Anglian Water

11A. STRATEGIC REGIONAL SOLUTION

Draft Determination Representation, August 2019

RESPONSIBLE BUSINESS OF THE YEAR 2017
BUSINESS IN THE COMMUNITY

THE QUEEN'S AWARDS FOR ENTERPRISE: SUSTAINABLE DEVELOPMENT 2015

love every drop.
anglianwater

Strategic regional water resource solutions

Affinity Water, Anglian Water, Severn Trent Water, Southern Water, South West, Thames Water, United Utilities, Wessex Water

30 August 2019

Joint Company Statement

Following the Draft Determination (DD) the working group has met several times to continue to work collaboratively to optimise the processes for developing the next set of strategic water resource solutions.

The DD has added some additional options into the mix of schemes as well as increasing the number of companies working across the schemes from six to eight. These additional companies and schemes are welcomed as they will help provide additional choices when deriving the best value plans for customers, stakeholders and the environment.

Our engagement with the regulators during the development of the plan have continued to help and shape this response. The recent meetings with RAPID, EA and Ofwat (in July and August) have been very encouraging and we look forward to working collaboratively to align the gated processes, national framework timetables and statutory planning processes.

We want to ensure that the timetables and processes are efficient and co-ordinated, and we believe we can achieve this through a few simple re-alignments of some of the gates during the process. Through this alignment we can ensure that the timetables developed by the National Framework and agreed with the senior steering group can be achieved.

The expanded working group remain committed to continue working with RAPID, EA, Ofwat and the DWI to make all of the planning processes and statutory timetables a success.

1 Executive summary

The proposed gateway process to develop the next set of strategic water resource options continues to be a welcomed step forward. It provides a good mechanism for the industry, regulators, stakeholders and customers to input into the development and scheduling of these strategic solutions through the combined set of statutory and regulatory processes, including the National framework, Drinking Water Safety Plans, Business Plans and WRMPs.

The All Company Working Group has continued to make good progress with the development of the detail for this new process. The work is ongoing and the companies have coordinated their efforts and worked efficiently to produce a cohesive and coherent suite of proposals both at the scheme level and the joint working group level. There continues to be a series of challenges to be worked through as the detail of this new process evolves and early engagement with the RAPID team has helped. All parties continue to work together to ensure a smooth integration of the statutory and non-statutory processes and programmes.

Whilst we recognise that we will continue to work with RAPID going forward, the purpose of this document is to highlight where we remain concerned and how we believe these concerns could be overcome. These can be summarised as follows, which we have highlighted in our discussions with RAPID:

- proposed gate timings and definitions of activities do not align with the timeline of the National Framework and the statutory Water Resources Management Plans (WRMPs), which companies must adhere to. We believe some minor realignment of the gates and clarification of the required activities by each gate can resolve this. Specifically, gates 1 and 2 should be moved from April to August, and gate 1 should be used as the initial test for each option, with gate 2 being the key decision point for the option continuing to full design stage of DCO or non-DCO development. As the planning route for each scheme, DCO or non-DCO, and the degree of planning complexity and investigation requirements won't be known until August 2020, some flexibility in gates 3, 4 and 5 is required to ensure the challenges of either planning route can be accommodated.
- the incentives on companies to spend efficiently are weakened as they depart from the established regulatory mechanism to share totex overspend and underspend with customers. Applying the standard regulatory incentive mechanism would resolve this.
- the reconciliation mechanism by which unneeded totex is returned to customers via revenue only adjustment risks penalising companies. This can be resolved by allowing companies to return money to customers in the same way as it was raised.
- although the overall totex allowance appears sufficient, allocation between gates is inflexible. Allowing companies to carry forward unspent totex from one gate to future gates would resolve this.

- the requirement for consultation at each gate may cause confusion and ‘fatigue’ with stakeholders and customers. We believe that sufficient consultation opportunities are provided by the statutory WRMP and new regional water resource planning processes. Decisions made by Ofwat and the regulators would of course be published as part of the Board minutes, which will make the processes open and transparent.

We believe that these changes would help all parties to deliver the work required to promote the schemes in the tight timetable that we are facing. We would welcome any further discussion with yourselves or via RAPID to assist inclusion of the above in your Final Determination.

Contents

1 Executive summary 2
2 Introduction 5
3 Gates – definition of activities 6
3.1 Further work on the definition of gate 1 6
3.2 How we propose to develop gates 2 to 5 11
3.3 Proportion of funding at each gate 11
4 Gates - timing and interaction with WRMP24 13
4.1 Schemes and timelines 14
4.2 Gateway timings 14
4.3 Gateway durations 16
4.4 Consultations 17
5 Reconciliation mechanism 18
5.1 Reconciliation mechanism to align with funding 18
5.2 Reduced efficiency incentives 19
5.3 Penalties for late delivery or poor quality 19
5.4 Restricted opportunity to identify new scheme partners. 20
5.5 Deliverability through the gateway process 20
5.6 Working with RAPID to establish the gateway process 20
6 Proposed forward work programme with RAPID 22
Appendix A: Mott MacDonald report 23
Appendix B: DD and proposed revised timelines 23

2 Introduction

As part of the initial assessment of companies' business plans (IAP) Ofwat introduced proposals to support the delivery of strategic regional solutions to support drought resilience in the south east over the next 5 to 15 years. The proposals allocate funding and describe an associated gated process for the co-ordination and development of a consistent set of strategic water resource schemes. This proposal affected six companies, these being: Affinity Water, Anglian Water, Severn Trent Water, Southern Water, Thames Water and United Utilities.

Companies responded to the IAP proposal in April and May with further detail on the gated process, proposed totex allowances, joint working arrangements and funding mechanisms. As part of the Draft Determinations (DDs) Ofwat refined its proposals for strategic regional solutions, responding to companies' recommendations and amending its proposal. Ofwat also extended its proposals to include two more companies, Wessex Water and South West Water. These companies, along with the six companies identified at IAP, form the **All Company Working Group** (ACWG).

Since the DDs, companies have continued to work together and with RAPID, EA and Ofwat, to develop the strategic regional solutions (SRS) proposals, and aim to continue to do so up to and beyond Final Determinations (FDs). This document is a joint response by the ACWG to Ofwat's DD proposals on SRS. Each company may also submit their own individual response, on aspects of the DD specific to them.

The rest of this paper is structured as follows.

- Section 3 provides further detail on the definition of the activities to be carried out up to each gate;
- Section 4 reviews the proposed timing of each gate and recommends some amendments to ensure alignment with existing statutory processes;
- Section 5 sets out some concerns we have with the proposed funding and reconciliation mechanism, and offers suggestions to improve efficiency and protect customers;
- Section 6 provides a forward work programme.

3 Gates – definition of activities

This section provides the companies' response to the DD proposals for the gated processes deliverables, as set out in Section 4 of the strategic regional water resource solutions appendix.[1] It is important that each scheme is developed in a consistent manner to allow schemes to be compared with each other, recognising that the schemes will continue to be developed in detail through each of the gated processes as information is obtained and developed.

We welcome the DD proposal for an additional gate within AMP7, allowing an earlier progress check ahead of draft regional plans. We also welcome the proposal for close working between the industry, regional groups and RAPID to allow change in the gate activities and outcomes as the programme develops.

Below we have provided further evidence to support the definitions for gate 1, which would need to form part of the FDs. We then set out proposals for developing the definitions for gate 2 to 5. After that we briefly set out the companies' views on the proportion of funding at each gate. Our response regarding gate timings can be found in Section 5.

3.1 Further work on the definition of gate 1

It is critical that a deliverable set of outputs are agreed between Ofwat and the companies for gate 1. We agree that an earlier progress check before the draft WRMP's will be helpful, given that the schemes are starting from different levels of maturity to ensure schemes are being developed in a consistent way.

The companies have subsequently worked with Mott MacDonald to review the current levels of consistency to improve our understanding of and inform the priorities for gate 1 (appendix A). In summary we have identified the following areas of particular relevance to gate 1:

- Level of design development
- Capex and opex estimating
- Approach to uncertainty in cost estimation
- Approach to whole life costing
- Basis of offers between water companies
- Common approach to SEA and HRA
- Common approach to valuation of environmental effects
- Consistent categorisation and assessment of drinking water quality impacts

The work with Mott MacDonald also explored consistency in deployable output assessments that confirms the Ml/d benefit of each option. The main concern are the scenarios used to

[1] Ofwat, July 2019, "PR19 draft determinations: Strategic regional water resource solutions appendix".

define deployable output and it is expected that this concern will be addressed within the development of the regional plans and the application of a consistent resilience standard which must be met by all companies.

We address each of the bullet points above in turn in the following text.

The **level of design maturity** is a critical consideration for gate 1 and subsequent gates. There is a typical linear process of developing designs through a project lifecycle but no commonly used terminology or set of definitions for the stages of design. Terms like initial design, conceptual design, outline design and detailed designs can mean different things within different companies and can sometimes be used interchangeably.

At present different strategic schemes have been developed to different levels of maturity. More advanced schemes cannot be "un-designed" so the priority is to establish a common minimum level of design for gate 1 which is achievable for all schemes and then ensure that schemes develop more mature designs in a consistent way for later gates. Those schemes which have a mature level of design at gate 1 could take this into account in the assessment of risks in cost estimation, benefits estimation and programme delivery.

We therefore propose the following definitions:

Name	Definition
Notional design (gate 1)	This first level of detail is based on a desk-top study using existing available information. The design will use a block-diagram type approach, using company standard or industry standard solutions. Existing and new assets[2] will be identified. This will detail standardised components of the design e.g. "inline booster pumping station" or "phosphate dosing" by size or capacity to allow cost estimates to be generated. Site locations will also be identified but not the location of assets within the site. The notional design will be produced by the primary engineering discipline e.g. a process engineer for a water treatment solution, or a civil engineer for a network solution. This aims to generate sufficient information for feasible options to be initially assessed in WRMPs and regional plans. This allows an option to pass Gate 1 and continue to the key decision at gate 2 to move to full planning activity.
Concept design (gate 2)	This second level of detail is based on a more detailed desk-top study, supplemented by additional water quality samples or flow data where appropriate. Existing asset condition data will be reviewed alongside historical information about the site. Desktop searches will gather existing ground and environmental data. Ongoing environmental studies will be completed to evidence risk against the Water Framework Directive, and any potential mitigations to resolve risks costed.

[2] An asset being an assembly of individual components that together make up an item of equipment.

Name	Definition
	Hydraulics will be considered and the process design reviewed. At this stage a multi-disciplinary engineering team will develop an updated block diagram type design. A number of variants will be considered and reviewed for constructability, cost and whether they meet the identified need. An investment appraisal model will be used to select a preferred option variant. Alongside the concept design, a gap analysis will identify the need for geotechnical surveys, environmental surveys to inform the next stage of design development. This level of detail will provide further information for regional plans and WRMPs production, and allow a decision at gate 2 for the option to continue to DCO or Non-DCO planning activities. NB: For large options that meet the National Policy Statement for Water criteria there is a requirement for alignment with relevant company WRMPs and Secretary of State sign off to continue through DCO.
Developed design (gates 3 and 4)	This will be the first "detailed" design and therefore a large increase on funding requirement. This will consider the configuration and asset requirements, informed by contractor involvement and the results of geotechnical and environmental surveys. It will consider environmental constraints and define key factors including materials, landscaping requirements and vehicle access. The developed design will undergo various stages of iteration, consultation and refinement to result in sufficient information for a planning application and be suitable for issuing to tender for a construction contractor.
Technical design (after gate 5)	This will be a fully detailed design specifying specific components (e.g. a specific model of pump by specific manufacturers). The technical design is normally developed by the construction contractor and is suitable for use by specialist subcontractors to build the assets.

Our work with Mott MacDonald shows that companies generally follow similar approaches to capex and opex estimating using cost models from either company or industry data. Our proposed way forward is to develop a consistent approach to costing options taking into account guidance from HM Treasury[3].

The approach to risk and uncertainty in cost estimation is an important area where further work needs to be done to ensure a consistent approach. One issue to address is optimism bias, which is the tendency for appraisers to be over-optimistic about key project parameters, including capital costs, operating costs, project duration and benefits

[3] THE GREEN BOOK CENTRAL GOVERNMENT GUIDANCE ON APPRAISAL AND EVALUATION, HM Treasury, 2018.

delivery.[4] Some companies account for risk and uncertainty by calibrating their estimating models to a range of historic project outturn costs. Others include an additional, flexible adjustment factor to cost estimates, which can reduce over time as certainty grows. This is the recommended approach by HM Treasury[5]. Our proposal is to utilise the HM Treasury approach costing using internal resources or suitable consultants. We will then commission an independent professional review of the inclusion of risk and optimism bias in the cost estimates for all schemes. This will ensure the approach taken allows options to be compared, and that optimism bias is included where appropriate and equally ensure that risks are not double counted or over-estimated for schemes.

The approach to whole life costing is set out in the current Water Resources Planning Guidelines (WRPGs):

> "A profile of the costs over 80 years, split into capital (including maintenance and replacement costs); operating (both fixed and variable costs) and financing costs. Financing costs should be calculated as a stream of annual costs over the life of the option, using an assumed 3.6% average cost of capital (the "vanilla" real wholesale WACC in PR14). The NPV of all costs should then be calculated using the Treasury Test Discount rate as set out in the HM Treasury "Green Book" (Appraisal and Evaluation in Central Government, HM Treasury 2003). This is 3.5% for years 0-30 of the appraisal period, 3.0% for years 31-75, and 2.5% for years 76-125 (see Table 6.1 of the "Green Book" if longer periods are required). The appraisal period should at least cover the lifetime of the longest lasting asset."[6]

All companies will therefore follow this guidance (or subsequent updates of the Green Book or WRPGs) in a consistent way.

The basis of offers between water companies is another area where there is potential inconsistency which could have a significant impact on the appraisal of schemes. Some potential exporting companies have provided indicative bulk supply prices to the potential importing company and kept the underlying costs confidential. Others may have provided their capex and opex estimates for use in the scheme appraisal. **New regulatory guidance is needed** on how consistency should be achieved without compromising an effective water trading market and ensuring full compliance with competition law and to comply with the bid assessment frameworks and market information tables.

Companies, supported by environmental consultancies, carry out SEA and HRA appraisals of water resources options and plans. While the approaches are broadly similar and meet the WRPGs there can be slight differences of methodology, e.g. definitions or grouping of

[4]Ibid, page 6.
[5] HM Treasury Green Book supplementary guidance: optimism bias, April 2013, www.gov.uk/government/publications/green-book-supplementary-guidance-optimism-bias.
[6] Water Resources Planning Guideline, Environment Agency and Natural Resources Wales, July 2018, page 35.

SEA objectives. The companies will therefore need to assess all the schemes using a consistent methodology so the assessments of all the strategic options can be compared.

Companies have also used different approaches to the valuation of environmental and social effects, with all approaches meeting the WRPGs. Some companies have not sought to monetise the effects, others have carried out environmental and social costing using the Environment Agency's Benefits Assessment Guidance and one company has used a high level natural capital valuation. The National Framework for Water Resources is currently considering the potential for natural capital valuation to be used in regional and company planning. Currently all companies meet the requirements of the WRPGs, which does not include the need for natural capital valuation. We await to see the updated WRPGs for WRMP24, and will ensure we meet the statutory requirement.

Drinking water quality is another area where there are currently inconsistent approaches. The companies propose to work together with DWI and RAPID to establish a common reporting format to identify water quality objectives and impacts for each strategic option.

These proposals are reflected in the table below focusing on the evidence for gate 1. This table identifies those activities where companies proposed a different level of detail for gate 1, all other activities in gate 1 are agreed. This will provide an initial view of the developing strategic options. Key activities such as environmental studies will be completed for gate 2 for a number of options. These will impact costing, deployable output and environmental reviews for SEAs.

Gate 1 Activities	
Ofwat's Draft Determination	**Companies' Proposal**

Initial feasibility, design and multi-solution decision making
• Preliminary feasibility and data collection presented in a conceptual design report:
  ○ Initial outline solution design(s)
  ○ Consistent costing and cost report
  ○ Consistent deployable output benefit (water provided in a drought) analysis to the regional design standards
  ○ Consistent social, environmental and economic assessment (impact and benefits) and in-combination effects of solution within the same catchment
	Initial feasibility, notional design and multi-solution decision making
	• Preliminary feasibility and data collection presented in a report:
	  ○ Notional design(s)
	  ○ Initial consistent whole life costing and estimating report supported by benchmarking evidence
	  ○ Information provided to regional groups to support consistent initial deployable output assessment
	  ○ Initial option level SEA and HRA appraisals using a consistent methodology, including in-combination effects
	  ○ Initial consistent environmental and social valuations, either

Gate 1 Activities	
Ofwat's Draft Determination	Companies' Proposal
○ Consistent drinking water quality considerations	Natural Capital or following the Benefits Assessment Guidance. ○ Initial consistent drinking water quality appraisal

3.2 How we propose to develop gates 2 to 5

We welcome Ofwat's draft determination proposal that companies submit more detail on subsequent gate activities during each gate submission. We see gate 2 being a critical gate in the process as it provides some timely decisions in the formulation of the next company and regional plans and consequently the development of the next strategic option(s).

Our proposal is to submit the requirements for gate 2 by gate 1. Likewise, we propose to submit requirements for gate 3 by gate 2 and so on. After stage 2 the most likely planning route will also be established which will allow the subsequent timelines to be better understood.

The companies are committed to continue working together through the ACWG to develop these proposals. They also welcome the ongoing engagement with the regulators, supported by RAPID, to develop these proposals in a collaborative way to ensure we have an integrated, efficient process which can achieve the overall objective of developing options in a consistent manner to allow regional and company plans to develop through the statutory processes.

3.3 Proportion of funding at each gate

In their IAP responses companies proposed a range of different cost allocations between gates. Ofwat's draft determination proposed a common allocation:

- gate 1 – 10%
- gate 2 – 15%
- gate 3 – 35%
- gate 4 – 40%

In practice the schemes will need different proportions of expenditure at the gates. Each scheme is currently at a different level of maturity in its development, and therefore some schemes will need to incur a greater proportion of expenditure at early gates in order to "catch-up" with other schemes. The schemes also vary in type and the risks that they face – which will likely mean expenditure at each stage will need to be either accelerated or rolled forward to future gates, to address scheme specific issues.

We understand the regulatory convenience of assuming a common allocation, and the companies will manage the timing mismatch between allowed and actual expenditure, providing the reconciliation mechanism allows overspend and underspend to be balanced across all the gates (see section 5).

4 Gates - timing and interaction with WRMP24

The draft determination has put forward 14 strategic water resource schemes to be investigated over the next few years. This represents an excellent opportunity to ensure these schemes are developed to a consistent level of detail which is appropriate for the staged gateway process.

Looking at the proposed gated processes we believe that modifications to the following areas will ensure we have a more joined up and efficient process which aligns with the goals set out in the joint regulatory letter in August 2018[7]. The key areas are:

1) Clarification of which schemes follow an accelerated timetable for their development and which schemes follow the normal timeline;
2) Alignment of the timing of the gateways with the other statutory and national timetables;
3) The duration of the gateways both during and between them; and
4) Consultation on the schemes.

Progression of the nominated schemes through a gated process should ensure regulators and companies understand the benefits and issues of each of the schemes and why schemes end up being chosen or stopped.

If a scheme is stopped at a gateway but it features in a preferred or alternative plan then the WRMP and regional plans will have to ensure that the rejected scheme does not feature in the next AMP period. i.e. the scheme is might still be feasible, but just not in the timescales required for promotion in the next AMP.

Potentially 11 of the proposed strategic water resource schemes could be promoted under a DCO route. The final promotion route for a scheme will only be confirmed once the regional plans and WRMPs have be reconciled. At this point we will then understand which combination and scale of schemes feature in the preferred plans. Therefore flexibility between the gates, as set out above, will be key.

The interaction between the gated process and the national framework timetable is important if this process is to remain efficient and decisions are understandable to stakeholders and customers. We believe that by moving the gates this can be achieved. We discuss this further in the rest of this section.

As the schemes progress through the gated process the decisions made by the regulators will be subject to judicial review (all public bodies are subject to this). If a challenge is received then it is assumed that the schemes will continue, as set out in the decision by the regulators, until informed otherwise.

[7] Building resilient supplies – a joint letter (August 2018).

4.1 Schemes and timelines

Given that there are two timelines defined in the DD and two routes for their promotion we have set out in the table below which schemes will be progressed using the normal timelines and which schemes will be progressed using the accelerated timeline.

Scheme No.	Solution name	Timeline
1	Abingdon reservoir	Normal
2	Fawley desalination	Accelerated
3	River Itchen effluent reuse	Accelerated
4	London effluent reuse	Normal
5	Minworth effluent reuse	Normal
6	Severn Trent Water sources	Normal
7	South Lincolnshire reservoir	Normal
8	United Utilities sources	Normal
9	West Country Sources	Normal
10	Anglian to Affinity transfer	Normal
11	Grand Union Canal transfer	Normal
12	River Severn to River Thames transfer	Normal
13	Thames to Affinity transfer	Normal
14	Thames to Southern transfer	Normal
15	West Country to Southern transfer	Normal

Each of the companies will highlight which timeframe they are following in their submissions, if they are investigating a scheme with Southern Water.

4.2 Gateway timings

In our April 2019 and May 2019 submissions we proposed to Ofwat a number of gateways whose timings were aligned with the WRMP process and the defined National Framework timetable.

The timing of the then proposed gateways were based on the principle that the regional plans and draft WRMPs would provide additional information to the gateway decision process around which schemes formed part of a best value plan and which schemes featured in alternative plans.

In addition it was also recognised that the timing of gates 3 to 5 would be determined by external factors such as in-situ field testing; collecting seasonal environmental information; undertaking specific surveys and engaging with local customers and stakeholders to get their views on the schemes.

The draft determination has outlined a new set of gates and an advancement of the gateway timings. For the non-accelerated timeline the proposed timings of the 4 month gateway processes now conclude when the draft regional and WRMP are being signed off. Therefore

the interaction of the two sets of processes are currently misaligned. To overcome this we suggest that moving the gateways back would allow a more efficient and integrated approach to be developed. **We have set out our proposal for gateway timings in the table below:**

Gateway	Draft Determination	ACWG timescales
gate 1	Apr-21	Aug-21
gate 2	Apr-22	Aug-22
gate 3	Apr-23	Aug-23
gate 4	Jun-24	Oct-24
gate 5	Dec-25	Apr-26

We have illustrated how the timetable proposed in the DD conflicts with the national timelines and WRMP timelines in a more detailed programme appraisal which we shared with RAPID, OFWAT and the EA in July 2019.

We believe that by moving gates 1 and 2 back to August, rather than April, we could improve the efficiency and robustness of the overall processes and provide some additional key data into the process for consideration. The table also shows some indicative timing of gates 3 to 5. However, it should be recognised that some flexibility is required for the timing of these gates which should be agreed at the appropriate preceding gate.

A revised alignment of these gates would add value by allowing the RAPID team to make a fuller assessment as part of their recommendations. This was discussed with RAPID on 13 August. We have shown the original and revised timelines in detail in appendix B, but for illustrative purposes we have shown how the revised timetable would work for gates 1, 2 and 3 in the illustration below.

Following the completion of stage 1 up to gate 1 (initial feasibility, design and multi-solution decision making) and stage 2 up to gate 2 (detailed feasibility, design and multi-solution decision making) there are two planning routes:

- A 'conventional' planning application made under the Town and Country Planning Act 1990 for determination by the Local Planning Authorities (LPA). In the event that the water company is compelled to appeal following the refusal or non-determination of the application by the LPA, the appeal would be determined by the Secretary of State.
- An application for a Development Consent Order (DCO) made to the Secretary of State under the Planning Act 2008. This consenting route is applicable for developments including:
    - reservoirs holding 30 million cubic metres or more
    - reservoirs with a deployable output of at least 80 million litres per day
    - water transfer infrastructure with a deployable output of at least 80 million litres per day
    - desalination plants with a deployable output of at least 80 million litres per day

Provisional work undertaken by Savills indicates that the timescales outlined through gates 3 to 5 might for a conventional planning route would not work if there is are objection to any of the schemes, setting aside the other potential challenges that the projects can face. Likewise for a DCO route the application process would require different gateways to be established and an assumption that the critical aspects of the planning applications are allowed to progress before a decision is made at the gateway. **We recommend that the next gateway timings are reviewed as each gate is passed to ensure issues and opportunities are taken account of as they arise.**

4.3 Gateway durations

The time taken for a decision to be made on whether a scheme is to progress should be kept to a minimum. The current proposal is that this process will take four months. This represents a quarter of the time companies have to progress to the next gate, which seems disproportionately large. It is unclear whether companies are able to progress with the development of the scheme during this decision making progress or whether schemes would be put on hold. If schemes are put on hold then this is likely to impact costs and some of the environmental survey windows will be missed which could affect successful delivery of the schemes.

We recommend that the ACWG works with RAPID to agree, in principle, that critical path tasks are allowed to progress while gateway decisions are made. These tasks can be agreed at the beginning of the programme and reviewed at each gateway.

The time difference between the gateways remains challenging from a perspective of: gathering robust environmental data; undertaking in-situ tests; or progressing through the various planning stages when there is a dependency on third parties for access. Therefore, as discussed in the previous chapter there is a need to understand the expectations of the evidence that will be required by the regulators for each of the gateway processes.

We would be keen to work with the regulators during the development of the schemes to ensure that the application of precautionary principle does not rule out schemes too early in the process, or set back their development for later AMPs.

4.4 Consultations

Consultations with customers and stakeholders during the development of these schemes will be key to keeping them informed. However the current set of processes shows that local communities could be consulted on specific schemes or decisions regarding them up to 7 times in the course of 60 months. This is on the basis that each gateway decision is consulted on as well as the regional and WRMPs (5 gateways + regional and WRMP consultations).

A local community affected by an individual water infrastructure proposal might thus find itself confronted with repeated consultations on what, to them, might seem the same set of questions about the same scheme, or changing schemes due to improved information in what seems like short timescales. This apparent duplication is unlikely to be received sympathetically and might be perceived (incorrectly) as an attempt to wear down and divide local communities, exhaust their limited capacity and resources to sustain objections, or that the water sector is simply not listening.

If we are not careful some communities and stakeholders might feel they are being consulted too many times on the same scheme, particularly if the scheme progresses in a way they did not want.

Our recommendation is that the decisions by each of the regulatory boards are posted on the website, as they are currently, and consultations are kept within the statutory processes. This would reduce the duration of the decision making process and work within the established processes. It would also reduce the potential of repeated consultations on the same issue. This would also mean that the time taken to make a decision on the gated process reduces from a total of 20 months to 10 months in a 60-month timescale.

5 Reconciliation mechanism

Ofwat's DD proposes several amendments to the framework developed jointly by the ACWG and submitted in response to the IAP actions. We agree Ofwat's reconciliation mechanism addresses the need for flexibility in the delivery of the strategic water resources projects. With so much uncertainty still to be addressed as the schemes develop, it is important that Ofwat sets a reasonable framework at FDs that can protect customers and incentivise companies to work efficiently.

However, we are concerned that the proposed funding and reconciliation mechanism as currently set out would lead to sub-optimal outcomes and not maximise benefits to customers.

Our key concerns are:

1. Returning funds for capital projects via revenue rather than via RCV does not align with how funds are recovered.
2. Efficiency incentives are reduced due to the removal of cost sharing and recovery of efficient overspend.
3. The principle of penalties for late delivery or poor quality is reasonable, but to be effective and reasonable there needs to be more clarity on how these criteria will be measured and how penalties would be calculated and applied.
4. The opportunity to identify new scheme partners is restricted.
5. There are high risks to deliverability through the gateway process.
6. There is ongoing uncertainty over how we work with RAPID through the gateways.

In addition, although not a concern with the current proposal, we do seek guidance from Ofwat on how it anticipates the strategic regional solutions (and potentially others identified during AMP7) and its proposed regulatory framework will interact with the proposals for the bilateral market for water resources (which Ofwat has assumed could be implemented in 2022).

Please also refer to each company's individual submission for responses on the proposed funding arrangements, which the ACWG agreed should be scheme-specific.

We look at each of our concerns in turn in the following sections.

5.1 Reconciliation mechanism to align with funding

We agree that funds should be returned to customers if they are no longer needed, because development of a scheme has stopped. However, the method for returning funds needs further thought. Ofwat's DD proposes that funds are returned solely through a revenue adjustment at the start of AMP8. However, the schemes identified so far have a significant capital expenditure element, which we believe should be considered when setting the type of reconciliation mechanism. Funds for capital projects are typically recovered from customers across multiple AMPs, through a combination of RCV and

revenue allowances. Returning funds that are no longer needed purely through a revenue adjustment could unnecessarily penalise companies, where funds have yet to be recovered from customers in the first place.

We request that Ofwat sets a reconciliation mechanism that best aligns with how the funds for the strategic schemes are recovered from customers.

5.2 Reduced efficiency incentives

Ofwat's DD proposes that the standard regulatory cost sharing mechanism should not apply to the expenditure allowance, either for overspend or underspend. We disagree with this approach. Companies should be incentivised to outperform on their cost allowances and not incentivised to spend up to their expenditure allowance because savings will not be retained. Similarly, we consider the schemes should be treated like our other projects and cost sharing should also apply to overspend. We see no reason why totex for the strategic regional solutions should be treated differently from other totex in the regulatory allowance.

Our proposed ODI mechanism in our 3 May submission included outperformance to recognise our schemes are based on current knowledge but project scope may grow when new information is gathered. We consider it is appropriate to allow recovery of efficient overspend at a gateway to ensure companies pursue the optimal value scope for customers, rather than purely least cost.

We have identified at least one project where early studies could significantly adapt a scheme's scope at gate 1, not just at gate 4 where Ofwat specified companies could seek transition expenditure for PR24. In the 3 May STT joint submission[8], we highlighted there are risks relating to the environmental impact of flow changes in the River Vyrnwy. A mitigation option is a pipeline (180 Ml/d, 22.3km) from the Vyrnwy Aqueduct upstream of Oswestry to the River Severn. Several £ms of additional design and development costs could be needed from gates 1 or 2 depending on when/if the need is confirmed.

The individual company submissions explain further risks associated with their specific schemes.

5.3 Penalties for late delivery or poor quality

Ofwat has specified that penalties should apply if a company delivers outputs late or of poor quality, where those deliverables are necessary for decisions on whether a scheme progresses are affected. We agree that companies should be incentivised to deliver on time and at a high quality, to protect customers and encourage companies to be efficient.

However, for a penalty mechanism to be effective at incentivising companies to avoid undesirable outcomes, companies need to know in advance how their performance and

[8] From Thames Water, Severn Trent Water and United Utilities.

their deliverables will be assessed. Further clarity is needed about the proposed penalty structure, including how Ofwat will decide if a penalty is needed, how it will judge the scale of any penalty and who it should apply to. It is also important to set out circumstances outside a company's control for which a penalty would not be applied. Without this further clarity companies could be exposed to penalties that they cannot quantify in advance, which increases their risk and damages trust in the regulatory framework.

5.4 Restricted opportunity to identify new scheme partners.

Ofwat has specified that new scheme partners can only join until gate 2. We propose a longer timeframe to better align with finalisation of the regional plans and WRMPs, because this process may identify other suitable scheme partners.

For example, there may be other potential donors (e.g. Welsh Water) or potential receivers of water (e.g. Affinity Water) for the STT scheme that may seek to become partners.

We propose Ofwat allows new scheme partners to join up to gate 3. Further detail on the gate definitions are set out in Sections 3 and 4.

5.5 Deliverability through the gateway process

Ofwat explained its reconciliation mechanism would return unused funds for any solution that had been discontinued, calculated from the point of a gate decision. **We seek clarity on this** because companies may stop or reduce work to reduce 'potential inefficient spend' during Ofwat's proposed four-month decision window for RAPID. If this happened, they would be hard pressed to increase progress in time for the following gateway if their scheme was to continue. We would like confirmation that companies should progress with schemes as necessary throughout the decision-making window because unused funds will be calculated from the final decision (by RAPID or Ofwat, whichever is latest) and not the start of the gateway.

In Sections 3 and 4 we explain our revised gateway definitions and timings are necessary to ensure consistency with existing statutory processes and regional planning. If those revisions are accepted by Ofwat, we believe we can deliver timely and quality deliverables to allow for decision making by RAPID and help Ofwat ensure appropriate funds are recovered from customers.

5.6 Working with RAPID to establish the gateway process

We understand that the structure and governance arrangements for RAPID are still in development and **request that it clarifies with companies its role as soon as possible**.

There is ongoing uncertainty about how and what decisions will be made, by whom, at each gateway. We will look to use our future discussions with Ofwat, EA and RAPID to help provide this certainty and understand the role of each entity.

We will work with Ofwat, EA and RAPID to develop the:

- Assessment criteria for the gateway decisions: What is considered late or poor quality? What consideration will be given to factors outside of management control? Will the extent of penalty decision fall to RAPID or Ofwat? What would be the threshold for the penalty to apply to all scheme funding at a gate?
- Change control process: What evidence is required to allow a scope change? How should companies propose scheme substitutions or changes in scheme partners? Do new partners already need to be at an equivalent consistency level?

We also seek clarity on whether penalties would apply to actual spend at a gateway or whether efficient spend should be interpreted as proportion of total development funding, as set out in table 4.4 on page 30 of Ofwat's strategic resource solutions appendix.

Refer to Section 6 for our proposed forward work programme for the ACWG to engage with RAPID.

6 Proposed forward work programme with RAPID

The draft determination has put forward 14 strategic water resource schemes to be investigated over the next few years. There are a number of key points which we would like to work with RAPID to progress, these being:

- To develop an overall timetable / programme for the progression of the schemes through the gated process.
- We would like to set up a series of workshops / meetings to assist in developing the processes with the regulators; possibly using some of the existing schemes to test the processes along the way. These workshops would also allow us to develop and define the level of detail required for each gateway.
- During these workshops it would also be good to understand how the precautionary principle will be applied to schemes where environmental data is still being gathered to inform key decisions. Also how this would affect how the schemes progress through the gateway progress.
- Some schemes will also require other permissions to either collect data or operate the schemes (abstraction licences and discharge consents). Early engagement with the relevant organisations will help progress these applications within the necessary timescales.
- We will commission further work to meet the consistency challenges across the schemes. We have made a start on this with our gap analysis and we will continue this work in the forthcoming months. We recognise that further work will also be required to ensure that we have robust data and processes in place and we will continue to work with RAPID to help shape and guide there development.

We recommend that RAPID, EA and Ofwat meets with the ACWG in the period up to FDs to continue the constructive engagement and provide feedback on this submission and the proposed way forward.

Appendix A: Mott MacDonald report

MOTT MACDONALD

Technical Note

Project:	All Companies Working Group Consistency Assessment		
Our reference:	410795FA01	**Revision:**	Rev 3 – Final version
Prepared by:	Alice Mortimore / David Ocio Nicola Levy / Sarah-Jane Court	**Date:**	16/8/19
Approved by:	Paul Chadwick	**Checked by:**	Peter Ede/Bill Hume-Smith
Subject:	Gap analysis and future requirements		

Contents

1 Background 2

2 Costs 3

2.1 Gap Analysis 3

2.2 Future Requirement 8

3 Deployable Output 8

3.1 Gap Analysis 8

3.2 Future Requirement 13

4 Social, environmental and economic effects 14

4.1 Gap Analysis 14

4.2 Future Requirement 15

5 Drinking water quality 15
5.1 Gap Analysis 15
5.2 Future Requirement 15
6 Summary of Considerations 16
7 Alignment of Regional Plans and Ofwat Gateways 18

1 Background

Ofwat has published, in July 2019, its PR19 Draft Determination (DD) including an appendix for the Strategic Regional Resource Solutions, where funding for the development of 15 schemes is allocated (up to £450M during 2020-25) so that they can be construction ready in 2025-30. This funding would be distributed among several stages as follows:

- Gate 1 - Initial feasibility, design and multi-solution decision making, April 2021, 10%
- Gate 2 – Detailed feasibility, design and multi-solution decision making, April 2022, 15%
- Gate 3 – Finalised feasibility, pre-planning investigations and planning applications, April 2023, 35%
- Gate 4 – Planning applications, procurement strategy and land purchase, June 2024, 40%

It is envisaged that as information on the options improves and regional plans and WRMPs are published, decisions will be taken such that some non-preferred options will not proceed to the end of the gated process.

For Gate 1, Ofwat is expecting that solutions are tested in regional plans based upon *"initial outline solution design(s)"* and:

- *"Consistent costing and cost report*
- *Consistent deployable output benefit (water provided in a drought) analysis to the regional design standards*
- *Consistent social, environmental and economic assessment (impact and benefits) and in-combination effects of solution within the same catchment*
- *Consistent drinking water quality considerations"*[9]

The requirement for consistency emanates from the need to assess the feasibility of each scheme on the same basis, so that the final chosen portfolio represents the best possible value for money without any bias in the criteria used for its selection. It also reflects that, although the current position of each water company meets the requisites of the Environment Agency's

[9] Ofwat, PR19 draft determinations, Strategic regional water resource solutions appendix, July 2019, pp 27 & 31

Water Resources Planning Guideline, as expected at this stage, more work would be needed through the Gates to avoid inconsistencies across the different solutions put forward.

Ofwat's DD explains that its Initial Assessment of Plans (IAP) *"highlighted concerns with consistency of assumptions and inputs, and transparency of decision making across company plans. We raised these issues in our consultation responses to company draft water resources management plans. This highlighted a common issue, of regional groups focusing on company specific solutions within a regional context, rather than looking at all types (both company and third party) and scale (local, regional and national) of solutions, within a regional and national context. We expect to see improvements in this area going forward."*[10]

The regional solutions appendix allocates funding to the following eight water companies that together form the All Company Working Group (ACWG):

- Affinity Water
- Anglian Water
- Severn Trent Water
- Southern Water
- South West Water
- Thames Water
- United Utilities
- Wessex Water

Mott MacDonald was tasked to undertake a rapid review of the areas identified by Ofwat as requiring consistency:

- Cost
- Deployable output
- Social, environmental and economic effects
- Drinking water quality

The rapid review was intended to include reviewing consistency between the eight companies, identifying the potential gaps and scoping the work required to achieve greater consistency. This Technical Note presents the findings of the rapid analysis, which was commissioned by Anglian Water to support the common submission to Ofwat from the ACWG companies. Interviews with members of the ACWG have been conducted and this note was prepared over the course of a one week period. Members of the ACWG were requested to provide comments and feedback on any areas of improvement that were identified in the draft issue of the technical note. The comments received have been incorporated in Revisions 2 and 3

[10] Ofwat, PR19 draft determinations, Strategic regional water resource solutions appendix, July 2019, pp 6

2 Costs

2.1 Gap Analysis

All companies in the ACWG have produced Water Resource Management Plans (WRMPs) following the published guidance from the EA. The guidance includes a requirement to report scheme costs in a standard format but it does not prescribe a detailed methodology for cost estimation.

In the WRMP process companies formulate an Unconstrained List of supply options that is assessed and reduced to a Constrained List of options that are considered to be feasible. These options are then further assessed in the Programme Appraisal process to determine a series of potential water resource plans, including the preferred plan. Each stage of the process considers option cost but this review of consistency is focussed on the approach to option costing of the Constrained List options that inform Programme Appraisal and the preferred plans.

All companies develop capital and operational costs for the individual projects included in the WRMPs and for the regional schemes this is likely to involve a combination of cost model information and bottom up costing from existing industry data. Companies also take account of uncertainty or risk in their estimates. Whole life costs are generated taking into account utilisation of the water supply and the planning period associated with the WRMP. There are a number of areas in this process where inconsistencies can arise.

Table 1 provides a summary of discussions with the companies to inform the gap analysis. Areas of inconsistency are discussed below:

- Capex and opex estimation – most companies have used regional cost data to inform the capital cost rather than industry wide data. It is noted that Ofwat's DD refers to "*common cost models*"[11], however standard cost models would not necessarily account for regional cost variations.
- Capex estimation – approaches vary from all-in cost models to build up from cost curves with addition of on-costs
- Capex estimation – many of the regional schemes include elements of work that are outside the ranges of costs curves or models based on local historical data and for these schemes further work (including design work and / or cost benchmarking) has been undertaken to develop representative costs. Therefore, there is likely to be inconsistency in the level of design development for the options.
- Optimism Bias and risk – Thames Water and Severn Trent Water are the only companies to have adopted an optimism bias approach based on the Treasury Green Book. Approach to risk varies with each company.
- Whole life costing and financing assumptions – insufficient data were collected to inform the review; however, it is likely that companies have not made consistent assumptions in this area. It is also noted that some companies have extended the planning period beyond the minimum of 25years due to the extent of the longer term requirement for water driven by expected climate change and growth. This affects whole life costing of options. Thames Water utilised a planning period of 80 years after

[11] Ofwat, PR19 draft determinations, Strategic regional water resource solutions appendix, July 2019, pp 27

guidance from an economic consultancy and Affinity has a planning period of 60 years. The choice of planning period is influenced by the scale and longevity of the proposed solutions which explains the variation between companies.

Table 1: WRMP Costing Approach

Company	Schemes	Capex / Opex approach	Optimism Bias	Allowance for risk or uncertainty	Whole life cost	Comments
Affinity Water	Abingdon Reservoir Minworth Effluent Reuse South Lincolnshire Reservoir Anglian – Affinity Transfer Grand Union Canal Transfer Thames – Affinity Transfer	Bespoke capex and opex models based on historical Affinity data augmented by TR61 and other industry data where insufficient data sets are available internally.	No OB applied	Cost built up in Long Run Marginal Cost spreadsheets includes allowance for complexity	Not confirmed during study	Although Affinity have in house cost models the three strategic solutions are transfers into their area and significant proportion of the costs are provided by others. The Thames Water costs for Abingdon and the Severn Thames Transfer include OB which is an inconsistency with other costs in the Affinity plan. This was recognised but not changed following a review by Affinity. Affinity have costed transfer from the River Thames and treatment into supply. Grand Union Canal is dependent on the cost provided by the Canal and River Trust (CRT), which in turn depends on a Severn Trent Water offer of water from Minworth. The basis of the CRT costs has not been validated. Affinity have costed transfer from the canal and treatment into supply including Reverse Osmosis. The South Lincs reservoir has been costed by Anglian Water. Affinity have costed the treated water transfer and conditioning for integration into their network.
Anglian Water	South Lincolnshire reservoir Anglian – Affinity transfer	C55 cost estimating system, using cost models based on historic outturn cost data analysis, inclusive of on cost calculated at project level.	No OB applied	Based on historic outturn cost data analysis, no further risk is allocated to the estimation, however, in C55 there is an allowance for “location factors”; it is a number of percentage add-ons for project solution estimates to allow for exceptional site-specific complexities/risks (hereafter termed as, “location factors”) such as poor ground condition, temporary works , etc. that are not accounted for within the	Not confirmed during study	Additional work undertaken to develop costs for the reservoir.

Company	Schemes	Capex / Opex approach	Optimism Bias	Allowance for risk or uncertainty	Whole life cost	Comments
				cost data that underpins the curves used in estimating solution costs		
Severn Trent Water	Minworth Effluent Reuse Severn Trent Water Resources (including Netheridge Effluent Reuse, Mythe spare licence and Redeployment of Shrewsbury) River Severn to River Thames Transfer	From Assurance Statement: We worked with specialist engineering (Atkins) and environmental (Ricardo) consultants to appraise the feasible options and have used their cost and environmental appraisal models to inform the costs and benefits of each scheme.	OB following Green Book approach	Not confirmed during study	Set asset life and replacement costs for M&E equipment.	
Southern Water	Fawley Desalination River Itchen Effluent Reuse Thames to Southern Transfer West Country – Southern Transfer	Infrastructure capex costs were derived using typical water industry unit costs from consultant. Non-infrastructure treatment costs were derived from supplier quotes, known outturn costs and, in the case of desalination plants, a desk study into typical costs over a range of capacities internationally. Fixed and variable opex costs were generated.	No OB applied	Sensitivity analysis at plan level	The investment model assumes full annuitised capex from the moment the decision is made to implement an option. Treasury Green Book discount rates applied.	Further work has been undertaken on Fawley desal between WRMP and PR19, although bottom line cost not changed significantly.
South West Water	West Country Sources West Country Transfer	Plan in surplus, no options in WRMP. Bournemouth transfer to Southern was costed. Consultant cost models for capex and opex based on industry wide data rather than local region.	No OB applied	Not confirmed during study	n/a	South West Water's WRMP identified a 20 Ml/d surplus in the Bournemouth zone, which has been offered to Southern Water. Indicative costing were prepared, and the impact of such a transfer was included as a scenario in SWW's plan.
Thames Water	Abingdon Reservoir London effluent reuse River Severn to River Thames transfer Thames – Affinity transfer Thames – Southern transfer	Capex and Opex cost models based on Thames Water data where available. Majority of strategic options used consultant costings. Models supplemented with bottom up costing benchmarked against similar schemes for items	OB following Green Book approach. Approach audited by third party company.	Based on solution specific risk assessment	Recurring capex costs included based upon asset lives	Collaboration with UU and SVT on the Severn to Thames transfer led to removal of OB in the April 2019 submission as first option to Ofwat to align with UU costing approach. (NB: This does not follow Green Book). Also, the UU offer to supply water incudes fixed and variable charge. Whole life cost

Company	Schemes	Capex / Opex approach	Optimism Bias	Allowance for risk or uncertainty	Whole life cost	Comments
		outside the range of cost model data.				assumes that fixed charge is payable to reserve the water from start of lead in period. Affinity and Southern transfers costed by the receiving entity. Cotswold Canal transfer not currently on Constrained List as it was screened out following detailed investigation of the option. The option contains elements outside scope of cost models.
United Utilities	United Utilities sources Severn Trent Water Sources (Redeployment of Shrewsbury abstraction) River Severn to River Thames Transfer (Vyrnwy source)	Cost curves based on in house data. Additions for on costs	No OB	Curves include for risk that have occurred on similar projects. Additions for tender to out-turn estimated using standard approach that allows for uncertainty.	Set asset life and replacement costs for Civils, M&E equipment etc.	Significant work needed in UU area to release Vyrnwy water for TW. This work mainly within parameters of the cost curves. Some non-standard work at Vyrnwy and in the existing aqueduct.
Wessex Water	West Country Sources West Country Transfer	Plan in surplus no costing undertaken	n/a	n/a	n/a	Wessex has a surplus and will explore options to export water, the options are not currently defined. Wessex indicated that they generally generate cost estimates on a bottom up basis using local cost data. They have undertaken Monte Carlo risk analysis in the past for more complex schemes.

Source: WRMP and interviews

2.2 Future Requirement

There are a number of areas that need to be addressed to provide greater consistency in costs:

- **Level of design development** – the various strategic solutions have been developed to different levels. Some are just starting to be developed (west country sources) whereas others have been subject to design development beyond the requirements of WRMP guidance to reduce uncertainty and provide data for costing non-standard elements. Southern Water will continue to develop Fawley Desalination to meet tighter timescales. To allow schemes to be compared, ideally a consistent level of design development would be achieved. Alternatively, an approach could be developed that recognises that options may be at different stages, and a consistent approach to risk allowances could be applied that adjusts risk as schemes are developed – the options appraisal process would then need to take account of the likely greater uncertainty around the less mature options.
- **Capex and opex estimating** – Table 4.3 of the Ofwat appendix refers to common cost models and assumptions; but the review indicates that a number of companies have utilised local data to provide representative costs. It is not clear that use of common cost models would provide reliable estimates if it did not take account of regional variations in costs. Also, water companies - who have the statutory duty to supply customers and to develop and deliver plans - will also need to take ownership of cost estimates. One way forward would be to carry out capex cost benchmarking across the schemes. This could look at the basis of the cost curves and models being used and the confidence that there is in them (e.g. how robust are the cost models (water company own cost models, TR61 etc), approach to bottom up estimates etc). It could also look at what are the most material costs for water resources schemes (e.g. pipelines, water treatment, reuse treatment, desalination) benchmark the cost estimates, and where there are differences seek to understand the basis of them. This will take some time to do but could be done for example through the envisaged WRSE project on cost consistency.
- There are significant **variations in approaches to uncertainty** and likely **variations in whole life costing**, a common methodology could be developed to address this, taking account of Treasury Green Book guidance in this area. The methodology should also consider adjustments for differing planning horizons between companies, utilisation assumptions, which base year is used, the discounting method and how to commonly apply RPI and CPI-H etc,
- **Offers between water companies** (and from other third parties) have a significant impact on some of the strategic solutions and this is an area with little transparency and potential inconsistency. Consideration is needed on how increased consistency may be achieved without compromising an effective water trading market.

3 Deployable Output

3.1 Gap Analysis

The main benefit associated with a particular strategic regional water resource solution is the increase in Deployable Output (DO) it will provide. This will then be compared with the costs, incorporating environmental and social aspects, to obtain its overall cost effectiveness, which can be used to rank options. There are two potential sources of bias in the determination of the DO, which could lead to an unrealistically high or low value, thus compromising an equitable comparison. They are:

- Methodology of analysis. It should be able to resemble reality as regards the availability of surface and groundwater, its allocation to demand centres given the existing operation rules and infrastructure and the occurrence of drought episodes affecting the level of service.
- Scenarios of analysis. They are intended to stress test the system so that a certain level of service is guaranteed in the future for plausible adverse conditions.

A comparison of the main methodologies applied by each water company to define its DO is presented in Table 2: Main methodologies for determining Deployable Output. Methods used are varied and adapted to the particular nature of each resource zone and the degree of complexity of the supply system. They are considered suitable and although not consistent, differences are not expected to influence the reliability of the results.

Table 2: Main methodologies for determining Deployable Output

Water company	Surface water sources	Groundwater sources	Conjunctive use
Affinity	N/A (licence constrained)	Assessment diagrams and Lumped Parameter Models	Miser
Anglian	Stanford, HYSIM and TETIS	Assessment diagrams	Aquator
Severn Trent	HYSIM Note: effluent re-use deployable output based on historic dry weather flows supported by HYSIM analysis of back-to-back water supply sources	Assessment diagrams	Aquator
South West	Historic recorded flows and Future Flows and GW levels project	Assessment diagrams and EA regional models	Miser
Southern	Catchmod	Assessment diagrams and distributed resource groundwater models	PyWR simulator and Aquator
Thames	Catchmod	Assessment diagrams	IRAS and WARMS2 (Aquator)
United Utilities	Historic recorded flows and Catchmod	Assessment diagrams	PyWR simulator and Aquator
Wessex	HBV	Assessment diagrams	Miser

Source: WRMPs

Table 3: Scenarios of analysis used to establish the Deployable Output gathers the different scenarios used by each water company to define the DO of its system and that of the strategic regional resource solution. They have been chosen considering their impact on the individual area of influence and not necessarily on the area with which potential trading might occur. This lack of consistency might have an effect on the reliability of the DO as follows:

- The transfer from Grafham reservoir to Affinity has been tested with the CC scenario adopted by Anglian that is different from the ones used by Affinity. Therefore, Affinity is assuming the transfer is available for CC scenarios not tested by Anglian. The same applies to the synthetic droughts as Affinity has used different ones than the ones used by Anglian.
- The transfer from the West Country to Southern Water is assuming a surplus that in the case of South West Water is not considering the first half of the 20th century, precisely when Southern Water has its critical droughts. Likewise, Wessex and South West Water have not conducted any stochastic analysis, with potential more severe droughts obtained by perturbing the worst historic drought in each case,

which do not coincide with the Southern Water ones. Finally, Southern has used UKCP09 probabilistic projections while Wessex and South West Water have opted for the Spatially Coherent Projections

- Abingdon reservoir is expected to provide water to Affinity and potentially Southern Water. Expected yield from this reservoir has been obtained considering the impact on the London total reservoir system storage alone, and then conditioned by the critical periods there. This yield has also been obtained by assuming synthetic droughts and CC scenarios selected as worst case of the Thames system (which includes Affinity Water area in terms of hydrology), which differ from the ones adopted by Affinity and Southern Water. Potential transfers with origin in this source were not explicitly modelled, although Affinity Water has carried out some checks to confirm that the quoted yield (100Ml/d for one third of the storage volume) is likely to be realised for their critical droughts. This could have an impact on the overall yield depending on the timing and magnitude of the required transferred water and knowing that drought characteristics in the source and recipient areas are different.
- The transfer from United Utilities to Thames Water with origin in Lake Vyrnwy assumes water is available under CC scenarios selected by United Utilities, which differ from the ones adopted by Thames Water. As regards synthetic drought, a reconciliation exercise was done based on simulated flows at Vyrnwy so that consistent synthetic scenarios were chosen in each area.

It can be argued that if each water company has adopted the worst-case scenario for their area of influence, the inconsistency in synthetic drought and CC scenarios would not matter as the availability of water for transfer would not be compromised in other potentially more benign scenarios adopted by neighbouring water companies. However, this conclusion should be taken with caution, given:

- The non-linearity of the combined impact of seasonal changes in rainfall and PET on river flows and groundwater levels; and
- The fact that only a finite number of synthetic droughts and CC scenarios have been adopted based on drought indicators targeting the individual area of interest.

Further testing would help to clarify the situation unless there is absolute certainty that the required transfer rate is available at any time and under any situation, including all possible 1:200 drought and CC scenarios.

Table 3: Scenarios of analysis used to establish the Deployable Output

Water company	Which is the baseline period?	How have stochastic analyses been calculated (if any)?	How was the 1:200 drought derived? Where there several alternatives?	Which climate change scenarios were tested? How were they derived?	How were inter-company transfers modelled?	Has 1:500 drought been assessed?
Affinity	1920-2014	Stochastic rainfall and PET data were provided by WRSE	The most appropriate WRSE rainfall and PET stochastic dataset was selected for each lumped parameter groundwater level model and run to generate regional groundwater levels. They were ranked according to both annual minima and July values, allowing selection of years that are representative of return periods.	Identifying a representative sample of 100 climate change scenarios from the UKCP09 10,000 member ensemble for the 2080s under a medium emission scenario.	Assumed a constant value from Grafham.	Yes, preliminary impact on DO
Anglian	1920-2015	Newcastle WG with bias correction	Sub-sample of the 18,000 years stochastic data based on SPI and return period of accumulated rainfall during 12, 24 and 36 months in each region. An alternative 1:200 drought to the worst historic drought and two 1:500 droughts were selected in each region.	SCP8 medium scenario was used for obtaining DO but other scenarios (SCPLow4, High5, High 6 and High10) were used for headroom estimations.	Constant value of 91Ml/d from Grafham, reduced with time due to CC.	Yes, preliminary stress test
Severn Trent	1920-2014	Newcastle WG with bias correction	Sub-sample of the 14,000 years stochastic dataset based on return period of accumulated volume during 18, 24 and 30 months in the case of surface water sources or accumulated effective rainfall for longer durations in the case of GW sources. Additional verification of historic droughts in the last part of the 19th century.	Identifying a representative sample of 20 climate change scenarios from the UKCP09 10,000 member ensemble for the 2080s under a medium emission scenario using a Drought Indicator. This sub-sample included 10 projections towards the “dry” end of the range and 10 equally spaced projections across the remaining range. The median model output (rank 50) scenario adopted as central estimate of CC impacts in the baseline plan.	Constant as treated effluent from WWTW.	Yes, preliminary stress test
Southern	Not applicable but Weather Generator fitted to 1908-1998	Enhanced Newcastle WG to improve drought persistence.	Sub-sample of 100,000 years stochastic data by bootstrapping and keeping the statistics of the whole series. Statistical analysis and sensitivity runs of the water resource model outputs were performed to ensure that the 2,000 years sample provided a good representation of the overall synthetic data set and the historic climate. This series contained droughts of different magnitudes.	Latin Hypercube Sampling of UKCP09 probabilistic projections based on 3 indicators (24month rainfall, effective rainfall and PET) verified with rapid assessment of the impacts of climate change on drought indicators (hydrologically effective rainfall during two historical droughts: 1900-1903 and 1918-22). 20 scenarios were selected, and factors applied to the 2,000 years series	A constant value from Thames and South West. Sensitivity tests for lower rates conducted.	Yes, as part of the 2,000 years series

Water company	Which is the baseline period?	How have stochastic analyses been calculated (if any)?	How was the 1:200 drought derived? Where there several alternatives?	Which climate change scenarios were tested? How were they derived?	How were inter-company transfers modelled?	Has 1:500 drought been assessed?
South West	1957-2015	None	Variations of the worst historic drought (1975/76) by: • Extending its end • Adopting winter 1975/76 flows 10% drier than historic • Swapping 1977 and 1978 historic flows The Met Office assigned return periods to these plausible droughts for each WRZ ranging from 350 to over 5,000 years.	11 UKCP09 SCPs to generate monthly climate change factors for precipitation and PET in the 2080s, which were then applied to rainfall-runoff and GW model inputs to generate 11 sets of flow sequences and GW levels. Best estimate assumed as the mean of the WAFU determinations resulting from the different climate change projections.	Assumed a constant value as constrained in peak period.	Yes
Thames	1920-2016	Newcastle WG with bias correction	Sub-sample of the stochastic series selected by running the whole set through the IRAS model, which produced yield, resilience and DO metrics. These outputs were used to rank both individual droughts and each 100-year time series according to water resource severity. This allowed specific 100-year sequences, with known relative risk profiles, to be selected for full testing of resilience and key water resource options with the WARMS2 model.	IRAS model applied to simulate the full 10,000 member UKCP09 ensemble for the 2080s medium emission scenario. A sub-sample of 20 UKCP09 CC scenarios was chosen so as to provide the most appropriate representation of the range and likelihood of the projected climate change impacts in the London and SWOX WRZs. The “best estimate” was calculated by modelling a discrete probability as a weighted average of the 20 CC scenarios.	Assumed a constant value.	Yes
United Utilities	1927-2017	Newcastle WG with bias correction. The work was conducted worked jointly with Thames Water to develop a stochastic sequence of 17,400 years that was regionally coherent.	The stochastic flows were run through PyWR simulator to assess system response. This allowed identifying how often in 17,400 years a drought of a similar severity to the 1:200 one would be expected. 66 different droughts were selected from the stochastic series based on the impact on system performance rather than the five historical droughts, with some as severe as 1:1000 years.	Latin Hypercube Sampling was completed to select a sub-sample of 100 scenarios from the 10,000 UKCP09 probabilistic projections. They were used to produce flows and run through the PyWR simulator to come up with 20 scenarios representative of the potential DO.	A Thames demand sequence that matched UU stochastic record, was adopted.	Yes
Wessex	1911-2016	None	An aridity index accounting for the balance between rainfall and actual evapotranspiration was used to generate more extreme events than observed in the historical record, by perturbing the rainfall and PET of key historic drought events: 1921, 1933, and 1976.	11 UKCP09 SCPs adopted to generate monthly climate change factors for precipitation and PET in the 2080s, which were then applied to rainfall-runoff model inputs to generate 11 sets of flow sequences.	Assumed a constant value.	No

Source: WRMP and interviews

3.2 Future Requirement

The main concern as regards consistency in the estimation of the DO relates to the scenarios used to define it. Although all water companies have applied plausible 1:200 droughts and incorporated the impact of climate change, they have done this in various ways and focusing on their respective areas of influence.

In the short term, some tasks could be undertaken to reduce the uncertainties derived from the different degrees of development of the schemes if a more detailed response to Ofwat draft determination is required. They include:

- Extend South West baseline back to the start of the 20th century by means of rainfall-runoff modelling to verify the estimated surplus.
- Test the existence of the estimated surplus in South West and Wessex Water areas for the 1:200 synthetic droughts and CC scenarios adopted by Southern Water.

In addition, to provide Ofwat with the evidence that water would be available for transfer under any agreed circumstance, so that DO values can be reconfirmed, the following actions would be advisable:

- Test the performance of the Grafham transfer using the worst CC scenario adopted by Affinity Water to confirm the expected rate can be maintained.
- Repeat the yield assessment of the Abingdon reservoir with the two transfers to Affinity and Southern Water in place and targeting their critical drought periods.
- Test the performance of the supported Severn Thames Transfer (STT) from Lake Vyrnwy using the worst CC scenario adopted by Thames Water to confirm the expected rate can be maintained. It is also important to note that an extensive programme of investigations spanning several years is being developed to address Environment Agency concerns associated with the STT that could have a significant impact on the scheme DO, including due to changes in the Hands off Flow at Deerhurst that would impact the unsupported DO benefit, losses in the River Severn that would impact the DO benefit from sources of River Severn flow support, and water quality losses due to algal bloom patterns under climate change).

If no immediate response to Ofwat draft determination is needed, in the medium term (AMP7) it is expected that the regional plans will help address inconsistencies. In particular WRSE's regional plan has the potential to integrate all strategic schemes, for which it could expand its analysis to cover United Utilities, Anglian Water and the West Country as the sources of the transfers to the South East (noted that WRSE modelling currently includes the Severn Thames transfer as an option). If this is not feasible, regional plans will need to have a close interaction to ensure uniformity is achieved. This would involve having a coordination group between WRSE, WRE and WRW. In either case, the following would be needed:

- A single period of analysis, eg 1890-2017 as covered by HadUK rainfall dataset.
- A move to a 1:500 drought design standard in anticipation of a regulatory change
- A single regional system simulator with a degree of complexity sufficient to estimate the DO of the whole system and each individual WRZ. Results would not need to closely match those of the individual water company models but should provide a reliable comparison of performance in relative terms.

- A single Weather Generator covering all areas of interest and producing spatially coherent synthetic scenarios. Subsampling this dataset should imply regional modelling of all involved water companies' supply systems, with drought indicators targeting selected schemes as follows:
  - Grafham transfer should consider a combined DO metric for Anglian and Affinity Water.
  - Abingdon reservoir should consider a combined DO metric for Thames, Affinity and Southern Water.
  - Severn Thames transfer should consider a combined DO metric for United Utilities and Thames Water.
  - The West Country transfer should consider a combined DO metric for South West, Wessex and Southern Water.
- A single set of climate change scenarios for each strategic scheme selected based on combined DO metrics as indicated above and derived from the newest UKCP18 projections.

The national dataset project will provide a unique spatially coherent set of synthetic droughts and CC scenarios to avoid inconsistencies and ensure the different drought features of each region are considered. In addition, a guidance on the minimum analytical requirements needed to produce reliable DO estimations should be agreed and shared by all water companies, so that the different future DO determinations can be comparable and accurate.

4 Social, environmental and economic effects

4.1 Gap Analysis

All the water companies have followed the WRP guidance regarding requirements for Strategic Environmental Assessment (SEA), Habitats Regulations Assessment (HRA) and Water Framework Directive (WFD) assessment. Two of the water companies, Wessex Water and South West Water did not propose any future water resource options and therefore, were not required to undertake a full SEA or HRA.

Several of the water companies undertook additional environmental studies including natural capital assessment or ecosystem services assessment. The methodologies used for these varied across water companies, from using a qualitative approach to full monetarisation. A few of the water companies (United Utilities and Thames Water) undertook a study to determine approaches for using natural capital/ecosystem services approaches but concluded that a robust and consistent methodology was not yet available.

The approach to incorporating the environmental assessment findings into decision-making for the preferred programme differed across the water companies. Table 4 demonstrates the different approaches taken.

Table 4: Approaches to inclusion of environmental assessments in decision-making

Water Company	Approach
Affinity Water	Assessed the environment impact of an option based on the SEA work on a scale of -5 (being negative impact) to +5 (positive impact). This was used to inform the Multi-Criteria Assessment of the options

Water Company	Approach
Anglian Water	Qualitative approach to environmental and social effects using a +++ to - - - scoring system. Environmental assessment results used to screen out options and identify mitigation. Semi-quantitative ecosystem services assessment used to compare options
Severn Trent Water	Monetarisation of some environmental and social costs included in investment model
South West Water	Used a high-level natural capital assessment and valuation
Southern Water	Qualitative approach to environmental and social effects.
Thames Water	Used environmental and social metrics to translate the SEA, HRA and WFD findings for each option into numerical form for inclusion in the programme appraisal model. This consisted of using a grade scale of -10 to 0 (negative) and 0 to +10 (positive). Method checked and validated by an Expert Panel. Decision taken not to include monetary valuation apart from carbon.
United Utilities	Followed the Benefits Assessment guidance, with some environmental and social impacted assessed qualitatively and others monetarised. Utilised AISC values to generate a ranked assessment of overall option costs
Wessex Water	Used qualitative, quantitative and monetary assessment of environmental and social impacts. Monetary assessment used the Environment Agency's Benefits Assessment Guidance (BAG) approach.

Source: WRMP and interviews

4.2 Future Requirement

Whilst all companies have met the WRMP guidelines for environmental assessment and reporting there are differences in the approaches adopted. A common approach needs further consideration and agreement within the ACWG.

If the West Country transfer to Southern Water is progressed, a full HRA would be required for the project following the standard guidance. SEA is undertaken at the WRMP programme level not an individual project level and the following options could be considered to complete an SEA:

- If revisions to relevant company WRMP 2019 plans are anticipated, then they could include the scheme and the SEA would then be revised to include it
- If the scheme is going to be in WRMP 2024 instead then the SEA for this will cover the scheme
- If the scheme is developed outside of the WRMP process, then it could go through normal project level environmental assessment/EIA (as required) and be included in any common environmental framework developed by the ACWG companies.

5 Drinking water quality

5.1 Gap Analysis

There is no standard guidance on drinking water quality in the WRMP guidelines; however, companies are required to satisfy the DWI that the plans will fulfil their statutory obligations with regards to drinking water.

Each company has considered drinking water quality during development of the WRMPs generally at the solution level; however, there is no consistency in reporting and discussion with the companies indicated that there is some confusion in what Ofwat is looking for in this regard.

Appropriate considerations vary with option type as follows:

- **Raw water transfers and indirect reuse options** - impact river water quality and existing drinking water abstractions and treatment in the receiving catchment. Algae in source water has potential to impact receiving catchment with knock-on effect on DO
- **Treated water transfers and Desalination** - integration issues that affect taste and odour or have other impacts on the receiving supply network
- **Reservoir solutions** - algae and cumulative parameters are of interest and potentially impact DO as reservoirs are drawn down.

Thames Water has taken a no deterioration approach to water quality for raw water transfer (post discussions and consultation feedback from the EA) and reuse solutions (post discussion with an ex DWI Chief Inspector for drinking water parameters) across their plan.

Affinity indicated that the DWI have expressed interest in the resilience of their system to pollution events due to the lower levels of storage in their system. This is not an option level consideration but an overarching issue for the plan.

5.2 Future Requirement

Drinking water quality considerations are not consistently assessed or reported and it is not clear what Ofwat and the DWI would like to see in this regard.

It is suggested that a common reporting format is developed by the ACWG alongside a common approach to drinking water quality assessment for each option type. This could include:

- A clear identification of water quality objectives relevant to each option type:
  - Option types with impacts on the natural environment and drinking water (Raw water transfers and indirect reuse)
  - Options with supply network impacts (Treated water transfers and Desalination)
  - Options with potential impacts on deployable output and natural environment (Reservoirs)
- Categorisation and appropriate assessment of water quality impacts:

The reporting format should consider each strategic option and also have space for a plan level review. Further discussion with Ofwat and the DWI may be appropriate to ratify this approach, with the support of an appropriate consultant to confirm suitable approach has been taken.

6 Summary of Considerations

As part of the present review, several areas of improvement have been identified so that a consistent approach is obtained across all proposed strategic regional solutions put forward. This

will enable a fair comparison. The identified actions are achievable and the All Companies Working Group intends to work together through Gate 1 to Gate 2 to meet Ofwat's requirements.

Costs	**Establish a common level of design for the gated process** Consistent costing relies on consistent level of design development. The ACWG feedback session suggested a checklist of design issues for each strategic solution that would allow a review of consistency. **Cost Benchmarking across the strategic solutions** Move away from the common set of cost models suggested by Ofwat but benchmark the costing data used to inform estimates. **Common approach to uncertainty and optimism bias** Further work to develop and agree a common approach that is flexible to the scale of each scheme and aligns with Treasury Green Book guidance, with guidance to confirm common approach by an appropriate consultant. **Common approach to resource offers** ACWG feedback session suggested a working group to look at this issue and take discussion forward with Ofwat and the RAPID group.
Deployable Output	**West Country transfer** Analyses of this transfer are less detailed in comparison with others. More should be done to validate its feasibility from a Deployable Output perspective if it is to be put forward. **Further evidence needed to support DO assessment as regards the impact of synthetic droughts and climate change** The lack of consistency in stress test scenarios can be perceived by Ofwat as a risk that actually less water is available for transfer. However, water companies might be comfortable with the analysis already undertaken and can confirm with absolute certainty that estimated DO is available under all circumstances. ACWG could seek guidance to confirm results are comparable by an appropriate consultant. **Is the future regional planning going to solve the lack of consistency?** Having a new conjunctive use model would enable the adoption of consistent methodologies and scenarios of analysis. To do so, the modelling exercise should cross the boundaries of the regional plan and benefit from the outcomes of the new national dataset project. Due to the complexity, have an appropriate consultant review the results to ensure a common approach has been undertaken.

Environmental and social assessment	**Incorporating environmental and social impacts in ACWG decision making** There are variances in the approaches adopted across the WRMPs and there is a general move in the direction of natural capital accounting. Further work is needed in this area to establish a common approach to assessment methodology and integration with decision making for best value plans. The ACWG feedback session suggested production of a common set of subjects for assessment, so all companies have reviewed each of their options against the same set, and ratification of approach by an appropriate consultant
Drinking Water quality	**Establishing consistency in drinking water quality considerations** The AWCG feedback session supported development of a common assessment and reporting approach for water quality. ACWG could seek guidance to confirm common approach from an appropriate consultant.

MOTT MACDONALD

7 Alignment of Regional Plans and Ofwat Gateways

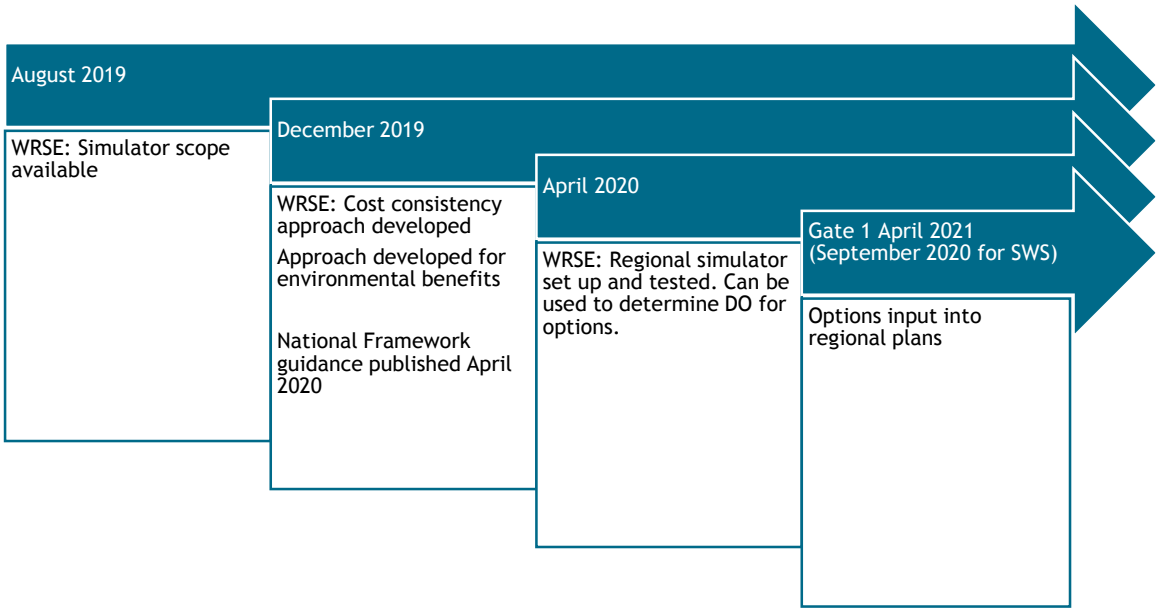
Ofwat's Gate 1 requires common assumptions and consistent approaches to be used in preliminary work to determine consistent availability of water, environmental constraints, environmental and social benefits, for all options and to test solutions in high level regional models to determine benefits in the selected set of scenarios. Ofwat's DD expectation is for this to be complete by **April 2021** (for Southern Water **September 2020**). Southern Water options are fast tracked so that water is made available for Southern Water to meet environmental obligations by 2027. Ofwat has stated that this will be possible as three of Southern Water's solutions are joint in nature, but are not complex cross-catchment transfer solutions and are not directly reliant on other solutions to progress. However, consistent approaches to costing and defining deployable output for the options will be required to be complete for the initial design and costing of the Southern Water options.

The regional plans involved with the listed strategic options include; Water Resources East, Water Resources West and Water Resources West Country. However, all the options will be represented in the Water Resources South East (WRSE) regional resilience plan. Consistency of approaches is therefore most pertinent in WRSE but other regional plans will need to be consistent with WRSE as some options will be represented across more than one regional plan.

The scope for the WRSE regional resilience plan is to identify the best value set of strategic options to satisfy water needs across the region for the water companies and other sectors. The WRSE plan involves tasks to identify and remove inconsistencies in approaches to development and assessment of the strategic schemes. The time available for the development of consistent approaches for the strategic options is limited. WRSE programme dates associated with consistency of approaches include:

- WRSE's ambition is to include metrics to assess environmental benefits and drinking water quality in the simulator model. The WRSE simulator model scope should be available by the end of **September 2019** and this should give greater visibility of the likely phasing of the simulator functionality in these areas.
- Cost consistency review is programmed in WRSE to be undertaken by **December 2019.** [Note that this may be impacted by ongoing studies that could have a marked impact on any costs due to required mitigations to resolve issues. This has been experienced with Teddington Direct River Abstraction and another at-risk option is Severn Thames Transfer]
- The methodology for the Environmental Appraisal in WRSE is due by **December 2019**.
- It is considered that the deployable output of the options will be represented in the simulator model which will be made available **April 2020.**
- Drinking water considerations are to be considered as part of the WRSE simulator model, available in **April 2020,** but all considerations may not be included in the model.
- Optioneering work for the WRSE regional resilience plan is due to be started at the end of 2019 and completed by **September 2020.**
- The next draft regional plan is anticipated to be produced by **August 2021 (after Gate 1)**, and

A revised draft regional plan will be produced for **August 2022 (after Gate 2)** in line with draft WRMP24 submissions. A more detailed phased programme is being developed to determine when the validation and sign off of strategic options for use in the WRSE Regional Resilience Plan development and modelling phase will be required.



Engagement between regional groups and Ofwat is likely to be needed to achieve alignment between gate timings/activities and regional plan dates/activities including:

- Ofwat's DD shows Gate 1 occurring in April 2021 before draft regional plans are produced in August 2021 – it is unclear how Gate 1 decisions can be made without outputs from the regional modelling. Gates may be best timed after publication of regional plan staged outputs, such that Ofwat has sufficient time to review the outputs from each regional plan stage before making decisions at Gates;
- Consideration as to what regional plan outputs will be available to feed into the earlier gates proposed by Ofwat for Southern Water
- Recognition in the Gate activities that investigations associated with some options are likely to continue beyond Gate 1 (and potentially Gate 2), and so assessments of cost, DO and wider benefits (environmental, social and economic) will need to be updated at each stage/gate.

Appendix B: DD and proposed revised timelines

National and draft determination timelines

Date	Draft determination	National framework timeline	Regional update windows for plans	WRMP update windows for plans
Jul-19	Ofwat draft determination	Draft national modelling work setting out case of need	Update window 1 for regional data sets	Update window 1 for company data sets for their WRMP
Aug-19		Multi-sector demands		
Sep-19				
Oct-19		Draft national policies		
Nov-19		Final national modelling work		
Dec-19	Ofwat final determination	National framework outputs signed off by SSG		
Jan-20	Gate 1 activity Gate 1 outputs consultation	Develop of statement of need		
Feb-20		Statement of need		
Mar-20		Simulation modelling and data set construction and review		
Apr-20				
May-20				
Jun-20				
Jul-20		Method statements		
Aug-20		Input data for regional plan completed		
Sep-20				
Oct-20				
Nov-20		Investment modelling and derivation of best value resilience plan		
Dec-20				
Jan-21				
Feb-21		Statement of need		
Mar-21		Initial regional plan		
Apr-21		Audit, assurance and stakeholder engagement		
May-21				
Jun-21				
Jul-21		Exec sign off of initial draft plan		
Aug-21	Gate 1:Submission, assesment and decsions	Initial draft regional plan submitted		
Sep-21	Gate 1: consultation on decision			
Oct-21	Gate 1: consultation on decision	National reconciliation of initial draft regional plans & Exec sign off		
Nov-21	Gate 1: results publication			
Dec-21				
Jan-22		Consultation of draft regional plans Pre-consultation of dWRMP Consultation of draft regional plans	Update window 2 for regional data sets	
Feb-22				
Mar-22		National reconciliation of draft regional plans		
Apr-22				
May-22		Audit and assurance		
Jun-22				
Jul-22		Exec sign off of initial dWRMP & rdRP		
Aug-22	Gate 2:Submission, assesment and decsions	revised draft regional plans draft WRMP's submitted to Defra	Update window 3 for regional data sets	Update window 2 for company datasets for draft WRMP
Sep-22	Gate 2: consultation on decision			
Oct-22	Gate 2: consultation on decision	Consultation on draft WRMPs		
Nov-22	Gate 2: results publication			
Dec-22		Update of models following consultation		
Jan-23		Exec sign off of initial dWRMP & rdRP		
Feb-23		SoR & rdWRMP		
Mar-23				
Apr-23		Final modelling to take on board any further constraints		
May-23				
Jun-23				
Jul-23				
Aug-23	Gate 3:Submission, assesment and decsions			
Sep-23	Gate 3: consultation on decision	Final WRMP and Regional Plans		
Oct-23	Gate 3: consultation on decision			
Nov-23	Gate 3: results publication			
Dec-23				
Jan-24				
Feb-24				
Mar-24				
Apr-24		Undertake a lessons learnt review and update of models , methods and data sets following the production of the regional plan and WRMPS.		
May-24				
Jun-24				
Jul-24				
Aug-24				
Sep-24			Update window 1 for regional data sets	
Oct-24	Gate 4:Submission, assesment and decsions			
Nov-24	Gate 4: consultation on decision			
Dec-24	Gate 4: consultation on decision			
Jan-25	Gate 4: results publication	Develop of statement of need		
Feb-25		Statement of need		
Mar-25				
Apr-25		Simulation modelling and data set construction and review		
May-25				
Jun-25				
Jul-25		Method statements		
Aug-25		Input data for regional plan completed		
Sep-25				
Oct-25				
Nov-25		Investment modelling and derivation of best value resilience plan		
Dec-25				
Jan-26				
Feb-26		Statement of need		
Mar-26		Initial regional plan		
Apr-26	Gate 5: Submission, assesment and decsions	Audit, assurance and stakeholder engagement		
May-26	Gate 5: consultation on decision			
Jun-26	Gate 5: consultation on decision			
Jul-26	Gate 5: results publication	Exec sign off of initial draft plan		
Aug-26		Initial draft regional plan submitted		
Sep-26				
Oct-26		National reconciliation of initial draft regional plans		
Nov-26				
Dec-26				
Jan-27		Consultation of draft regional plans Pre-consultation of dWRMP Consultation of draft regional plans	Update window 2 for regional data sets	
Feb-27				
Mar-27		National reconciliation of draft regional plans		
Apr-27				
May-27		Audit and assurance		
Jun-27				
Jul-27		Exec sign off of initial dWRMP & rdRP		
Aug-27		revised draft regional plans draft WRMP's submitted to Defra	Update window 3 for regional data sets	
Sep-27				
Oct-27		Consultation on draft WRMPs		
Nov-27				
Dec-27		Update of models following consultation		
Jan-28		Exec sign off of initial dWRMP & rdRP		
Feb-28		SoR & rdWRMP		
Mar-28				
Apr-28		Final modelling to take on board any further constraints		
May-28				
Jun-28				
Jul-28				
Aug-28				
Sep-28		Final WRMP and Regional Plans		