment, which includes continued measures to reduce demand for water as well as physical environmental enhancement measures. As part of the Section 20 Operating Agreement signed at the close of the Inquiry on the Licence changes to the Itchen, Test and Candover borehole abstractions, we committed to a significant package of environmental monitoring and mitigation measures, and compensation under the Habitat Regulations, associated with potential drought permits and drought orders that might be required over the next 10 years or so. Southern Water works closely with Portsmouth Water and with other companies in developing its proposals for new resource development and demand management measures. Southern Water has set out the steps it is proposing to take within its WRMP to implement measures to further environmental resilience. These include the Catchment First initiative, together with the detailed mitigation, monitoring and compensation measures in the Western Area arising from the s20 agreement. Southern Water is also developing its natural capital framework approach and defining its environmental net gain definition as part of its future policy planning.	Revised draft WRMP has been updated to reflect the outcomes of the Inquiry, and to set out the preferred strategy for the Western Area, as set out in Section 7.5 of the Technical Overview, and in WRMP Annex 9.
RSPB	37	•We would like Southern Water to support the joint "Naturally Resilient" project being promoted through Water UK and Blueprint for Water to explore the interplay between resilience in the water sector and resilience of the natural environment. •We are pleased to see Southern Water changing the pattern of abstraction from the Medway into Bewl Water to leave more water in the river during the summer period to benefit wildlife.	Southern Water supports the Naturally Resilient project and welcomes the support expressed for the operation of the River Medway Scheme.	None.

RSPB	37	Sustainability reductions and the Abstraction Incentive Mechanism (AIM) Addressing existing unsustainable abstraction and its impact on the environment is a priority for the RSPB and for Blueprint for Water and we also want to see action taken to remove the risk of WFD deterioration from changes in the use of existing abstraction licences. • We expect Southern Water to have addressed all remaining RSA sustainability reduction actions linked to known impacts on protected conservation sites and Water Framework Directive water body status by the end of AMP7. • We are pleased to see that there will be ongoing work to investigate and progress the best solutions to address Water Framework Directive risk of status deterioration. We would like to see a similar approach more widely undertaken in other sectors such as agriculture and land use planning if WFD requirements are to be met. Whilst the existing sustainability reduction programme has focused on addressing impacts of existing abstraction on water dependant conservation sites it has not considered future long-term risks to these sites from abstraction in light of climate change and associated changes in flow patterns and groundwater levels. It is therefore not truly a sustainability programme and we believe a new forward looking programme needs to be established by the sector. The multi-sectoral work undertaken in WRE did start to shine a light on this future challenge and start to signpost potential solutions that addressed both the environmental sustainability challenge and the needs of public water supply and of other sectors. • We are pleased to see Southern Water commit on p39 of your plan to undertaking investigative work in AMP7 to assess future risks to conservation sites and the environment arising from your abstractions given a likely climate change scenario of changing flow patterns and groundwater levels. We are pleased to see OFWAT mandating the adoption of the Abstraction Incentive Mechanism (AIM) in AMP7 but struggled to find any information in the draft plan on where and how Southern Water propose to use it. However, we are aware that the company is looking to develop an AIM scheme and associated performance commitment to contribute to protecting the Hampshire chalk rivers. • We ask Southern Water to set out in more detail their proposals for utilising AIM in AMP7 including where and how they will use AIM to mitigate for risks of impact on environmental sites and WFD status.	We are keen to work with Natural England and our catchment partners to identify the wider potential co-benefits of our catchment management schemes. We are not yet able to adopt a PC relating to our catchment first initiative as we want to plan and implement a number of catchment solutions to identify the most appropriate performance measures to adopt. We are however proposing to adopt a PC relating to natural and social capital in our Business Plan submission. RSPB has asked us to set out in more detail our proposals for utilising AIM. Our proposals for this are set out in our Business Plan which is published in September 2018.	None
RSPB	37	Ambition on demand management The UK Water Resources Long Term Planning Framework report highlighted the resilience challenges faced by water companies and the need for them to make a step change on demand management. This challenge to the companies to go much further and faster on demand management including on leakage, metering and water efficiency was echoed in the guidance from government and the regulators and in the Blueprint for PR19. We believe companies WRMPs should be prioritising demand management solutions that leave more water in the environment, increase resilience and can save customers money over major new supply side schemes. We expect to see evidence of a step change in ambition on demand management in the draft WRMPs. • We are pleased to see that Southern Water is not planning overall to put more water into distribution by the end of AMP7 in 2025. This is one of our priorities in the Blueprint for PR19. We would like to see a similar commitment in the longer term to 2045.	We set out ambitious plans in our draft WRMP through our Target 100 initiative to reduce demand to 100 l/h/d by 2040. This step change in our approach will require significant investment and close working with our partners to be successful, but will bring significant benefits to the environment through reduced demand and distribution input Southern Water's leakage and PCC proposals will have performance commitments in the Business Plan, as will the Target 100 initiative and the AIM. These individual components are considered to be the most appropriate performance measures to be adopted.	
RSPB	37	• We are pleased to see Southern Water collaborating with Portsmouth Water to share valuable resources. However, given the limited resources in the South East we would also like to see the two companies collaborating more on demand side measures where currently Southern Water are at the leading edge and Portsmouth Water are not. This could free up additional valuable resources. Your anticipated performance on leakage of around 76 l/property/day in 2020 means you are one of the best performing water company in the sector on leakage and we are pleased to see an AMP7 ambition to reduce this to 65 l/p/d by 2025. However, your longer term ambition to 2045 falls short of that shown by other companies in the South East such as Anglian Water and Affinity Water. • We want to see Southern Water increasing its level of long term ambition beyond 2025 on leakage reflecting the level of importance of leakage to customers. Given Southern Water's significant water resource challenges in terms of sustainability reductions together with plans for new supply side schemes we do not think the company is ambitious enough in the longer term on leakage. Your anticipated performance on metering of 87% penetration (excl voids) is sector leading and your draft plan target of 92% by 2025 is welcomed and would see the company remain as the sector lead. However, in the longer term to 2045 several other companies such as Severn Trent and Anglian propose going further that Southern Water. • We are pleased with Southern Water's short and long-term commitment to metering however we like to see the company endeavour to remain at the leading edge in the sector in the longer term given the resource challenges faced. Your draft plan position of 138 l/h/d per capita consumption in 2020 is relatively good for the sector as is your 2025 target of 124 l/h/d and longer-term target of for 2045 target of 120 l/h/d. We are pleased to see this level of overall ambition and your plans to use customer interactions and developer applications to promote water efficiency. • We are pleased with Southern Water's ambition on PCC in both the short and long term. We believe the Target100 initiative to be sector leading. We are also pleased to see this transformational initiative reflected in the company's draft performance commitments. • We want to see Southern Water highlighting to OFWAT any issues that it is having in engaging business customers on water efficiency via the new water retail companies given the water resources challenges highlighted in the draft plan. We are pleased to see Southern Water continuing to prioritise working with householders on water usage as part of the Target 100 initiative. We would like to see the use of household and of community incentives currently being piloted in one area extended. • We want Southern Water to commit in your final plan to extending the use of household and community incentives during dry weather periods to reduce demand.	In our draft WRMP we committed to a strategy of further active leakage control in the short term followed by mains replacement programmes in the medium to longer term to ensure that we continue our drive down on leakage by 15% by 2025. We have now increased this commitment in the revised draft WRMP, to seek to achieve a 50% reduction in our current leakage levels by 2050. and we have long term plans to reduce leakage by 40% by 2040 and by 50% by 2050. This will be reflected in our final WRMP. Southern Water already has high metering penetration as a result of its successful implementation of its universal metering programme in AMP5. The company has nevertheless considered options which could increase metering further through an extension of its compulsory metering programme. Due this already high level of metering, the feasibility of some types of metering becomes an issue - as there may be insufficient customers from the remaining unmetered customer base to make some metering options to be viable. We will however be aiming to increase meter penetration from 88% to 92% in the Western and Central areas as part of our plans to reduce overall per capita consumption to 100 l/h/d by 2040. The RSPBs support for our Target 100 initiative is welcomed. Southern Water is engaging with retailers and their business customers on water efficiency. It is an emerging market, and we have held workshops with them on water efficiency measures for business customers. We are evaluating the outcomes of the community incentive pilot to determine the extent to which this can be a valuable tool to use as part of our Target 100 approach. We will follow measures in the Drought Plan during dry periods. Metering of our customers continues to deliver reductions in demand over and above unmetered households. The revised draft WRMP proposes to extend metering, reduce leakage and promote greater water efficiency through Target 100.	No change as a result of these comments, however an increased commitment to leakage reduction is included within the revised draft WRMP as set out in Section 5.3 of the Technical Overview and WRMP Annex 2.
RSPB	37	We are pleased to see Southern Water engaging with developers such as at Ebbsfleet on water efficiency and encouraging good practice. We want to see the company advocating for all new development to be at the leading edge on water efficiency. • We want Southern Water to commit in your final plan to working with developers to ensure new development incorporates water efficient homes and with other stakeholders to advocate to government for stronger building regulations in water stressed areas.	We have set ourselves the target of reducing water use to 100 litres per day by 2040 - a reduction of 25% by 2040. Some of our metered households achieve this level of water use already. To achieve this across the board, we will need Building Regulations and Local Plan policy support, and we will engage with individual local authorities in both their local plan preparation and development management decision making to seek to achieve this. We already work closely with LPA planning officers, and will continue to do this both in relation to the evolution of planning policy, and also through the investigation and promotion of individual water resources schemes.	None

RSPB	37	Supply side schemes Whilst we want companies to prioritise investment in demand side measures which leave more water in the environment we do recognise the need for demand side measures to meet growth and climate change and in Southern Water's case deficits arising from sustainability reductions. In your draft Plan you identify the need for new supply side schemes alongside demand management. • The draft Plan indicates that the majority of supply side solutions will be implemented from 2025 onwards with relatively few in 2020-2025. However, there seems to be a significant level of uncertainty over the exact blend of those supply side options and their relative environmental and customer acceptability. Given this we suggest that Southern Water starts the planning for 2025 onwards early, working with stakeholder and customers to help refine and focus a robust plan for 2025 onwards. • We are satisfied with Southern Water's efforts to identify the environmental implications of the supply side schemes put forward including the SEA, Habitats Directive Assessments and WFD compliance assessments. However, we have found it difficult to get a clear picture on the scale and location of inter-company transfers. We understand that discussions are still live between companies and with the regulators and that these include major schemes such as the Severn Thames transfer. • We believe that additional stakeholder and customer engagement will be necessary if there are any substantive changes between the draft and final plan with respect to the preferred supply side solutions. We are pleased to see government promoting the "net gain" principle in relation to development. This is in line with the ambition to leave the environment in a better state than when we found it and is included in Defra's 25 Year Plan for the Environment and as a principle in the consultation on the National Policy Statement for Water Resources. Whilst there are risks of trade-offs between aspects of the environment we believe if implemented correctly the principle can deliver positive outcomes. • We want Southern Water to commit in its final plan that all the supply side water resource schemes you progress in AMP7 will deliver a net gain in biodiversity and for the wider environment	We recognise the significant scale of the challenges we face, notably within the Western Area where rapid progress needs to be made on the detailed investigation and promotion of a number of strategic new supply schemes in tandem, in order to deliver the necessary new resources to the timetable we have agreed to at the Hampshire Licences Inquiry. We are committed to achieving this and will be working closely with the EA, Natural England, LPAs and our other environmental partners and other stakeholders. We will need to undertake additional more detailed feasibility investigations and modelling, environmental assessment, preparation of planning documentation, and detailed design for the options we intend to implement. The expressed support for the environmental assessments in our SEA, HRA and WFD are welcomed. We have updated these documents to reflect additional commitments we have given in response to comments from Natural England, and to include biodiversity net gain. We have liaised closely with our neighbouring and other companies to ensure that transfers between us reflect the latest available information on water availability and environmental and other risks associated with those transfers. In some cases, other companies have now indicated that they are no longer seeking a transfer of water from us during the plan period. Our transfer schemes have changed and been updated since the draft WRMP, including to update pipeline route proposals to reflect comments from Natural England and others. These are all reflected in the revised draft WRMP.	None
RSPB	37	Adopting the Catchment Based Approach We are strong advocates of the Catchment Based Approach and have been at the forefront in working with water companies to progress catchment solutions rather than end of pipe solutions tackling problems at source. We want to see water companies as active players in advocating and encouraging good land management that reduces risks to their customers and increases the resilience of their assets and operations. • We are pleased to see Southern Water significantly expanding the scale and remit of its catchment management work through the transformational Catchment First initiative on the Test; Arun and Medway. We are pleased that the company intends to take a more holistic approach in these catchments rather than a focus on a single chemical or issue. We would like to see Southern Water adopt a bespoke performance commitment for AMP7 relating to the Catchment First initiative. We would like to see the company set itself a performance commitment linked to this programme of work to reflect its profile as one of the five transformational initiatives being progressed by the company • We are interested in Southern Water's developing project with Kent University considering future land use change and the water environment and would be keen to stay involved with it. • We want to see Southern Water advocating regulatory measures where voluntary catchment actions have not been sufficiently successful and where it is in the customer's interest.	Southern Water is keen to work with Natural England and our catchment partners to identify the wider potential co-benefits of our catchment management schemes which have a primary focus on improving drinking water quality and/or enhancing environmental resilience of water bodies from which we abstract. As part of our commitment to achieving overall net environmental gain from implementation of our WRMP, we will actively work with Natural England and our catchment partners to maximise benefits for biodiversity and society as a whole from our catchment management investment, adopting ecosystem services and Natural Capital assessment approaches in line with the Government's 25 year plan for the environment and Southern Water's wider Integrated Water Cycle Management approach. We are not yet able to adopt a PC relating to our catchment first initiative as we want to plan and implement a number of catchment management solutions to identify the most appropriate performance measures to adopt. We welcome joint involvement in the project with Kent University. In areas where we are experiencing sustainability reductions we will look to the Environment Agency to assist in ensuring the full implementation of potential catchment management measures.	None
RSPB	37	Use of natural capital / environmental B:C Defra have signaled in the 25 Year Plan for the Environment the expectation that organisations will increasingly factor the value of natural capital (NC) into their decision making. This is something we support providing that things that are hard to put a financial value on such as biodiversity are adequately incorporated. RSPB recently published a Natural Capital Account of our own estate and we would be happy to work with you on how the approach is taken up in your organisation. Many water companies are planning to assess their natural capital stocks across their estate in AMP7 as well as developing the NC approach so that it can be used to inform investment decision-making in time for the PR24. Several are finalizing performance commitments linked to NC. •Stakeholder interest in the use of Natural Capital is highlighted on p16 of the Technical Overview of your plan however this is the only mention in the Technical Overview. We do know that Southern Water are actively looking at how they can use Natural Capital to inform decision making in future WRMPs and think this deserves greater prominence in the final plan. •We want to see Southern Water commit to undertake an assessment of the Natural Capital stocks it is directly responsible for across its estate and to make a commitment to maintain and enhance those stocks.	Southern Water will be producing a policy document to guide its future planning, which will incorporate natural capital accounting and we will work closely with our partners as we develop our policies and approaches. Southern Water has included in its revised draft WRMP its commitment to a number of design principles for its supply enhancement options as set out in Annex 6 of the revised draft WRMP (and in the SEA, HRA and WFD Reports) that will inform the detailed design of schemes which includes seeking an overall net biodiversity gain in developing each scheme as far as possible, working in close dialogue with Natural England, Environment Agency and other stakeholders SWS is trialling natural capital across its WRMP schemes and will seek to consult on the methodology it puts forward for valuation and once the methodology is developed further, it will be used as part of the derivation of the next WRMP. If proven to be viable Southern Water could adopt this beyond the WRMP.	We have committed to design principles to protect the environment in line with discussions with Natural England, and these are set out in Annex 6 plus SEA Report.

Appendix 7.16 - Salmon & Trout Conservation UK

Respondent	Reference no.	Response comment	SWS' Consideration of Response	Changes Required to dWRMP
Salmon & Trout Conservation UK	69	Introduction: This response deals only with the Strategy for the Western Area. Since the EA's proposals to alter the abstraction licences for the Itchen, Candover, and Test have now been agreed this response only deals with Strategy A.	This context for the comments below is noted.	None
Salmon & Trout Conservation UK	69	Overview: It is not acceptable to rely on abstraction from the Itchen, Test and Candover ("the chalk streams" to deal with drought except in the most extreme (once in 500 years) and unforeseen drought conditions. It is only because of the past lack of investment in alternative measures that some reliance on these abstractions unfortunately appears to be necessary in the short term. The Plan must make it clear that all best endeavours will be used to put alternative measures in place as soon as possible. The timescale for ceasing to rely on abstraction from the chalk streams to deal with drought conditions should be "as soon as possible" and in any event by 2027 at the very latest as required under WFD. In the interim, everything possible should be done to reduce the extent of any such abstraction, including early use of overall demand management in the Western area. As Southern Water have already accepted in their recent s.20 Agreement with the Environment Agency that they will "use all best endeavours", these words should be included in the Plan.	Following the Inquiry, a Section 20 Operating Agreement is now in place between the Environment Agency and Southern Water. The outcome of the Inquiry means that once the Secretary of State makes the final determination on the licence changes, some sustainability reductions will be brought in with immediate effect. This means that we will have insufficient supplies of water available in our Western area to supply our customers in all but normal environmental conditions. As soon as conditions become drier than normal, we will in the short term, have to impose temporary use bans and apply for Drought Permits and Orders to allow us to continue to abstract water below the conditions imposed in the new licences. Where Drought Orders are applied for, we will implement river restoration and habitat mitigation measures in potentially affected rivers in combination with Drought Orders, with compensatory measures required for the River Itchen SAC under the Habitats Directive. Our supplies to customers will remain at risk during the AMP7 period and into AMP8 until sufficient alternative supplies are delivered. The extent of the deficit is such that we need to deliver large new resources and these will take time to deliver. We will seek to deliver these in a timely manner in accordance with the terms of the Section 20 Agreement and in consultation with key stakeholders. Our revised draft WRMP will set out the terms of the Section 20 Agreement. We are committed to delivering the Long Term Water Resources Scheme as referred to in the s20 agreement, which will be the final strategy for the Western Area to be set out in the final WRMP. We have included the "all best endeavours" wording in the WRMP that that we have already signed up to in the s20 agreement.	The revised draft WRMP has been updated to reflect the s20 agreement. It has also been updated to reflect the outcomes of additional technical work and modelling. The revised draft WRMP preferred strategy for the Western Area is set out in section 7.5 in the Technical Overview and in Annex 9.
Salmon & Trout Conservation UK	69	The Plan is a long-term plan, but there is a tendency in such plans for proposals which will take some time to bring forward to be delayed, particularly where significant and expensive infrastructure is required. The Government's recent consultation on the National Policy Statement for Water Resources recognises the importance of timely delivery of water infrastructure and emphasises the importance of WRMP's in achieving timely delivery. That recognition also lies behind the proposal to enable large desalination plants to be brought forward through the NSIP. One of the matters which an WRMP is required to "address in particular" is "the likely sequence and timing for implementing" the measures set out in the Plan (s.37A(3)(c)). The Plan is then required to be reviewed annually, the conclusions of the review reported to the Secretary of State, and the plan revised if a material change of circumstances is indicated or the Secretary of State so directs (s.37A (5) and (6). To ensure that this Plan is implemented in a timely manner using best endeavours it needs to include a detailed programme for each of the measures proposed that can be scrutinised and reviewed on at least an annual basis. Without a publicly available detailed programme identifying the critical path, it will be very difficult to assess whether the timescale is realistic, whether best endeavours are being used, and whether alternative solutions need to be readied in case there is a delay. Without such a programme, subject to annual review, the Plan will remain not as effective in ensuring the timely delivery that Government says it requires for water infrastructure. In such a case, S&TCUK believes that the Secretary of State should require the WRMP to be amended.	We have included additional information in the WRMP as a response to the outcomes of the Hampshire Licences Inquiry and the s20 agreement. This includes expanded information on the Long Term Water Resources Scheme (our preferred strategy for the Western Area) that we are committed to delivering to the timescales that we have agreed. We have included information on the risks and uncertainties we face, and described the way we will investigate, assess and promote both our preferred schemes and alternatives to them to minimise and mitigate potential risks to delivery. We will be working closely with our partner organisations and other stakeholders and will regularly report on progress as part of stakeholder working groups, and more publicly via our annual returns to the Secretary of State. Southern Water will also be reporting on progress with schemes in the Western Area publicly through updates on its website.	The revised draft WRMP has been updated to reflect the s20 agreement. It has also been updated to reflect the outcomes of additional technical work and modelling. The revised draft WRMP preferred strategy for the Western Area is set out in section 7.5 in the Technical Overview and in Annex 9.
Salmon & Trout Conservation UK	69	A large-scale desalination plant: The most obvious example of the need for this approach is the proposal for a large-scale desalination plant which appears to be the key factor in replacing abstraction in drought conditions. The Plan explains that a number of factors were taken into account in selecting the exact locations for potential desalination plants (Annex 6 p.28) and that the earliest start dates were assessed taking into account a number of factors (Annex 6 p.15). The preferred site is identified as the now disused power station site at Fawley (Annex 9 p.29 and Annex 6 p.43). However, no details are given as to the extent of assessments that have already been carried out and there are no details of the programme and timescale for the construction of the project.	The preferred location for a desalination plant in the draft WRMP was identified as being within the site of the now disused Fawley Power Station, which is identified for a mixed use redevelopment. The location was chosen because of the potential to utilise (subject to landowner agreements) the Fawley Power station's existing discharge structure, and the site's location within close proximity of both Southampton Water and the Western Solent. As part of the preparation of the draft WRMP alternative desalination plant locations and scales were investigated, including at Marchwood, Sholing, and on the Isle of Wight. The options at Fawley were selected as being the most appropriate for inclusion within the draft WRMP.	In response to comments received, we have amended the location of the proposed desalination plant, and the proposed transfer pipeline routings and included additional information in the WRMP. The relevant sections of the Technical Overview, and detailed annexes (Options Appraisal - Annex 6, SEA - Annex 13, HRA - Annex 14, WFD - Annex 15) have all been updated.

Salmon & Trout Conservation UK	69	The Plan seems to assume that a large-scale Fawley desalination plant could be operating by 2027 but explains that date by reference to "policy decisions of the company" rather than the earliest start date for the desalination plant (Annex 9 p.24). The plan does not explain whether 2027 is the earliest possible date using all best endeavours, whether it is a reasonable central estimate of the plants availability, or whether it is unrelated to the plants availability. However, the Plan caveats the 2027 date by warning that slippages may result in the extended use of drought orders (Annex 9 p.41). Information needs to be provided. The Plan should: a. Identify the work done so far such as any investigations and assessments; b. Provide a detailed timetable to demonstrate the potential timescale for provision if best endeavours are used; c. Provide sensitivity tests to show the range of likely outcomes. This could best be done in an Annex which could be easily updated. If this information is provided it will enable a judgement to be made as to the realism of the estimated date of provision, and it will provide the basis for monitoring of that programme. Given the current absence of such information interested parties should be given the opportunity to comment on that information before the Plan is approved. Progress should be monitored, that monitoring made public, and the plan updated as necessary on a regular basis (at least annually in line with the requirement to review and report to the SoS required by s. 37A). It may be sensible to publicize the results of monitoring in conjunction with the six monthly meetings to consider application readiness.	In our revised draft WRMP we have revised our Fawley desalination scheme, taking into account consultation responses including from Natural England and Fawley Waterside, and reflecting ongoing engineering investigations and assessments of the potential scheme. The revised draft WRMP now proposes a location for the desalination plant that is not dependent on land forming part of the former power station, reflecting concerns raised by Fawley Waterside, but still with the potential (subject to agreements) to utilise the discharge infrastructure. The indicated location is south of Ashlett Creek, and comprises land that lies within the New Forest National Park. The statutory tests relating to need and alternatives for such a development in this location are acknowledged, and we will continue to develop the case for this location in tandem with exploring options with nearby landowners. The transfer pipelines have also been amended to reduce the potential impact on designated sites, in response to Natural England comments. Wherever possible, the pipeline has been re-routed to avoid designated sites and sensitive habitats, and justification for any sections that cannot be rerouted has been provided, along with mitigation measures to minimise adverse effects. These have been discussed with Natural England. We have also included in our revised draft WRMP its commitment to a number of design principles as set out in Annex 6 of the revised draft WRMP (and in the SEA, HRA and WFD Reports) that will inform the detailed design of the scheme (as set out above). We have updated the HRA and/or SEA assessments accordingly.	
Salmon & Trout Conservation UK	69	Other Measures: This approach should also be applied to the other main measures being proposed including, but not limited to, the Havant Thicket storage reservoir and various water re-use schemes. It should also be applied to any "back up" alternative solutions. In order to have an alternative to desalination, it is likely to be necessary to carry out preliminary work to ensure that an alternative could be implemented if the primary solution is delayed or incapable of provision.	We have included additional information in the WRMP Annexes on the work undertaken to date and on the assessment outcomes for the preferred schemes and alternatives.	The relevant sections of the Technical Overview, and detailed annexes (Options Appraisal - Annex 6, SEA - Annex 13, HRA - Annex 14, WFD - Annex 15) have all been updated.
Salmon & Trout Conservation UK	69	This is a long-term plan and should be as sustainable as possible. The approach should also be applied to long term sustainable solutions such as more sophisticated metering. Demand management may not be a substitute for large scale infrastructure but it is part of the package to make water supply more sustainable and should be progressed as quickly as is reasonably possible. Without more information about the programme it is not possible for this to be assessed and monitored.	The Environment Agency has welcomed our Target 100 initiative and it is considered to be ambitious in comparison to other water company targets. As part of Target 100 we will be pursuing a range of innovative water demand initiatives over the plan period, and we have included further details in the WRMP. Our universal metering programme has been incredibly successful and we aim to increase meter penetration to 92% in the Western Area as part of our plans to reduce overall per capita consumption to 100 l/h/d by 2040. We have also increased our commitment to leakage reduction from that included in the draft WRMP. We previously proposed to reduce leakage by 15% by 2025. We have retained this commitment but are now going further, to reduce leakage by 40% of current levels by 2040 and by 50% by 2050.	The relevant sections of the Technical Overview, and detailed annexes (Annex 9 and Annex 13) have all been updated.
Salmon & Trout Conservation UK	69	Conclusion: The Plan should make it clear that the timescale for ceasing to rely on abstraction from the chalk streams to deal with drought conditions is "as soon as possible" and by 2027 at the latest. Southern Water have already accepted in their recent s.20 Agreement with the Environment Agency that they will "use all best endeavours" these words should be included in the Plan. To ensure that this Plan is implemented in a timely manner using best endeavours it needs to include a detailed programme for each of the measures proposed that can be scrutinised and reviewed, on at least an annual basis, to avoid slippage. Those programmes could conveniently be provided in an annex to the Plan to facilitate updating Those programmes should be made publicly available for comment before the Secretary of State makes a decision on the Plan. Those programmes should be reviewed and updated on at least an annual basis and the conclusions of that review made publicly available for comment before the Secretary of State considers the report of each annual review. It would be sensible for the monitoring and updating of the programmes to be coordinated with the six monthly meetings that are to be held to consider application readiness.	As noted above, we are committed to delivering the Long Term Water Resources Scheme (our preferred strategy) for the Western Area, and have agreed to use all best endeavours to achieve this. We have included additional information and explanation in the revised draft WRMP on this commitment, and on the nature and details of the individual schemes. We will be working closely with our environmental partners and other stakeholders including within steering groups for the Western Area on the individual schemes that we will be implementing. We will share progress reports with patterns and stakeholders through these groups, and more publicly in our annual returns to the Secretary of State.	The relevant sections of the Technical Overview, and detailed annexes (Options Appraisal - Annex 6, SEA - Annex 13, HRA - Annex 14, WFD - Annex 15) have all been updated.

Appendix 7.17 - National Farmers Union (NFU)

Respondent	Reference no.	Response comment	SWS' Consideration of Response
National Farmers Union - Tom Ormesher	41	Despite the expectation that population in South East England will increase 20% by 2045 and over half a million new homes will be built in the region, we are dismayed that no net growth in water use demand is forecast in relation to the agricultural sector over this period. Clearly some additional water will be needed for food production but this has not been recognised in any of the draft WRMP's. We are concerned that the non-household demand forecasting scenarios have been unable to provide a sufficiently granular level of detail to account for some critically important factors affecting the sector. Because of this we feel that there should be a more focussed plan to help secure sustainable growth in the farming and food production industries. In a recent survey of 122 NFU members, we have identified that: - 80% of farmers use mains water for both non-household and household (business and domestic) purposes, and a further 11% use mains water for non-household purposes only - When asked about consumption of mains water compared to water from other sources, three-quarters (74%) of farmers were primarily mains water users (farmers typically described mains water as providing at least three-quarters of their total water consumption). We consider these results broadly representative of the industry as a whole. Whilst there is some reliance on private supplies (particular for dairy and irrigable production), for the vast majority of our members, mains water is critical. For livestock businesses there is a statutory duty contained within the Animal Welfare Act (2006) to take reasonable steps to make sure that animal's needs are met. The associated regulation sets minimum standards for all farm animals based upon the 'Five Freedoms', which includes freedom from hunger or thirst, discomfort, pain, injury, disease, fear and distress; and freedom to express normal behaviour. Reliable access to water is a key requirement underpinning this statutory duty and as such there can be no risk over any form of supply interruption where commercial livestock are kept. For horticultural production there are significant business continuity risks associated with water supply, particularly in the context of securing jobs and retaining market position. Where a business relies upon mains water for irrigation, a supply interruption is likely to cause the loss of crops to harvest, leading to seasonal job losses and a failure to satisfy their customer's needs. These are disruptions where the business may find it hard to recover from, due to likely difficulties in future staff recruitment and permanently damaged customer relationships. In this context a temporary supply interruption could easily become a permanent impact and must be avoided by fail safe water resource planning. As trickle irrigation has recently been brought into the licensing regime, growers will also be subject to hands off flow restrictions, meaning that at critical low flow periods they must now stop abstracting. In circumstances where they do not have their own reservoirs or boreholes, this will possibly cause an increased demand on the public water supply network during low flow, high demand periods. Our concern is that without proper planning, such demand spikes may not be serviceable by the network, exposing	Demand from agriculture currently accounts for 3.6% of our total non-household demand. It is difficult to predict how the agriculture sector will develop post-Brexit but we are forecasting 10% growth in water demand by the agriculture sector over the planning period. While it is possible for actual growth in the sector to be higher, we anticipate the opening of the retail market will promote water efficiency in the non-household sector as well and lead to more efficient use of water; which is a scare resource in South East England. We will work with the NFU and the farming community to help establish further details of demand forecasting for the agricultural sector for our next WRMP.
National Farmers Union	41	**Farming in the Southern Water Supply Area** A high level review of available farming statistics within the principal local authority areas covered by Southern Water, demonstrates there are several key hotspots where mains water is likely to be a critical factor for the sustainable development of agriculture. Table 1 highlights ten local authority areas where there are significant proportions of total regional supplies of livestock and key fruit and vegetable growing areas. These statistics give a broad indication as to where some of the most critical areas are for securing food supplies, where over time there may be more growth in water demand and more risk associated with supply interruptions.	See response above
National Farmers Union	41	*Table 1 – Priority Local Authority Areas in Southern Water Supply Area*[3] **Total Farmed Area** / **Fruit and Vegetables** / **Cattle** / **Sheep** / **Pigs** / **Poultry** **Brighton & Hove, Lewes**: 2.4% / 0.4% / **3.0%** / 3.1% / 1.4% / 1.3% **Hastings & Rother**: 2.8% / **3.1%** / 2.4% / 8.5% / 1.1% / 0.3% **Horsham**: 2.7% / 1.3% / **4.5%** / 2.5% / 2.1% / **3.7%** **New Forest**: 2.7% / 0.5% / **3.5%** / 0.9% / **4.3%** / **3.1%** **Test Valley**: 3.9% / 0.8% / 2.9% / 1.8% / **4.2%** / **5.4%** **Winchester**: 4.0% / 1.8% / **4.3%** / 1.2% / **7.7%** / **5.3%** **Isle of Wight**: 2.1% / **2.1%** / **3.1%** / 2.7% / 0.7% / 0.25% **Medway**: 0.7% / **4.6%** / 0.6% / 0.7% / - / 0.01% **South East Region total**: 1.1 million ha / 18,470 ha / 406,000 head / 1.2 million / 210,000 / 10.2 million	See response above

National Farmers Union	41	**A forward look for UK farming** In the recent "Health and Harmony" consultation4, Defra has identified that direct payments to farmers will be phased out over the coming years. In the South East region these payments account for 78% of farm business income during the period 2014-175 so the withdrawal is likely to have a substantial impact. Direct payments have historically performed the function of providing a buffer against sustained low market returns and as such represent a measure to protect farming against the impacts of economic volatility. For example the costs of production for some farming systems have recently varied by as much as 70% from year to year where direct payments have supported farms through periods of negative returns. The withdrawal of direct payments will expose more farm businesses to global commodity price fluctuations, where only the most efficient and market oriented are likely to be able to survive any sustained period of low prices. This is relevant to water resource planning as it implies a number of changes to the structure and function of the farming industry. In particular it is possible that: - Smaller enterprises may find it increasingly difficult to continue farming. In some places this will cause a number of exits from the industry, but this may also lead to more risky decisions where farms seek to avoid costs, increase income and save time. For example in some cases, farms may seek to substantially increase herd numbers, but may find it difficult to invest in new farm infrastructure. This may increase the amount of slurry generated and the amount of water used for drinking and washing. - Medium and large scale enterprises are likely to seek consolidation for growth. In order to become more efficient in managing costs and scaling up potential income, commercial operations are likely to consolidate around specific hubs where the water resource demand is likely to increase substantially. In effect this means that certain parts of the mains network are likely to become of greater strategic importance in servicing the food supply chain. In order to save on costs there is also likely to be more supply chain integration where packing, processing and distribution activities are likely to be developed on or near to farms, further increasing water demand around specific locations.	We note the changes that could occur in the farming industry. As set out in our draft and revised draft WRMP we are proposing a number of catchment interventions and water recycling schemes which will provide opportunities to work with the farmers in the future to potentially derive schemes that can benefit both sectors.
National Farmers Union	41	**Concluding Remarks** The agricultural sector has a high dependency on water resources and those demands are forecast to change substantially over the coming years. This means that the sector has a specific range of requirements and constraints that should be given careful consideration within a water resource planning context. For example we believe it highly likely that there will be key areas of consolidation and growth for the food and farming sector and that strategic network planning will be required to support this. At the present time we are concerned that many of the specific requirements of the sector have not been taken into consideration within the assessment process. Taken together, we feel that there is great need for a separate assessment to establish a more realistic prediction of water resource demand for farming and food production, as well as to provide a more realistic forecast of where the growth in demand, or the risks to supply interruptions may be most likely.	We look forward to working with the NFU as we undertake further work ahead of our next WRMP, including appropriate assessments to establish a more realistic prediction of water resource demand for farming and food production

Appendix 7.18 - Kent Wildlife Trust and Sussex Wildlife Trust

Respondent	Reference no.	Response comment	SWS' Consideration of Response	Changes Required to dWRMP
Kent Wildlife Trust & Sussex Wildlife Trust - Jess Price (Conservation Policy Officer) Chloe Sadler (Water for Wildlife Officer)	58	The following comments are made on behalf of Kent Wildlife Trust and Sussex Wildlife Trust in relation to Southern Water's Draft Water Resources Management Plan 2020-70 (WRMP). We would like to thank Southern Water for consulting us on this plan as the company supply drinking water to customers across Sussex and Kent. This is a joint response supported by both Wildlife Trusts.	The comments and context for the response below is noted.	None.
Kent Wildlife Trust & Sussex Wildlife Trust	58	**Use Water Wisely and Price Water Fairly** The Wildlife Trusts have a particular interest in the state of our freshwaters and the wetland habitats and species that they support. We recognise that there are considerable challenges in maintaining an adequate water supply for a growing population in an area of high environmental sensitivity, which is already experiencing serious water stress. The Wildlife Trusts are therefore pleased to see that the WRMP focuses on making the most of existing water for the first five years through demand management, reducing leaks and developing its catchment management ambitions. This is in line with customer preferences and should be the priority ahead of any supply-side schemes being progressed. We also support Southern Water's aims in regard to long term resilience and sustainability as set out in the Technical Overview. We commend Southern Water on their ambition to reduce per capita consumption by 9.9% in AMP7, this is an ambitious target compared to other water companies. However the reduction appears to drop off during the remainder of the plan (AMP8-11). We acknowledge that Southern Water have already done a lot to reduce consumption, in particular through universal metering, however publicly available comparative data indicates that United Utilities starts with a lower predicted PCC than Southern Water in 2020 and still aims for a 16% reduction overall by 2045, compared to 13% for Southern Water.	The Environment Agency has welcomed our Target 100 initiative and it is considered to be ambitious in comparison to other water company targets. The Target 100 extends across all homes, not just new homes. It is agreed that there is potential with new homes to deliver lower pcc in new homes and have a number of initiatives seeking to achieve this. Our universal metering programme has been incredibly successful and we aim to increase meter penetration to 92% in the Central area as part of our plans to reduce overall per capita consumption to 100 l/h/d by 2040. We consider that our proposals are achievable within the time horizons that we have set out, but will require significant partnership working by Southern Water and the support of its customer base to be achieved.	None.
Kent Wildlife Trust & Sussex Wildlife Trust	58	The Wildlife Trusts do fully support the aspiration of the Target 100 initiative and in particular encourage Southern Water to work closely with developers and the relevant national policy makers to ensure that new development is truly sustainable. We commend the initiatives in Ebbsfleet Garden City, Kent and Fawley Waterside, Hampshire and given the large quantum of development predicted in the South East, we would like to see this work rolled out to a wider area. We also welcome the commitment to extend the universal metering programme and enhance meter reading frequency across all three of Southern Water's supply areas. The Wildlife Trusts strongly support Southern Water's ambition to push for universal metering across the water industry and would also support any drive to increase the requirements for sustainable water use in new development. The Wildlife Trusts recognise Southern Water's plan to reduce leakage and acknowledge the investment that has allowed reductions to date, in particular the use of leak alarms. We support the plans for active leakage control and permanent acoustic logging to allow leaks to be identified quickly. However we note that Essex & Suffolk Water is being significantly more ambitious. Despite starting from a lower leakage level, it is aiming for over a 50% reduction in leakage by 2050 in line with the April 2018 NIC Report into the resilience of water supply infrastructure. In comparison, the leakage reduction predicted by Southern Water is only 31% between AMP7 and AMP11. Given that leakage reduction could have a key role in reducing the need to abstract water, and is the highest priority for customers, the Wildlife Trusts would like to see this ambition increased and encourage Southern Water to consider the plans of Essex & Suffolk Water if looking to develop a bolder programme. The Wildlife Trusts are pleased to see that Southern Water have already embraced innovative approaches to demand management, for example the reward scheme being trialled in the Western Area and the work with Brighton and Hove City Council to make water savings in 1000 social housing homes. We, like many Wildlife Trusts have pledged our support to encouraging community water resource reduction and are keen to explore the many opportunities to collaborate and extend these and other similar demand management programmes. The Wildlife Trusts also support forward thinking proposals to use water wisely such as the 'Resource Hubs' which should have multiple benefits such as providing green energy and a community resource. We note that Southern Water are also planning to trial seasonal tariffs and rising block tariffs in AMP7. We support this initiative and would like to see the outcomes progressed as quickly as possible. Managing demand should be the long-term solution to the sustainable development of water resources in the South East. Southern Water Futures states that currently 'roughly 28% of all licensed water abstractions in the UK are used for energy generation'. It is unclear whether the non-household demand forecast takes into account the potential for hydrocarbon exploration, particularly through hydraulic fracturing, given the interest in development of this industry in the South East. We believe this likely increase in demand from industry should be included, together with options to manage this new demand.	Managing leakage is an important part of our water resources strategy. A low level of leakage is desirable, both for the environment, and because it defers the need to invest in new resources which would otherwise be required to meet increases in demand over time. However, as noted, it is not necessary economic to reduce leakage to very low levels, because to do so could involve very large additional costs for relatively small savings of water. Our approach, and that of our regulators, is to set leakage at a level that is optimal for our customers and society as a whole. Our draft WRMP set out a combined strategy of further active leakage control in the short term followed by mains replacement programmes in the medium to longer term to ensure that we continue our drive down on leakage by 15% by 2025. We have now increased this commitment in the revised draft WRMP, to seek to achieve a 40% reduction in our current leakage levels by 2040 and a 50% reduction by 2050. Our Target 100 initiative is considered to be ambitious in comparison to other water company targets, and has been welcomed by the Environment Agency and others in their responses to the WRMP. The Target 100 extends across all homes, not just new home, and our initial plans have four key strands: 1. Installation of smart metering technology: We are currently undertaking trials of devices that can read meters and send the reading to the customers using their Wifi. If the trial proves successful, we plan to roll out 100,000 devices over AMP7. 2. Home visits: We currently undertake water efficiency home visits, which has a high uptake rate and can result in up to 10% further savings on top of that achieved through metering. We will continue with this programme and combine it with leak detection. 3. Proactive customer contact: We are looking to develop tools and systems to identify any significant increase in consumption. We can then proactively engage with customers at an early stage to determine if the increase is due to change in circumstances or may be a leak. This will allow us to specifically target customers or geographical areas for water efficiency messages during periods of high demand. 4. Incentivising water efficiency behaviour: Our research has shown little appetite for seasonal tariffs and so as an alternative, we are looking to reward customers for conserving water. The first scheme will be rolled out in Hampshire in partnership with Eastleigh Borough Council. The scheme will offer rewards to residents for recycling waste and reducing water consumption on a monthly basis. The scheme will be introduced in the Central area towards the end of AMP7 and in the Eastern area during AMP8. To achieve Target 100 we will also need to continue our work with developers and local planning authorities to actively promote water efficiency. We also agree that changes to Building Regulations will greatly assist in achieving Target 100. It is agreed that there is potential with new homes to deliver lower pcc in new homes and have a number of initiatives seeking to achieve this. Non-household demand takes into account hydrocarbon exploration as part of the mining sector and energy sector forecasts. It is	Our proposals to tackle leakage have been increased in the revised draft WRMP, as set out in Section 5.3 of the Technical Overview, and WRMP Annex 2.
Kent Wildlife Trust & Sussex Wildlife Trust	58	**Keep Our Rivers Flowing and Wetlands Wet** Not damaging the environment is a high priority for customers. Managing the impacts of abstraction is critical to ensure that pressures on our freshwater habitats and the species they support is reduced. The 2016 State of Nature report found that over half of our UK freshwater and wetland species are in decline, with 13% threatened with extinction. Blueprint for Water calls for a water-neutral PR19 and as a whole the industry is expecting to put less water into distribution in England in both the short and long term. Southern Water will be contributing to this in AMP7 and AMP8, however we note that by 2045 it predicts more water input into distribution. The Wildlife Trusts would like to see this risk reduced and therefore encourage Southern Water to adopt a Performance Commitment of 'towards water neutrality' to encourage innovation. We are pleased to see that Southern Water has been an active partner in supporting delivery of the Environment Agency's Restoring Sustainable Abstraction programme and that it plans to reduce abstraction from some of its existing sources to prevent Water Framework Directive (WFD) status deterioration to waterbodies.	Southern Water is not yet in a position to formally commit to a specific performance commitment relating to 'towards neutrality', however the company supports the principles of the approach and is willing to work closely with our environmental partners to explore how we can incorporate these into our policy planning. Since privatisation Southern Water has driven down its DI, and current levels are down to equivalent of 1970s. Support for our role in the RSA programme is welcome.	None.

Kent Wildlife Trust & Sussex Wildlife Trust	58	We notice that as part of Ofwat's Abstraction Incentive Mechanism, which encourages water companies to reduce abstraction of water at environmentally sensitive sites during critical periods, Southern Water is currently trialing a community incentive programme in its Western Area. Whilst we applaud this scheme, we would like to see Southern Water extend this thinking to other areas where abstraction is impacting on valuable habitats, particularly chalk streams (all of which have been elevated to UK High Priority water bodies by Natural England), to demonstrate a commitment to ensuring existing abstractions are sustainable beyond that which is required by the regulators. The WRMP takes a flexible approach to demand and supply options after AMP7. The Trusts understand that there is a level of uncertainty in regards to the outcomes of the Environment Agency sustainability reductions, climate change and population growth and therefore it is appropriate for Southern Water to take an adaptable approach. The Wildlife Trusts commend the use of detailed Strategic Environmental Assessments, Habitat Regulations Assessments and Water Framework Directive Assessments for all feasible management options. This level of assessment should continue as plans progress. We ask that any new supply options chosen are the least environmentally damaging and ideally the most environmentally beneficial. In addition, any proposal being brought forward should: •contribute to achieving good ecological status in freshwaters and coastal sites and must not cause any deterioration in WFD status of local water bodies •be sufficiently scaled to address problems of over-abstraction, •include measures to prevent the spread of invasive non-native species • reduce the need for energy-intensive systems • along with mitigating impacts, secure significant enhancements for the environment • be accompanied by stringent assessment of environmental and energy impacts • demonstrate that there are no suitable demand measurers that have not yet been implemented that could lessen need The Trusts also encourage closer working between WRSE members to identify joint funding opportunities for environmentally beneficial schemes that are currently not economically viable alone. We would welcome the opportunity for further discussion and consultation on more detailed proposals in due course, to ensure any potential environmental impacts are identified and resolved.	Support for our approach to assessing various futures is welcome. Detailed SEA, Habitat Regulations Assessment (HRA) and WFD assessments have been undertaken for all feasible options to fully understand the overall potential effects of all our options. Where applicable, we have identified mitigation measures to prevent or reduce any identified significant adverse environmental or social effects of an option. We took these mitigation measures into account in assessing the potential residual effects on the environment and/or supply. Southern Water will be producing a policy document to guide its future planning, which will incorporate natural capital accounting and we will work closely with our partners as we develop our policies and approaches. Natural Capital information relating to the WRMP has been utilised with our SEA. Southern Water has included in its revised draft WRMP its commitment to a number of design principles for its supply enhancement options as set out in Annex 6 of the revised draft WRMP (and in the SEA, HRA and WFD Reports) that will inform the detailed design of schemes which includes seeking an overall net biodiversity gain in developing each scheme as far as possible, working in close dialogue with Natural England, Environment Agency and other stakeholders. Southern Water is undertaking a review of all its sources over the next 5 years, and has a large number of schemes in the WINEP programme. With the completion of those studies, Southern Water will know which may be appropriate as AIM schemes, or other forms of interventions. We are committed to working closely with other water companies through the WRSE group, however the basis for the selection of schemes both within WRSE and at a company level has to accord with the water resources planning guidelines published by the Environment Agency.	None.
Kent Wildlife Trust & Sussex Wildlife Trust	58	**Protect and Restore Catchments from Source to Sea** The Wildlife Trusts are extremely encouraged by Southern Water's Catchment First plan and would strongly support further investment in this element of the WRMP. We strongly support the inclusion of the studies in the River Test, Arun and Medway catchments and would like to see catchment solutions implemented across Southern Water's entire supply area to improve resilience. We note that customer consultation ranked catchment management approaches 2nd out of 10 choices, demonstrating clear support for this approach and we congratulate Southern Water employing specific staff to further catchment management work. Southern Water already works well in partnership in this arena and we encourage the continuation of these broader partnerships in developing catchment ambitions. We would like to highlight that all except three catchment management schemes and demand management options were found in the SEA to be compliant with WFD requirements and that none of the options within the strategy would lead to permanent deterioration of WFD status for any waterbody. We support Southern Water's plan to reduce abstractions to ensure waterbody WFD status does not deteriorate and although Southern Water are planning for numerous different futures within the WRMP to help improve resilience to change, all future scenarios should include catchment management options. The Wildlife Trusts are concerned that the use of drought orders or permits in severe droughts in the short term in Central and Western Areas, and under extreme drought conditions, may lead to temporary deterioration of WFD status of some waterbodies. We encourage Southern Water to continue to monitor the WRMP options and work with partners to investigate if measures could be implemented to avoid this critical scenario.	The Trust's support for our Catchment First initiative is noted and welcomed and we are committed to working closely with the Trust and our other partners in taking forward this initiative. Southern Water is keen to work with Natural England and our catchment partners to identify the wider potential co-benefits of our catchment management schemes which have a primary focus on improving drinking water quality and/or enhancing environmental resilience of water bodies from which we abstract. As part of our commitment to achieving overall net environmental gain from implementation of our WRMP, we will actively work with Natural England and our catchment partners to maximise benefits for biodiversity and society as a whole from our catchment management investment, adopting ecosystem services and Natural Capital assessment approaches in line with the Government's 25 year plan for the environment and Southern Water's wider Integrated Water Cycle Management approach. All our strategies under future scenarios, as set out in the Technical Overview, include catchment schemes. The draft WRMP19 and the revised draft WRMP19 set out the importance of enhancing resilience drought events, including environmental resilience. We have committed to a range of measures to enhance environmental resilience. Where potential adverse effects on the environment have been identified in respect of our WRMP strategy, we have committed to implementation of mitigation (and in some case compensatory) measures to minimise the effects and seek overall net environmental gain from implementation of our WRMP. There is a short term reliance on Drought Permits and Orders while the permanent solutions are developed and implemented, but in the longer term (2030s onwards) our customers and the environment in which we operate will benefit from our planned resilience investment, which includes continued measures to reduce demand for water as well as physical environmental enhancement measures. As part of the S20 Operating Agreement that emerged from the Inquiry on the Licence changes to the River Itchen, River Test and Candover, we committed to a significant package of environmental monitoring and mitigation measures associated with potential drought permits and drought orders that might be required over the next 10 years or so.	None.
Kent Wildlife Trust & Sussex Wildlife Trust	58	We are also concerned that locally important designated sites, such as Local Wildlife Sites (LWS), have not been recognised as part of the environmental baseline of the plan. Together with statutory designated sites, LWS contain the most important habitats and species in each county and form the core of our biodiversity resource; they are integral to ecosystem resilience. The SEA acknowledges that conserving and enhancing biodiversity, along with improving connectivity between fragmented habitats to create functioning corridors and stepping stones are key issues. We are therefore disappointed to see that there is no reference made to locally designated sites within this document. This is in contrast to South East Water which does include consideration of non-statutory designated sites in its SEA. We recommend that the condition of LWS's should be included in the monitoring indicators for biodiversity (SEA Table 15). Southern Water indeed own many Local Wildlife Sites across the region and we expect to see all these sites as exemplars of the water industry delivering biodiversity. The Wildlife Trusts are encouraged to see that an attempt has been made to consider ecosystem services within the SEA. Defra's 25 Year Environment plan encourages growth in natural capital and measurement of ecosystem services. Additionally WISER recommends that water companies consider how natural capital accounting can inform water industry planning. Stakeholder and regulator engagement indicated that natural capital is important and as such we encourage Southern Water to integrate natural capital within the decision-making process for the preferred plan and any future updates. Southern Water is already displaying some innovative approaches to Natural Capital and we encourage the company not to lose momentum with this over the course of the plan. We support Southern Water's 'Greener Future' strategy, but note that there is no reference to a commitment to ensuring net gains to biodiversity as per the government's Biodiversity 2020 Strategy. We recommend that Southern Water implement a net gains policy or update their Environment Policy to incorporate this feature. We hope that Southern Water are able to take our comments into account, along with those made by other Wildlife Trusts, and look forward to seeing these reflected in the company's Statement of Response and final Water Resources Management Plan when published. Please do not hesitate to contact us about any of the above points.	Southern Water will be producing a policy document to guide its future planning, which will incorporate natural capital accounting and we will work closely with our partners as we develop our policies and approaches. Natural Capital information relating to the WRMP has been utilised with our SEA. As set out above, Southern Water has included in its revised draft WRMP its commitment to a number of design principles for its supply enhancement options as set out in Annex 6 of the revised draft WRMP (and in the SEA, HRA and WFD Reports) that will inform the detailed design of schemes which includes seeking an overall net biodiversity gain in developing each scheme as far as possible, working in close dialogue with Natural England, Environment Agency and other stakeholders [Subject to SWS agreement to this commitment]. LWS are not included in the environmental baseline of the plan.	The relevant sections of the Technical Overview, and detailed annexes (Options Appraisal - Annex 6, SEA - Annex 13, HRA - Annex 14, WFD - Annex 15) have all been updated to reflect the Inquiry outcomes and s20 agreement, and our commitments to design principles discussed with Natural England.

Appendix 7.19 - Hampshire & Isle of Wight Wildlife Trust

Respondent	Response no.	Response comment	SWS' Consideration of Response	Changes Required to dWRMP
Hampshire & Isle of Wight Wildlife Trust - Ali Morse	48	Hampshire & Isle of Wight Wildlife Trust welcome the opportunity to comment on the draft Water Resources Management Plan from Southern Water (SW), as the company supply drinking water to customers across large parts of Hampshire and all of the Isle of Wight. The Trust takes a significant interest in the state of our freshwaters and of the wetland habitats that depend upon them. As such we have an interest in the role that water companies operating across Hampshire and the Isle of Wight can play in achieving sustainable abstraction in order to protect our freshwater habitats, and in the wide range of environmental outcomes that the price review could potentially deliver. The Wildlife Trusts helped to develop the Blueprint for PR19, and through the 'Blueprint for Water' group of environmental NGOs have been reviewing companies' draft plans against the aspirations set out in that publication. Using the themes contained in that document, we now set out our thoughts on SW's draft Water Resources Management Plan:	The context for the comments is noted and welcomed.	None.
Hampshire & Isle of Wight Wildlife Trust	48	Use water wisely and price water fairly Particularly here in the South East, where water resources in the UK are most under pressure, it is crucial that we limit the amount of water wasted, by managing demand and reducing leakage. Of the five broad schemes proposed for the first Asset Management Plan Period covered by the plan (AMP7), two - 'Reduce Leaks' and 'Target 100' - are substantial programmes dealing with reducing water wastage. We are pleased that such measures are put forward, in line with customer and stakeholder preferences (priorities 3, 4 & 5 in one customer survey described in the plan), and that they commence in the early years of the plan ahead of major supply-side schemes being progressed.	Support for the leakage reduction target expressed in the draft WRMP and our Target 100 initiative is welcome (see also response below).	None.
Hampshire & Isle of Wight Wildlife Trust	48	On leakage (measured as litres per property per day) the company is currently one of the best-performing across the industry. However, other companies with similar leakage rates are proposing more ambitious reductions. A NIC Report into the resilience of water supply infrastructure published in April 2018 recommends that companies should halve leakage by 2050, yet according to publicly available comparative data SW propose only a 31% reduction by 2045, a relatively low rate, with some other companies proposing almost twice that. The ambition for AMP7 is reasonably good, with the company aiming to come close to the 15% target recommended by Ofwat (delivering a reduction of ~10 litres per property per day). We welcome the company's consideration of a range of leakage reduction measures including permanent acoustic logging (aiding leak detection), pressure reducing valves and mains renewal. Neighbouring Portsmouth Water have made a commitment to carrying out free repairs on customers' supply pipes as well as fixing leaks on company assets, which could be an approach worth considering. However, progress planned by SW after AMP7 is limited, with the reduction of approximately 12 litres that is proposed for the subsequent AMPs to 2045 - a further 20 years in total - being not significantly more than that which is proposed for the first five years.	Managing leakage is an important part of our water resources strategy. A low level of leakage is desirable, both for the environment, and because it defers the need to invest in new resources which would otherwise be required to meet increases in demand over time. However, as noted, it is not necessary economic to reduce leakage to very low levels, because to do so could involve very large additional costs for relatively small savings of water. Our approach, and that of our regulators, is to set leakage at a level that is optimal for our customers and society as a whole. Our draft WRMP set out a combined strategy of further active leakage control in the short term followed by mains replacement programmes in the medium to longer term to ensure that we continue our drive down on leakage by 15% by 2025. We have now increased this commitment in the revised draft WRMP, to seek to achieve a 40% reduction in our current leakage levels by 2040 and a 50% reduction by 2050. In response to the comment, Southern Water confirms that it carrys out free repairs on customers supply pipes as well as fixing leaks on company assets.	Our proposals to tackle leakage have been increased in the revised draft WRMP, as set out in Section 5.3 of the Technical Overview and WRMP Annex 2.
Hampshire & Isle of Wight Wildlife Trust	48	The technical report shows that leakage reduction will feature as a 'first port of call' in all SW areas (Eastern, Central, Western) in all future AMPs, and in all possible futures (more challenging, less challenging). On the face of it this is a positive message that will be well received by stakeholders and customers alike, so it is disappointing that the scale of reductions planned appears small. This is a concern given the ecological sensitivity of the chalk rivers which are prominent across the company's area (and directly from which, or from the groundwaters that feed them, the company abstract a reasonable portion of their supplies), as leakage reduction has the scope to play a key role in reducing the need to abstract.	We have increased our commitment to leakage reduction in the revised draft WRMP (see answer above).	Our proposals to tackle leakage have been increased in the revised draft WRMP, as set out in Section 5.3 of the Technical Overview and WRMP Annex 2.
Hampshire & Isle of Wight Wildlife Trust	48	Although no detail is provided, the technical report suggests that the proposed measures could reduce leakage rates beyond the Sustainable Economic Level of Leakage (SELL), prompted by the environmental benefits this may bring. Given the international importance of the chalk river and wetland habitats that can be impacted by abstraction in this area, and the support from customers for further reducing leakage, we suggest that the company should certainly be looking to achieve, if not go beyond, the lowest estimate of any SELL figure. It was particularly interesting to learn that 'future customers' prioritised protecting the environment, suggesting that customer support for measures such as leakage reduction will be even greater in the future. The plans of Essex & Suffolk Water, who propose a >50% reduction over the same period despite starting out with the lowest leakage rate of all companies, may be informative if looking to develop a more ambitious programme.	We have increased our commitment to leakage reduction in the revised draft WRMP (see answer above).	Our proposals to tackle leakage have been increased in the revised draft WRMP, as set out in Section 5.3 of the Technical Overview and WRMP Annex 2.

Hampshire & Isle of Wight Wildlife Trust	48	By contrast, the company's proposals on per capita consumption (average, litres per person per day) are industry-leading. The reduction proposed by SW for AMP7 is the largest of all companies at 9.9%, to be achieved through the 'Target 100' programme. This trend continues into future AMPs, with the company proposing a further 13% reduction by 2045, again one of the highest percentage reductions proposed. This is against a backdrop of improvements already made via the company's large-scale metering programme, meaning that the starting point is already one of more efficient customers (making achieving further savings a challenge).	Support for our ambitious Target 100 programme is welcomed.	None.
Hampshire & Isle of Wight Wildlife Trust	48	Target 100 will commence with a media and education campaign, but beyond this the dWRMP technical report provides little additional detail. The options appraisal document mentions large scale retrofitting of the most water efficient devices available, along with widespread greywater reuse systems installed in customer households - measures that we welcome - and we would like to be kept informed of plans as they develop. As a component of this work we note that in the past the company has worked with Brighton and Hove City Council to deliver water efficiency work in social-housing homes. We would welcome expansion of this area of work, not only as a way of delivering water savings, but also as a means of providing practical support to customers who may otherwise find it difficult to manage their bills (- even if not billed via a water meter, customers will benefit financially from saving water since a third of energy consumed in the average household is used to heat water).	Our Target 100 initiative is considered to be ambitious in comparison to other water company targets, and has been welcomed by the Environment Agency and others in their responses to the WRMP. The Target 100 extends across all homes, not just new home, and our initial plans have four key strands: 1. Installation of smart metering technology: We are currently undertaking trials of devices that can read meters and send the reading to the customers using their Wifi. If the trial proves successful, we plan to roll out 100,000 devices over AMP7. 2. Home visits: We currently undertake water efficiency home visits, which has a high uptake rate and can result in up to 10% further savings on top of that achieved through metering. We will continue with this programme and combine it with leak detection. 3. Proactive customer contact: We are looking to develop tools and systems to identify any significant increase in consumption. We can then proactively engage with customers at an early stage to determine if the increase is due to change in circumstances or may be a leak. This will allow us to specifically target customers or geographical areas for water efficiency messages during periods of high demand. 4. Incentivising water efficiency behaviour: Our research has shown little appetite for seasonal tariffs and so as an alternative, we are looking to reward customers for conserving water. The first scheme will be rolled out in Hampshire in partnership with Eastleigh Borough Council. The scheme will offer rewards to residents for recycling waste and reducing water consumption on a monthly basis. The scheme will be introduced in the Central area towards the end of AMP7 and in the Eastern area during AMP8. To achieve Target 100 we will also need to continue our work with developers and local planning authorities to actively promote water efficiency. We also agree that changes to Building Regulations will greatly assist in achieving Target 100. It is agreed that there is potential with new homes to deliver lower pcc in new homes and have a number of initiatives seeking to achieve this.	We have included additional explanation on our Target 100 proposals in the revised draft WRMP, as set out in Annex 2.
Hampshire & Isle of Wight Wildlife Trust	48	In addition we welcome the proposals to work with developers such as at Fawley Waterside to help them create water-efficient homes, which will be an important way of limiting future increases in water demand, given the extensive housing development which is planned across the region. Indeed, housing is noted by the company as a key challenge to future water resource provision, but also a key opportunity, discussed in both the dWRMP and the Water Futures South East report.	The support for our partnership work with large scale developments is welcome.	
Hampshire & Isle of Wight Wildlife Trust	48	We recognise metering as the measure which underpins most customer-focused water saving efforts and provides the fairest way to pay for water used, so we welcome proposals for further metering across the region. We note that unmetered customers on the Isle of Wight use more water on average than those in other areas, suggesting that prioritising metering work on the island might deliver the greatest benefits. Seasonal tariffs and rising block tariffs are discussed in the options appraisal and we welcome the proposal to trial tariff options during AMP7 for potential inclusion in WRMP24; given the high meter penetration achieved by the company, they are well placed to benefit from the implementation of any tariffs if these can be demonstrated to be successful and in line with Defra & Ofwat guidance. We note that customers are generally not in favour of tariffs, but question whether in polling, the distinction has been made between punitive tariffs and those which are reward-based, as the latter tend to be much better received.	The Isle of Wight is already 95% metered through Southern Water's previous metering programme. Where additional metering is economic it has been incorporated into the revised draft WRMP, including increasing metering elsewhere in Hampshire from 88% to 92% of households. Our Target 100 proposals will be targeted to reduce water usage across metered and unmetered households and our forecasts show that water usage is predicted to reduce in unmetered households on the Isle of Wight. Reward based tariffs were considered more favourable than punitive tariffs in the research that Southern Water undertook with its customers. Southern Water will undertake further work and research in this area to inform the development of potential reward or incentive tariffs for potential inclusion in subsequent WRMPs.	None
Hampshire & Isle of Wight Wildlife Trust	48	<u>Keep our rivers flowing and wetlands wet</u> Managing the impacts of abstraction is critical to ensure that pressures on our waters, and the species they support, are reduced. The 2016 State of Nature report found that over half of our UK freshwater and wetland species are in decline, with 13% threatened with extinction. The Restoring Sustainable Abstraction programme, the Water Industry National Environment Programme (WINEP), and the choices made by companies on the future water resources measures to implement, are all key to this issue.	The comments are noted and welcomed.	None.

Hampshire & Isle of Wight Wildlife Trust	48	The company's plan is in line with the principle advocated by regulators of delivering a twin-track approach of increasing water supplies and reducing water demand (albeit that the level of ambition on leakage reduction is limited, as discussed above). We would be critical of a plan which employed new water source development ahead of other options, and welcome the use of coloured icons on the water strategy maps to distinguish between measures that deliver 'better use of existing water' as opposed to those which are 'new sources of water', as we feel that this is an important distinction to share with customers. The first AMP has a clear focus on these 'better use' measures, and they continue to feature throughout future AMPs.	The support for our approach and strategies is noted and welcomed.	None.
Hampshire & Isle of Wight Wildlife Trust	48	The other notable feature of these maps is the presence of Drought Actions in Hampshire and West Sussex, necessary in the early phases of the plan. We recognise these measures as the correct and necessary way of managing abstraction during a drought and are pleased to see the Hampshire Drought Orders described within the plan, the use of which (if needed) is as a result of the company's agreement to implement sustainability reductions to licences on the Test and Itchen rivers. This is a move which stakeholders have long been calling for. Locally we, and our partners, are involved in helping to develop packages of monitoring, mitigation and compensation measures, which ensure that the environment has been appropriately safeguarded should it be necessary for the company to utilise the Drought Permits (DPs) / Orders (DOs) in the future, and we welcome the company's efforts to involve local stakeholders in this process. It is important to note that the level of environmental mitigation / compensation is still being agreed between the company and the regulators, and that any 'push-back' from the company could be challenged by local stakeholders, and could jeopardise the obtaining of Drought Orders in due course. Having said that, we applaud the efforts of both sides in reaching this agreement, which will see Hampshire's chalk streams better protected from abstraction impacts, and habitat enhancements put in place which will provide permanent improvements to the ecology (regardless of whether the DPs / DOs are ever required). We await sign-off on this agreement by the Secretary of State	We are committed to delivering our agreed actions set out in the s20 agreement signed at the close of the Hampshire Licence Inquiry, include the details of the environmental mitigation, monitoring and compensation measures that the Trust and other partners helped us to devise.	None as a result of these comments, however the WRMP has been updated to reflect the s20 agreement and the outcomes of the Inquiry.
Hampshire & Isle of Wight Wildlife Trust	48	Furthermore, through discussions with the company as members of Blueprint for Water, we understand that SW are proposing to have a Performance Commitment (PC) on the Abstraction Incentive Mechanism covering the Itchen at Otterbourne. The scheme will seek to alleviate low flows by increasing the import of water from Portsmouth Water. We welcome this PC, which would see protection for flows over and above the level of protection required by the Environment Agency's licence changes.	The support for our proposed Performance Commitment (PC) on the Abstraction Incentive Mechanism covering the Itchen at Otterbourne is welcomed. This will be in place for the remainder of this AMP period (to 2020) and beyond that is a matter for the Business Plan.	None.
Hampshire & Isle of Wight Wildlife Trust	48	It is now necessary that a commitment is secured, through the WRMP process, to developing and delivering the various supply- and demand-side schemes that will offset the reduction in Deployable Output lost through implementation of the licence reductions. The licence reductions leave SW with a supply shortfall, and until alternatives can be found, the rivers still remain vulnerable to the impacts of excess abstraction during times of drought (albeit with protection provided via mitigation and, in the case of the SAC-designated Itchen, ecological compensation). This consultation is a key opportunity to highlight the need for the company to progress the measures that will plug this gap.	Following the Inquiry, a Section 20 Operating Agreement is now in place between the Environment Agency and Southern Water. The outcome of the Inquiry means that some sustainability reductions will be brought in with immediate effect once approved by the Secretary of State. This means that we will have insufficient supplies of water available in our Western area to supply our customers in all but normal environmental conditions. As soon as conditions become drier than normal, we will in the short term, have to impose temporary use bans and apply for Drought Orders to allow us to continue to abstract water below the conditions imposed in the new licences. Where Drought Orders are applied for, we will implement river restoration and habitat mitigation measures in potentially affected rivers in combination with Drought Orders. Our supplies to customers will remain at risk during the AMP7 period and into AMP8 until sufficient supplies are delivered. The extent of the deficit is such that we need to deliver large new resources and these will take time to deliver. We have committed through the s20 agreement to use all best endeavours to deliver these to the agreed timescales.	None.
Hampshire & Isle of Wight Wildlife Trust	48	The choice of future measures will need to be informed by action required under the WINEP. We understand that (on the water resources side at least) the investigations and other schemes put forward for the company are of a scale that should be deliverable; we welcome in particular the commitment to deliver WINEP investigations, as we see these as a critical way of ensuring that future choices are properly evidence-based.	The comments are noted and welcomed.	None.

Hampshire & Isle of Wight Wildlife Trust	48	In terms of future measures, customers have shown strong support for protecting and improving the environment and, in line with the Blueprint for PR19, we would advocate that any supply options chosen (whether these deliver new supplies or enhance existing ones) should be the least environmentally damaging, or ideally, the most environmentally beneficial. They should contribute to achieving good ecological status under the Water Framework Directive (WFD) in both freshwater and coastal sites, should be sufficiently scaled to address problems of over-abstraction, include measures to prevent the spread of invasive non-native species (INNS) and reduce the need for energy-intensive systems.	Detailed SEA, Habitat Regulations Assessment (HRA) and WFD assessments have been undertaken for all feasible options to fully understand the overall potential effects of all our options. Where applicable, we have identified mitigation measures to prevent or reduce any identified significant adverse environmental or social effects of an option. We took these mitigation measures into account in assessing the potential residual effects on the environment and/or supply. Southern Water has included in its revised draft WRMP its commitment to a number of design principles for its supply enhancement options as set out in Annex 6 of the revised draft WRMP (and in the SEA, HRA and WFD Reports) that will inform the detailed design of schemes which includes seeking an overall net biodiversity gain in developing each scheme as far as possible, working in close dialogue with Natural England, Environment Agency and other stakeholders.	None.
Hampshire & Isle of Wight Wildlife Trust	48	We note in particular that the dWRMP is WFD complaint, with the plan including measures to reduce abstraction from some sources to address risks of WFD status deterioration, and demonstrating that none of the options included (either alone or in-combination) would lead to a permanent deterioration of WFD status for any water body. This is commendable.	The support is noted and welcomed	None.
Hampshire & Isle of Wight Wildlife Trust	48	Our comments relating to future water resource measures that follow relate primarily to Hampshire and the Isle of Wight (the Western Area), our key area of interest, although we would wish to see the principles we advocate applied across the company's entire area of operation.	The comments are noted.	None.
Hampshire & Isle of Wight Wildlife Trust	48	As well as water efficiency and leakage reduction work, catchment management scores highly in customer surveys, and we welcome the inclusion of multiple catchment management schemes (discussed further below), most of which are assessed through the Strategic Environmental Assessment (SEA) as being likely to deliver impacts which are almost exclusively beneficial.	The support is noted and welcomed	None.
Hampshire & Isle of Wight Wildlife Trust	48	We support in principle the upgrading of the supply network and the construction of new network connections to allow flexibility in moving water around the area, within and between Water Resource Zones, and between companies. We would wish to work with the company to ensure that the environmental impacts of any pipeline construction are limited, particularly where routes pass through land in which we have an interest. Construction of the Test to Itchen pipeline proposed for AMP8 is predicted to have a number of adverse effects, particularly on biodiversity, and we would want to see appropriate management and mitigation measures in place for all works. In addition, if transporting raw water, SW must ensure that the risks of spreading INNS (including micro-organisms) and risks to water quality are considered; action to manage these risks must be a feature of long-term operating instructions rather than just of up-front environmental assessments.	Further work has been undertaken to assess the effects of the pipeline for the Southampton Link Main in the revised draft WRMP to better reflect the bi-directional nature of this main to link the two Southampton Water Resource Zones) on designated sites. Wherever possible, the pipeline has been re-routed to avoid designated sites and sensitive habitats, and justification for any sections that cannot be rerouted has been provided, along with mitigation measures to minimise adverse effects. These have been discussed with Natural England. We have specifically revised a number of pipeline routes in response to comments from Natural England and other respondents, including re-routing pipelines to avoid designated sites wherever possible. The permanence of impacts from the pipeline has been further reviewed in light of Natural England's concerns, including assessing any impacts to groundwater flows to wetland habitats, and the loss of irreplaceable habitats (e.g. chalk grassland, ancient woodland) which cannot be mitigated for. Southern Water has included in its revised draft WRMP its commitment to a number of design principles as set out in Annex 6 of the revised draft WRMP (and in the SEA, HRA and WFD Reports) that will inform the detailed design of the scheme (as set out above). We will include measures to avoid transfer of invasive non native species.	The relevant sections of the Technical Overview, and detailed annexes (Options Appraisal - Annex 6, SEA - Annex 13, HRA - Annex 14, WFD - Annex 15) have all been updated.
Hampshire & Isle of Wight Wildlife Trust	48	Looking further ahead we welcome schemes that look to minimise or to time abstraction from freshwaters in order to protect the water environment; recycling water from wastewater treatment works and Aquifer Storage and Recovery schemes both have the scope to do this provided that any wider environmental concerns can be dealt with. For example, both must consider the impacts of scheme operation upon river flow regimes.	The comments and in principle support is noted and welcomed. Detailed investigations and assessments for such schemes will need to address any potential impacts on river flow regimes where relevant.	None.

Hampshire & Isle of Wight Wildlife Trust	48	In terms of desalination, we do not recognise this as a panacea to protect our chalk streams; whilst such schemes undeniably provide the benefit of limiting water abstracted, they do little to encourage the sustainable management of our rivers. Before these schemes are developed we would wish to see catchment management employed as a 'go-to' solution in line with the company's 'Catchment First' approach. If desalination is to be progressed, we have two main areas of concern; one is the management of waste products in terms of the impacts that a concentrated brine effluent stream could have upon the marine environment, and the other is the energy-intensive nature of scheme operation. We would wish to see full consideration of detailed project-level proposals through Environmental Impact, Habitats Regulations and WFD assessment processes as applicable, and acceptance by the regulator of the monitoring, mitigation and (where relevant) compensation that would need to accompany scheme construction and operation. Desalination also consistently scores badly in customer surveys.	Southern Water is committed to delivering its Catchment First initiative, working closely with the Trust and other partners in identifying and delivering solutions. We will be adopting this approach in parallel with our proposed new resource developments including water reuse and desalination, as the timescales we have agreed in the s20 agreement require us to twin track our approaches to reduce the risks of needing to rely on drought permits and drought orders within the AMP8 period (2025-2030). Our assessment of desalination options has included the potential impacts of hyper saline discharge into the marine environment and the outcomes of this work, and the Environment Agency's response to it, has informed the selection of site options for desalination in our WRMP.	None.
Hampshire & Isle of Wight Wildlife Trust	48	More broadly, we welcome the production of the SEA, HRA and WFD assessments which accompany the dWRMP; few companies have provided so much environmental information. It is important that the SEA and other environmental assessment processes are used not only to screen out any options that would be entirely environmentally unacceptable, but also to identify the opportunities for mitigating any of the negative impacts identified for the options that are to be taken forward. For example, the company could consider the use of Sustainable Drainage to protect infrastructure that is vulnerable to flooding, could target catchment management to offset impacts upon water quality, and deliver climate change resilience (for example, drawing on initiatives such as 'Keeping Rivers Cool') to offset air and climate impacts. The implementation of mitigation beyond any legal minimum requirements would be well received, and is in line with the Ofwat 'Resilience Duty' and the best practice guidance contained in the EA and NE Water Industry Strategic Environmental Requirements (WISER) document.	Southern Water has included in its revised draft WRMP its commitment to a number of design principles for its supply enhancement options as set out in Annex 6 of the revised draft WRMP (and in the SEA, HRA and WFD Reports) that will inform the detailed design of schemes which includes seeking an overall net biodiversity gain in developing each scheme as far as possible, working in close dialogue with Natural England, Environment Agency and other stakeholders.	The relevant sections of the Technical Overview, and detailed annexes (Options Appraisal - Annex 6, SEA - Annex 13, HRA - Annex 14, WFD - Annex 15) have all been updated.
Hampshire & Isle of Wight Wildlife Trust	48	We note that the strategy for the Western Area as a whole contains the same 6 options for the latter half of AMP8 regardless of which 'future' is considered; this suggests that those options appear relatively certain (barring any changes that may be prompted by taking an increasingly regional approach), and so it would be prudent for the company to start engaging with stakeholders early (during AMP7) to discuss these AMP8 proposals. Late engagement with stakeholders whose permission may be required for the implementation of particular measures (for example, landowners over whose land a pipeline may cross), is a significant risk to timely delivery.	This is agreed. We are aware that a number of our schemes have long lead in times and we will need to investigate and promote a number of options within AMP7. We are committed to achieving the successful implementation of our preferred strategy for the Western Area, and we will investigate and promote in parallel alternative solutions where necessary to ensure that risks relating to delivery of any individual option are minimised and mitigated.	None.
Hampshire & Isle of Wight Wildlife Trust	48	In terms of limiting future abstraction, Blueprint for Water called for a water-neutral PR19, and as a whole the industry is expecting to put less water into distribution in England in both the short term and long term despite climate change and population growth. We note that Southern Water contribute positively to this action in AMP8 with their proposed plan enabling them to reduce the volume of water they take from the environment, but by 2045 six companies including SW predict more water input into distribution. We suggest that a 'towards water neutrality' Performance Commitment should be adopted by those companies as a bespoke environmental PC, in order to increase efforts to counter this trend.	Southern Water is not yet in a position to formally commit to a specific performance commitment relating to 'towards neutrality', however the company supports the principles of the approach and is willing to work closely with our environmental partners to explore how we can incorporate these into our policy planning. Since privatisation Southern Water has driven down its DI, and current levels are down to equivalent of 1970s.	None.
Hampshire & Isle of Wight Wildlife Trust	48	The company's involvement in Water Resources South East (WRSE) has contributed to the selection by both SW and Portsmouth Water of the development of Havant Thicket reservoir, which will help to provide solutions to regional water shortages, and enable the company to move away from the use of Drought Orders to increase abstraction from the River Itchen in times of drought. In the longer term, closer working between WRSE members could identify joint-funding opportunities for demand- or supply-side schemes that are currently not economically viable alone, and we welcome the potential closer working of WRSE companies in future. The proposed joint development of a shared water resource with South East Water is a good example of this, and such solutions may in future also allow reduced reliance upon drought measures on the River Test. The opportunity to engage other sectors such as agriculture in order to move towards multi-sectoral planning could also be embraced, learning from the experiences of the Water Resources East Group.	Southern Water will continue to actively work with neighbouring water companies through the Water Resources South East group to further enhance the benefits of joint working on all aspects of water resources management and strategic planning for the South East region, including promotion of water efficiency, the development of joint schemes or trading options as applicable and facilitating cumulative environmental assessment (for example in respect of cumulative landscape effects). As noted, our plan demonstrates the benefits of the WRSE group with several water trading and/or joint water resource scheme developments included in our strategies for each of our operating areas.	None.

Hampshire & Isle of Wight Wildlife Trust	48	Protect and restore catchments from source to sea In addition to the above measures, many companies plan to extend investment in catchment management and are considering a broader range of applications; not just protecting raw water quality (as is now well established through initiatives such as South West Water's 'Upstream Thinking'), but also working, with partners, to deliver schemes to increase catchment resilience. This indicates a (welcomed) recognition that the health of the natural environment underpins companies' operations, and must be protected. The Options Appraisal accompanying the company's dWRMP identifies the scope to work, through catchment management, not only on water quality issues (particularly nitrates and pesticides) but also on water quantity (highlighting the opportunity to build ecological resilience on the Test and Itchen rivers), and we welcome this broader interpretation of what catchment management can be. We hope the company will continue to involve partners, and Catchment Partnerships, in future delivery. Southern Water's catchment work to date, such as in Brighton, Worthing and Medway, has paved the way for 'Catchment First' which seeks to embed catchment thinking in all company activity (and particularly, the idea of 'improving our environment so it can provide and store more water naturally'). This is identified by the company as a transformational scheme which will help to build resilience, in line with Ofwat's priorities and aspirations for PR19.	The Trust's support for our Catchment First initiative is noted and welcomed and we are committed to working closely with the Trust and our other partners in taking forward this initiative.	None.
Hampshire & Isle of Wight Wildlife Trust	48	In better accounting for the value of the natural environment in future, a number of companies are starting to embrace natural capital accounting. This was identified as an area of interest by SW's stakeholders and regulators, with both keen that the company considers the value of water and of the natural environment. In response, the company are developing proposals for Natural Capital work focused around the development of 'catchment accounts' for three priority catchments, with metrics and visions to be jointly developed with stakeholders. The long-term goal is to integrate natural and social capital in Southern Water decision making. The company hope to develop a Performance Commitment on this for the coming AMP, and we suggest that this could seek to secure growth (or at least no decline) in natural capital in those catchments as a result of the company's activities. This activity could help to build the case for the resilience schemes that are to be delivered via Catchment First, and should be informed by the company's proposed integrated catchment monitoring work. We welcome this approach, which is a response to a 'gap' in the WRMP methodology around the value of environmental assessment. Furthermore, we hope that embedding these considerations during AMP7 will enable the company to then use them in decision making for PR24, ensuring that such wider considerations more fully influence the options selection process employed by the company for its water resources planning. For example, work to reduce leakage beyond the SELL may become more viable if accounting for the reduced abstraction from chalk streams that would result.	Southern Water will be producing a policy document to guide its future planning, which will incorporate natural capital accounting and we will work closely with our partners as we develop our policies and approaches. Natural Capital information relating to the WRMP has been utilised with our SEA. Southern Water has included in its revised draft WRMP its commitment to a number of design principles for its supply enhancement options as set out in Annex 6 of the revised draft WRMP (and in the SEA, HRA and WFD Reports) that will inform the detailed design of schemes which includes seeking an overall net biodiversity gain in developing each scheme as far as possible, working in close dialogue with Natural England, Environment Agency and other stakeholders.	The relevant sections of the Technical Overview, and detailed annexes (Options Appraisal - Annex 6, SEA - Annex 13, HRA - Annex 14, WFD - Annex 15) have all been updated to reflect the Inquiry outcomes and s20 agreement, and our commitments to design principles discussed with Natural England.
Hampshire & Isle of Wight Wildlife Trust	48	Finally, on the other PCs which will help shape delivery in AMP7, we understand that over 40 have been put forward to Ofwat, with others still in development. This is a relatively large number and covers a broad spread of issues. We are sighted on SW's proposals for environmental PCs and welcome the broad alignment with Blueprint for PR19 aspirations. Given the large number, we agree with the company's suggestion that these will be prioritised by scaling the financial rewards and penalties associated with them. On pollution events, whilst we welcome the proposals to improve compliance, we would prefer to see penalty-only incentives associated with such PC targets, believing that companies should not be financially rewarded for achieving (or, failing less badly to achieve!) legal compliance. We believe that rewards could be most transformative if associated with more innovative commitments such as Catchment First or Natural Capital.	Penalty-only incentives are generally not supported by customers in the research we have undertaken. Our research has shown little appetite for seasonal tariffs and so as an alternative, we are looking to reward customers for conserving water. The first scheme will be rolled out in Hampshire in partnership with Eastleigh Borough Council. The scheme will offer rewards to residents for recycling waste and reducing water consumption on a monthly basis. The scheme will be introduced in the Central area towards the end of AMP7 and in the Eastern area during AMP8.	None.
Hampshire & Isle of Wight Wildlife Trust	48	Some of these commitments relate to aspects not within the remit of Water Resources Management Planning, particularly those around waste water. However, it is worth raising here because investment secured through the WRMP process must complement investment in sewerage, and account must be taken in particular of where these elements of the business interact, such as where pollution events as a result of sewer capacity / misuse can impact abstraction sources, and where customer engagement around water efficiency could be usefully broadened to cover wider water management. In this regard we welcome the company's work on considering long-term drainage needs (such as Drainage 2030, mentioned briefly in the plan) and on awareness campaigns such as 'The Unflushables'.	The support for Southern Water's wider work, beyond the remit of the WRMP, is noted and welcomed.	None.
Hampshire & Isle of Wight Wildlife Trust	48	We hope that Southern Water are able to take our comments into account, along with those made by other Wildlife Trusts, and look forward to seeing these reflected in the company's Statement of Response and final Water Resources Management Plan when published.	The comments are noted.	None.

Appendix 7.20 - Arun & Rother Rivers Trust

Respondent	Reference no.	Response comment	SWS' Consideration of Response	Changes Required to dWRMP
Arun & Rother Rivers Trust (ARRT) - John Archer	52	We welcome the proposed reduction of abstraction through the development of alternative water resources. Any increase in river flows will provide a better basis on which we can build to achieve our objectives.	The Trust's support is welcomed.	None.
Arun & Rother Rivers Trust	52	We are particularly excited by the prospect of the Catchment First scheme, to manage catchments holistically to reduce demand on the natural water environment. We formed the Rother Valley Farmers Group (RVFG) two years ago as a farm cluster to negotiate Countryside Stewardship agreements with Natural England based on catchment-scale environmental improvement. In January 2018 we won funding for this for the next three years from Natural England's Facilitation Fund. We are grateful to Southern Water for providing interim funding that enabled the RVFG to develop in its initial stages. We now have a farmer group that we expect to continue in the long-term, comprising over 30 farming businesses covering some 8,000 hectares throughout the Rother catchment. RVFG members are committed to improving water quality and enhancing wildlife habitat in the valley as part of their commercial farming operations. Although originally intended to participate in Countryside Stewardship, the RVFG provides an excellent vehicle for future partnership working with other organisations. We look forward to working with Southern Water on Catchment First in the flagship Arun and Western Streams catchment and on the INTERREG-funded scheme for Payment for Eco-system Services specifically in the Rother.	Southern Water is keen to work with our catchment partners to identify the wider potential co-benefits of our catchment management schemes which have a primary focus on improving drinking water quality and/or enhancing environmental resilience of water bodies from which we abstract. As part of our commitment to achieving overall net environmental gain from implementation of our WRMP, we will actively work with our catchment partners to maximise benefits for biodiversity and society as a whole from our catchment management investment, adopting ecosystem services and Natural Capital assessment approaches in line with the Government's 25 year plan for the environment and Southern Water's wider Integrated Water Cycle Management approach. We look forward to continued close working with ARRT.	None.

Appendix 7.21 - Wessex Chalk Streams and Rivers Trust

Respondent	Reference no.	Response comment	SWS' Consideration of Response	Changes Required to dWRMP
Wessex Chalk Stream and Rivers Trust - Dr. A. Martijn Antheunisse	59	The Wessex Chalk Stream and Rivers Trust is delighted to use the opportunity to provide our representation on the recently published Draft Water Resource Management Plan for the area serviced by Southern Water for the period 2020-2070. We acknowledge that the WRMP is a very important tool to investigate and address water resource challenges across the south of England in the years ahead.	The comments are welcomed and noted.	None
Wessex Chalk Stream and Rivers Trust	59	WCSRT is an environmental charity formed in 2010 to protect the fragile and globally important chalk-based ecosystems of rivers in the region. The UK is home to around 85% of the world's chalk streams and the Trust's catchments of the Dorset Stour in the west, the Avon, the Test, the Itchen and the Meon in the east, contain many of the most iconic examples of this rare and important habitat. WCSRT forms part of the wider Rivers Trust movement that has been at the forefront of influencing policy and delivering catchment-wide environmental initiatives for over 20 years. This membership of the network of Rivers Trusts places WCSRT in an excellent position to shape and deliver action for these globally important and threatened habitats. The Trust is run by a Board of Trustees and has a six-strong team of full-time and part-time employees. WCSRT is the one of the two host organisations for the Test & Itchen Catchment Partnership and we are involved in the other catchment partnerships in the area. Due to our geographical remit, out representation is limited to the Hampshire area serviced by Southern Water.	The comments are welcomed and noted.	None.
Wessex Chalk Stream and Rivers Trust	59	We appreciate that Southern Water has drafted a WRMP that looks ahead 50 years, and not just the required 25 years. The water resource challenges the south-east of England is facing are not confined to just 25 years. We feel that the WRMP provides a holistic approach, proposing a wide range of measures and interventions to balance supply and demand. It acknowledges the need for a significant intervention in the Hampshire area that has probably been lacking from previous plans. We applaud the significant ambition in reducing PCC to 100 l/d by 2040 and a significant effort to reduce leakage. However, we could not identify the actual percentage in the Draft WRMP, and could therefore also not assess whether this complies with the 15% leakage reduction as set out in the 25 Year Environment Plan. A quantitative comparison is therefore difficult.	The Council's support for the Target 100 and leakage reduction measures set out in the draft WRMP are welcomed. Our draft WRMP set out a combined strategy of further active leakage control in the short term followed by mains replacement programmes in the medium to longer term to ensure that we continue our drive down on leakage by 15% by 2025. We have now increased this commitment in the revised draft WRMP, to seek to achieve a 40% reduction in our current leakage levels by 2040 and a 50% reduction by 2050.	No change as a result of these comments, however an increased commitment to leakage reduction is included within the revised draft WRMP as set out in Appendix C to Annex 6.
Wessex Chalk Stream and Rivers Trust	59	Catchment Management is proposed as an investment to further increase the resilience of vulnerable water resources (chalk streams and aquifers) to abstraction. Building resilience by working with partners is in itself a good thing, but it should be noted that only a very small part of the designated rivers is in favourable condition at the moment. Therefore, investments into river rehabilitation to reach this 'favourable' condition will be a necessity, before any additional abstraction can be allowed.	Southern Water is keen to work with our catchment partners to identify the wider potential co-benefits of our catchment management schemes which have a primary focus on improving drinking water quality and/or enhancing environmental resilience of water bodies from which we abstract. As part of our commitment to achieving overall net environmental gain from implementation of our WRMP, we will actively work with Natural England and our catchment partners to maximise benefits for biodiversity and society as a whole from our catchment management investment, adopting ecosystem services and Natural Capital assessment approaches in line with the Government's 25 year plan for the environment and Southern Water's wider Integrated Water Cycle Management approach. Southern Water invests in activities that relate to its ability to supply water for customers, which includes catchment management solutions. River restoration is considered to be a wider issue, however in the Western Area there is a commitment through the s20 agreement for Southern Water to fund a series of mitigation and compensation measures for the Rivers Test and Itchen, which fall into the river restoration category.	None, however the relevant sections of the Technical Overview, and detailed annexes (Options Appraisal - Annex 6, SEA - Annex 13, HRA - Annex 14, WFD - Annex 15) have all been updated to reflect the outcomes of the Hampshire Licence Inquiry and the s20 agreement.
Wessex Chalk Stream and Rivers Trust	59	It is disappointing to see that the only way to cope with water demand (in dry years) in the Hampshire Area over the next ten years will be through applying for drought orders to abstract quantities that will impact the fragile ecosystems of the rivers Test, Itchen and Candover. We urge Southern Water to start as soon as possible with implementing mitigation (and compensation) measures as agreed with the Environment Agency as outcome of the Water Abstraction Enquiry, to minimize the impact if we have to face droughts already in the next couple of years.	Following the Inquiry, a Section 20 Operating Agreement is now in place between the Environment Agency and Southern Water. The outcome of the Inquiry means that some sustainability reductions will be brought in with immediate effect once approved by the Secretary of State. This means that we will have insufficient supplies of water available in our Western area to supply our customers in all but normal environmental conditions. As soon as conditions become drier than normal, we will in the short term, have to impose temporary use bans and apply for Drought Orders to allow us to continue to abstract water below the conditions imposed in the new licences. Where Drought Orders are applied for, we will implement river restoration and habitat mitigation measures in potentially affected rivers in combination with Drought Orders. Our supplies to customers will remain at risk during the AMP7 period and into AMP8 until sufficient supplies are delivered. The extent of the deficit is such that we need to deliver large new resources and these will take time to deliver. We have committed through the s20 agreement to use all best endeavours to deliver these to the agreed timescales.	The relevant sections of the Technical Overview, and detailed annexes (Options Appraisal - Annex 6, SEA - Annex 13, HRA - Annex 14, WFD - Annex 15) have all been updated.
Wessex Chalk Stream and Rivers Trust	59	Southern Water proposes a number of (potential) investments to gain access to new water resources or improve the yield of existing resources. These include the import of water from neighbouring water companies, recycling of treated waste water and investing in a desalination plant. We fully support the proposal of Southern Water working together with Portsmouth Water to develop the Havant Thicket reservoir as a sustainable resource. We are hesitant to express our support for bulk imports from sources that are not as sustainable, such as using water being sourced directly or indirectly from chalk streams in neighbouring catchments. Southern Water should make sure that financial gains (for Wessex Water) by importing water from the Hampshire Avon catchment are fully re-invested in that catchment to increase its resilience. Recycling of used, treated water, either directly or indirectly makes a lot of sense, and we support this as an important option to improve the water resource situation, as long as water quality is sufficient and meets all ecological demands, and negative impacts on the river ecology will not occur.	General support for our WRMP is welcome, Southern Water will continue to actively work with neighbouring water companies through the WRSE group to further enhance the benefits of joint working on all aspects of water resources management and strategic planning for the South East region, including promotion of water efficiency, the development of joint schemes or trading options as applicable. Our plan demonstrates the benefits of the WRSE group with several water trading and/or joint water resource scheme developments included in our strategies for each of our operating areas. The environmental impacts of schemes to share water with neighbouring companies are considered within the SEA and HRA that supports our plan. This includes impacts from abstraction of water and the routeing of pipelines. Further work has been undertaken to review pipeline routes to avoid designated sites and sensitive habitats wherever possible, and justification for any sections that cannot be rerouted have been provided, together with proposed mitigation measures to minimise any adverse effects. We have specifically sought assurances from the source water company for each transfer included within our plan on the environmental impacts associated with the water being made available for transfer, and the degree to which any could be threatened through future licence changes. The information provided gives us confidence that they are reliable sources. A revised scheme has now been included in the revised draft WRMP, which is a joint scheme proposed by South West Water and Wessex Water as part of the West Country Water Resources Group work. The revised scheme involves a revised pipeline route that avoids the New Forest National Park and New Forest SAC, SPA and Ramsar sites. We have revised our environmental assessments in the SEA and HRA (and WFD) Reports to reflect the revised scheme. This indicates there would be no adverse effects on designated sites but that further revisions to the precise route of the pipeline may be required to avoid adverse effects on a number of Priority Habitats in a small number of locations along the pipeline route, or otherwise agree detailed mitigation and compensatory measures with Natural England during the detailed design phase. This will need to be informed by detailed environmental surveys along the pipeline route and ongoing dialogue with Natural England (and the Environment Agency where applicable). In line with other pipeline route options that have the potential to affect sensitive environments, Southern Water has included in its revised draft WRMP its commitment to a number of design principles as set out in Annex 6 of the revised draft WRMP (and in the SEA, HRA and WFD Reports) that will inform the detailed design of the scheme.	The relevant sections of the Technical Overview, and detailed annexes (Options Appraisal - Annex 6, SEA - Annex 13, HRA - Annex 14, WFD - Annex 15) have all been updated.

Wessex Chalk Stream and Rivers Trust	59	We have concerns about the validity of proposing a desalination plant as a mid-term solution to increase water supply in the Hampshire area. The environmental impact of desalination plants is significant: not just the carbon footprint through the energy demand of the SWRO process, but also the impact of the effluent on the Solent and associated coastal ecosystems. We feel there is more remit in further investment in reducing water use and recycling of water, and building a desalination plant should be considered as a last resort.	Our plan contains both supply side and demand side options (building on our already very high metering levels, for example). The company identified a range of alternative options in its Draft WRMP and we will continue to investigate these in parallel with any desalination option. However, the company faces some significant deficits that require us to look towards a mix of options. Our modelling undertaken on the draft WRMP indicates that under all potential futures we need to investigate in AMP 7, and then build in AMP8 a large desalination plant. We are committed to delivering the necessary infrastructure within the Western Area, as we agreed to in the s20 agreement following the Hampshire Licence Inquiry in March 2018. We will, as part of this work, be investigating and promoting alternatives in parallel with this to ensure that we will be able to meet the commitment to use all best endeavours to achieve this within the agreed timescales. We will need to undertake additional more detailed feasibility investigations and modelling, environmental assessment, preparation of planning documentation, and detailed design for our preferred and alternative schemes, and will look to work closely with the Trust in this work.	None
Wessex Chalk Stream and Rivers Trust	59	WCSRT is well known for it's engagement and education work in the area, as well as delivery of habitat restoration projects and works to improve surface (and ground) water quality by reducing nutrient and sediment inputs. We would welcome discussions with Southern Water and partner organisations to investigate opportunities for our organisations to work together to enhance water use efficiency, and further reduce the negative impact of abstraction and water quality issues on the chalk streams in the area.	We would welcome further engagement with the Wessex Chalk Streams and Rivers Trust, including in relation to water efficiency measures and on our catchment first, and river restoration proposals.	None

Appendix 7.22 - South East Rivers Trust

Respondent	Response no.	Response comment	SWS' Consideration of Response	Changes Required to dWRMP
South East Rivers Trust (Dr Bella Davies)	65	I write on behalf of the South East Rivers Trust in response to the consultation on Southern Water's draft Water Resource Management Plan (WRMP) 2020 - 2070. We welcome the opportunity to provide input to a very important process governing the future of water in the area covered by Southern Water.	Noted.	
South East Rivers Trust	65	The South East Rivers Trust (SERT) is an environmental charity dedicated to the restoration and enhancement of rivers and their catchments. Our vision is to achieve healthy river ecosystems for all across the South East of England by delivering outstanding river ecosystem enhancement through science-based action, collaboration, education and engagement. We are keen to work with you, Southern Water, to achieve our common aims.	Collaborative working with the South East Rivers Trust is welcome.	None.
South East Rivers Trust	65	SERT is part of the national Rivers Trust network and we work across 12 river catchments with over 200 Water Framework Directive (WFD) waterbodies as well as many other watercourses and aquatic habitats. SERT delivers the Catchment Based Approach (CaBA) and is involved in the hosting of 10 catchment partnerships, which bring together different stakeholders and partners to better understand the pressures and impacts on rivers and their catchments, and to plan and deliver solutions to ensure a more sustainable future for water. Southern Water provides both water supply and wastewater services within the region covered by SERT. We welcome the opportunity to be able to comment on the proposed WRMP and we are keen to provide key feedback and highlight concerns.	The context for the comments are noted.	None.
South East Rivers Trust	65	**The need for truly integrated regional planning** The South East of England is classified as 'seriously water stressed' by the Environment Agency (EA). Forecasts of population growth, increased urban development and climate change will exacerbate this already extreme situation. Consequently, there is a very urgent need for truly integrated water resource planning across the South East region, with all water companies working together. This is especially important regarding the outcome of a public inquiry called by the Secretary of State for the Environment which, in March 2018, resulted in a formal agreement to restrict the amount of water that Southern Water can abstract from iconic and internationally renowned chalk rivers, and in particular the Itchen and the Test. Whilst the six water companies in the South East do come together through Water Resources South East (WRSE) to strategically plan water resources, the WRMP process still results in each water company developing and producing plans that widely differ in stated delivery dates, ambitions and targets. Despite evident interdependence between the companies, forecasts of climatic and demographic change and individual company plans still appear to be developed in isolation with companies planning to different end dates.	Southern Water will continue to actively work with neighbouring water companies through the Water Resources South East group to further enhance the benefits of joint working on all aspects of water resources management and strategic planning for the South East region, including promotion of water efficiency, the development of joint schemes or trading options as applicable and facilitating cumulative environmental assessment (for example in respect of cumulative landscape effects). Our plan demonstrates the benefits of the WRSE group with several water trading and/or joint water resource scheme developments included in our strategies for each of our operating areas. The introduction of a statutory Regional WRMP, Regional Planning body and common methodology is a matter for Defra.	None.
South East Rivers Trust	65	SERT supports the need for mutual planning and joint decision making within WRSE. SERT would welcome (i) the introduction of a statutory requirement for regional WRMPs to ensure that a regional perspective is considered and (ii) the establishment of regional planning bodies that take customer and stakeholder representation into account. Even in the absence of a statutory requirement, the proactive and adaptive management philosophy of Southern Water clearly reveals a company that can lead the way towards consistency in joint planning to better address the many concerns that affect the water sector. For example, while we welcome the long term WRMP planning undertaken by each company, we are concerned that the individual isolated planning process may have resulted in an underestimate of the full impact of future requirements for water transfer between WRSE group companies.	We are committed to working as part of the Water Resources South East group, delivering benefits of joint working on all aspects of water resources management and strategic planning for the South East region, including promotion of water efficiency, the development of joint schemes or trading options as applicable. We are also working across regions and nationally as part of our existing networks, and looking to share experience and techniques across the industry, with government and with other key sectors.	None.
South East Rivers Trust	65	In addition, it is not clear whether common modelling methodologies have been used by WRSE group members in their plans. We understand there was a common starting point with modelling through WRSE but it appears that individual companies have then taken forward modelling WRMP options and scenarios separately. Modelling is an essential tool used to inform the timing and outcome of WRMP options under complex scenarios of change. Uncertainty, an inherent but quantifiable part of any complex modelling process, has a number of sources, ranging from forecasting method effects, to data quality, inaccuracies in measurements and modelling outputs. Uncertainty can differ greatly between models, but it can be quantified through uncertainty analyses and the results can be factored into modelling output to assess their reliability. We strongly urge the implementation of common methodologies, protocols and data sharing or pooling to better support regional decision-making, planning and co-operation. Without this, there is little chance of achieving truly sustainable, resilient and efficient water resource systems in a region where the situation is already critical. Therefore, whilst trading water with other companies in the WRSE grouping will be necessary to provide a resilient supply, we think it could be better planned. Equally, planning for possible futures should be tied in with other water companies better. Whilst a wide range of possible 'futures' may need to be modelled, it would be better to undertake this modelling continuously as predictions are updated, rather than only every five years. To make the modelling of a wide range of possible 'futures' useful for Southern Water, the business plan must have the flexibility to build in continuous modelling and adapt in response to it, rather than creating a rigid plan which is only updated every five years. Building in flexibility will also allow Southern Water to respond to the unforeseen opportunities that will inevitably arise within the five year planning cycle. This will allow the company to continue to be innovative, and is particularly important to tie in with other planning cycles that usually do not coincide with the timing of the Price Review process.	Southern Water will continue to actively work with neighbouring water companies through the Water Resources South East group,, to further enhance the benefits of joint working on all aspects of water resources management and strategic planning for the South East region, including promotion of water efficiency, the development of joint schemes or trading options as applicable. This includes sharing approaches and information on modelling and seeking to develop common approaches that can be adopted across the industry. We work with other companies not just as part of WRSE, but across the country. Our approaches to stochastic modelling, the use of real options, and future modelling have been industry leading. As noted, our plan demonstrates the benefits of the WRSE group with several water trading and/or joint water resource scheme developments included in our strategies for each of our operating areas.	None.
South East Rivers Trust	65	**Sustainable and Resilient Water Supply** Major drivers behind Southern Water's 2020-2070 WRMP are (i) important recent changes to the granting of EA abstraction licenses from chalk river systems and the groundwaters that feed them; and (ii) compliance with the European Union Water Framework Directive (EU WFD) to leave "more water in rivers and the ground to improve our natural environment". SERT is aware that the requirements of the WFD has meant that rivers and their catchments (and the communities within them) have enjoyed improving water quality, more resilient and more biodiverse habitats than without this far-reaching piece of EU legislation. Water companies are important beneficiaries of good quality and plentiful water. This is only attained sustainably through effective catchment management and we strongly encourage Southern Water to lead the way in applying a holistic and catchment-based approach through the Catchment First programme. We also strongly encourage Southern Water to vocally back catchment management and the Catchment Based Approach throughout the EU exit process to ensure that the targets set by the WFD stay on the government's agenda and continue to be fully implemented after 'Brexit'. Spatial dynamic patterns in population, regional climate and the distribution and availability of water resources and associated ecosystems underpin the WRMP objectives and aims for the Western, Central and Eastern areas served by Southern Water. Presently, Southern Water supply is overwhelmingly dependent on groundwater, followed by rivers, transfers and then reservoirs for water supply. Six water resource zones are totally dependent on groundwater supply and one is totally dependent on river water (Southampton West, Hampshire) for water supply. In other words, fifty percent of the water resource zones supplied by Southern Water currently depend on a single type of water source. The Hampshire and Isle of Wight areas served by Southern Water appear to be more vulnerable to water shortage and will be subject to more frequent drought actions compared to other areas served by Southern Water. Consequently, enhancing resilience of supply as well as resilience of the environmental systems on which supply is dependent, is of utmost importance.	The support for our Catchment First approach is noted and welcomed and we look forward to working with the Trust and our other partners and stakeholders in implementing catchment solutions across our supply areas. The licence changes already proposed, and potential additional licence changes we may face during the plan period have been incorporated into our forecasts and are a key influencer on the scale and location of new water resources infrastructure within our plan. We have an existing network of connections between WRZs that we plan to increase during the plan period, coupled with new connections with neighbouring companies enabling us to share water resources where environmentally appropriate. All of this, together with our plans for our own new water resources and Target 100 initiative, leakage reduction and increased metering will make our water resources system more resilient to the uncertain futures we face.	None.
South East Rivers Trust		Use of water restrictions is highlighted as potentially being needed every 10 years, and more frequently in the first instance in some areas. The frequency of needing to employ water restrictions is rather alarming and indicates either poor planning and anticipation of demand in previous WRMPs, or a lack of new infrastructure being built quickly enough, or both. Clearly Southern Water needs be investing in new water sources with urgency but must also employ new measures and approaches and think innovatively about how to increase resilience in the round. This presents an opportunity for Southern Water to become leaders in their field which the company should most certainly strive towards. Water restrictions should only be used as a last resort and can be helpful in highlighting the extremity of the issue to customers. If they are employed too frequently, they will lose their effectiveness. Environmental impact (as an alternative to water restrictions) is completely unacceptable and should not be a last resort, it should never happen.	Southern Water would not accept the suggestion that the likely need for water restrictions is as a result of poor planning or lack of investment in new infrastructure. In the Western Area we face a period of higher risk of restrictions whilst we develop new long term resources, with the need for these arising from a number of licence changes proposed by the Environment Agency. We have accepted the introduction of these changes, and agreed a comprehensive s20 agreement with the Environment Agency that commits both parties to a series of actions during the period whilst new resources are planned and delivered. Our forecasts identify that there is a risk of further licence changes in the future, and our future forecasts take account of this uncertainty in modelling appropriate solutions that will protect both the environment and supplies to customers. We will continue to plan to respond to the challenging future we face, through our WRMP and Drought Plan processes, working closely with partners and other stakeholders.	None
South East Rivers Trust		The WRMP presents a set of schemes to increase water supply and SERT is particularly supportive of the Target 100, Catchment First and Resource Hub initiatives. New water sources must be sought with urgency and Southern Water should look to deliver multiple benefits that enhance the natural capital of their region in the choices they make. Water recycling from waste water may have a role to play in securing future water supplied but this should be fully investigated and only proceed if it provides positive environmental benefit. SERT is less supportive of desalination at this time given the resource intensive nature of the process. We also encourage Southern Water to talk to neighbouring water companies where customer support for desalination options differed substantially.	The comments are noted and welcomed. Southern Water is committed to Target 100, leakage reduction, Catchment First, and to sharing resources with other companies and our draft and revised draft WRMPs reflect this. We are also committed to investigating and promoting higher technology solutions such as desalination and water re-use as part of our longer term solutions, and as part of developing a resilient water resources network for the future.	None

South East Rivers Trust	65	The use of renewable energy should be a priority and Southern Water should match the targets of other water companies, where 100% of energy used from renewable sources has already been achieved. The WRMP presents innovation in the context of renewable energy but Southern Water should be considering innovation in everything it does, not just with respect to energy provision. Innovation must be taken in the context of UK, or preferably global, innovation not just something that Southern Water hasn't previously undertaken but is already standard in other water companies. SERT welcomes Southern Water's long term investment in sustained customer engagement in the planning process to assess and discuss schemes to provide water. We strongly support the Catchment First approach and recommend that it should be fully backed and invested in by Southern Water. This should be a priority and Southern Water should not be afraid to work with partners to deliver benefits on third party land. A resilient and sustainable water future cannot be achieved by Southern Water on its own and this needs to be recognised throughout all levels and departments of the company. Southern Water must embrace partnership working and invest in it, backing other organisations and sectors who can bring about sustainable change that benefits Southern Water customers and society. We fully support the inclusion of catchment approaches in all of the area strategies for the next AMP. However, we would encourage Southern Water to roll the approach out further, ideally in the next AMP but with the understanding that it can take some time for approaches to be developed. Southern Water must work with neighbouring water companies, particularly where resources are shared, to ensure that innovative catchment delivery is implemented across water company boundaries. Catchment management needs to be delivered at the catchment scale and Southern Water must take the bold step of backing holistic catchment management rather than focusing on single issues such as metaldehyde. Good catchment management will be crucial to securing a resilient future for water resources.	In terms of innovation we need to embrace new technologies where they deliver solutions that are cost effective and benefit the environment. This will extend beyond, but include renewable energy. Southern Water is keen to work with our catchment partners to identify the wider potential co-benefits of our catchment management schemes which have a primary focus on improving drinking water quality and/or enhancing environmental resilience of water bodies from which we abstract. As part of our commitment to achieving overall net environmental gain from implementation of our WRMP, we will actively work with our catchment partners to maximise benefits for biodiversity and society as a whole from our catchment management investment, adopting ecosystem services and Natural Capital assessment approaches in line with the Government's 25 year plan for the environment and Southern Water's wider Integrated Water Cycle Management approach.	None
South East Rivers Trust	65	**River systems in the South East: addressing abstraction and flow** The Trust recognises Southern Water's efforts to invest in alternative sources of water supply, following the result of the public enquiry to reduce abstraction from the world renowned chalk rivers Test and Itchen. However, it will be necessary to consider the potential impacts of the measures listed in Southern Water's WRMP on all chalk rivers and streams. Only 200 chalk rivers and streams exist worldwide: they are globally rare, protected habitats with high aesthetic value. Their clear, chalk-filtered waters support a wide variety of wildlife and recreation activities. The manifestly important role of chalk rivers in the well-being of Southern Water's customers, via the provision of natural capital and multiple benefits, implies a duty of care by Southern Water to protect and enhance these unique habitats for future generations. SERT supports Southern Water's strategy (from 2020 – 2025) to undertake "work to improve the Test and Itchen Rivers" but strongly encourages Southern Water to specify, and involve external partners in, the proposed measures that the improvement work will involve. However, we note that Southern Water plans to increase river abstraction from 23% to 30% of total supply by 2070. This 7% increase will be supported by a series of measures, many of which rely on the Itchen, Test and Candover, as well as other river systems such as the Rivers Rother, Yar, Arun and the Avon. Southern Water intends to apply for drought orders on the Rivers Test and Itchen, Candover groundwater source (2020 - 2030) and the River Rother (2020 – 2025) to continue abstracting water in "dry weather". Recent updates on the situation for drought orders indicate that new restrictions have been agreed but are yet to be ratified.	We will undertake an 'Instream Catchment Resilience Scheme' option as part of the Catchment First initiative where the benefit is assumed to be the offsetting of part of the potential future sustainability reductions in the Test catchment, for example from the AMP6 Andover NEP scheme. This will involve collaborative working with a number of external partners. Following the Inquiry, a Section 20 Agreement is now in place between the Environment Agency and Southern Water, subject to Secretary of State approval. The outcome of the Inquiry means that some sustainability reductions will be brought in with immediate effect. This means that we will have insufficient supplies of water available in our Western area to supply our customers in all but normal environmental conditions. As soon as conditions become drier than normal, we will in the short term, have to impose temporary use bans and apply for Drought Orders to allow us to continue to abstract water below the conditions imposed in the new licences. Where Drought Orders are applied for, we will implement river restoration and habitat mitigation measures in potentially affected rivers in combination with Drought Orders. Our supplies to customers will remain at risk during the AMP7 period and into AMP8 until sufficient supplies are delivered. The extent of the deficit is such that we need to deliver large new resources and these will take time to deliver. We will seek to deliver these in a timely manner and in consultation with key stakeholders. The stated 7% increase in abstraction is not, in fact an increase in the level of abstraction from rivers. It is a change to the proportion of our supplies secured from these sources.	None as a response to these comments, however the proposals for the Western Area have been updated in the revised draft WRMP, as set out in section 7.3 of the Technical Overview and Annex 9.
South East Rivers Trust	65	We have several observations to make on these specific measures. First, the use of the term "dry weather" as a justification to apply for drought orders is vague and misleading, i.e. no clear reference to drought conditions is made in these statements. Further, there are inherent sources of uncertainty associated with modelling that originate from forecasting methods and inaccuracies in measurements and modelling outputs. These sources of uncertainty, which must be taken into account and explained to stakeholders and customers, can potentially influence the predictive capacity of the stochastic modelling methods that have been used to underpin the timing and order of WRMP, including abstraction resulting from drought order applications. SERT urges Southern Water to exploit less vulnerable, valued and protected ecosystems and continue to explore alternative sources of water for future water supply.	The WRMP is one part of our detailed planning undertaken to seek to protect the supplies to customers and the environment. The Drought Plan provides detailed proposals over a five year period for how we plan to prepare for and manage supplies during drought events. We published a draft of our revised Drought Plan earlier this year for consultation and have submitted our Statement of Response to Defra. We are currently awaiting the Secretary of State's decision on our plan. We have expanded the information and commitments in the Drought Plan on monitoring, mitigation and where necessary compensation for the environment in relation to potential drought actions we may need to take. We are working closely with our partners on these measures, and particularly within Hampshire where the likely need for drought measures is higher in the short term as a result of planned licence changes for the Test, Itchen and Candover boreholes. Southern Water is committed to investigating and promoting alternative sources of supply, and also to actively promote water efficiency measures through out Target 100 initiative, and to tackle leakage. Since the publication of the draft WRMP in which we committed to reducing leakage by 15% by 2025, we have now committed to go further in seeking to achieve a 40% reduction on current leakage levels by 2040 and a 50% reduction by 2050.	None as a response to these comments, however the proposals for the Western Area have been updated in the revised draft WRMP, as set out in section 7.3 of the Technical Overview and Annex 9.
South East Rivers Trust	65	Since Southern Water deals in both water supply and wastewater treatment, it proposes to use recycled water from wastewater treatment works to increase flows in selected river systems (Eastern Yar, Itchen and Western Rother) to subsequently abstract and clean for drinking water. SERT is concerned about the potential ecological impacts of these recycling schemes and strongly advises Southern Water to monitor for potential change in the physicochemical characteristics of the rivers receiving recycled water. For example, several migratory species found on the Itchen may be affected by changes in associated habitats along these river systems (e.g. such as wetlands and riparian galleries) that may be impacted by changes in flow and/or nutrient levels. Southern Water also plans to use recycled water to "increase water in the environment". Again, this is a very vague statement that lacks any specific detail on the methods that Southern Water intends to use to meet this objective.	Southern Water has undertaken extensive investigation of potential water recycling or reuse options during the last decade, both in terms of the potential locations where such schemes may be appropriate, the potential customer issues relating to recycling water for reuse, and the technical and environmental challenges that such options pose (including physiochemical challenges). We have completed sufficient investigation and assessment work to provide the confidence that such schemes are acceptable in principle, but further more detailed investigations and assessments will need to be undertaken as part of the preparation and determination of necessary consents. We look forward to working with the Trust and other partners and stakeholders on the details of these schemes.	None
South East Rivers Trust	65	The Catchment First initiative highlights Southern Water and Southern Water's customer awareness of the importance an overarching catchment based approach to address environmental issues. "Catchment Management" is the second most popular customer choice for potential water provision schemes proposed by the company. An estimated 25% of Southern Water customers are members of Blueprint for Water organisations which strongly support a catchment based approach. Catchment Management is a priority measure across all of Southern Water's scenario (more to less challenging scenarios) based planning. SERT actively encourages a catchment based vision since it the supports the Catchment Based Approach we use to engage people and groups to help improve water environments. However, we feel that more detail on specific Catchment Management measures such as Catchment Sensitive Farming methods and the use of green and blue infrastructures in the landscape should be provided.	Southern Water is keen to work with our catchment partners to identify the wider potential co-benefits of our catchment management schemes which have a primary focus on improving drinking water quality and/or enhancing environmental resilience of water bodies from which we abstract. As part of our commitment to achieving overall net environmental gain from implementation of our WRMP, we will actively work with Natural England and our catchment partners to maximise benefits for biodiversity and society as a whole from our catchment management investment, adopting ecosystem services and Natural Capital assessment approaches in line with the Government's 25 year plan for the environment and Southern Water's wider Integrated Water Cycle Management approach.	None

South East Rivers Trust	65	SERT is very concerned over Southern Water's scheme to supply the Hampshire and the Isle of Wight regional grid via new water supply from the River Avon that will be piped through the New Forest. Over 200 km of the Hampshire Avon, which supports a world renowned Atlantic salmon fishery, is a designated Site of Special Scientific Interest (SSSIs). The Avon catchment contains Areas of Outstanding Natural Beauty, Environmentally Sensitive Areas, Special Areas of Conservation and several National Natural Reserves. This swathe of designations highlights the remarkable biodiversity value supported by the Avon river system. Bournemouth Water, Southern Water's neighbouring company, serves just under half a million customers by abstracting approximately 75% of its water supply from the Rivers Avon and Stour, followed by groundwater abstraction (≈ 25 %). We believe that diverting even larger quantities of water from an obviously valuable lowland river system will have serious deleterious effects on processes that are fundamental to maintaining ecosystem integrity and function, including both surface and groundwater water quality and water quantity. We urge Southern Water to procure alternative sources for water supply, continue dialogue with other water companies and use findings from modelling and research on the Hampshire Avon to appreciate the consequences of further diminished flow on this prized river system. We advocate that this option should not go forward if it has an ecological impact.	Environmental impacts of schemes to share water with neighbouring companies is considered within the SEA and HRA that supports our plan. This includes impacts from abstraction of water and the routeing of pipelines. Further work has been undertaken to review pipeline routes to avoid designated sites and sensitive habitats wherever possible, and justification for any sections that cannot be rerouted have been provided in the documents supporting our revised draft WRMP, together with proposed mitigation measures to minimise any adverse effects. A revised scheme has now been included in the revised draft WRMP, which is a joint scheme proposed by South West Water and Wessex Water as part of the West Country Water Resources Group work. The revised scheme involves a different source of water and a revised pipeline route that avoids the New Forest National Park and New Forest SAC, SPA and Ramsar sites. We have revised our environmental assessments in the SEA and HRA (and WFD) Reports to reflect the revised scheme. This indicates there would be no adverse effects on designated sites but that further revisions to the precise route of the pipeline may be required to avoid adverse effects on a number of Priority Habitats in a small number of locations along the pipeline route, or otherwise agree detailed mitigation and compensatory measures with Natural England during the detailed design phase. This will need to be informed by detailed environmental surveys along the pipeline route and ongoing dialogue with Natural England (and the Environment Agency where applicable). In line with other pipeline route options that have the potential to affect sensitive environments, Southern Water has included in its revised draft WRMP its commitment to a number of design principles as set out in Annex 6 of the revised draft WRMP (and in the SEA, HRA and WFD Reports) that will inform the detailed design of the scheme (see section XXXX of Annex 6). We have investigated the reliability of the water that could be supplied through this scheme with the providing water companies and they have provided assurances that water would be available in environmental conditions up to a 1:200 year event. This also takes account of known potential licence changes or environmental constraints on sources within the providing water companies.	The details of the schemes have been amended to reflect the new approach put forward by South West Water and Wessex Water, and the relevant parts of the SEA, HRA and WFD all updated as a result. See Annexes 14, 15 and 16 of the revised draft WRMP.
South East Rivers Trust	65	In the Eastern Area we support the increase of height in Bewl Water reservoir subject to no negative impacts on associated rivers and the immediate implementation of better, more effective mitigation measures to restore more natural flow regimes and habitat on river reaches downstream of the reservoir.	Whilst the potential increase in the height of Bewl reservoir by 0.4m was included within the draft WRMP, following further investigation and re-modelling for the revised draft WRMP, the Bewl raising option does not now form part of the preferred plan. Part of the reason for this is Southern Water's additional commitments to leakage reduction, but also as a result of new information from neighbouring water companies that indicates they would be likely to need less water from Southern Water in the future than was anticipated in the draft WRMP.	None in response to these comments but the preferred plan for the Eastern Area has been updated in the revised draft WRMP, as set out in Section 7.1 of the Technical Overview and in Annex 11.
South East Rivers Trust	65	**Working in Partnership** The Catchment Based Approach (CaBA) enshrines collaborative working at a river catchment scale to deliver cross-cutting improvements to water environments. This process is dynamic, often leading to additional outcomes and action beyond each partner's investment and participation. A recent review found for every £1 directly invested by the government, CaBA partnerships raised £8.63 from non-governmental funders, including grant giving bodies, EU funds, volunteer value, as well as water company investment. This indicates a financial benefit from partnership-delivered projects as well as many other non-monetary benefits. SERT hosts seven catchment partnerships falling within the Southern Water supply or wastewater service area. SERT recognises Southern Water's work in partnership with landowners, environmental organisations and local authorities at catchment scale to manage land use and work toward effective nitrate removal schemes to protect its water supply aquifers and fully anticipates the development of future partnerships in the management of other aspects of the integrated management of its water resources and environment.	Southern Water is keen to work with our catchment partners to identify the wider potential co-benefits of our catchment management schemes which have a primary focus on improving drinking water quality and/or enhancing environmental resilience of water bodies from which we abstract. As part of our commitment to achieving overall net environmental gain from implementation of our WRMP, we will actively work with Natural England and our catchment partners to maximise benefits for biodiversity and society as a whole from our catchment management investment, adopting ecosystem services and Natural Capital assessment approaches in line with the Government's 25 year plan for the environment and Southern Water's wider Integrated Water Cycle Management approach.	None.
South East Rivers Trust	65	**Concluding Remarks** This letter has been written in response to Southern Water's draft Water Resource Management Plan for 2020 – 2070. Southern Water is a major provider of water and wastewater in the UK and should lead the way in securing resilient water supplies through a holistic, collaborative, coordinated and catchment level approach to environmental stewardship. The South East Rivers Trust strongly supports Southern Water's actions to engage customers and stakeholders with water resource planning. We encourage Southern Water to develop water resources that do not rely on, or impact on, the globally rare chalk stream habitats in the South East of England. We strongly support and endorse the Catchment First initiative and encourage Southern Water to embrace this approach and roll it out further, working with a range of partners as the approach requires. The Trust would very much like to be involved in developing solutions with Southern Water. In particular we would like to be part of catchment management approaches and community schemes to save water and we are experienced in delivering both of these initiatives. Delivering sustainable solutions for a resilient future for water requires many actors to play their part in this common goal. We look forward to working with and alongside Southern Water to secure a healthy future for water and our rivers.	The comments are noted and welcomed and Southern Water looks forward to working with the Trust as it seeks to further investigate and promote the schemes in the preferred strategy, and as we pan for future WRMPs.	None.

Appendix 7.23 - Canal & Rivers Trust

Respondent	Reference no.	Response comment	SWS' Consideration of Response
Canal & Rivers Trust - Darren leftley - Head of Commercial Water Development	39	We are writing to share our views on the Southern Water Draft Water Resources Management Plan 2019 (dWRMP19), published on 5th March 2018. This response is submitted on behalf of the Canal & River Trust (the Trust). We believe the Trust can play a significant role supporting the water sector as it strives for resilience and affordability in delivering public water supply. Our waterway infrastructure already exists and with investment from the sector could unlock resilient and cost-effective water transfer schemes across England and Wales. We recognise the issues that are putting pressure on the water resources in the South East of England and have been engaged with the Water Resources South East (WRSE) group to identify how we can support strategic water supply options into the region, both now and into the future. Although our existing waterways do not extend into Southern Water's supply area, we have been working with both Affinity Water and Thames Water through the dWRMP19 process, to develop resilient water transfers that will ultimately benefit customers in the South East of England. We are encouraged to see canal transfer schemes included in both of their dWRMP19 preferred plans.	The comments on the scope of the response and the area of CRTs interest are noted and welcomed.
Canal & Rivers Trust	39	**Canal & River Trust** The Trust is a registered charity, formed in 2012 to care for 2,000 miles of working canals and river navigations, docks and reservoirs across England and Wales. Our vision is for living waterways that transform places and enrich lives. The inland waterway network in our care is one of the finest examples of working industrial heritage in the world. As well as canals and rivers, it includes 72 reservoirs, four inland ports, along with hundreds of bridges, aqueducts, tunnels, embankments and important wildlife sites. Built over two centuries ago to enable the Industrial Revolution, it comprises the third largest collection of listed buildings in the country, 49 scheduled ancient monuments, two museums and five World Heritage Sites, one of which we manage directly. The nation's inland waterways are one of the UK's largest free-to-access cultural spaces, visited by an estimated 20 million people each year, generating nearly 396 million visits in aggregate and with circa 4.3 million people visiting regularly. Analysis of the 2011 Census indicates that over eight million people live within one kilometre of a waterway owned and managed by the Trust in England and Wales (representing 14.5% of the total population for England and Wales); this population is reflective of the diverse nature of communities in the UK. This extensive waterway network provides the Trust with an immense potential reach, in both geographical and demographic terms. We work in partnership with others to support the health and wellbeing of millions of local people, offering sustainable routes which connect communities and providing access to learning and education for thousands of children and young people. We license and support boating on our waterways, as well as promoting a wide variety of other uses from canoeing and angling to freight movement and renewable energy. We work extensively with private, public and voluntary partners to conserve, enhance and improve our waterways. We believe that our expertise and responsibility for water space, combined with the ownership of docks, canals and waterside properties, puts us in a unique position to facilitate redevelopment for economic, social and environmental gain. The Trust is proactive in utilising its property assets and joint venture vehicles to bring forward land to deliver regeneration, wider benefits to the community and to attract private sector investment. As a charitable body, all the net rental income and capital receipts generated from our property estate and other commercial activities are used to maintain the waterways. Importantly for the water sector, the Trust has an extensive track record of managing raw water transfers for public water supply. For many decades, we have and continue to provide resilient water transfers of up to 245 Ml/d for Bristol Water, United Utilities and Wessex Water. Water transfers along our network can support several other business sectors including the energy sector, agricultural sector, housing sector, construction sector, pharmaceutical sector and manufacturing sector. The water transfers can also support low carbon energy for heating and cooling.	The comments on the role that CRT plays in managing waterways, including in relation to water supply are noted and welcomed.
Canal & Rivers Trust	39	We consider that the waterways have much greater potential to support the water sector in delivering affordability and resilience to its customers. Given our existing waterway network there is already substantial infrastructure in place which crosses several water company areas including: • Anglian Water; • Thames Water; • Affinity Water; • South Staffs Water; • United Utilities; • Yorkshire Water; • Severn Trent Water; • Bristol Water; and • Wessex Water. The attractiveness of using our waterways for water transfers is that the infrastructure already exists and only needs upgrading to transfer more water. In many cases the infrastructure upgrades will be on the Trust's land minimising the costs of dealing with several landowners and potentially, lengthy planning disputes.	The comments on the extent to which CRT works with water companies are noted and welcomed.
Canal & Rivers Trust	39	**Canal & River Trust Approach to WRMP19** During AMP6, and in the spirit of the Environment Agency (EA) Water Resource Planning Guidelines, the Trust has been proactive in engaging with many of the water companies to explore the options to transfer water using the canal network to meet resource shortfalls under different demand scenarios including drought. We support this approach and will continue to work with the water companies to develop resilient and cost-effective schemes in the future. We note that, while we have had detailed discussions with some water companies to identify potential schemes, there is a perceived complexity of a canal transfer and uncertainty over how commercial terms between water companies and a third party will work. We have raised these concerns with Ofwat and have been reassured that these issues should not be taken into consideration when potential schemes are evaluated. In 2016, a joint study was commissioned by the Trust and five neighbouring water companies, to investigate the feasibility of a range of collaborative canal transfer schemes that could have multiple beneficiaries and could be utilised as both in supply-demand and/or drought options. The report issued by consultants Black & Veatch (B&V) highlighted the associated costs involved in canal transfers for three flow scenarios, namely 50, 100 and 200 Ml/d. In 2017, the Trust requested an addendum to the study to include another flow scenario at 75 Ml/d and to utilise a more refined hydraulic gradient in their transfer calculations. B&V subsequently concluded that the requirement for bank raising and bridge modifications were significantly reduced for transfers up to 100 Ml/d. We included the indicative costs associated with the WRMP19 canal transfer schemes discussed specifically with Affinity Water and Thames Water in our proposals for their consideration and evaluation.	The comments explaining the research that CRT has undertaken, and the input to WRMPS being prepared by Affinity and Thames Water are welcomed.

Canal & Rivers Trust	39	**Conclusion** It is the Trust's opinion that Southern Water have produced a draft plan that highlights the issues they face and how they plan to address them. The Trust will continue to work with the WRSE group to help develop strategic options to ensure cost-effective and resilient water supply options that will benefit Southern Water and their customers. We look forward to continuing to develop these options further with the WRSE regional group.	The Trust's support for our approach is welcomed, and we look forward to working with the Trust through WRSE and on any individual proposals that may be identified for the future.

Appendix 7.24 - South West Water

Respondent	Reference no.	Response comment	SWS' Consideration of Response	Changes Required to dWRMP
South West Water - Rob Scarrott (Head of Environment and Upstream Markets)	70	I am writing to provide a consultation response to Southern Water Service's (SWS) draft Water Resources Management Plan. Thank you for offering South West Water (SWW) the opportunity to comment.		
South West Water	70	Both SWW and SWS included a potential bulk transfer from the Bournemouth supply area to the Southern Water network in their draft WRMPs. SWS's plan implements the transfer in the 2035-39 period following other investments. In our plan we signaled it as available from the earliest start date i.e. in the 2025-2030 period. The date in the SWS plan does not have a significant effect on any other decisions in our plan. A transfer is however complex and there is a need to further refine our understanding of the details of it. In particular agreeing the final volume of water available, the timescale of this availability, and the reliability of the supply under different drought conditions.	We welcome South West Water's response and confirmation that it could make a bulk supply available to Southern Water during the period 2025-2030. We have since received further information from the West Country Water Resources Group on the volume, timing and reliability of a bulk supply from South West Water (Bournemouth WRZ) and we will continue liaising with this group as we finalise our revised draft WRMP to confirm the option and ensure it is represented consistently in both our revised draft WRMPs	Annex 6 will be updated to reflect the work of the West Country Water Resources Group to help identify bulk supply options. Options will be updated and reflected in option fact files, WRP tables and all documents describing the strategies (Annex 9, Technical overview report)
South West Water	70	To improve our understanding, SWW commissioned Atkins to undertake a study to further develop the transfer options between the Bournemouth water resource zone and SWS's supply area, along with options that would allow us to make Wessex Water's surplus available to you via transmission through our network. We wish to offer our thanks to SWS for the assistance provided to our contractors as they undertook this study. We were pleased to be able to share the findings at the West Country Water Resources Group meeting, held on 22nd May 2018, and will be happy to provide the information SWS requested to allow them to include the findings in their final WRMP.	We very much welcome the further work undertaken to identify opportunities for bulk transfers from both South West Water and Wessex Water and were pleased to receive a technical note summarising the outcome of this work. We have since had further positive discussions with South West Water and look forward to working with them closely as we finalise our respective WRMPs to ensure bulk supply opportunities are fully explored.	Annex 6 will be updated to reflect the work of the West Country Water Resources Group to help identify bulk supply options.
South West Water	70	By the end of 15th June 2018 we will provide the following information to SWS: • The volume of water that we forecast will be available from the Bournemouth water resource zone. • The dates from which this water will be available. • Our estimate of the reliability of a transfer under different drought conditions. • The preliminary scheme costing data from the Atkins study. We will be happy to provide other information should it be required.	This information has been received and used to refine the bulk supply option we are including in the investment modelling being undertaken for our revised draft WRMP. It highlights there are some uncertainties still around the environmental sustainability of available supplies with respect to WFD risk of deterioration and we want to work with the company to help resolve these as soon as possible	The bulk supply option from South West Water has been updated in light of the new information provided. This will be reflected in option fact files, the WRP tables and all documents describing the strategies (Annex 9, Technical overview report)
South West Water	70	We look forward to working further with SWS, and the other members of the West Country Water Resources Group, to continue to develop bulk transfer options.	Noted	None required

Appendix 7.25 - Affinity Water

Respondent	Reference no.	Response comment	SWS' Consideration of Response	Changes Required to dWRMP
Affinity Water - Mike Pocock - Director of Asset Strategy	36	Thank you for the opportunity to comment on Southern Waters' Draft Water Resources Management Plan 2019 (dWRMP19). Further to the submission of the Southern Water Services (SWS) dWRMP19 and our submission, we have had the opportunity to review the relevant transfer options with respect to alignment between our two plans.	We thank Affinity Water for responding to our draft WRMP19 consultation and commenting on how we have represented the transfer options between the two companies.	No change required
Affinity Water	36	We believe the following to be a correct appraisal of the alignment on transfers between our dWRMP19 submissions. Southern Water list two shared options with Affinity Water: • An import from Affinity Water at Napchester (0.1Ml/d) • An export to Affinity Water at Deal (0.07Ml/d) The Affinity dWRMP19 aligns with what SWS have included: • The Napchester Import (AFF export) as 0.1Ml/d throughout the planning period as a continuation from 2020/21 onwards The Affinity dWRMP19 only partially aligns with one transfer: • Deal Export is stated in both plans as 0.07Ml/d from 2020/21. Affinity Water assumed this 0.07Ml/d was the maximum possible volume throughout the planning period and has included it as such • Whereas Southern Water state this export would rise to 2Ml/d in 2024 and again to 4Ml/d in 2029	We agree with how Affinity Water has set out how we have represented the two shared options in our draft WRMP19. This highlights there is a difference in how we and Affinity Water have represented the Deal export (from Southern to Affinity) from 2025/26 onwards. We are in dialogue with Affinity Water to ensure this is resolved so that our revised WRMPs are consistent in how they represent this transfer.	The Deal Export transfer will be amended if necessary from 2025/26 onwards and this will be detailed in Table 1 of Annex 5 which describes all the existing bulk supply options that we have.
Affinity Water	36	Annex 1 & 2 provides a screenshot of the inclusion of the deal option and then the maximum utilisations for both shared options from within the SWS dWRMP19. We therefore believe the dWRMP19 submissions are aligned (with the exception of Deal post 2024), which requires alignment ahead of the revised plan submission.	See above	See above
Affinity Water	36	We also note the following text within the SWS dWRMP19: ■ Three groundwater source options included in the Affinity Water draft paln feasible list would involve increased abstraction from the East Kent Chalk - Stour WFD groundwater body, resulting in possible cumulative effects with the West Sandwich and North Deal licence variation. This could lead to cumulative adverse effects on the quantitative status of the WFD groundwater body and will require further investigation should Affinity Water include the groundwater schemes in its draft plan strategy.	See below	See below
Affinity Water	36	Can SWS please provide further details on specifically which groundwater source options are being highlighted as relevant to this observation and we will address the concern within a response in our cumulative SEA process. As part of this communication could SWS also indicate whether this concern has been raised as part of the WRSE cumulative SEA assessment, which Affinity have used as part of our own SEA cumulative assessment. We confirm that at this time no other related transfers between the two companies have been identified as required within any of the plans that are presented within the Affinity Water dWRMP19 for consultation. In order to make sure both sets of WRP tables align ahead of the revised plan submissions we propose to provide SWS with our utilisations ahead of inclusion within our revised plan, this summer (2018). We hope this is acceptable, and look forward to continuing with this dialogue.	The three Affinity Water groundwater source options we refer to in Annex 14 (SEA non-technical summary) are Cow Lane upgrade, Lye Oak licence variation and Tappington South licence variation. These were detailed in Annex 16 (WFD main report) of our draft WRMP. We are liaising with Affinity Water to understand potential cumulative impacts of these options with our own West Sandwich and North Deal licence variation options in our revised WRMPs and this will depend on whether these options are selected in our respected revised strategies. We also confirm no other transfer options to/from Affinity have been identified for inclusion in our WRMP. We will continue dialogue with Affinity until we have consistency across both our WRMPs in respect of bulk transfers and the cumulative impact of options	Annex 14 and 16 have been updated to reflect further consideration of the potential for cumulative impacts depending on whether these options are selected by Affinity and Southern Water in their revised plans.

Appendix 7.26 - Portsmouth Water

Respondent	Response no.	Response comment	SWS' Consideration of Response	Changes Required to dWRMP
Portsmouth Water - Neville Smith - Managing Director	42	We have been asked to ensure that Portsmouth Water's Water Resources Management Plan 2019 is consistent with Southern Water's Plan. Having read Southern Water's Draft Water Resources Management Plan 2019 we are happy that the key features, such as new bulk supplies, are included in both Plans. There will be differences in the planning assumptions but the overall solution is the same. Both companies have taken account of the WRSE modelling results and will continue to work together on this initiative. We have also commented on Southern Water's Draft Drought Plan 2018 and the consistency with our own Drought Plan. Portsmouth Water is very pleased to be part of a resilient solution to the water supply challenges in the South East.	We welcome Portsmouth Water's comments and commitment to continue working together through the WRSE group and bilaterally. The bulk supply options we collaboratively identified are included in both company's draft WRMPs with some minor amendments needed to ensure they are represented in exactly the same way with respect to timing of availability and reliability (in different severity droughts). We support the development of Havant Thicket reservoir as a new regional resource as it will help us partly resolve the large supply-demand deficits we face in Hampshire.	We will ensure there is a consistent representation of our bulk supply options with Portsmouth Water in the option fact files, strategy descriptions (Technical Overview report, Annex 9) and WRP tables

Appendix 7.27 - Wessex Water

Respondent	Reference no.	Response comment	SWS' Consideration of Response	Changes Required to dWRMP
Wessex Water - Aimee Shaw	66	Thank you for consulting with us on the publication of Southern Water's draft Water Resources Management Plan 2019. We recognise the work undertaken by Southern Water in the development of the draft Water Resources Management Plan. We were pleased to be involved in pre-consultation discussions with you regarding existing and future bulk water transfer options between our supply areas. These discussions have been ongoing since the publication of our draft plans with particular reference to the potential for a new bulk export from our supply area to your Hampshire water resources zone. Our draft plan indicated the likely availability of 10 to15 Ml/d and we commit to providing additional information on this to you for inclusion in your revised plan. We look forward to working with you further to determine in more detail volumes under specific scenarios, timings and associated costs. We are pleased to be working with Southern Water and other organisations in the south west through the West Country Water Resources Group. We look forward to continued joint working through this platform as we develop a deeper shared understanding of water resources challenges in our area and the wider UK and develop strategies	We welcome Wessex Water's response and indication that it could make a bulk supply of 10-15 Ml/d available to Southern Water. We have since received further information from the West Country Water Resources Group on the volume, timing and reliability of a bulk supply from Wessex Water and we will continue liaising with this group and Wessex Water as we finalise our revised draft WRMP to confirm the option and ensure it is represented consistently in both our revised draft WRMPs,	Annex 6 has been updated to reflect the work of the West Country Water Resources Group to help identify bulk supply options. Options have been updated and reflected in option fact files, WRP tables and all documents describing the strategies (see Annex 6, and Annex 9, Technical overview report)

Appendix 7.28 - West Country Water Resources Group

Respondent	Reference no.	Response comment	SWS' Consideration of Response	Changes Required to dWRMP
West Country Water Resources Group (Bristol Water, South West Water, Wessex Water)	63	Bristol Water, South West Water and Wessex Water recognise the extensive work that Southern Water has carried out in developing its draft plan and their commitment to delivering both resilience and environmental improvements. Last year saw the creation of the West Country Water Resources Group partnership with ourselves, Southern Water and the Environment Agency. Through this we are developing a deeper understanding of the collective current and emerging water resource challenges and opportunities that apply across this area of the UK. In particular, we identified a collaborative water transfer to yourselves as a possible future supply option. Since submitting our draft Water Resources Management Plans, we have undertaken further analysis to develop a more definitive understanding of the possible transfer volumes available, the timing and costs. In particular the uncertainty in the treatment works constraints in the Bournemouth Water area has been removed improving the reliability of this and other potential options with regard to infrastructure availability. We commit to providing additional information on the transfer for inclusion in your final modelling for this round of Plans. We look forward to working with you through the West Country Water Resources Group to ensure we collectively make the best use of regional water resources, all our customers receive a resilient service and our local environment is protected and enhanced into the future.	We welcome the opportunity for continued dialogue with West Country Resources Group. Working with the Group we have been able to develop further our scheme to import water from Bournemouth Water. The revised scheme will involve a revised pipeline route that avoids the New Forest National Park and New Forest SAC, SPA and Ramsar Sites. We look forward to continuing to work with the Group as we look to implement this plan, and as we develop our proposes for the future.	Revisions to details of Bournemouth Water Pipeline Transfer scheme have been included within the revised draft WRMP, and the updated HRA and SEA.

Appendix 7.29 - Mr Chris Lowe

Respondent	Reference no.	Response comment	SWS' Consideration of Response
Chris Lowe	50	I place great emphasis on the need for much more effort on demand management because that would be the most efficient method of reducing the amount of water required to be abstracted from the environment. This includes dramatically reducing Per Capita Consumption (PCC) as well as losses (leakage) which is still too high. I can do no better than to quote the National Infrastructure Commission who recently reported that if the water industry does not improve water efficiency we risk a future without enough water for people, business, farmers, wildlife and the environment. Likewise the Environment Agency has just published two reports on the State of the Environment. One on Water Resources and one on Water Quality (www.gov.uk/government/publications/state-of-the-environment). For water resources the EA says that wasted water from leaking pipes and overuse in homes is causing damage to rivers and wildlife and putting increasing pressure on overstretched supplies, so that industry should look at ways to use water more efficiently. Similarly for water quality, there are unacceptable levels of phosphorus in over half of English rivers, usually due to sewage effluent and pollution from farm land, which chokes wildlife as algal blooms use up their oxygen. Groundwater quality is currently deteriorating. This vital source of drinking water is often heavily polluted with nitrates, mainly from agriculture. Water companies then have to treat water from different sources to make it safe to drink. So these reinforce my contention that there is insufficient focus on Demand management. Although demand for water, and in particular, Per Capita Consumption (PCC) and Losses, are useful, they should not be the only focus of long term ambitions. As noted in the Waterwise "Water Efficiency Strategy for the UK" December 2017, the "Blueprint for Water" coalition promotes a 'water neutral' approach to ensure that water abstractions do not increase. So using the 'Quantity of water abstracted' as the management target would recognise that limiting abstractions minimises environmental damage and this would drive innovation and take-up of new technologies. This would also concentrate attention on the whole supply system from source to sink.	We have presented what we consider to be a balanced plan. It contains both supply side and demand side options (building on Southern Water's already very high metering levels, for example). However, the company faces some very significant deficits that cannot be met by demand management options alone - they require development of large scale supply side schemes. Our draft WRMP set out a combined strategy of further active leakage control in the short term followed by mains replacement programmes in the medium to longer term to ensure that we continue our drive down on leakage by 15% by 2025. We have now increased this commitment in the revised draft WRMP, to seek to achieve a 40% reduction in our current leakage levels by 2040 and a 50% reduction by 2050. We have set ourselves the target of reducing water use to 100 litres per day by 2040 - a reduction of 25% by 2040. Some of our metered households achieve this level of water use already. To achieve this across the board, we will need Building Regulations and Local Plan policy support. We will need to innovate and lead the way in ensuring that we can achieve this target.
Chris Lowe	50	**Areas for more focus:** **1 Housing and commercial developers** It is recognised that "one of the key drivers for water use is new developments," and part of that is new or expanded water connections. The charge for such connections is the Infrastructure Charge (for example, see Infrastructure-charge-and-miscellaneous-services-2018-19.pdf on: https://corporate.southeastwater.co.uk/news-info/publications/our-charges) and water companies can have some flexibility in how they apply charges for connecting new or enlarged developments. When I was at Kent & Canterbury Hospital (KCH), South Eastern Water's (SEW) predecessor company, Mid Kent Water (MKW), wanted us to pay a large charge for connecting the new nurses home on the basis that site water use would increase because the new occupants increased the on-site population. However MKW agreed with us that if we guaranteed that total site water use would not increase above what it had been previously, then we would not need to pay anything. We achieved that target, and our water efficiency measures actually reduced site use by half. So for future water supply estimation it would be far better to simply define the Infrastructure Charge in terms of maximum flow rate through the Meter, and that would avoid any need for all the multipliers such as those shown on page 6, Infrastructure Charges, for SEW. So water companies should include changing its Infrastructure Charges in their WRMP19, because it could provide a dramatic restraint on water use, as we showed at KCH. Alternatively, as recommended by the Waterwise "Water Efficiency Strategy for the UK" December 2017, an agreement could be for the development to include certified water saving measures that are not easily bypassed, or the Charge could be scaled according to total site use or total site use could be restricted to a maximum value. In 1990, when we paid to have a half inch (15mm) domestic meter installed at home, the MKW General Manager told me that the flow rate through the meter was restricted, so this demonstrates that it is possible to offer lower maximum flows for lower charges.	Southern Water is exploring potential ways in which it might be able to utilise variable infrastructure charging to reflect and reward water efficiency in new properties. For example, one potential solution could be to adopt an approach whereby water efficient properties may pay a lower connection charge.
Chris Lowe	50	**2 The Price of Water** Water is not expensive – it is cheaper than sewerage services, and electricity for example, but using the forward price of water based on future scarcity, or the Long Range Marginal Cost (LRMC) would help drive change. This would help drive users' water efficiency and would be equitable because it would be highlighting the damage caused by excessive abstractions.	Whilst the price of water may be regarded as low by the respondent, Southern Water works within a regulatory framework set by Government and regulated by Ofwat.
Chris Lowe	50	**3 Tariffs** Currently the only incentive for most customers to reduce water use is to save money on the water and sewerage bill. A key message that is sometimes forgotten is that saving hot water also saves the energy cost of heating that water and also reduces effluent charges, which are higher than for water, so any publicity needs to emphasise that the cost saving is far greater than double the 'simple' cost per cubic metre of water. Unfortunately tariffs are crude, and the Standing Charge reduces the incentive to save water, because it dilutes the charge per cubic metre signal. For example we use about 56 cu.m. per annum, pay £31 for the Standing Charge, and £91 for the water, total £122, so the Standing charge is 25% of the whole bill. Without the separate Standing charge, the volumetric charge would be 25% higher so any change in use would be 25% more noticeable, but water companies would have no loss of income from the change. So a more direct incentive would be for there to be no standing charge. It is particularly important to send clear messages to users with high Per Capita Consumption, unless use is essential such as for medical reasons, dialysis for example, for which allowance can be made. So the cost per cubic metre should be on rising block basis. For example the first 50 cubic metres per annum would cost 150 p/cu.m, but next 25 cu.m would cost 170 p/cu.m, and so on until the Long Range Marginal Cost is reached. It would obviously be beneficial for water meters to be 'smart' because it will be imperative for customers to have access to real- time consumption information and bespoke advice and tools to influence their water use and to help them manage demand. As the one of the targets is "to increase the frequency of meter readings for all households" (Section 7.3, WRMP 2020-2070 Technical Overview), smart meters would enable very frequent readings and could monitor night flows too. Also this would dramatically reduce supply pipe leakage, as evidenced by Thames Water's proposal for the biggest reduction in Customer Supply Pipe Leakage from 53 to 17 l/prop/day, through installing smart meters and using these to target customer supply pipe leaks (Fig 14: The-long-term-potential-for-deep-reductions-in-household-water-demand-report-by-Artesia-Consulting 26/4/2018 www.ofwat.gov.uk/publication/long-term-potential-deep-reductions-household-water-demand-report-artesia-consulting/) United Utilities already has a trial of new Home Usage Reports for 100,000 metered customers. These online reports will present customers with user friendly, timely information on their water consumption to empower them to manage their bills through improved water efficiency (OFWAT, Speech by David Black, Smart Water Systems, 25 April 2018). This type of scheme needs replicating. Modern technology provides low energy use data transmitters so battery powered sensors at the meter box could transmit the information. These changes would also avoid the costs of meter readers and so pay for themselves over time, especially as leaks would be found very quickly. These changes, together with the Infrastructure Charge amendments would provide a very clear water saving incentive, especially if the sewerage providers followed the	Penalty-only incentives are generally not supported by customers in the research we have undertaken. Our research has shown little appetite for seasonal tariffs and so as an alternative, we are looking to reward customers for conserving water. The first scheme will be rolled out in Hampshire in partnership with Eastleigh Borough Council. The scheme will offer rewards to residents for recycling waste and reducing water consumption on a monthly basis. The scheme will be introduced in the Central area towards the end of AMP7 and in the Eastern area during AMP8.

Chris Lowe	50	**4 Better Promotion of Water Saving Measures** I welcome Southern Water's target of reducing 100 litres per day (l/d) per capita consumption (PCC) but it is only expected to be achieved by 2040 but the Artesia Consulting research (ibid) shows that less than 80 l/d is achievable so much more proactive measures are needed to achieve 80 l/d before 2040. There has already been research of the prospective cost-benefits of water companies actually providing low water use devices, such as WCs, because there are still thousands of old ones with 9 litre flushes. The cost-benefit ratio is greatly improved by including the environmental cost of increasing water supplies in this very dry area, so that it is now much more economically beneficial to save water rather than expand supplies. In addition the reliability of flush valves in new WCs has been less good than expected - Artesia Consulting (paragraph 6.1) regards this as one of the top three priorities for reducing water demand, but leak-free low water use siphonic WCs are available, such as the Ifo ES4, a 4/ 2.6 litre dual flush water saving WC, with siphonic flush available from: www.greenbuildingstore.co.uk/product-category/water-saving-products/wc-siphon/ Even that low water use performance can be improved. For example the Propelair WC (http://www.propelair.com/homepage) achieves even better performance, using 1.5 litres per flush, and is supported by Thames Water, for example, and referred to in Artesia's report. Although total industrial and commercial water use is smaller than total domestic use, there are some large savings to be made because the water and sewerage costs are not always "visible" to those who hold the purse strings, and the organisation may not have the expertise to know what to do do. So this should also be a focus for water and sewerage activities. The Propelair mentioned above is a prime example where significant savings could be made by commercial organisations with high WC use. For hotels and laundries, the Xeros Polymer XOrb Washing Machine Model SM35 (http://www.xeroscleaning.com/xeros-35-lb-washer) reduces water use by 80%, and energy and detergent use by 35%, and similar advances are being made in other fields. For the water supplier any reduction in water demand will also reduce the company's energy and chemical use, so that is a benefit to the company as well as to users. Although OFWAT adjusts the K factor to account for legitimate cost increases borne by the water supplier, the public is keen to keep such increases to a minimum, and being able to delay or avoid schemes with high capital costs, which would mean a lower K factor and greater customer satisfaction.	Our Target 100 initiative is considered to be ambitious in comparison to other water company targets, and has been welcomed by the Environment Agency and others in their responses to the WRMP. The Target 100 extends across all homes, not just new home, and our initial plans have four key strands: 1. Installation of smart metering technology: We are currently undertaking trials of devices that can read meters and send the reading to the customers using their Wifi. If the trial proves successful, we plan to roll out 100,000 devices over AMP7. 2. Home visits: We currently undertake water efficiency home visits, which has a high uptake rate and can result in up to 10% further savings on top of that achieved through metering. We will continue with this programme and combine it with leak detection. 3. Proactive customer contact: We are looking to develop tools and systems to identify any significant increase in consumption. We can then proactively engage with customers at an early stage to determine if the increase is due to change in circumstances or may be a leak. This will allow us to specifically target customers or geographical areas for water efficiency messages during periods of high demand. 4. Incentivising water efficiency behaviour: Our research has shown little appetite for seasonal tariffs and so as an alternative, we are looking to reward customers for conserving water. The first scheme will be rolled out in Hampshire in partnership with Eastleigh Borough Council. The scheme will offer rewards to residents for recycling waste and reducing water consumption on a monthly basis. The scheme will be introduced in the Central area towards the end of AMP7 and in the Eastern area during AMP8. To achieve Target 100 we will also need to continue our work with developers and local planning authorities to actively promote water efficiency. We also agree that changes to Building Regulations will greatly assist in achieving Target 100. It is agreed that there is potential with new homes to deliver lower pcc in new homes
Chris Lowe	50	**5 Rain water harvesting** All new developments should include rainwater harvesting and storage because this contributes to Sustainable Urban Drainage Systems (SUDS) as well as reducing water use and costs. If larger storage volumes are provided then even greater resilience can be provided as well as further improving SUDS performance.	To achieve this across the board, we will need Building Regulations and Local Plan policy support, and to gain the support of the housing development industry and homeowners. We are committed through our target 100 initiative to seek to increase water efficiency in new homes specifically, and will be working to achieve rainwater harvesting measures as much as we are able to within the regulations that we and the developers currently work within. We will also be pushing Government for increased water efficiency measures to be incorporated into Building Regulations, and working with planning authorities to get measures included within their planning policies.
Chris Lowe	50	**6 Community Water Schemes** A rapidly developing aspect of energy supplies are Community Energy schemes (see: www.gov.uk/guidance/community-energy) which aim to enable communities become more resilient and also reduce energy use and save money as well as increasing community spirit. This idea has also been suggested in the water industry for example, Artesia Consulting referred to 'Community rainwater harvesting', and its Figure 16 shows that it is achievable within a decade and potentially yields over 80 litres/property/day (The-long-term-potential-for-deep-reductions-in-household-water-demand-report-by-Artesia-Consulting 26/4/2018). It also identifies this as a 'Short-term, no-regret option' and with the scaling-up of other activities that the sector is currently delivering, such as smart home retrofit visits, such measures could be implemented more widely in the near future without significant innovation (Paragraph 6.1). Community schemes could use Photovoltaic panels on roofs for pumping or desalination, and reed beds could improve reuse in the local environment. The biggest problem is the need for some initial support and the water companies could have key role to play here, for example using Southern Water's knowledge and resources.	We have undertaken a water efficiency community based scheme within Hampshire, in a village near to the River Itchen and are currently evaluating the results of this trial to determine whether and how it could be replicated elsewhere. The trial involved a community incentive for efficiency in water use.
Chris Lowe	50	**7 Amendment to Abstraction Regime** Existing exemptions from licensing for some abstractions have been ended, and a licence is now usually needed. This may not, in the short term, make a lot of difference, but in due course it is likely that licences will be subject to more restrictions, especially because of the Water Framework Directive (WFD) and other environmental issues. This may assist in keeping more water in the environment and reducing the water abstraction reductions required from water companies for the WFD.	The comments are noted. We have acknowledged the challenge of licence changes in our WRMP. Existing (known) licence changes are one of the key drivers for our plan in the Western Area, and the risk of future licence changes is one of the single largest factors affecting the scale and location of our forecast supply demand deficits during the plan period.
Chris Lowe	50	**B dWRMP19 TIMESCALES** I am very pleased that there is a focus on leakage management and water efficiency, as these are obviously making the best use of the resources that we already have. The Artesia Consulting Report, Figure 19 (ibid), shows that Scenario 'S3 Technology and Service Innovation' with total PCC 49 l/head/day, is the most effective scenario for reducing per capita consumption, and this also has the lowest level of losses. The over-riding importance is to reduce damage to the local environment by reducing abstraction, so reducing leakage beyond its estimated economic value would assist with that, so the benefit of reduced abstraction needs to be fully included in the calculations, especially as the value of reducing abstraction can give very high intangible values even if they are not directly calculable. I note that Drought Orders & Permits, only appear in the first decade from 2020 to 2030, of the illustrative Fig 7.4 (Water Resource Management Plan 2019: Technical Overview), but such Orders give a strong signal to consumers for them to reduce water use. So they should be part of the Plan for all decades for the "More challenging" situation to reinforce the message that we are facing challenging times, so that we all need to react. For similar reasons I have concerns about deferring some of the water re-use schemes such as Weatherlees, because they are using water that is available but otherwise goes to the sea, so should be brought in earlier, especially as that would help South East Water too. Water reuse has the benefit of being a virtuous circle so is very resilient. Hence I support the Sandwich WwTW indirect potable reuse scheme (Section 7.3, WRMP 2020-2070 Technical Overview) as well as the Medway WWTW indirect reuse proposal provided the pipeline impact on archaeology & cultural heritage can be avoided. I would however expect Southern and South East Water to work together to ensure that the maximum total yield can gained from this water whether by indirect reuse or by desalination, so that both companies gain the benefits.	Managing leakage is an important part of our water resources strategy. A low level of leakage is desirable, both for the environment, and because it defers the need to invest in new resources which would otherwise be required to meet increases in demand over time. However, as noted, it is not necessary economic to reduce leakage to very low levels, because to do so could involve very large additional costs for relatively small savings of water. Our approach, and that of our regulators, is to set leakage at a level that is optimal for our customers and society as a whole. Our plan looks at a combined strategy of further active leakage control in the short term followed by mains replacement programmes in the medium to longer term to ensure that we continue our drive down on leakage. The frequency of Drought Orders and Permits are set out in our Levels of Service. In determining our Level of Service, we take into account customer preferences and current guidance. That leads us to adopt a resilient approach, meaning that we expect there to be less than 10% chance that we will have to resort to restrictions such as rota cuts or standpipes over 50 year planning period of our plan. The strategy presented in our dWRMP comprises a mix of options that are considered to: provide a secure supply of water, protect the environment and represent best value for customers. The optioneering process takes into account a range of financial, environmental and social considerations in determining both the range of options but also when these options are needed. It is not therefore the case of deferring schemes but developing them when they are needed. Support for the Sandwich and Medway Water Reuse schemes is welcome. Once a plan is published, we will need to undertake additional more detailed feasibility investigations and modelling, environmental assessment, preparation of planning documentation, and detailed design. We will also engage widely with
Chris Lowe	50	I also strongly support the Catchment Management schemes at Darwell & Powdermill reservoirs because it is vital to reduce pesticides in the environment as well as for water benefits, and similarly for the Eastern area (Section 7.3, WRMP 2020-2070 Technical Overview). Much work has been and continues to be done on desalination processes. Indeed, researchers at Manchester University have demonstrated that graphene-oxide membranes can be used to filter common salts out of salty water and make it safe to drink. This could dramatically reduce cost and energy requirements for desalination. In addition, the re-use of effluent for water supply and waste for energy generation could reduce or even remove the need for clean water abstraction. (OFWAT, Speech by David Black, Smart Water Systems, 25 April 2018). Unfortunately many of the public are unfamiliar with Catchment Management, Effluent reuse and Desalination, and hence do not give them the priority one might expect, as shown by the SEW's Fig 5.3 page 132, dWRMP. It is to be expected that the public know little about these processes, because desalination, for example is probably associated with hot countries such as the Arabian gulf areas, and effluent reuse may sound like going to the toilet then drinking what comes from that. Similarly Catchment Management sounds quite complicated and people may not have confidence in it achieving the results claimed. Both Catchment Management and Effluent Reuse are improving the efficiency of the hydrological cycle. Effluent reuse in particular is a "Virtuous circle" - if you use more water you produce more effluent and hence generate more water, albeit there are some losses en route, but it does allow increase in water use without using as much 'fresh' water. Therefore they are actually improving the resilience of the system, the prime aim of the dWRMPs.	Support for our catchment management schemes is welcome. The comments in respect of desalination and water re-use are noted. We have undertaken customer research on water re-use, including investigating any concerns that customers may have over the use of such schemes within their local area, and the terminology used to describe them.

Chris Lowe	50	In the case of desalination, solar thermal processes can be used also solar photovoltaic panels (PV) can generate the electricity required. Indeed the Chinese have demonstrated that PV can be mounted on floating platforms, so reservoirs such as Bewl could generate large amounts of electricity, even if the panels have to be located only in the central part of the water surface. Traditionally wind pumps have been used to pump water, but wind turbines can equally be used to generate electricity for processes. All these mean much lower costs for desalination or other processes. Hence the water companies need to educate people and businesses and promote these measures to reduce such concerns because of the improved efficiency now obtainable. To help in this, the term recycling should be used instead of the term Reuse or Desalination, because the latter seems a misnomer in that the proposed waters are not 'pure' seawater but fresh waters with some salinity and other impurities, therefore the treatment process is much easier than for seawater (in general terms needing less energy per cubic metre delivered water) and for public perception the term recycling would be better. For example at the Broad Oak Reservoir Inquiry 1979, I had sample analysed from the Seasalter ditches, near Whitstable, which showed much lower salinity of 1640 mg/litre of chloride, compared to the Snowdown Colliery saline minewater concentration of 6000 mg/l, or seawater around 35,000 mg/l for example, with drinking water usually below 250 mg/l. I appreciate that the waste-water from the process may be an issue but discharge into long-sea outfalls which already exist around the coast would be no worse than the previous discharges from them, and would achieve good dilution. In addition the energy required can be produced from renewables, thereby reducing the carbon impact of purification. For locations where there is a traditional power station or steam raising plant, the waste energy can be used for desalination without affecting the efficiency of the power station, thus providing a very efficient system over-all, as	The comments in respect of desalination and water re-use are noted. We have undertaken customer research on water re-use, including investigating any concerns that customers may have over the use of such schemes within their local area, and the terminology used to describe them. We will, as part of water re-use and desalination proposals investigate the potential for the use of renewables for power, and we have also through work to date, been investigating the potential benefits of co-locating desalination plants close to existing power stations where thermal benefits from the use of cooling water, and the potential to mix and dilute hypersaline discharges has been investigated.
Chris Lowe	50	I would also promote the Maidenhead (in Bracknell area) Aquifer Storage and recovery ahead of other schemes as that again is making best use of existing resources. Similarly the water treatment works upgrade (SEW's SEA Environmental Report 8.2.7) Bewl provides more water from existing available resources, so should be brought forward as soon as demand requires it. All these would help improve resilience	These are not proposals in our draft WRMP - they are proposals by other water companies set out in their draft plans.
Chris Lowe	50	**C EAST KENT PROPOSALS** *DETAILED COMMENTS WERE ALSO PROVIDED ON AFFINITY WATER PROPOSALS, AND SOUTH EAST WATER PROPOSALS IN THEIR DRAFT WRMPs.*	The comments relate to proposals in other water company plans. It is not appropriate for Southern Water to respond to those comments.

Appendix 7.30 - Mr William Cutting

Respondent	Reference no.	Response comment	SWS' Consideration of Response	Changes Required to dWRMP
William Cutting	35	I have read the above plan and find it very disappointing. It is over optimistic. It relies on unachievable and unsustainable reductions in per capita consumption. It relies on energy intensive desalination and wastewater recycling. It does not include any reference to my proposal to make more efficient and effective use of the water in the region's rivers. It requires the use of drought permits and water use restrictions, even assuming the reduction in per capita consumption is achieved. This plan is leading the company in the wrong direction; it does not produce a resilient future or a cheap solution. The way the water environment is currently managed inevitably leads to a crisis. Underground aquifers are the primary source, with the annual abstraction equaling the inflow from rainfall. There is no reserve. Because demand is greater than the ability of the aquifers to supply, the rivers are used to meet the additional demand. When the river flow is below MRF, the reservoirs are used, until they are empty. Then, at the moment of crisis you have to apply for drought orders etc. which seek to abstract more water from the rivers, at the very time they are least able to provide it. And – you will also have to impose restrictions on the use of water.	We have presented what we consider to be a balanced plan. It contains both supply side and demand side option (building on Southern Water's already very high metering levels, for example). However, the company faces some very significant deficits that cannot be met by demand management options alone - they require development of large scale supply side schemes. The draft WRMP19 and the revised draft WRMP19 set out the importance of enhancing resilience to and during drought events, including environmental resilience. We have committed to a range of measures to enhance environmental resilience. There is a short term reliance on Drought Permits and Orders while the permanent solutions are developed and implemented, but in the longer term (2030s onwards) our customers and the environment in which we operate will benefit from our planned resilience investment, which includes continued measures to reduce demand for water as well as physical environmental enhancement measures.	None
William Cutting	35	Following our protracted communication and meetings, you do not appear to have accepted that the problem is wholly created by the Environment Agency's Catchment Abstraction Management Strategy requiring the natural flow in the rivers to continue into the sea once flow is below the MRF. In order to continue supply, you are forced to empty the reservoirs, even though more water than you require is being allowed to go to sea. I have shown you an easy, quick and flexible way of enabling you to continue abstraction without using a reservoir and still maintaining the flow to sea. My process involves	Thank you for the suggested solution, which as you say, you have previously made Southern Water aware of, and which has been discussed with you. It is not appropriate to criticise the Environment Agency's CAMS approach as the environmental regulators objectives are to protect the environment and it has decided on the	None

		using a movable weir or sluice gate to temporarily store the requisite amount of tidal water at the top of the estuary on each tide, either by the introduction of an additional movable weir associated with the final weir or by constructing a tidal lagoon. As the tide falls this water is steadily released to substitute for the water you can abstract from the freshwater section, close to the tidal limit, thus maintaining the natural flow to sea.	approach that it considers most appropriate. The details of your proposed solution are understood.	
William Cutting	35	I attach the recent proposal I have made to the Environment Agency, concerning the River Medway Scheme. It is a typical example of the application of my process and as I pointed out to you in my email of the 6th September 2018, it can be implemented in any river with a suitable tidal range and geographical features. The proposal is at two levels. Level one has a tidal lagoon large enough to guarantee abstraction can take place at Springfield without release from Bewl. This immediately removes the need to pump water back up river. Level two doubles the volume stored on each tide and thus doubles the amount you can abstract at Springfield. By not having to use Bewl to double the yield, you do not have to double the size of the reservoir nor more than double your pumping. All this process requires is for the Environment Agency to grant permission to install the removable weir in association with the existing final weir or to accept the construction of a small tidal lagoon as close to the HWMOST as is possible. In the case of the Medway, there is a very suitable area between Allington Weir and the M20. I have briefly examined a number of rivers and the process can be installed elsewhere. Introducing my process can make river abstractions the priority, because the tide is absolutely certain. The 95%ile flow in the region's rivers totals 1125 Megalitres per day. Even restricting your abstraction to 50% of this still makes more available than you require. However, probably the most attractive part of my process is that it leaves the maximum amount of water in the freshwater environment. If you install my process in sufficient rivers (and this can be a gradual process as demand increases) you can take the strain off the underground aquifers. Aquifer levels will steadily rise and this will become your strategic reserve for times of real drought. This idea, known as conjunctive use, has been thought of before but not implemented. Now, with my process it can be and, as my email said, if carried out in the east of your area of supply and with using Bewl as a focal point, you can start moving water west.	The potential to store water within floodplains was considered as part of our options appraisal process, however the option did not pass through to our constrained options list given the objection of the Environment Agency to such an approach. However, Southern Water commits to investigating this option further in time for subsequent WRMPs.	None

William Cutting	35	In conclusion. The only large scale resource available to you is the water currently being allowed to flow into the sea. The proposals in this plan of trying to reduce consumption or move existing freshwater around will not work. The introduction of non natural sources is expensive and will increase the costs to the customer and will significantly increase greenhouse gas emissions. I suggest that you take very seriously my proposal for making a more efficient and effective use of the water in the rivers and take this plan back for review.	Southern Water commits to investigating this option further in time for subsequent WRMPs.	None

Appendix 7.31 - Tracey Crouch MP

Respondent	Reference no.	Response comment	SWS' Consideration of Response	Changes Required to dWRMP
Tracey Couch MP	72	I am writing in response to the current consultation on the above, as the MP for Chatham & Aylesford. In my own constituency, Southern Water (SW) have a scheme they propose to bring forward to meet future demand in developing a water reuse scheme in Eccles, alongside South East Water. I would like to say from the outset that I fully appreciate the need to secure water supplies in Kent and meet our future water needs. This is particularly important for an area which is under pressure in terms of resources. However, I know that there are concerns around the impact the scheme would have on the local community, including the increase in heavy goods traffic, their impact on local roads which are already severely congested at peak times, and the potential increase in air pollution. I am sure these are issues that will have been raised with SW and SEW at the public exhibitions. I have also encouraged South East Water separately to hold additional exhibitions in the village of Eccles within my constituency, many of whom will be directly affected by this proposal. While as I have mentioned I appreciate the need to secure our future water supply, I also believe this must be done in a way which is sensitive to the impact each proposal has on the local communities, including increase in traffic and air pollution. I would therefore expect that SW continue to engage with local communities and stakeholders as they develop their plans further to ensure any impact on local communities is mitigated.	The comments and concerns expressed on behalf of local constituents are welcomed and noted. Our proposals for the water re-use scheme near Eccles was included within the draft WRMP and is retained as part of our preferred plan in the revised draft WRMP. We have undertaken sufficient engineering, environmental and other assessment work as part of our WRMP preparation to provide the confidence that the scheme can be designed, constructed and operated without causing unacceptable levels of impacts either on the environment or on local communities. Southern Water is aware of the local concerns about HGV movements, and will undertake additional more detailed feasibility investigations and modelling, environmental assessment, and detailed design for this scheme before any applications for planning or other permissions are made. We will want to liaise closely with local stakeholders including the Parish and District Councils, and hold pre-application consultation and engagement with potentially affected residents.	None in response to this comment.

Appendix 7.32 - Fawley Waterside Ltd

Respondent	Reference no.	Response comment	SWS' Consideration of Response	Changes Required to dWRMP
Fawley Waterside Ltd (Adams Infrastructure Planning Limited)	73	1.1 This representation is made on behalf of Fawley Waterside Ltd. (FWL). FWL. acquired the freehold of the Fawley Power Station site from RWE npower in 2015. The site comprises 37.4 hectares of former operational land, 8.8 hectares of operational land leased to National Grid, 60.6 hectares of non-operational land including 'Tom Tiddlers Ground' that extends southwards to Calshot Spit and the intake channel of 14 hectares (see attached Appendix 1). 1.2 FWL is bringing forward proposals for approximately 1500 homes, 2,500 jobs, community and leisure facilities through the local plan review exercises that are being conducted currently by New Forest District Council and the New Forest National Park Authority.	Comments are noted.	None.
Fawley Waterside Ltd	73	1.3 FWL welcomes the development of the draft Water Resources Management Plan 2019 (DWRMP 2019) and the opportunity to comment on the draft strategy. 1.4 FWL comments on the following aspects of the DWRMP 2019: 1. Scope for water transfers from adjoining water companies; 2. Target 100 Vision; 3. The location of a 100ml desalination plant at Fawley Waterside; 4. Potential use by Southern Water of the disused Fawley Power Station Cooling Water discharge outfall into the Western Solent.	Noted.	None.
Fawley Waterside Ltd	73	2.1 These responses are to the questions posed in the DWRMP 2019 Technical Overview that are of key concern to FWL. The responses are informed by a meeting held with representatives of Southern Water and Atkins on 16th January 2017 and a site visit made by Southern Water engineers on 5th February 2018.	Noted.	None.
Fawley Waterside Ltd	73	Do you think it is a good idea to trade water with neighbouring water companies in a 'regional grid' as part of the Water Resources in the South East Group? 2.2 FWL support the trading of water with adjoining water companies to even out supply and demand or to deal with localized capacity constraints. The Fawley Waterside site is served by a 14" Bournemouth Water Company main that used to provide an industrial supply to the site and a 6" Southern Water main. This is an example where trading water with an adjoining water company could be effective at little or no infrastructure cost, subject to any environmental constraints that the Bournemouth Water Company may have on abstraction from the River Avon.	The comments and support for sharing water with other companies are welcomed. Southern Water is exploring options for Wessex Water or other companies to provide new resources to it for the supply of customers, whether through existing or potential new water transfer infrastructure. The potential for the use of the existing pipework will be included within those discussions.	None as a result of these comments
Fawley Waterside Ltd	73	Do you support our Target 100 to reduce personal water use to 100 litres per day by 2040? 2.3 FWL supports Target 100 objectives to reduce personal water use. FWL intends to introduce innovative measures in its residential and commercial developments to seek to achieve the Target 100 objectives.	Support for our Target 100 imitative is welcome, along with the proposed measures you intend to introduce.	None.
Fawley Waterside Ltd	73	Do you agree with our plan to start investigating new options for water recycling, desalination and reservoirs now, in case they are needed in the future? 2.4 Yes, and because some of the new options may have long lead times.	Support is welcome.	None.
Fawley Waterside Ltd	73	Do you think water recycling (from wastewater) has a role to play in securing water supplies in the future. 2.5 Yes, water recycling has a role to play, potentially, because the infrastructure and energy costs are likely to be lower than for desalination. In addition, wastewater is usually discharged close to water consumers.	Comments are noted.	None.
Fawley Waterside Ltd	73	Do you think desalination has a role to play in securing water supplies for the future? 2.6 Desalination may have a role to play if other measures such as water trading and water recycling are not capable of providing security of supply. FWL recognises the significant likely deficit in the Western Area as a result of the introduction of sustainability reductions in 2017 on the Itchen and Test.	Our plan contains both supply side and demand side options (building on our already very high metering levels, for example). However, the company faces some significant deficits that require us to look towards a mix of options. Our modelling undertaken on the draft WRMP indicates that under all potential futures we need to investigate in AMP 7, and then build in AMP8 a large desalination plant. Once a plan is published, we will need to undertake additional more detailed feasibility investigations and modelling, environmental assessment, preparation of planning documentation, and detailed design. This will be undertaken in due course, as with any option. The company identified a range of alternative options in its Draft WRMP and we will continue to investigate these in parallel with any desalination option.	None.
Fawley Waterside Ltd	73	Do you support the fact we have selected some water recycling options in preference to desalination to align with the preferences of our customers? 2.7 Yes, for the reasons set out in 2.5 above.	Noted.	None.
Fawley Waterside Ltd	73	A large scale new desalination plant in Hampshire is needed to balance the supply and demand for water. We could reduce our reliance on desalination by combining this with water recycling (water re-use) scheme, where treated wastewater would be released into the Lower Itchen for re-abstraction. Which approach do your prefer? 2.8 Reduce reliance on desalination by combining this with water recycling (water re-use) scheme, where treated wastewater would be released into the Lower Itchen for re-abstraction.	Comments noted. Once a plan is published, we will need to undertake additional more detailed feasibility investigations and modelling, environmental assessment, preparation of planning documentation, and detailed design. This will be undertaken in due course, as with any option. The company identified a range of alternative options in its Draft WRMP and we will continue to investigate these in parallel with any desalination option.	None.
Fawley Waterside Ltd	73	Would you like to get involved in developing our solutions to provide water, for example, community schemes to save water, developing water recycling and desalination options or in any other way? 2.9 FWL is committed to achieving the Target 100 objective in the development of Fawley Waterside. FWL is also willing to engage in a dialogue on the potential use by Southern Water of the former Fawley Power Station Cooling Water discharge outfall (see below).	Southern Water welcomes the opportunity for further dialogue, and to continue the existing working relationship, with FWL.	None.
Fawley Waterside Ltd	73	Did you find the information you needed in our consultation? What else would you like to know? 2.10 FWL has engaged with Southern Water since January 2017 in response to requests made by Atkins and Southern Water about some of the infrastructure that was built as part of Fawley Power Station. FWL has made repeated requests about the scale, impact and safeguarding criteria that may apply if a desalination plant is to be provided at Fawley Waterside. No information has been provided apart from a communication from Andy Blaxland of Adams Hendry dated 11th October to which were attached plans showing the location of a 100ml/d and 50 ml/d desalination plant at Fawley Waterside. 2.11 As these questions have remained unanswered the position of FWL is that it objects to proposals for a desalination plant at Fawley Waterside. FWL is willing to discuss further the potential use of the cooling water outfall for the discharge of brine (and potentially the abstraction of seawater) on the understanding that the desalination plant is not located at Fawley Waterside. 2.12 More information that provides the reasoning behind this position is set out in Section 3.	Southern Water has engaged with FWL through the preparation of the draft WRMP, and through related discussions on the potential for water recycling and related environmental features within the proposed FWL development at the former power station site. This has included a direct meeting at Chief Executive level between FWL and Southern Water. Southern Water is disappointed that FWL consider it needs to object at the current time, especially on the basis of a lack of information. Southern Water included the location of the proposed desalination plant at Fawley in its Draft WRMP as one of a number of potential locations. Should FWL consider that land within the former power station is no longer available for this use, then Southern Water would continue to investigate and promote alternative locations, whilst continuing to seek to engage with FWL at the same time. Southern Water welcomes FWL's willingness to continue to discuss the proposals, including the potential for abstraction and discharge from infrastructure related to FWL's interests. The proposed location of the desalination plant has been amended in the revised draft WRMP to land outside FWL's landownership.	The desalination plant proposals have been updated in response to comments received and the revised information included within Annex 6 of the revised draft WRMP.
Fawley Waterside Ltd	73	3 Detailed comments on the suitability of the Fawley Waterside site for a 100 ml/d desalination plant. 3.1 These comments set out the context for the regeneration of the Fawley Waterside site. This provides the reasoning for the position that FWL is taking with respect to the potential desalination plant on the site.	Noted	None

Fawley Waterside Ltd	73	Fawley Waterside - development opportunities and constraints 3.2 Fawley Waterside provides a good opportunity for a mixed-use development to meet housing needs and employment in New Forest District and the New Forest National Park. There are, however, significant constraints that need to be addressed in the development of the site. These include: 1. HSE Middle and Outer Safeguarding Zones for Esso Oil Refinery and a number of chemical works within the site; 2. Parts of the site are located in Environment Agency Flood Zones 2 and 3; 3. The wide range of UK and European nature conservation designations that apply to the coast adjoining the site; 4. The policy constraints that apply in the New Forest National Park surrounding the operational land of the former power station; and, 5. The limited capacity of the A326 Fawley by-pass that provides the main transport access to the site. 3.3 A Masterplan for the first phase of development at Fawley Waterside is shown as Appendix 3. An Indicative Masterplan that includes a second phase of development in the 20 – 30 year timescale is attached as Appendix 4. This second phase includes the relocation of the 400Kv substation enabling the site to be redeveloped. Development will be residential-led south of the yellow safeguarding line where the HSE does not advise against residential development in the Outer Safeguarding Zone for Fawley Oil Refinery.	The information on the proposed development by FWL is welcomed and noted, including the potential second phase of development following the relocation of the existing large substation.	None as a result of these comments
Fawley Waterside Ltd	73	Southern Water, Water Resources Management Plan 2015, Technical Report – option for a 25 Ml/d desalination plant at Fawley Power station 3.4 One option put forward by Southern Water in the current WRMP for the period 2015 – 2040 is for a 25Ml/d scheme in 2025/6. "This is a seawater desalination plant within the existing site of a power station on the western side of Southampton Water". The power station is not named but the context indicates that the site is at Fawley Power Station. The report identifies in paragraph 8.123 potential impacts that include: • "Treatment works may have significant visual impacts, especially in residential, tourist and designated areas along the coastline; • Significant supporting infrastructure (roads, power, pipelines) is required that may have social and environmental impacts…" 3.5 Attention is also drawn to the potential impacts on the adjoining European sites and the opportunity to mitigate impacts of brine discharge by blending it with power station cooling water that is discharged from the sea outfall. 3.6 The Water Resources Management Plan 2015, Technical Report made a commitment to the further evaluation of desalination options during the Amp 6 period, i.e. 2015 – 2020.	The information quotes is from the previous WRMP documentation, and not from the Draft WRMP and its related supporting information. The quotations relate to the potential generic impacts of desalination plant, and the proposal at the time (2014/15).	None as a result of these comments
Fawley Waterside Ltd	73	Southern Water, Draft Water Resources Management Plan 2018, Technical Report – option for a 100 Ml/d desalination plant at Fawley Power station 3.7 The report says that "The modelling undertaken for the draft WRMP indicates that under all of potential futures we investigate in AMP7 (2020 – 2025), and then build in AMP 8 (2025 – 2030) under Strategy A, a very large desalination plant on the Solent, designed to utilise the existing outfall infrastructure that was associated with the Fawley Power Station. We anticipate that this could be required to be up to 100 Ml/d in scale (100 million litres of water a day) when in full operation…."(page 70).	Noted.	None.
Fawley Waterside Ltd	73	Response of Fawley Waterside Ltd. to the desalination plant proposals 3.8 The scale of the desalination plant has grown fourfold from the 25Ml/d option identified in the current WRMP 2015 to the 100Ml/d scheme identified in the draft WRMP 2018. At a meeting at Fawley Waterside on 19th January 2017 water engineers from Atkins advised that: 1. a 1 – 3 hectares site would be needed; 2. liquid chlorine is used to treat seawater in the intake pipe – its use is subject to COMAH regulations; 3. lime is used for remineralisation – about 23 tonnes of lime per day; and, 4. in all there would be 5 – 6 tanker movements per day. 3.9 FWL has made a number of requests to Southern Water since January 2017 for further information on the scale, operational noise and air quality associated with a desalination plant. No specific information has been received apart from the site plan that is attached as Appendix 2. 3.10 FWL understands the resource that the former Fawley Power Station Cooling Water Discharge infrastructure offers to enable brine to be dispersed into the Western Solent but it is concerned that the impact of a desalination plant at Fawley Waterside would prejudice the development of the Masterplan proposals. Particular concerns are: 1. The visual impact of the desalination plant; 2. Noise and air quality impacts arising from the operation of the plant; 3. The potential hazards arising from the use of chlorine on the site and restrictions on acceptable land uses adjoining the site if the quantities of chlorine to be used exceed the thresholds set out in The Planning (Hazardous Substances) Regulations 1992; 4. Traffic impacts of daily tanker deliveries of lime and chemicals for use in the plant. 3.11 FWL therefore objects to the location of the desalination plant within the redline boundary shown on Appendix 1.	As is noted in the Draft WRMP, the need for the larger desalination plant is directly linked to licence changes in Hampshire, the full scale and impact of which was not known of in 2014/15 when the previous WRMP was being finalised. The licences were the subject of an Inquiry in April 2018 at which Southern Water and the Environment Agency reached agreement on a Section 20 Operating Agreement relating to licences on the Rivers Test and Itchen, and the Candover boreholes. Southern Water has shared limited available information with FWL as part of the preparation of its Draft WRMP, including high level plans of the footprint of different scales of potential desalination plant within the northernmost part of the FWL site, a location which FWL indicated would be the only appropriate part of the site for such a use. It is accepted that Southern Water has not yet been able to provide the fuller details to FWL that it would wish to see, however Southern Water and its specialist consultants (Atkins) have met with representatives of FWL and briefed them on the desalination proposals, including providing general and specific technical information at the meeting and subsequent to it. Some of the concerns expressed in the FWL representation have the potential to be capable of being accommodated through further technical work and discussions with FWL, including in relation to the following matters: 1. The visual impact of the desalination plant - there is the potential (through design and through potential excavation) to reduce the bulk and visual impact of the proposals, and to design a 'public facing' element of the proposals as may be appropriate, as explained to FWL through meetings to date. 2. Noise and air quality impacts arising from the operation of the plant - further information on likely levels of noise generation and any potential emissions can be modelled or provided, and strategies for mitigating any potential impacts identified; 3. The potential hazards arising from the use of chlorine on the site and restrictions on acceptable land uses adjoining the site - details of the potential chemical usage, and quantities, can change according to the precise plant details and sizing, but likely levels can be provided to re-assure FWL on these matters; 4. Traffic impacts of daily tanker deliveries of lime and chemicals for use in the plant - the level of vehicle movements remains at a low level one operational, as previously advised to FWL.	The desalination plant proposals have been updated in response to comments received and the revised information included within Annex 6 of the revised draft WRMP.
			Southern Water recognises that the use of the northern part of the FWL site as a desalination plant has given rise to concerns for FWL on a number of matters, including the relationship to the potential second phase of development following the relocation of the substation site. Southern Water is willing to continue its existing dialogue with FWL on the details of its proposals, but equally willing and able to pursue alternative locations for the desalination plant should FWL maintain its current objections.	
Fawley Waterside Ltd	73	3.12 FWL does, however, recognise the role that the Cooling Water discharge infrastructure may have in overcoming problems that Southern Water may have in discharging brine into Southampton Water. FWL therefore suggests that two further options for the location of a desalination plant are explored: 1. Locate the desalination plant at Marchwood (as previously considered in the WRMP 2015) and route the brine discharge pipe to connect to the Cooling Water outfall off Calshot Spit; and, 2. Locate the desalination plant on Southern Water owned land on, and adjoining, Ashlett Creek Wastewater Treatment Works. 3.13 These options could provide some significant savings as compared to the location of the plant at Fawley Waterside. For example the input water at Marchwood would have a lower salt content and therefore the energy cost of desalination should be significantly lower. The costs of pumping brine to Fawley would be broadly similar to the costs of pumping freshwater from Fawley. Other savings could be made, for example in the length of truck movements transporting lime and chemicals. 3.10 Location of the desalination plant at Ashlett Creek Wastewater Treatment Works could provide options for water reuse or the use of the treatment works discharge to dilute brine produced by the desalination plant. 3.11 FWL looks forward to engaging in studies with Southern Water should it decide to review these desalination plant options in greater detail.	Southern Water has been, and continues to explore these and other alternatives for the development of a desalination plant. Southern Water remains certain that its desalination proposals are consentable and implementable, and that through inclusion of the desalination plant within the Revised Draft WRMP, and ongoing technical and environmental work, the necessary applications for consents and subsequent implementation of the desalination plant will be achieved as part of the Long Term Water Resources Solution for the Western Area.	The desalination plant proposals have been updated in response to comments received and the revised information included within Annex 6 of the revised draft WRMP.
Fawley Waterside Ltd	73	NB: Note Appendix 1 -4 - Series of plans showing ownership, site layout for desalination plant and Fawley Masterplan	Noted	Noted

Appendix 7.33 - Little River Management and Barker Mill Estate

Respondent	Response no.	Response comment	SWS' Consideration of Response
Little River Management	62	A document providing summary and detailed comments on the proposed Drought Plan monitoring and mitigation plans relating to the River Test were submitted as part of the Draft Drought Plan consultation in Spring 2018. A copy of the same documents were submitted in response to the WRMP consultation.	The summary and detailed comments relate to monitoring and mitigation matters addressed in Southern Water's Drought Plan. Responses to the comments have been provided as part of the Drought Plan SOR document, published in June 2018. To the extent that any comments are relevant to the WRMP proposals, Southern Water has commented below.
Little River Management	62	The proposed Environmental Monitoring Plan and proposed mitigation measures for the drought plan are NOT fit for purpose. In fact, the proposed environmental monitoring is woefully inadequate for the lower rive Test south of the M27 (Ref. Annex 5 Environmental Monitoring Plan table 6.1.8 p92-95). The proposals do not directly address the potential environmental damage to the lower river Test, specifically the reach most impacted by drought immediately downstream of Southern Water Testwood abstraction point. LRM wishes to accommodate the monitoring and mitigation plans and indeed to contribute to them in the areas in which they are currently deficient.	SWS updated the environmental monitoring and mitigation plans relating to the River Test to reflect the agreements reached with the EA at the Hampshire Licences Inquiry and the content of the signed s20 agreement. SWS has, through the s20 agreement, reached agreement with the EA on the monitoring and mitigation measures that are necessary as part of the proposed Drought Permit and Drought Order applications. These do not require the agreement of the lower test landowners/lessees as that consent is currently withheld. To the extent that agreement is reached and additional monitoring and mitigation is implemented, this is considered additional to that necessary for the Drought permit and Drought Order applications. SWS continues to seek to reach agreement to enable this to take place. This matter was addressed in the Drought Plan SOR.
Little River Management	62	This section of the lower river Test is of high ecological importance as show in Dominic Longley's (Environment Agency) Paper of Evidence submitted to the recent Public Inquiry on Southern Water's (SWS) appeal against the Environment Agency's abstraction licence proposals. For example, it is habitat for rare species such as sea lamprey and Atlantic salmon. This reach is most important for monitoring of Fish Distress with triggers and response plans as this is the reach where the majority of Atlantic salmon will be and the most impacted by abstraction. There are several fish passes on this fishery. The construction of these passes means they do not work in low water conditions as noted in the 1976 drought for example. The reengineering of these fish passes should be included in the drought mitigation package. Salinity monitoring need to be installed at Testwood Pool. We have witnessed saline ingress here during high tides and low river conditions. These mitigation and monitoring requirements are outlined in the SEA for the Drought Plan that are not being properly addressed in the Environmental Monitoring Plan. 8.2 Mitigation may be defined as a measure to limit the effect of an identified significant impact or, where possible, to avoid the adverse impact altogether. 8.3 Monitoring is required to track the environmental effects to show whether they are as predicted, to help identify any adverse impacts and trigger deployment of mitigation measures. Following the Public Inquiry, we (LRM and BME) are working with SWS to try and get a Consent and Compensation Agreement in place which will address the concerns we are raising about the current inadequacies of the Monitoring and Mitigation plans which form part of the Drought Plan, but progress is slow and we can't be confident at this stage that an agreement will be reached.	
Little River Management	62	The proposed Monitoring plans are not sufficient as they need to include improved fish counters and flow meters on the lower river Test. For example, here the river splits into two arms – the Great Test and the Little Test. Currently only the Little Test has a flow meter and only the Great Test has a fish counter. In order to collate accurate data both arms require both flow meters and fish counters. While the abstraction is from the Great Test salmon and sea trout migrate using both arms of the river depending on the flow and temperature conditions they are met with so it is important to gather data from the Little Test as well	
Little River Management	62	The Monitoring plans cannot be implemented without our agreement to allow access. SWS need to agree the proposed Consent and Compensation Agreement in order to cover the loss of income and increased costs in order to protect our fishery business and our employees. Similarly no mitigation work can be undertaken on the lower river Test without our agreement. Again this depends on finalising the Consent and Compensation Agreement. The proposed mitigation plans with other NGOs farther upstream might be an 'easy fix' but it is not properly addressing the definition within the SEA and is not properly mitigating the most potentially impacted areas of the lower river and therefore fails to protect the most important habitats and critical first stages of salmon and sea trout migration impacted by drought and compounded by additional abstraction below the normal Hands of Flow	
Little River Management	62	At the Public Inquiry, in its Statement of Case LRM referred to the potential operational and commercial risks to its business, and the consequential environmental risks, of any monitoring plans and restoration works. See attached Monitoring Plan Submission.	
Little River Management	62	We would urge Southern Water to initiate a thorough and fit for purpose monitoring and mitigation plan by continuing to engage with us to ensure a fair and reasonable Agreement is put in place to address our legitimate concerns and allow our input with local knowledge of the river to work with Southern Water and the Environment Agency to initiate a comprehensive monitoring and mitigation plan for the lower river Test rather than the box ticking quick fix plans included in this Drought Plan that circumvent the real issues.	
Little River Management	62	A detailed Drought Plan monitoring plan submission was submitted dated 19th March 2018 by Little River Management Limited (LRM).	

Appendix 7.34 - Isle of Wight Rowing Forum

Respondent	Reference no.	Response comment	SWS' Consideration of Response	Changes Required to dWRMP
Isle of Wight Rowing Forum	129	We at the Isle of Wight Forum became aware of your consultation on the Southern Water Resources Management Plan that were running from 5th March to the 28th May 2018 which we wanted to contribute to. Unfortunately, as we only formally meet four times a year by the time we had the opportunity to to discuss a contribution to the debate the consultation period had already ended. However, as the Southern Water Resources Management Plan is clearly a long term project we felt that expressing our view and thoughts might still be mutually beneficial. The Isle of Wight Rowing Forum is the organisation of Isle of Wight Rowing Clubs that are all affiliated to the National Governing body of the sport - British Rowing - and act as the local "hub" for rowing on the Isle of Wight as part of the Wessex Regional Rowing Council. Our objectives are to create the medium for improved communications and collaboration between the clubs, schools governing bodies and other interested parties within the Island; to encourage and develop good practice within the IOW clubs, creating opportunities for further training and education whilst encouraging and developing safe practices; to endeavor to provide equal opportunities to participate in rowing regardless of culture, type of rowing boat, location, commitment, affiliation, age, gender, disability, faith and ethnic origin; to play an active part in developing rowing as part of the broader sporting and social agenda on the IOW, in order to benefit the local communities, to create links between schools indoor rowing clubs and local water based clubs to increase the number of young people taking part in rowing and foster an environment that encourages long term participation and to provide a welcoming environment and support for participants to enjoy the sport at whatever level they choose to participate and to maintain and to improve and increase access to suitable water for the sport of Rowing.	The context for the comments below is noted.	
Isle of Wight Rowing Forum	129	With regards to the access to suitable water – the particular needs of the IW Rowing Clubs – due to the constraints of tide and sea conditions / weather and how busy and crowded the IW Rivers are – is an island area of suitable water that we could access – and we have often looked at the River from Brading to St Helens embankment as a possibility. The possibility of providing significant water catchment from the river would be of great benefit to both Southern Water and all the Island Rowing Clubs. For example, the provision of a 1500m rowing course would allow training in a safe environment throughout the year – for rowing and other similar water sports – for example canoeing. Such a facility would be of particular benefit to the Island Clubs Junior / cadet rowers. The IWRF Clubs provide coaching for school children from ten years and upwards to learn to row and a facility as outlined along this river would not be tide dependent and would be free of other River traffic as found on the River Media. Also, with a reasonable width competitive rowing would be able to be provided. Mainland rowing clubs have easy access to such facilities which the IW Clubs cannot enjoy the benefits of due to location, ferry costs and travel time. Rowing on the proposed section would also be pollution free as the boats pose no environmental issues. Southern Water would benefit from a 1500m long section 3m deep and 50m wide and would provide around 225, 000 cubic meters of fresh water – a 100m wide course would provide 450,000 cubic meters of freshwater.	The comments and suggested idea for the provision of a rowing course on the Isle of Wight for use by local rowing clubs is noted. Unfortunately, this lies outside the scope of the WRMP consultation on our draft WRMP. The purpose of the consultation is to consider feedback on how we plan to secure water supplies for the future in the South East. We do not have any feasible options on the Isle of Wight which could potentially provide such an area of open water - the only potential option would have been through the creation of a reservoir in the Carisbrooke area, however this has not been taken forward as a feasible option as it has a number of environmental and technical constraints which mean it is not considered feasible at the current time. However, we welcome any future opportunities for dialogue with the Isle of Wight Rowing Forum.	None
Isle of Wight Rowing Forum	129	While we fully appreciate that the official's consultation period has ended we thought it would still be well worth sharing our thought's with you and that you might be willing to consider these thoughts as part of your development plans and we would welcome your reaction to the views we have expressed.		

Appendix 7.35 - Arun District Council

Respondent	Reference no.	Response comment	SWS' Consideration of Response	Changes Required to dWRMP
Arun District Council	**130**	The methodology of forecasting a range of more and less challenging futures based on climate change and differing levels of consumption/supply efficiency, appears a robust approach to flexible infrastructure planning over the long term — particularly as this also incorporates developments within the planning pipeline based on adopted and emerging local plans. The Government is currently proposing changes to national planning policies (eg. draft National Planning Policy Framework consultation closed on 10 May) which may potentially increase unplanned development pressure in locations and quantities that fall outside of the Local Plan. Arun would encourage Southern Water and, indeed, other infrastructure providers and utilities to fully engage with the Government in responding to national policy consultations, on the risks that unplanned development may pose to the soundness of their own business plans and long term management plans, frustrating delivery of future development and resource resilience and mitigation in the face of climate change.	The comments are noted and welcomed, including the support for our approach to forecasting and planning to accommodating a range of potential futures. We recognise the potential changes in growth that may take place, and accommodate this within the forecasts that we model. We work closely with Government, with other water companies and with planning authorities and other partners and stakeholders to take into account emerging development proposals and policies, and to seek to influence them.	None
Arun District Council	**130**	Depending on the futures forecast the Water Resources Management Plan identifies a number of infrastructure proposals that may be needed in the sub region. Under all future scenarios for the period 2025-2030 on page 16, it identifies the need for a potential 'Resource hub' for recycling/reuse of water that would fall within the Arun local planning authority area. Such proposals have the potential for local environmental impact in terms of odour, noise and air quality, and ADC would expect and require these matters to be mitigated against through the planning process. Early engagement with all stakeholders, including landowners and developer interests, should be progressed. This is especially relevant because the Arun Local Plan (2011-2031) which is expected to be adopted by this Council in July, sets out Strategic Allocations for housing and employment which need to be factored into any decision making in terms of proximity to existing or new communities, any necessary land take and infrastructure footprint. Mitigation would also need to be included during any construction phase, including any associated	The need for close working with the Council and with other partners and stakeholders through the investigation and promotion of our proposals for water re-use are well stated and understood. We are aware of the local Plan proposals for this location, and we will need to accommodate and reflect these in our own proposals, ensuring that we undertake the necessary assessments of potential impacts on existing and future communities and residents. We are confident that these assessments will enable any appropriate mitigation measures to be designed and incorporated into the eventual detailed proposals.	None
Arun District Council	**130**	The Council also note that there is mention of a potential desalination plant on the tidal stretch of the River Arun (scheme 14; page 24), which also falls within the Authority's planning remit. As desalination is only mentioned under the most extreme scenario for 2035-2040 on page 17, the Council would appreciate confirmation for the time period within which this should be expected, particularly to ensure it is considered within evidence for future planning documents. If it is deemed that this scheme is necessary then, again, early engagement with all stakeholders would be needed to ensure that an appropriate location is identified taking account sensitive landscapes and features; possible impacts of climate change (eg. flooding) and planned development and supporting infrastructure are considered/incorporated.	The desalination plant was included as a long term proposal in our draft WRMP, however the revised modelling for the revised draft WRMP is not now identifying the need for this plant within the plan period. We are still promoting a desalination plant at Shoreham however, and as part of the detailed investigations of that option we will need to investigate and consider potential alternatives, one of which would be on the tidal Arun. We will want to work closely with the Council as we progress this work.	None
Arun District Council	**130**	Finally. in relation to the potential for Aquifer Storage and Recovery facilities, should proposals emerge within the District but within the South Downs National Park authority area, you should take into consideration closed landfill sites in the area and their potential for impacting the groundwater in any confined aquifer which would need to be modelled.	The ASR proposal is not currently located within Arun District and detailed proposals for a pilot investigation are being prepared for a site within the South Downs National park near Sompting. Applications for necessary consents for this pilot scheme are to be submitted later in 2018. Southern Water is liaising closely with the Environment Agency on the groundwater and other aspects of this scheme.	None

Appendix 7.36 - World Wildlife Fund (WWF)

Respondent	Response no.	Response comment	SWS' Consideration of Response
World Wildlife Fund - Dani Jordan - Freshwater Policy Officer	61	Our comments on the draft Water Resources Management Plan (WRMP) are below. As part of the Blueprint for Water coalition of environmental NGOs, WWF has identified a number of high-level outcomes we would like to see delivered in PR19 through the WRMPs and business plans (see: http://blueprintforwater.org.uk/2016/11/ensuring-water-companies-deliver-for-nature/). These outcomes were discussed with and shared with the water sector through 2017 and into 2018. Blueprint for Water has also undertaken a comparative piece of work looking across the sector's draft WRMPs - our response draws on this.	The context for the comments is noted.
World Wildlife Fund	61	**Demand management** In the face of increasing pressures on water resources, we must make the best use of the water we take from the environment, ensuring it is not lost or wasted. WWF expect to see WRMPs that not only prioritise demand management options over major new supply schemes, but also provide a step-change in both scale and ambition. • We are pleased to see the target on PCC set by Southern Water through 'Target 100', and applaud the company for leading the industry in terms of setting out such a target. We do however think that Southern Water could go further and faster, especially when considering the strong base of universal metering; we would like to see a more ambitious target on PCC of 100 litres by 2025, and 75 litres by 2050. Only with stretching targets can the industry drive forward with serious ambition, searching out innovative solutions and breaking from 'business as usual' planning. • We would like to understand further what water efficiency activities Southern Water plan to undertake to support the 'Target 100'. • Southern Water has to date undertaken positive work with developers; we would like to see Southern Water commit to continue working with all developers in their area to ensure new developments are water efficient and to advocate (with other stakeholders) for stronger building regulations in water stressed areas. • We are pleased to see Southern Water taking up Ofwat's challenge of reducing leakage by 15% during AMP7. • We are pleased that Southern Water plan to meter remaining unmeasured customers, and increase the frequency of meter reads. Water meters are an important part of the demand management mix, not only assisting with leak detection and providing a corner stone to water efficiency work, but with smarter technology also offering the potential for long-term, targeted engagement with customers. • We are interested to understand more about the community incentive/reward programme in the Western area near the River Itchen SAC. What were the lessons from this programme and could it be extended elsewhere? • We note that one option considered to control demand was through seasonal tariffs and rising block tariffs. We would be interested to know if and how this option is to be implemented.	Our Target 100 initiative is considered to be ambitious in comparison to other water company targets, and has been welcomed by the Environment Agency and others in their responses to the WRMP. The Target 100 extends across all homes, not just new home, and our initial plans have four key strands: 1. Installation of smart metering technology: We are currently undertaking trials of devices that can read meters and send the reading to the customers using their Wifi. If the trial proves successful, we plan to roll out 100,000 devices over AMP7. 2. Home visits: We currently undertake water efficiency home visits, which has a high uptake rate and can result in up to 10% further savings on top of that achieved through metering. We will continue with this programme and combine it with leak detection. 3. Proactive customer contact: We are looking to develop tools and systems to identify any significant increase in consumption. We can then proactively engage with customers at an early stage to determine if the increase is due to change in circumstances or may be a leak. This will allow us to specifically target customers or geographical areas for water efficiency messages during periods of high demand. 4. Incentivising water efficiency behaviour: Our research has shown little appetite for seasonal tariffs and so as an alternative, we are looking to reward customers for conserving water. The first scheme will be rolled out in Hampshire in partnership with Eastleigh Borough Council. The scheme will offer rewards to residents for recycling waste and reducing water consumption on a monthly basis. The scheme will be introduced in the Central area towards the end of AMP7 and in the Eastern area during AMP8. To achieve Target 100 we will also need to continue our work with developers and local planning authorities to actively promote water efficiency. We also agree that changes to Building Regulations will greatly assist in achieving Target 100. We committed in our draft WRMP to aiming to meet Ofwat's leakage reduction target of 15% by the end of the next AMP (2024/25). We are now proposing to go further and are committing to seek to achieve a 40% reduction in our current leakage by 2040 and 50% by 2050 in our revised draft WRMP. Our universal metering programme has been incredibly successful and we aim to increase meter penetration to 92% in the Central area as part of our plans to reduce overall per capita consumption to 100 l/h/d by
World Wildlife Fund	61	**Supply development** Whilst we want water companies to prioritise investment in demand measures which leave more water in the environment, we recognise that development of sources is needed to remove or offset the environmental impacts of certain abstractions, prevent future deterioration of water bodies, and maintain security of supply within the context of future climate uncertainty. • We welcome Southern Water's emphasis on making better use of existing resources. However, we recognise that development of alternative sources will be needed where significant sustainability reductions are planned. In particular, alternative supply development needs to be advanced rapidly in the Western Area given the recently agreed changes to abstraction licences on the Lower Itchen, Test & Candover. We would like to see Southern Water commit to putting these alternative sources online as soon as possible - to avoid ecological damage to these rivers during drought orders. • We also welcome Southern Water's plans to convert wastewater treatment works into hubs to recycle water for industry, households and agriculture. • Should there be any notable changes between the draft and final plan with respect to the preferred supply side options, in particular around proposed inter-company transfers and reservoirs, we urge that further stakeholder and customer engagement is undertaken. • We want Southern Water to commit in its final plan that all the supply side water resource schemes progressed in AMP7 will deliver a net gain in biodiversity and for the wider environment.	Following the Inquiry, a Section 20 Operating Agreement is now in place between the Environment Agency and Southern Water. The outcome of the Inquiry means that some sustainability reductions will be brought in with immediate effect once approved by the Secretary of State. This means that we will have insufficient supplies of water available in our Western area to supply our customers in all but normal environmental conditions. As soon as conditions become drier than normal, we will in the short term, have to impose temporary use bans and apply for Drought Orders to allow us to continue to abstract water below the conditions imposed in the new licences. Where Drought Orders are applied for, we will implement river restoration and habitat mitigation measures in potentially affected rivers in combination with Drought Orders. Our supplies to customers will remain at risk during the AMP7 period and into AMP8 until sufficient supplies are delivered. The extent of the deficit is such that we need to deliver large new resources and these will take time to deliver. We will seek to deliver these in a timely manner and in consultation with key stakeholders. Support for our wastewater recycling hubs initiative is welcome. Southern Water has included in its revised draft WRMP its commitment to a number of design principles for its supply enhancement options as set out in Annex 6 of the revised draft WRMP (and in the SEA, HRA and WFD Reports) that will inform the detailed design of schemes which includes seeking an overall
World Wildlife Fund	61	**Addressing unsustainable abstraction** Addressing existing unsustainable abstraction and its impact on the environment is essential. • We are pleased that Southern Water are an active partner in the Environment Agency's (EA) Restoring Sustainability Abstraction (RSA) programme and that they are planning to reduce abstraction from existing sources in order to prevent waterbody WFD status deterioration. It is also commendable that Southern Water can be adaptable depending on the outcomes of sustainability reductions. • However, we note that some of these sustainability reductions may not happen until 2029. We want to be confident that Southern Water is doing everything it can to address implement sustainability reductions linked to known impacts on – or risk of deterioration at - protected conservation sites and WFD water body status within AMP7. • Ultimately, we want to see a clear commitment from Southern Water to reduce abstraction from environmentally sensitive sources and an explicit pathway to achieving that. • We are also pleased to see Southern Water making better use of water by allowing more abstraction from the River Medway in Winter when flows are higher – and using this to fill Bewl Water. This should leave more water in the environment during the summer to support wildlife. • We understand that work is being done to help improve environmental resilience to abstraction of water from the Rivers Itchen and Test during drought orders - e.g. catchment management and infrastructure schemes to reduce nutrient pollution, land-use practices, and in-stream river restoration work. We urge Southern Water to ensure comprehensive monitoring of - and reporting on - freshwater ecological health and biodiversity at these sites so that the effectiveness of these approaches can be properly evaluated. This is especially important because Southern Water's analysis shows that the use of drought orders/permits may lead to temporary deterioration of WFD status of some waterbodies. • We understand that Southern Water is exploring the use of the Abstraction Incentive Mechanism (AIM) at one site. We would be interested to understand what the barriers are to implementing AIM more widely across Southern Water's area.	Changes to our supplies as a result of sustainability reductions are either immediate or very short term, and can be very significant in scale, making them harder to plan and accommodate within our WRMP. Our modelling techniques allow us to explore this variability and identify' several states of the world' that we should plan to accommodate within our WRMP. We are then able to weight up the risks associated with these, and to identify the 'least regret' set of options for use to implement to ensure we have resilient supplies for customers. Support for initiative to make better use of water from the River Medway to fill of Bewl Water is welcome. The draft WRMP19 and the revised draft WRMP19 set out the importance of enhancing resilience drought events, including environmental resilience. We have committed to a range of measures to enhance environmental resilience. Where potential adverse effects on the environment have been identified in respect of our WRMP strategy, we have committed to implementation of mitigation (and in some case compensatory) measures to minimise the effects and seek overall net environmental gain from implementation of our WRMP. There is a short term reliance on Drought Permits and Orders while the permanent solutions are developed and implemented, but in the longer term (2030s onwards) our customers and the environment in which we operate will benefit from our planned resilience investment, which includes continued measures to reduce demand for water as well as physical environmental enhancement measures. As part of the S20 Operating Agreement that emerged from the Inquiry on the Licence changes to the River Itchen, River Test and Candover, we committed to a significant package of environmental monitoring and mitigation measures associated with potential drought permits and drought orders that might be required over the next 10 years or so.

World Wildlife Fund	61	Catchment approaches • We welcome Southern Water's increased emphasis on catchment approaches through its new "Catchment First" Scheme – which aims to work with landowners to improve water quality and store more water naturally. We urge Southern Water to signal its commitment to this by developing a catchment ODI.	In terms of Catchment First, Southern Water is keen to work with Natural England and our catchment partners to identify the wider potential co-benefits of our catchment management schemes which have a primary focus on improving drinking water quality and/or enhancing environmental resilience of water bodies from which we abstract. As part of our commitment to achieving overall net environmental gain from implementation of our WRMP, we will actively work with Natural England and our catchment partners to maximise benefits for biodiversity and society as a whole from our catchment management investment, adopting ecosystem services and Natural Capital assessment approaches in line with the Government's 25 year plan for the environment and Southern Water's wider Integrated Water Cycle Management approach. Whilst we do not have a specific catchment ODI, we have a series of ODIs that cover leakage, PCC, river water quality, AIM, and Target 100. We are not yet able to adopt a PC relating to our catchment first initiative as we want to plan and implement a number of catchment management solutions to identify the most appropriate performance measures to adopt.
World Wildlife Fund	61	**Compliance with Environmental Regulations and Natural Capital** • We understand that for all feasible management options detailed Strategic Environmental Assessments (SEA), Habitat Regulations Assessments (HRA) and Water Framework Directive (WFD) assessments were undertaken; and that none of the options within the strategy lead to permanent deterioration of WFD status for any waterbody – for this we commend Southern Water. • We would like to see water companies give material consideration to the value of natural capital and benefits of water left in the environment within water resource options appraisals. • Environmental valuation is not strong in the draft WRMP. However, we understand that Southern Water has an ambition to embed natural and social capital into options appraisal, and that they are looking at how natural capital valuation can support catchment approaches in this WRMP. We fully support Southern Water's ambition, and urge that an ODI is developed around natural capital – to ensure environmental considerations become properly embedded in decision-making during AMP7.	Southern Water will be producing a policy document to guide its future planning, which will incorporate natural capital accounting and we will work closely with our partners as we develop our policies and approaches. Natural Capital information relating to the WRMP has been utilised with our SEA. As set out above, Southern Water has included in its revised draft WRMP its commitment to a number of design principles for its supply enhancement options as set out in Annex 6 of the revised draft WRMP (and in the SEA, HRA and WFD Reports) that will inform the detailed design of schemes which includes seeking an overall net biodiversity gain in developing each scheme as far as possible, working in close dialogue with Natural England, Environment Agency and other stakeholders.
World Wildlife Fund	61	**Regional water resources planning** We support multi-sector, regional water resources planning: it provides more integrated solutions with the potential for wider and multi-sector benefits. We welcome Southern Water's efforts to engage in regional water resources planning through Water Resources South East (WRSE). • We'd like to see Southern Water commit to participating in and promoting national and regional-scale water resources planning which works with other major water-using sectors to assess future challenges and develop solutions. This planning should be guided by recommendations from the Environment Agency's WRMP24 initiative.	We are committed to working as part of the Water Resources South East group, delivering benefits of joint working on all aspects of water resources management and strategic planning for the South East region, including promotion of water efficiency, the development of joint schemes or trading options as applicable and facilitating cumulative environmental assessment (for example in respect of cumulative landscape effects). We are also working across regions and nationally as part of our existing networks, and looking to share experience and techniques across the industry, with government and with other key sectors.

Revised draft Water Resources Management Plan 2019

Statement of Response

Appendix 8: Summary of changes to WRMP Annexes

September 3rd 2018

Appendix 8: Summary of changes to WRMP Annexes in the revised draft WRMP

Each of the individual WRMP Annexes has a table at the start of the Annex that signposts the changes that have been made since the draft WRMP. A copy of those tables is copied below as a summary. For the details, please see the individual revised draft WRMP Annexes.

Annex 1 – Pre-Consultation and problem characterisation

Number	Section	SoR Ref.	Reason for change
5.4	Customer engagement	Ofwat 0.8 Ofwat 2.1 Ofwat 2.3 Ofwat 2.4	Address SoR
6	Levels of Service	M46	Address SoR comment, to provide better signposting
6.1	Stakeholder and customer preferences for levels of service	I1.2 Ofwat 0.8 Ofwat 2.1 Ofwat 2.2 Ofwat 2.4	Address SoR
6.3	Reference levels of service	M46	Address SoR, minor wording changes to improve clarity
6.4	Levels of service and drought triggers	n/a	Change to text to improve consistency with rWRMP model assumptions
6.5.1	Level of service statement	R5.1	Improve clarity of text and consistency with Western Area inquiry outcome
6.2	Target levels of service	R5.1	Address SoR to show annual risk
6.2	Target levels of service	Ofwat 1.2	Address SoR commentary
6.4	Levels of service and drought triggers	Ofwat 1.2 Ofwat 4.1	Address SoR commentary
7	References	n/a	Added reference

Annex 2 – Demand Forecast

Number	Section	EA/Ofwat reference	Reason for change
2 - 10	All sections *(Change in base-year from 2016-17 to 2017-18 means the starting position has changed for all tables and figures).*		To more accurately reflect the starting position for demand forecast

Number	Section	EA/Ofwat reference	Reason for change
3.2	Base-year demand *(Base-year demand and the baseline demand forecast now uses leakage figure derived using the new method)*.		To reflect likely leakage levels post AMP6
3.3	Demand factors *(Clarification on calculation of peak demand and the factors behind it).*	M13 (EA)	Incorporating EA feedback on draft WRMP
4.2	Accounting for uncertainty *(Experian report on WRMP19 growth forecast is now attached as Appendix A).*	M18 (EA)	Incorporating EA feedback on draft WRMP
4.3.1	Growth in total customer base *(Clarification on switching of unconnected population).*	M20; M27 (EA)	Incorporating EA feedback on draft WRMP
4.3.2	Growth in household customer base *(Clarification on incorporation of communal population in the growth forecast definition of household/non-household).*	M14; M15; M16 (EA)	Incorporating EA feedback on draft WRMP
5	Household demand forecast *(Further clarification of the rationale behind selection of household demand forecasting methodology).*	M23 (EA)	Incorporating EA feedback on draft WRMP
5	Household demand forecast *(Additional details of our current water efficiency activities and their incorporation in the baseline demand forecast).*	M9 (EA)	Incorporating EA feedback on draft WRMP
5	Household demand forecast *(Statement on future plans for data collection to inform demand forecasts).*	M26 (EA)	Incorporating EA feedback on draft WRMP
5.1	Customer segmentation *(Further clarification on the segmentation used for domestic customers).*	M24 (EA); 3.1 (Ofwat)	Incorporating EA and Ofwat feedback on draft WRMP
5.1	Customer segmentation *(Explanation of the treatment of new builds and voids in the demand forecast).*	M19; M21; M27 (EA)	Incorporating EA feedback on draft WRMP
5.2	Data *(Description of the data sources and assumptions used for forecasting consumption for metered and unmetered consumption).*	M22 (EA)	Incorporating EA feedback on draft WRMP
5.4	Climate change impact *(Explanation of climate change impact on demand)*	M33 (EA)	Incorporating EA feedback on draft WRMP
5.5	Total PCC *(Explanation of adjustment of NYAA PCC for DYAA, DYCP and DYMDO scenarios).*	M22 (EA)	Incorporating EA feedback on draft WRMP
5.6	Water efficiency (Target 100) (*Summarising the key features of our water efficiency strategy in order to meet Target 100).*	M25	Providing salient features of our Target 100 policy
6.2	Model *(Lowering of growth in NHH demand by 5% up to 2044-45 and by 10% up to 2069-70)*.	3.2 (Ofwat)	Incorporating Ofwat feedback on draft WRMP
7.1	Leakage *(Additional details our current leakage management activities and future plans).*	M5 (EA)	Incorporating EA feedback on draft WRMP
	Appendices C to K *(Forecasts for all micro-components of PCC and total PCC are shown separately for unmeasured and measured households).*	M22; M25	Incorporating EA feedback on draft WRMP

Annex 3 – Supply Forecast

Number	Section	SoR Ref.	Reason for change
3.5.3	Aquator models	M28	Address SoR

Number	Section	SoR Ref.	Reason for change
3.2.3	Weather generator overview	I1.1	Address SoR
3.2.6	Weather generator modelling process	I1.3, I1.6 I1.5	Address SoR
3.2.7	Sub-sampling for water resource modelling input	I1.7	Address SoR
3.2.9	Peer review of our approach	I1.2	Address SoR
3.2.8	Disaggregation of daily rainfall and generation of PET data	I1.4	Address SoR
3.3.7	Test and Itchen groundwater model (Hampshire WRZs)	I2.2, I1.4	Address SoR
3.5.8	Drought triggers and drought interventions	I2.4, I2.5	Address SoR Describe change in baseline modelling to exclude TUBs
3.5.9	Modelling of drought measures	I2.5	Describe how drought measures have been modelled
3.5.10	Levels of Service		
3.5.11	Assessment of Deployable Outputs	I2.1	Address SoR
4.1.2	Effect of demand restrictions	I2.4	Address SoR, update to methodology change
4.1.1	Effect of supply side measures	I2.5	Address SoR
4.5.6	Drought response surfaces	I2.1, I5.1	Address SoR, added SH WRZ
4.5.7	Links to our Drought Plan	I5.2, I5.3	Address SoR
3.3.13	East Kent groundwater model (Kent Thanet WRZ)	M29	Address SoR
4	Deployable Outputs	M30	Updated tables Address SoR to show change from WRMP14
5.2	AMP6 NEP		Updated following public inquiry
5.3	AMP7 WINEP	I4.4, I7.9	Address SoR and updating following release of WINEP 2 and WINEP 3
5.4	Incorporating sustainability reductions into the WRMP	I2.3 Ofwat 4.1	Address SoR
5.4.1	Test, Itchen, Candover abstraction licence public inquiry	Ofwat 4.1	Inclusion of outcome of public inquiry
6	Impacts of climate change on supplies	M34	Address SoR

Number	Section	SoR Ref.	Reason for change
3.7	Water quality impacts on Deployable Outputs	Ofwat 4.1, Ofwat 4.3, Ofwat 6.1	Address SoR, update data
4.3.1	Sussex North	I3.1	Address SoR
1.7	Outage	R1.1-R1.4, 4.5	Address SoR
2.6	Outage	R1.1-R1.4, 4.5	Address SoR
7	Process Losses	4.4	Address SoR
8	Outage Allowance	R1.1-R1.5, 4.5	Address SoR
Appendix F	Outage	R1.1-R1.5, 4.5	Address SoR
4.5.3	Our design droughts	I2.1, I5.1, I1.3	Address SoR, update to reflect DO changes
4.5.5	Credibility of our stochastic events for water resource planning	I1.3	Address SoR
6	Impacts of climate change on supplies	M34	Address SoR, updated tables
4.5.2	Standard precipitation indices	I1.5	Address SoR
4.5.7	Links to our Drought Plan (Table 10)	I5.2, I5.3	Address SoR

Annex 4 – Environmental Forecast

Number	Section	SoR Ref.	Reason for change
1	1 and 6	N/A	Description of use of environmental forecast for draft WRMP

Annex 5 – Baseline Supply Demand balance

Number	Section	SoR ref.	Reason for change
1	1.1	N/A	Text added to explain Public Inquiry outcome
2	1.2.1-1.2.3	N/A	Text and figures updated to reflect revised draft WRMP SDB results
3	2	Affinity Water - 36	Table 1 updated to reflect bulk supply assumptions used in revised draft WRMP19
4	1.1, 3, 4.4.4	N/A	Text added to explain Public Inquiry outcome

Number	Section	SoR ref.	Reason for change
5	3.1 – 3.3	N/A	Text and figures updated to reflect revised draft WRMP WAFU figures
6	4.3.3-4.3.4	EA I4.6: Climate change uncertainty	Additional explanation of climate change uncertainty approach added. Additional explanation of target headroom calculation added
7	4.3.3	N/A	Additional explanation of demand forecast scenarios added. Text added to explain revised water efficiency assumptions in demand forecast uncertainty modelling for revised draft WRMP.
8	4.3.3	EA I1.8: Integrated Risk Model – correlation coefficient	Text added to explain derivation of correlation coefficient.
9	4.3.4	Ofwat 5.1	Text added to explain the range in target headroom results.
10	4.3.4	N/A	Table 9 updated to reflect revised draft WRMP Target headroom results.
11	4.3.4	N/A	Text and figures updated to reflect revised draft WRMP IRM outputs.
12	4.4.3	N/A	Table 10 updated to reflect revised outage forecast for revised draft WRMP.
13	4.4.4	EA I4.4: Sustainability reductions and sensitivity testing	Text added to reflect revised approach to sustainability reductions in the Western area for the revised draft WRMP.
14	4.4.4	EA I7.9: The baseline includes sustainability reductions in Water Industry NEP1 (WINEP1) but not those in WINEP2 and WINEP3	Text added to explain how WINEP 3 has been taken into account for the revised draft WRMP
15	4.4.4	N/A	Text and Table 12 updated to reflect minor changes to sustainability reduction values for the revised draft WRMP. Values for Test and Itchen sustainability reductions added to table.
16	4.4.5	EA I4.2: Scenario Generator Model	New section added to explain approach to dependencies used in the SDB modelling.
17	4.4.7	N/A	Text and figures updated to reflect revised draft WRMP SGM results.
18	5	N/A	Text and figures updated to reflect revised draft SDB figures. New sub-sections added to explain changes in the SDB from draft to revised draft plan.
19	6	N/A	Additional references added relating to demand forecast uncertainty modelling.

Annex 6 – Options Appraisal

Number	Section	SoR ref.	Reason for change
1	2.4.2	n/a	Update to Target 100 and other demand management option descriptions for the revised draft WRMP following change to Southern Water policy.
2	2.4.2	49 - R5.4	Amended in response to consultation comment from the Environment Agency.
3	2.4.2	49 - R5.5	Amended in response to consultation comment from the Environment Agency.
4	2.4.2	49 - M12	Amended in response to consultation comment from the Environment Agency.
5	2.4.2	49 - M17	Amended in response to consultation comment from the Environment Agency.
6	2.4.1	49 - M47	Amended in response to consultation comment from the Environment Agency.
7	2.4.1	49 - M49	Amended in response to consultation comment from the Environment Agency.
8	2.4.2	49 - M8	Amended in response to consultation comment from the Environment Agency.
9	2.4.1	51 - 7.8	Increased detail provided in response to consultation comment from Ofwat.
10	Tables	n/a	The feasible options summary tables have been updated for the revised draft WRMP to reflect amendments made to feasible options.
11	2.4.2 & Appendix C	49 - R3 & R3.1	Revised approach to leakage reduction options described in response to consultation comment from the Environment Agency.
12	Appendix C	49 - M1	Revised approach to leakage reduction options described in response to consultation comment from the Environment Agency.
13	Appendix C	49 - M2	Revised approach to leakage reduction options described in response to consultation comment from the Environment Agency.
14	Appendix C	49 - M3	Revised approach to leakage reduction options described in response to consultation comment from the Environment Agency.
15	Appendix C	49 - M4	Revised approach to leakage reduction options described in response to consultation comment from the Environment Agency.
16	Appendix C	49 - M7	Revised approach to leakage reduction options described in response to consultation comment from the Environment Agency.
17	Appendix C	49 - M10	Revised approach to leakage reduction options described in response to consultation comment from the Environment Agency.
18	2.4.2	49 - M36	Amended in response to consultation comment from the Environment Agency and to reflect updated situation following public inquiry.
19	Appendix A	49 - M42	Amended in response to consultation comment from the Environment Agency.
20	2.4.2	51 - 7.2	Amended in response to consultation comment from Ofwat.
21	2.4.2 & Appendix C	51 - 7.1, 7.4	Amended in response to consultation comment from Ofwat.
22	2.4.2	51 - 7.5	Amended in response to consultation comment from Ofwat.

Number	Section	SoR ref.	Reason for change
23	2.4.2	66, 70	Amended in response to consultation comments from South West Water and Wessex Water, and further information that has been completed since publication of the draft WRMP.
24	2.4.1	43 - various	Amended in response to consultation comments from Natural England.

Annex 7 – Summary of rejected options

Number	Section	SoR ref.	Reason for change
1	Table 1		Additional rejected options added
2	Table 2		Additional rejected options added

Annex 8 – WRMP Strategy preparation

Number	Section	SoR ref.	Reason for change
1	2.3, 2.3.1	EA I4.1	Update and further explanation of States of the World concept
2	2.3, 2.3.2	EA I4.3	Further explanation of branches
3	2.3.2	EA I4.3	Testing of branch sensitivity
4	2.3.2	EA I4.4	Update branches explanation for western area – change of approach to inclusion of sustainability reductions
5	3.4.1	EA I4.5	Explanation of triggers and decision points for the preferred plan and alternative strategies
6	3, 3.1	EA I4.7	Approach to inclusion of customer preferences in the development of the preferred plan
7	3	EA I4.8	Development of the preferred plan from the least cost plan (links to I4.7)
8	3.2.1	EA I4.9	Environmental and social costing
9	2.3, 3	EA I4.10	Further explanation of appropriateness of the real options approach and comparison of the EBSD and real options decision making approaches
10	3.4.2	EA I6.1, Ofwat 1.3	Resilience to non-drought events
11	3.5	EA M49	Sensitivity testing for uncertainty of costs
12	2.3, 3	Ofwat 2.1	Further detail on decision making, given the complex methods adopted
13	3.4.1	Ofwat 7.7	Programme of works to demonstrate deliverability of preferred plan and alternative schemes
14	3	Ofwat 8.1	Further explanation around selection of preferred plan
15	3.4.1	Ofwat 8.2	Programme of works to demonstrate deliverability of preferred plan and alternative schemes and further explanation around the scenarios used to generate the preferred plan
16	3	Ofwat 8.3	Additional text around the approach in moving from a least cost plan to the preferred plan
17	3, 3.3	Ofwat 9.1	Inclusion of regional solutions (as from WRSE outputs)
18	3, 3.3, 3.4.1	Ofwat 9.2	Address Ofwat comments on balance of Southern Water-developed supply-options compared to water trading options

Annex 9 – Western Area Strategy

Number	Section	SoR ref.	Reason for change
1	Whole annex	-	Restructure of annex to try to make the stages we have followed to derive our preferred plan clearer
2	Whole annex	-	Revised modelling and outputs due to changes made to elements of the supply demand balance and options assessments since the DWRMP
3	3.5.2, 7.3	EA R2.1	Consistency of Portsmouth bulk supplies
4	3.5.2, 7.3	EA R2.2	Consistency of Bournemouth bulk supply
5	3.3	EA R3.1, Ofwat 7.4	Leakage reduction levels
6	7.2	EA R4.1 & Ofwat 7.7, 8.2	Programme of works to demonstrate deliverability of preferred plan and alternative schemes
7	5.3.6	EA R4.7	Potential transfer from Thames Water
8	4.4	EA R5.2	Greenhouse gas assessment for strategy
9	4.3	EA R5.3 & M32	Climate change assessment of strategy
10	3.4	EA I2.4	Demand side drought measures
11	3.4	EA I2.5	Supply side drought measures
12	5.1	EA I4.3	Testing of branch sensitivity
13	2.2.1	EA I4.4, Ofwat 5.2	Inclusion of sustainability reductions in the branches
14	7.2	EA I4.5	Trigger points for decision making
15	3.5.3	EA I4.7	Approach to inclusion of customer preferences in the development of the preferred plan
16	3	EA I4.8, Ofwat 8.3	Development of the preferred plan from the least cost plan (links to I4.7)
17	5.4	EA I4.10	Comparison of real options approach and the conventional EBSD approach
18	8	EA I6.1, Ofwat 1.3	Resilience to non-drought events
19	5.2	EA M49	Uncertainty around costs – sensitivity testing
20	5.5, 7.2	Ofwat 1.1	Comparison to WRMP14 and ‘adaptive pathway’ approach
21	4	Ofwat 4.1	Presentation of alternative strategies in advance of the uncertain outcome of the Hampshire Abstraction Public Inquiry, which has now been completed
22	4.1.7, 7.3	Ofwat 7.3	South West Water bulk supply uncertainty and regional planning
23	3.6	Ofwat 7.5	Details of proposed metering strategy
24	3.4, 7	Ofwat 7.7	Deliverability risks – interim position with drought permits / order
25	3.5.2, 5.3, 7.3	Ofwat 9.1	Assessment of regional options compared to ‘in-house’ solutions
26	3, 4	Ofwat 9.2	Ofwat welcomes the bulk supply from Havant Thicket. Update of strategy on latest water trading positions

Annex 10 – Central Area Strategy

Number	Section	SoR ref.	Reason for change
1	Whole annex	-	Restructure of annex to try to make the stages we have followed to derive our preferred plan clearer
2	Whole annex	-	Revised modelling and outputs due to changes made to elements of the supply demand balance and options assessments since the DWRMP
3	3.2	EA R3.1, Ofwat 7.4	Leakage reduction levels
4	7.2	EA R4.1 & Ofwat 7.7, 8.2	Programme of works to demonstrate deliverability of preferred plan and alternative schemes
5	4.4	EA R5.2	Greenhouse gas assessment for strategy
6	4.3	EA R5.3 & M32	Climate change assessment of strategy
7	3.3	EA I2.4	Demand side drought measures
8	3.3, 4.1.3	EA I2.5	Supply side drought measures
9	7.1	EA I3.1	Pulborough wellfield development uncertainty
10	5.1	EA I4.3	Testing of branch sensitivity
11	2.2.1	EA I4.4 & M37, Ofwat 5.2	Inclusion of sustainability reductions in the branches
12	7.2	EA I4.5	Trigger points for decision making
13	3.4.3	EA I4.7	Approach to inclusion of customer preferences in the development of the preferred plan
14	3	EA I4.8, Ofwat 8.3	Development of the preferred plan from the least cost plan (links to I4.7)
15	5.3	EA I4.10	Comparison of the EBSD and real options decision making approaches
16	8	EA I6.1, Ofwat 1.3	Resilience to non-drought events
17	5.1	EA M49	Uncertainty around costs – sensitivity testing
18	5.4, 7.2	Ofwat 1.1	Comparison to WRMP14 and ‘adaptive pathway’ approach
19	7.3	Ofwat 7.3	Regional planning
20	0	Ofwat 7.5	Approach to metering
21	3.4.2, 7.3	Ofwat 9.1	Assessment of regional options compared to ‘in-house’ solutions
22	3, 4	Ofwat 9.2	Update of strategy on latest water trading positions

Annex 11 – Eastern Area Strategy

Number	Section	SoR ref.	Reason for change
1	Whole annex	-	Restructure of annex to try to make the stages we have followed to derive our preferred plan clearer
2	Whole annex	-	Revised modelling and outputs due to changes made to elements of the supply demand balance and options assessments since the DWRMP
3	3.4.2	EA R2.5	Consistency of bulk supply agreements with South East Water

Number	Section	SoR ref.	Reason for change
4	3.2	EA R3.1, Ofwat 7.4	Leakage reduction levels
5	7.2	EA R4.1 & Ofwat 7.7, 8.2	Programme of works to demonstrate deliverability of preferred plan and alternative schemes
6	4.4	EA R5.2	Greenhouse gas assessment for strategy
7	4.3	EA R5.3 & M32	Climate change assessment of strategy
8	3.3	EA I2.4	Demand side drought measures
9	3.3, 4.1.3	EA I2.5	Supply side drought measures
10	5.1	EA I4.3	Testing of branch sensitivity
11	2.2.1	EA I4.4, Ofwat 5.2	Inclusion of sustainability reductions in the branches
12	7.2	EA I4.5	Trigger points for decision making
13	3.4.3	EA I4.7	Approach to inclusion of customer preferences in the development of the preferred plan
14	3	EA I4.8, Ofwat 8.3	Development of the preferred plan from the least cost plan (links to I4.7)
15	0	EA I4.10	Comparison of the EBSD and real options decision making approaches
16	8	EA I6.1, Ofwat 1.3	Resilience to non-drought events
17	3.4.2	EA M39	SEW shared resources and additional bulk supplies
18	5.1	EA M49	Uncertainty around costs – sensitivity testing
19	5.4	Ofwat 1.1	Comparison to WRMP14 and ‘adaptive pathway’ approach
20	7.3	Ofwat 7.3	Regional planning
21	3.4.2, 7.3	Ofwat 9.1	Assessment of regional options compared to ‘in-house’ solutions
	3, 4	Ofwat 9.2	Update of strategy on latest water trading positions

Annex 12 – not included in revised draft WRMP

Annex 13 – EA Checklist – restricted circulation

Annex 14 – SEA

Number	Section	SoR Ref.	Changes Made
All	All	N/A	Amended text to “revised” draft Water Resources Management Plan (WRMP)
8.1 9.3	Western Area strategy Cumulative Effects Assessment	EA comment R4.4	Western Area strategy text made clearer to confirm that the Fawley desalination scheme is mutually exclusive with the Portsmouth Harbour and Fareham WTW indirect potable reuse scheme. Cumulative effects section confirms no potential for cumulative effects between these two options
Appendix D	Bewl Raising 0.4m	EA comment I7.2	Appendix D assessment for the Bewl 0.4m reservoir raising option amended to include additional INNS risks and to note the need for appropriate mitigation. Note that this option has been removed from the preferred programme and is also not a strategic alternative option.

Number	Section	SoR Ref.	Changes Made
10.3	Marine Conservation Zones	EA Comment I7.5	Details provided of further assessment of potential effects on the Medway estuary habitats and associated designated sites.
Appendix B	Appendix B	EA comment M40	Appendix B updated to confirm that the Second Cycle of the Shoreline Management Plans have been published and that the SEA should consider the policy objectives set out in these plans.
9.4.3	Cumulative Effects Section	EA comment M40	The Cumulative Effects section has been updated to include assessment of the potential for cumulative effects with relevant Shoreline Management Plans
Appendix D	Appendix D	EA comment M41	Appendix D reformatted to improve navigation between each option assessment.
NTS	NTS	EA comment M45	SEA Non-Technical Summary amended to include more figures.
2.2.1 Appendix B	Review of Policies, Plans & Programmes	NE comment 2.1	Updated to include additional Acts, updated Regulations and the Government's 25 Year Environment Plan.
6.3.3 8.1.2 11.3.1	SEA Findings: Desalination SEA Western Area Strategy Mitigation of residual effects: Western Area	NE comment 2.2	Updated to add more information on marine environmental risks of desalination schemes Updated to add more information on marine environment risks associated with Fawley desalination scheme Updated to include discussion of mitigation measures for Fawley Desalination scheme
Appendix G	Appendix G	NE comment 2.3	Appendix G provides specific SSSI assessments for each option in the preferred programmes (strategies) and strategic alternative options to improve transparency of the assessed effects on SSSIs
8.1.2 Appendix G	Western Area Strategy SSSI assessments	NE Comments 1.3 & 2.3.1	Confirms the Test and Itchen river restoration options are additional to the restoration measures agreed in relation to the Test and Itchen drought permits/orders More information provided on the effects of the Southampton Link Main and Hampshire Grid Main option on the River Tests SSSI
6.3.3 8.1.2 & Appendix G 11.3.1	SEA Findings: Desalination SEA Western Area Strategy & SSSI assessment Mitigation of residual effects: Western Area	NE Comment 2.3.2	Updated to add more information on marine environmental risks of desalination schemes Updated to add more information on marine environment risks associated with Fawley desalination scheme Updated to include discussion of mitigation measures for Fawley Desalination scheme
8.2.2	Central Area strategy	NE comment 2.3.3	Tidal Arun desalination option removed from preferred programme (strategy) and is not selected as a strategic alternative option
8.2.2 & Appendix G	Central Area strategy SSSI assessment	NE comment 2.3.4	Confirms no impact on the Adur Estuary from the Pulborough Winter Transfer scheme Stage 2 Brine dispersion modelling findings presented in respect of Shoreham desalination plant option
8.2.2	Central Area strategy	NE comment 2.3.5	Littlehampton WTW reuse scheme pipeline route has been reviewed and revised to avoid adverse effects on the nationally rare ecological communities of the SSSI and minimise effects on other nearby sensitive habitats within the National Park.
8.2.3	Central Area strategic alternative options	NE comment 2.3.6	Pipeline route has been completely revised to avoid adverse effects on the ecological communities of the SSSI and minimise effects on other nearby sensitive habitats.

Number	Section	SoR Ref.	Changes Made
9.3 9.4.1	Cumulative effects assessment	NE comment 2.4	Details provided of cumulative landscape effects assessment. Proposal for a joint WRSE cumulative Protected Landscape Mitigation Strategy
8.1.2	Western Area strategy	NE comment 2.4.1	Updated information on revised pipeline routes to minimise effects on New Forest National Park
8.2.2 9.3 5.1.2	Central Area strategy Cumulative effects assessment Option screening	NE comment 2.4.2	Updated with assessment of revised pipeline routes in the South Downs National Park Reference to Table 14 providing cumulative effects assessment for South Downs National Park Confirmation that Pulborough Reservoir option removed from Feasible Options list
8.3.1 8.3.2 8.3.1 9.3	Eastern Area strategy Western Area strategy Cumulative effects assessment	NE comment 2.4.3	Confirmation that Bewl raising 0.4m option no longer included in revised draft WRMP19 Updated pipeline route impact information in relation to Kent Downs AONB Updated pipeline route impact information in relation to North Downs AONB Cumulative effects assessment for AONBs (Table 14)
10.3 11.3	MCZ assessment Mitigation measures – Eastern Area	NE comment 2.5	Section on MCZ assessment updated in accordance with Natural England's advice note Investigations to inform possible need for mitigation measures for Medway MCZ
8.3.2	Central Area strategy	NE comment 2.5.1	Confirms Arun Tidal desalination option removed from preferred programme (strategy) and not a strategic alternative option
9.4.2.	Cumulative effects assessment	NE comment 2.5.2	Updated to make clear there is no cumulative effect and that the various Sandown schemes are mutually exclusive.
8.4 8.5	National environmental policy objectives Natural capital & ecosystem services	NE comments 2.6, 3.2.1, 3.2.3, 3.2.4,	Net gain and natural capital principles for delivery of supply schemes
8.3.2	Eastern Area strategy	NE comment 2.6.2	Confirms measures to protect Priority Habitat for the Medway WTW reuse scheme
8.2.3	Central Area alternative options	NE comment 2.6.3	Pipeline route for Brighton WTW reuse scheme has been revised to minimise effects on Priority Habitats
9.3	Cumulative effects assessment	NE comment 2.6.4	Details provided of cumulative effects assessment for the Stour catchment
11.4	Monitoring & Mitigation	NE comment 2.7	Protected Species surveys information

Annex 15 – HRA

Number	Section	SoR Ref.	Changes Made
1.2	Requirement for Habitats Regulations Assessment	NE 1.1	Legislation updated to reflect 2017 regulations.
1.3	Consultation	N/A	Update to summary of consultation undertaken.
3.1	Methodology	N/A	New subsection: Stage 1 HRA Screening: Revised draft WRMP19

Number	Section	SoR Ref.	Changes Made
3.1	Methodology	NE 1.1	Included to summarise the changes to options which have been re-screened and the People over Wind ruling which has changed when mitigation can be taken into account in the HRA process.
4.2.2	4.2.2 Mitigation assumptions	NE 1.1	Section removed following “People over Wind” ruling - can no longer be taken into account at Stage 1 Screening.
4.4.1	4.4.1 Potentially affected European sites	N/A	New section listing the European sites being considered in relation to the preferred programme and strategic alternatives
Appendix A	Appendix A	NE 1.3, 1.4, 1.4.1, 1.4.2 1.5 EA R4.6	Screening updated to reflect changes to options including: Sandown indirect potable water reuse Hampshire Grid Main Southampton Link Main Littlehampton WwTW Brighton WTW Pulborough winter transfers
4.4.2	Western area preferred programme and strategic alternatives	EA R4.5	Updated to reflect revised preferred programme and strategic alternatives. Tables updated to reflect revised screening.
Appendix B	Fawley desalination	NE 1.3, 1.3.2 EA R4.1, R4.2, R4.3	Appropriate Assessment updated to reflect new options: 75 and 100Mll/d, the revised pipeline route through New Forest designations in wayleave (for 100Ml/d scheme only), use of existing disused outfalls at Fawley, dispersion modelling, and identify mitigation measures required
Appendix C	Bournemouth Water bulk supply	NE 1.3, 1.3.2, 1.3.3	Appropriate Assessment updated to reflect new pipeline route avoiding New Forest designations, and identify mitigation measures required
Appendix D	Test Industrial Water Reuse	NE 1.3	Appropriate Assessment completed for option – new
Appendix E	Portsmouth Water bulk supply 23Ml/d	NE 1.3, 1.3.1	Appropriate Assessment updated to reflect changes to pipeline route, and identify mitigation measures required
Appendix F	Southampton Grid Main	NE 1.3, 1.3.3	Appropriate Assessment updated to consider additional mitigation measures
Appendix G	Portsmouth Harbour WTW & Fareham WTW	EA R4.1	Appropriate Assessment of strategic alternative to Fawley desalination - new
4.4.3	Central area preferred programme and strategic alternatives	N/A	Updated to reflect revised preferred programme and strategic alternatives. Tables updated to reflect revised screening.
4.4.4	Eastern area preferred programme and strategic alternatives	N/A	Updated to reflect revised preferred programme and strategic alternatives. Tables updated to reflect revised screening
Appendix H	Appendix H Sittingbourne Industrial Reuse Appropriate Assessment	NE 1.5	Appropriate Assessment completed for option – new
5	Section 5 Stage 2 Appropriate Assessments	N/A	Additional information added on the methodology used in the Appropriate Assessments plus conclusions updated to take account of revised draft WRMP19.
6.1.1 and 6.1.2	The New Forest SAC and New Forest SPA & Ramsar Site – cumulative effects screening decision	NE 1.2	Revised to reflect new pipeline routes and therefore different in combination effects on New Forest between Bournemouth Water Bulk Supply and Fawley Desalination
6.1.3	Solent Maritime SAC – cumulative effects screening decision	NE 1.2	Revised cumulative assessment to take account of revised draft WRMP19 options.

Number	Section	SoR Ref.	Changes Made
6.1.4	Solent and Southampton Water SPA and Ramsar – cumulative effects screening decision	NE 1.2	Revised cumulative assessment to take account of revised draft WRMP19 options
6.1.5	River Itchen SAC – cumulative effects screening decision	NE 1.2	Revised cumulative assessment to take account of revised draft WRMP19 options
6.2.6	Other Water Company WRMPs	NE 1.2	Updated to reflect latest available information from other water companies on revised draft WRMP19s, including WRSE outputs.

Annex 16 – WFD

Number	Section	SoR Ref.	Changes Made
All	All	N/A	Amended text to "revised" draft Water Resources Management Plan (WRMP)
3	Summary of WFD compliance assessment	EA R2.3	Details provided on WFD risks associated with bulk water supply transfers from other water companies
4	Preferred programme compliance	EA I7.1 and I7.7	Details provided of proposed investigations and development of mitigation measures to address risk of potential WFD status deterioration for the West Chiltington groundwater scheme and the Sandown indirect potable reuse scheme.
4	Preferred programme compliance	EA R2.3	Details provided of proposed investigations to address risk of potential WFD status deterioration for the Bournemouth Water bulk supply transfer scheme.
4	Preferred programme compliance	N/A	Details provided of WFD compliance for strategic alternative options included in the revised draft WRMP19
4	Preferred programme compliance	N/A	Table 1 summary WFD compliance assessment updated to reflect options in revised draft WRMP19 preferred programme and strategic alternative options
4	Preferred programme compliance	EA I7.8	Table 1 confirms that the Pulborough winter transfer Stage 2 option involves no changes to the existing abstraction licence
4	Preferred programme compliance	N/A	Table 2 Potential cumulative effects on WFD water bodies updated to reflect options in revised draft WRMP19 preferred programme
4	Preferred programme compliance	N/A	Table 3 WFD cumulative effects assessment updated to reflect options in revised draft WRMP19 preferred programme
5	In-combination effects with other water company WRMPs	Natural England 2.6.4	Text and Table 4 WFD cumulative effects assessment with other water company revised draft WRMPs updated, including in relation to the East Kent Chalk-Stour WFD water body
6	Summary WFD compliance	N/A	Updated summary conclusions to reflect update to the WFD assessments for revised draft WRMP19

Number	Section	SoR Ref.	Changes Made
Appendices A-C	WFD assessments	N/A	Appendices updated to reflect options included in the revised draft WRMP19 (Appendix A & B) – including strategic alternative options - and those not included (Appendix A & C)
Appendix B	Section 1.1	EA I7.6	Confirms scheme details for Medway WTW indirect potable reuse scheme
Appendix C	Section 1.41 Raising Bewl by 0.4m	EA I7.3 & I7.4	Additional text provided in respect of the WFD risks associated with the Raising of Bewl by 0.4m option and confirming that this option is not included in the revised draft WRMP19