Strategic regional water resource solutions: Preliminary feasibility assessment

Gate-1 submission for Severn Trent Sources Strategic Resource Option

Date: 05 July 2021

Template version: draft 10, 9 February 2021

WONDERFUL ON TAP

SEVERN TRENT

Attention: Mr Paul Hickey
Managing Director
Regulators' Alliance for Progressing Infrastructure Development
Ofwat
City Centre Tower
7 Hill Street
Birmingham
B5 4UA

01 July 2021

Severn Trent Sources SRO Gate 1 Submission

Dear Paul

We are pleased to submit our gate-1 report for the Severn Trent Sources Strategic Resources Option (SRO). The report outlines how we have developed this SRO since its approval in the PR19 Final Determination, and the key steps we intend to take in gate-2.

The Severn Trent Sources SRO proposes to transfer water to support customers in the South East of England in times of need. The water will be supplied from two Severn Trent sites: Mythe water treatment works (requiring a temporary licence transfer of 15Ml/d) and Netheridge wastewater treatment works (requiring additional wastewater treatment processes, a pumping station, and a pipeline in order to transfer 35Ml/d).

Our team has been delighted to make this contribution to strengthening the UK's water infrastructure and creating a legacy of resilient water resources for future generations.

The Severn Trent Water Board confirms its support for this SRO with the supporting board statement attached.

We have aimed to create a gate-1 report that meets RAPID's requirements at this stage in the process. If there are elements you would like to discuss with the team, please contact justin.bailey@severntrent.co.uk and STSources@severntrent.co.uk; we would welcome the opportunity to provide further clarity where needed. We have received a letter of support from the Environment Agency, which can be provided on request. We look forward to receiving your feedback, and to developing the SRO into gate-2.

Yours sincerely

Liv Garfield
Chief Executive

Severn Trent Sources -

Gate 1 preliminary feasibility assessment

Severn Trent Sources Strategic Resource Option
Board Assurance Statement

This Board Assurance Statement is provided by Severn Trent Water. In support of this statement the company has undertaken internal assurance and due diligence.

The board is satisfied that the data and approaches used to develop the concept design and decision-making information included within the Gate 1 submission:

- meets the requirements set out in Ofwat's Final Determination, and subsequent additional feedback from Ofwat;
- has been subject to sufficient processes and internal systems of control to ensure that the information on design, costs and benefits contained in this submission are reliable;
- has been appropriately assured to give our stakeholders, including customers, trust and confidence in this Gate 1 submission;
- and has appropriately considered the feedback and opinion of independent external assurance partners.

The board confirm that they understand their role in this submission as suppliers of the water.

The board support the recommendation for the solution progression made in this submission and are satisfied that the:

- progress on the solution, to date, is commensurate with the Final Determination timeline of being 'construction ready' in AMP8;
- scope, detail and quality of the preliminary activities are that which would be expected of a large infrastructure scheme of this nature at this stage;
- expenditure incurred in generating the Gate 1 submission is efficient and relevant to the development of the submission.

On Behalf of:	**Name and position:**	**Date:**
Severn Trent Water	Liv Garfield CEO	1st July 2021

Contents

Glossary

ACWG	All Company Working Group	NE	**Natural England**
AIC	Annual Incremental Costs	**NPV**	Net Present Value
CAP	Competitively Appointed Provider	**NSIP**	Nationally Significant Infrastructure Project
CCG	Customer Challenge Group	**SEA**	Strategic Environmental Assessment
CCW	Consumer Council for Water	**SRO**	Strategic Resource Option
CPO	Compulsory Purchase Order	**STS**	Severn Trent Sources
DBFOM	Design, Build, Finance, Operate and Maintain	**STT**	Severn to Thames Transfer
DCO	Development Consent Order	**STW**	Severn Trent Water
DPC	Direct Procurement for Customers	**tCO_2e**	Tonnes CO_2 equivalent
DWF	Dry Weather Flow	**TCPA**	Town and Country Planning Act 1990
DWI	Drinking Water Inspectorate	**The Trust**	Canal & River Trust
DWSP	Drinking Water Safety Plan	**TWUL**	Thames Water Utilities Ltd
EA	Environment Agency	**WFD**	Water Framework Directive
GUC	Grand Union Canal	**WRMP**	Water Resources Management Plan
HoF	Hands-off Flow	**WRSE**	Water Resources South East
HRA	Habitat Regulations Assessment	**WRW**	Water Resources West
INNS	Invasive Non-Native Species	**WRZ**	Water Resource Zone
Ml/d	Megalitres per day	**WTW**	Water Treatment Works
NAU	National Appraisal Unit	**WwTW**	Wastewater Treatment Works

1. Executive Summary

Opening Statement

1.1. Severn Trent Sources (STS) Strategic Resource Option (SRO) is a viable solution that offers two sources of raw water flow augmentation for abstraction and transfer by the Severn to Thames Transfer (STT) SRO.

1.2. STS SRO offers a robust, reliable, and resilient source of raw water to support the STT SRO. Through gate-1 we have not discovered any showstoppers and recommend that this SRO proceed to gate-2.

1.3. We have delivered our gate-1 submission efficiently, at 42% below the Final Determination allowance.

1.4. It should be noted that Shrewsbury Redeployment, a Vyrnwy Mitigation option, is not included in this submission. This option is included in the STT SRO gate-1 report, as agreed with RAPID.

1.5. The two sources of raw water, Mythe Water Treatment works (WTW) and Netheridge Wastewater Treatment Works (WwTW) shown in Figures 1.1 and 1.2, represent 'Put' components of the 'Put and Take' arrangement agreed in principle with the Environment Agency (EA) to support abstraction by the STT SRO. The other raw water 'Put' components and the STT SRO are shown in Figure 2.1. Collectively, these form the STT SRO System. These are reported separately to RAPID in their own gate-1 submissions.

Figure 1.1: STS SRO – Mythe WTW
(Diagram for illustrative purposes only)

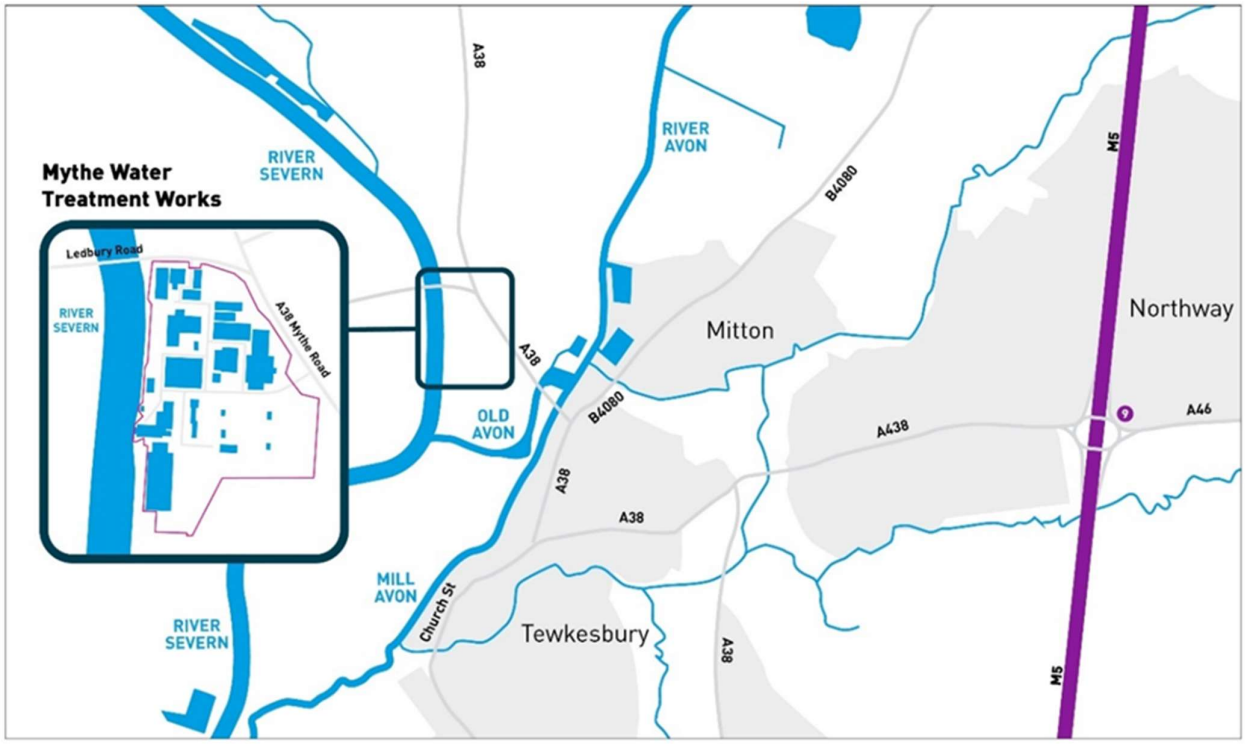
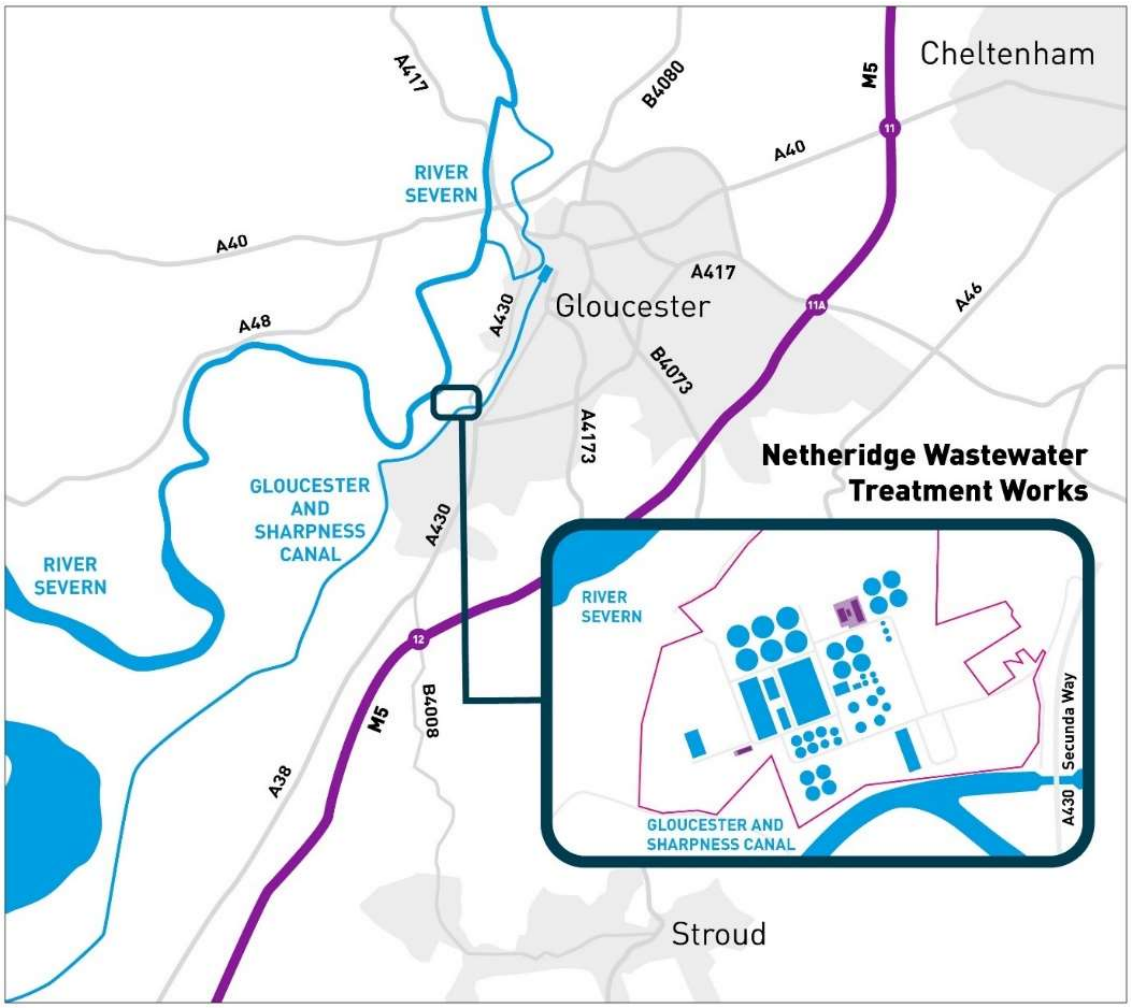


Figure 1.2: **STS SRO – Netheridge WwTW**
(Diagram for illustrative purposes only)



Key Facts

1.6. Mythe WTW will offer 'Put' support of 15 Ml/d by transferring part of Severn Trent Water's (STW's) existing River Severn abstraction licence.
1.7. Netheridge WwTW will offer 'Put' support of 35 Ml/d by diverting the Dry Weather Flow (DWF) portion of treated wastewater from its current discharge location in the River Severn.
1.8. Additional treatment will be required at Netheridge WwTW to ensure no detrimental impact to the Water Framework Directive (WFD) status of the receiving waterbodies.
1.9. Both sources will provide flow augmentation to the River Severn providing support for the STT SRO abstraction.
1.10. Customer and stakeholder consultations have indicated the scheme is feasible and has customer support.

Conclusions

1.11. Our work in gate-1 has shown the key environmental consideration for this SRO is the proposed Netheridge WwTW discharge location. We will do further work through gate-2 to determine the best Deerhurst WTW discharge location.

1.12. Netheridge WwTW will be construction ready in AMP8, as per the Final Determination requirement, with an earliest deployable output (DO) of Q1 2031. No construction is required for Mythe WTW.
1.13. The new assets required at Netheridge WwTW can be constructed more rapidly than the STT SRO that it supports. Mythe WTW is a licence transfer and can be made available whenever required.
1.14. Netheridge WwTW offers a robust, reliable, and resilient source of raw water to support the STT SRO. Mythe WTW will always be available as there is no hands-off flow (HoF) clause associated with the licence.
1.15. Care has been taken to ensure efficient and relevant spend on agreed activities to advance this project. At gate-1 we have spent 58% of our budget. We are demonstrating efficient spend through our third-line assurance.
1.16. We have welcomed the opportunity to consider a Direct Procurement for Customers (DPC) procurement route. Having carried out Test 1 (size) and Test 2 (discreteness), this SRO fails Test 1 and is marginal for Test 2. As a result, it is not suitable for DPC. We will continue to review our procurement options prior to gate-2.
1.17. Further work is required to refine the proposal for gate-2 and, in particular, confirm:
- the level of additional treatment required for discharge to the receiving waterbodies; and
- the exact discharge location for each STT SRO interconnector option.

Quarterly Dashboard Alignment

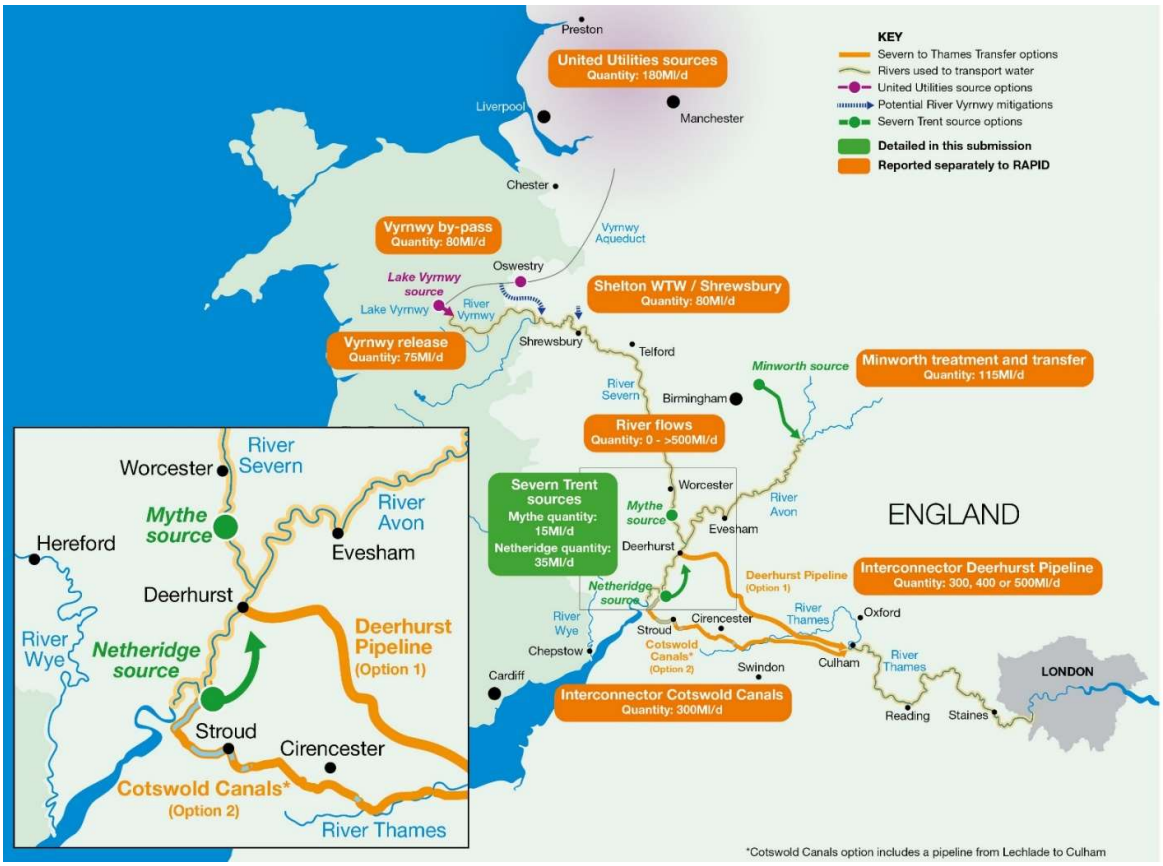
1.18. We confirm that all of the statements above are in accordance with those previously reported in quarterly dashboards. Where they vary, this is as a result of work undertaken in the development of the scheme.

2. Solution Description

Outline of the Solution

2.1. The STS SRO comprises two sources of raw water to provide support for the abstraction at the STT SRO, which seeks to transfer water from the River Severn Catchment to the River Thames Catchment. As noted in Section 1.4, Shrewsbury Redeployment is included in the STT SRO gate-1 submission.
2.2. Mythe WTW is located by the River Severn with a Public Water Supply abstraction licence of 120 Ml/d. The configuration of the WTW restricts its sustainable output to 105 Ml/d, leaving 15 Ml/d available for water trading. No new assets are required to affect this transfer; only a temporary transfer of the abstraction licence downstream to the STT SRO abstraction point.
2.3. Netheridge WwTW discharges treated wastewater to the River Severn. New assets, detailed in Chapter 4, will allow 35 Ml/d to be diverted for discharge either directly to the River Severn near to the STT SRO abstraction point, or directly to the STT SRO WTW.
2.4. The concept design for the STT SRO and System are described in its own gate-1 submission. The STT SRO System, including the raw water sources, is shown in Figure 2.1.

Figure 2.1: **STT SRO System**
(Diagram for illustrative purposes only)



Option Configurations

2.5. Please refer to Chapter 4 for technical details of the option configurations.

2.6. Given the relatively small source capacity of each of the two raw water sources, only a single flow option has been considered for each source. Each source is scalable if the Water Resources South East (WRSE) regional investment model determines a lower source capacity is appropriate. Operationally, the diverted flow will be capable of being varied if the drought scenario does not require full deployment.

2.7. Both sources will be capable of being deployed to either of the two STT SRO interconnector options (Deerhurst WTW pipeline or Cotswold Canals) and could be operated either individually or in combination.

2.8. Mythe WTW is a temporary licence transfer of 15 Ml/d, which will require detailed discussions with the Environment Agency (EA) for inclusion in the overall 'Put and Take' arrangement for the STT SRO. This option does not require the construction of any new assets, nor reconfiguration of Severn Trent Water's (STW's) supply network under normal operating conditions. Short-duration reconfigurations of STW's supply network may be required under peak demand or asset failure scenarios. These are well within the existing second source resilience capability to maintain supply to our own customers.

2.9. Netheridge WwTW diversion of 35 Ml/d will require different pipeline and discharge configurations, depending on the preferred STT SRO interconnector.

2.10. For all options, we have considered the additional treatment processes required at Netheridge WwTW to meet the likely discharge consent for each of the receiving water bodies. This assessment seeks to ensure there will be no deterioration to the published WFD status in terms

of physio-chemical elements. Ongoing environmental investigations will determine ecological elements (see Chapter 5).

2.11. We have instigated an enhanced water quality sampling programme that will better inform the design of the additional treatment process(es) required for each receiving waterbody.

2.12. Two discharge locations have been considered for the STT SRO Deerhurst WTW pipeline interconnector; either into the River Severn at or near the new abstraction for the Deerhurst WTW, or a direct discharge into the proposed STT SRO assets. The optimum discharge location will be determined at gate-2.

2.13. Two discharge locations have been considered for the STT SRO Cotswold Canals interconnector; either directly into the Gloucester & Sharpness Canal adjacent to the WwTW, or into the East Channel of the River Severn at or near the proposed STT SRO abstraction point adjacent to Gloucester Docks. Direct discharge to the Gloucester & Sharpness Canal has been discounted due to the potential water quality impacts on Bristol Water's abstraction from the canal for their Purton WTW. This would require further additional treatment processes at Netheridge WwTW with a corresponding increase in cost and carbon emissions.

2.14. The new assets required at Netheridge WwTW can be constructed more rapidly than the STT SRO they support. Mythe WTW is a licence transfer and can be made available whenever required.

Overall Costs

2.15. The costs associated with each option detailed in this SRO are shown in Table 10.1 in Chapter 10. All costs are presented in 19/20 prices. OPEX figures for the 10% sweetening flow include running costs for the scheme (e.g. electricity, power and chemicals scaled back, as well as full costs for staffing and operational maintenance). OPEX figures for the maximum flow are based on a volumetric rate.

2.16. STW costs have been presented to the WRSE model for options appraisal as a fixed annual charge and a variable charge, as these are trades of water from one company to another.

2.17. Forecast costs to each gateway are detailed below in Table 2.3.

Table 2.3: Summary of costs for each gateway

	Gate-1	Gate-2	Gate-3	Gate-4
Ofwat allowance for each gate	£0.53m	£0.795m	£1.855m	£2.12m

Resource Benefit of the Solution

2.18. Netheridge WwTW offers a robust, reliable, and resilient source of raw water to support the STT SRO. Mythe WTW will always be available as there is no HoF clause associated with the licence.

2.19. As a raw water source SRO, this scheme has no direct water resource deployable output benefit. The deployable output benefit will be realised through the transfer SRO and is assessed by WRSE water resource modelling. Refer to Chapter 2 of the STT SRO gate-1 submission for further information.

2.20. The maximum resource benefit of each raw water source is summarised below:

- Mythe WTW is 15 Ml/d. This is the portion of the existing abstraction licence which cannot be used on a reliable basis.
- Netheridge WwTW is 35 Ml/d. This is the portion of the existing DWF consented for discharge, which is always available.

Summary of Social, Environmental and Economic Assessment

2.21. Our work in gate-1 has shown the key environmental consideration is the proposed Netheridge WwTW discharge location. We will do further work through gate-2 to determine the best Deerhurst WTW discharge location.

2.22. The nature of this option means that, at scheme level, there are limited opportunities for social, environmental and economic benefits. Net gains will largely be realised through in-combination effects with the STT SRO. Please refer to Chapter 2 of the STT SRO gate-1 submission for details.
2.23. Environmental appraisals, undertaken as part of the STT SRO, have confirmed that the scheme is feasible. Although the assessment identified several 'Major Negative' effects, no showstopper has been revealed.
2.24. A number of the 'Major Negative' effects have already been mitigated by the proposed option configurations and we will continue to consider further mitigations during our gate-2 activity.
2.25. Some of the potential impacts identified are temporary in nature and largely unavoidable while construction works take place.
2.26. Environmental assessment of the scheme is detailed in Chapter 5.

Drinking Water Quality Considerations

2.27. Drinking water quality considerations have been assessed in accordance with the All Company Working Group (ACWG) Strategic Water Quality Risk Framework. This work was undertaken as part of the STT SRO and is detailed in Sections 5.28 – 5.32.
2.28. No water quality assessment is required for the Mythe WTW licence transfer as this will be the same as the source water abstracted by the STT SRO Deerhurst WTW abstraction. This is covered by the STT SRO Strategic Water Quality Risk Assessment and can be found in Chapter 5 of the STT SRO gate-1 submission.
2.29. Although the source of the flow augmentation will be treated wastewater, the discharge location will avoid the possibility of abstracting the undiluted treated wastewater. Subject to EA agreement, the discharge will be either just downstream of the STT SRO abstraction point or sufficiently far enough upstream to ensure adequate dilution prior to abstraction.
2.30. The option to discharge directly to the STT SRO WTW has not yet been discounted, but requires further analysis, which will be completed for gate-2.

Wider Resilience Benefits

2.31. The wider resilience benefits of these two raw water sources will be realised as part the STT SRO System. At scheme level, both sources are considered to be a resilient source of raw water. Both sources have been submitted to Water Resources West (WRW) and WRSE for water resource benefit modelling.
2.32. The existing Mythe WTW abstraction licence is constrained only at times when maximum river regulation coincides with high tides at Sharpness of 9m or higher. This condition has not been experienced since the restriction was added to the abstraction licence in 1996, and in any case would be expected to be a short-duration event.
2.33. Netheridge WwTW DWF discharge will be available under all drought and climate change scenarios and, along with Minworth SRO, is therefore considered to be one of the most robust sources of raw water available to STT.

Interactions with other Solutions

2.34. STS SRO is one of a suite of raw water sources to provide flow augmentation for the STT SRO abstraction from the River Severn. The need for the new abstraction, and therefore the timing of any new assets required, will be dictated by Thames Water's (TWUL's) future demand profile. This is the subject of further TWUL and WRSE water resource modelling detailed in the STT SRO gate-1 submission.
2.35. As raw water sources for a new abstraction, there is a direct interaction with the STT SRO in terms of its operational strategy and how STS SRO sources may be deployed. This is discussed in Chapter 6.
2.36. There are no direct interactions with other SROs, including the other STT SRO raw water source SROs (Minworth, and Vyrnwy Release and its mitigation options). STS SRO sources will be capable of deployment either completely independently of, or in combination with, the other raw water source SROs.

2.37. Details of the STT SRO interactions with other SROs are described in Chapter 2 of the STT SRO gate-1 submission.

Meeting the National Framework Requirements

2.38. The National Framework explores England's long-term water needs. We believe the STS SRO raw water sources represent a robust, reliable and resilient source to help deliver resilience to the 1 in 500-years drought. As a component of the STT SRO, it will increase supplies and move water to where it is needed.
2.39. The STS SRO will be reflected in the regional plans for the donor region, WRW, and the recipient region, WRSE.

3. Outline Project Plan

Overview

3.1. The scheme is proceeding to plan, with all key milestones met to date, including submissions to regional planning. Subject to timely decisions on scheme progression and a stated requirement from Regional Planning and Water Resources Management Plan 24 (WRMP24), the scheme remains on track to deliver through the gated process. It will be construction ready in AMP8, as per the Final Determination requirement.
3.2. The interaction with STT SRO leads to a choice of consenting options and procurement options, both of which affect the timelines for this outline plan. Advice has been sought to establish potential timelines and any limitations. To be as clear as possible at the gate-1 stage, we will consider the 'most likely' timeline and provide the earliest possible date to ensure that all milestones can be met. There is an inherent risk to these dates should the 'most likely' route not be followed. The planning and procurement are likely be more complex and take longer if Netheridge WwTW is combined with STT.
3.3. Figure 3.1 shows an outline plan for the 'most likely' timeline to construction for STS SRO. The 'most likely' timeline is chosen to account for the critical path, planning/consenting and procurement routes, then to align construction to the statement of need for the receiving SRO. An earliest possible delivery date is also provided below, but it is expected that this would incur additional cost downstream and would not be the optimum timeline for delivery. The 'most likely' start date for construction is indicated as Q3 2029, with a deployable output date of Q1 2034.
3.4. Further detail for DPC and Development Consent Order (DCO) options are outlined in Chapter 6 and Chapter 7. However, for clarity, our 'most likely' scenario includes a Town and Country Planning Act 1990 (TCPA) route with no DPC for the works at Netheridge WwTW, in line with advice.
3.5. Further detail on activities required to gate-2 can be found in Chapter 15.
3.6. Through gate-1 we have not discovered any showstoppers and recommend this SRO proceed to gate-2.

Phasing of Key Activities and Decisions

3.7. The critical path is through environmental and engineering investigations, planning/consenting and procurement. There is some variation in timeline depending upon the planning/consenting and procurement routes selected.
3.8. The 'most likely' and 'earliest possible' dates for delivery are outlined for each element in Table 3.1, but these will be developed further in line with the statement of need for the receiving SRO. Both scenarios are based on the currently advised planning/consenting and procurement routes, with the only variation in timeline due to the expected demand profile from the receiving SRO.
3.9. Analysis of the longest possible dates shows that STS SRO could be ready to supply STT SRO before the scheme would be ready to receive the output. Further work will be undertaken during gate-2 to understand the potential utilisation of the scheme and impact on the timeline for delivery.

3.10. The application for Mythe WTW license transfer is not considered to have any impact on the critical path.

Table 3.1: The 'most likely' and 'earliest possible' dates for delivery

		Most likely	Earliest Possible Date
Netheridge WwTW	Construction Start	TCPA & No DPC (starts in line with expected demand profile) **Q3 2029**	TCPA & No DPC (starts as soon as possible) **Q2 2026**
	Deployable Output	**Q1 2034**	**Q1 2031**

3.11. Planning/consenting and procurement activities are broadly aligned to the RAPID gates on our 'earliest possible' path. Some flexibility may be required to ensure the optimum point for decision making beyond gate-2 for the 'most likely' path. Should a different route be followed for planning/consenting or procurement, it is possible that these gates would not align. We propose to work with RAPID during gate-2, to understand any potential changes and to align future gate dates, in order to deliver these schemes in line with the statement of need of the receiving SRO.

3.12. Key decision points / critical path:

- Sufficient information needs to be obtained from draft regional plans and completed environmental investigations to confirm the requirement for Netheridge WwTW to serve the STT SRO. This information is required by June 2022 to allow a recommendation to be made to RAPID at gate-2.
- Approval to proceed from RAPID at gate-2 to allow progression of DCO pre-application and TCPA application in line with plan.
- Decision needed on appropriate procurement route for Netheridge WwTW.
- National Policy Statement for Water Resources needed via approval of WRMP24, providing statement of need should a DCO application be required (although this is unlikely).

Assumptions

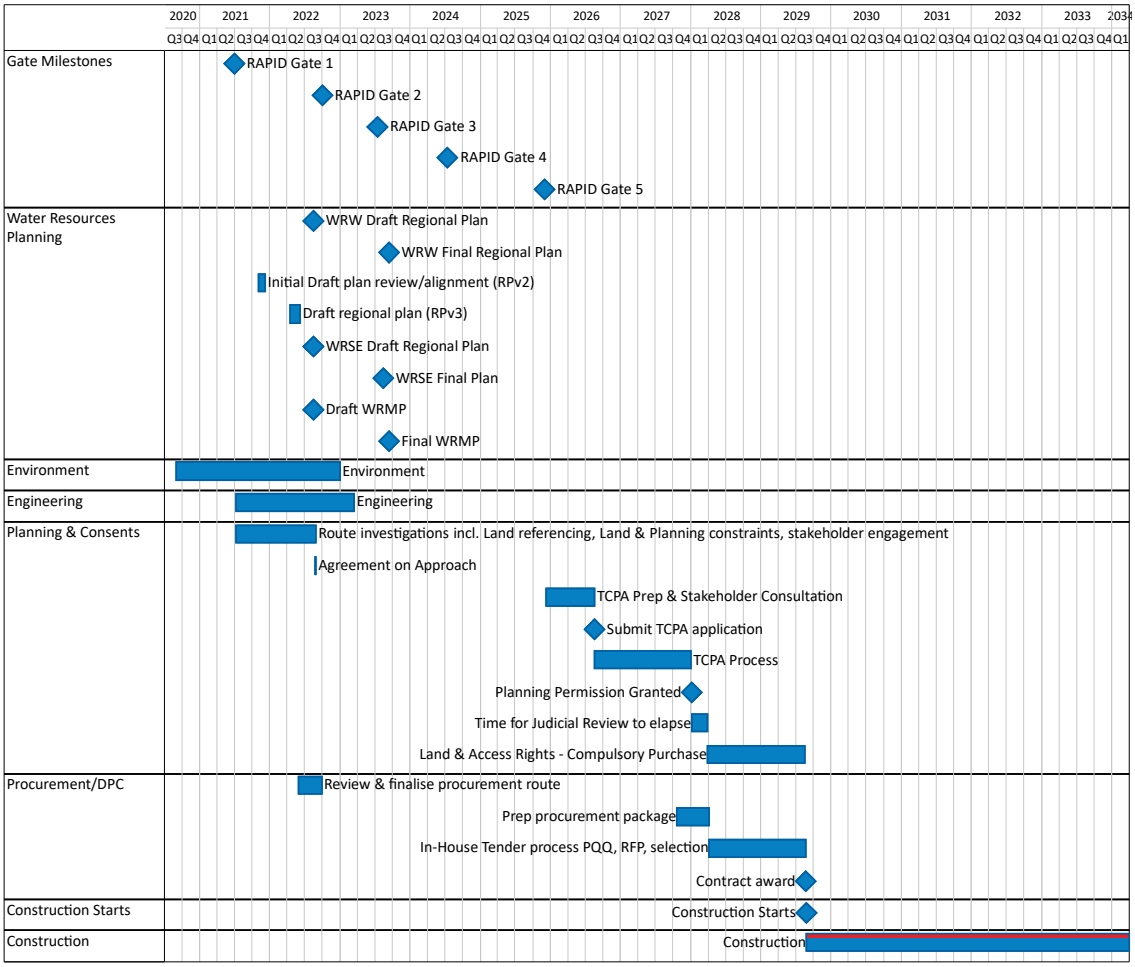
3.13. Assumptions made and dependencies considered for the 'most likely' timeline are outlined in Table 3.2 below.

Table 3.2: Assumptions and dependencies for 'most likely' timeline

Assumption	Dependency	Commentary
No delay or pause between gates		There is no delay or pause between gates, RAPID decisions, or in output from the regional planning and WRMP process.
Outputs from regional planning are not delayed		Outputs from regional planning are not delayed, allowing key decisions on supply to other SROs, and subsequent consenting and procurement routes to be chosen in agreement with the regulator in a timely manner.
No critical issues identified during environmental investigations		No critical issues identified during environmental investigations and engagement to delay or prevent use of the scheme. It is also assumed that the environmental investigations identified will provide sufficient valid information to allow decisions to be made.
Key stakeholder issues and concerns during gate-2 and beyond can be addressed		Issues and concerns arising from key stakeholders during gate-2 and beyond can be addressed and, where necessary, mitigated within the given timescales ahead of TCPA application. Based on experience of similar schemes, we believe the timelines provided to be sufficient for the stakeholder engagement activity for a scheme of this scale.
Time estimates are reasonable		Time estimates are given based on the best advice received to date. Further analysis of the schedule will be completed at gate-2.

Assumption	Dependency	Commentary
Further development of approach to consenting and procurement will be undertaken during gate-2		Further development of the most appropriate approach to consenting and procurement for this scheme will be undertaken during gate-2. The timeline is based on the current advice.
No delays in planning permission or additional challenges or enquiries		Planning permission is granted on first application with no additional conditions imposed, no requirement for additional public enquiry or legal challenges. Time has been allowed for judicial review and any compulsory land purchase, should it be required.
	Changing procurement legislation	Changing procurement legislation may impact the estimated timeline for procurement activity. The current timeline is based on recent STW experience of similar programmes.
	Shared deliverables with other SROs are received in time	All deliverables shared with other SROs (e.g. environmental investigations and analysis shared with STT) will continue as planned and be received in time for progression of STS SRO.
Enough information received from draft regional plans and draft WRMP to submit a TCPA application		In order to meet the earliest possible date, enough information is received from draft regional plans and draft WRMP to submit TCPA application for STS SRO.

Figure 3.1: STS SRO 'most likely' timeline



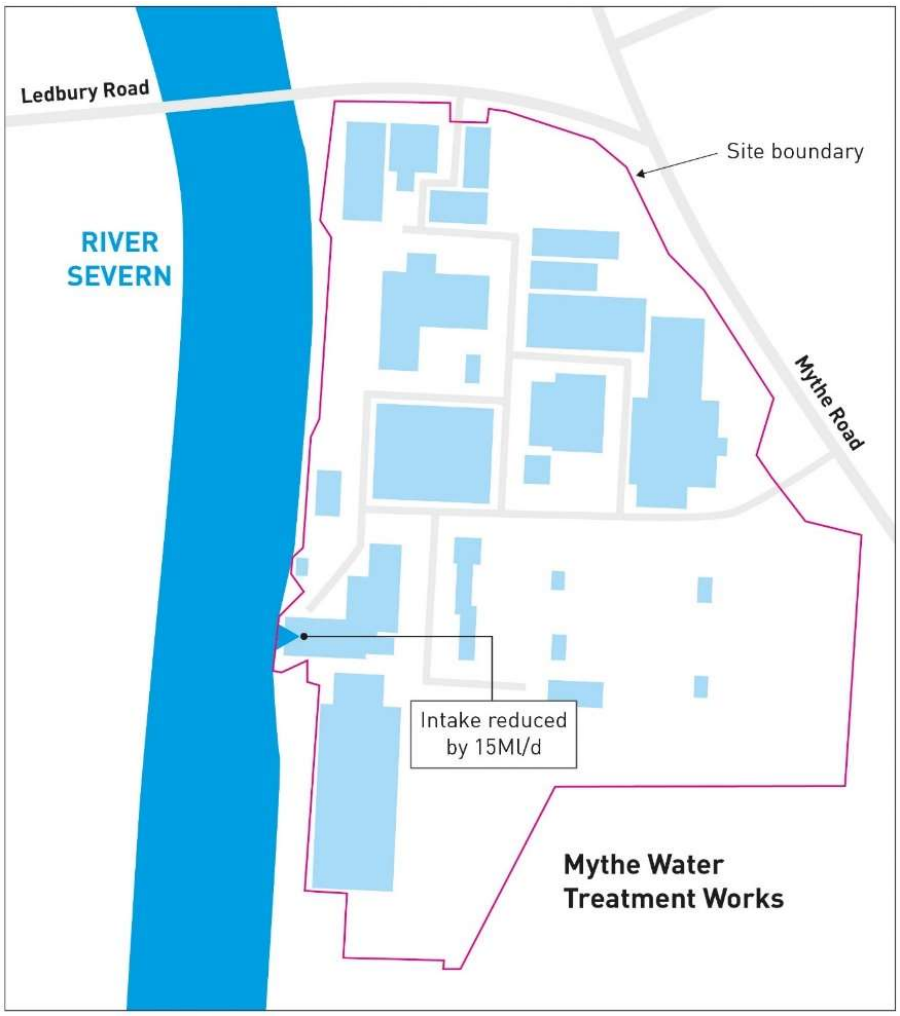
4. Technical Information

Option Configuration

Temporary transfer of part of Mythe WTW abstraction licence

4.1. Severn Trent Water (STW) operates Mythe WTW, shown in Figure 4.1, located just north of Tewkesbury. The WTW has a direct river abstraction from the River Severn. Although the abstraction licence allows abstraction of 136 Ml/d, only 120 Ml/d can be used for public water supply. Any abstraction above the 120 Ml/d limit must be returned to the river.

Figure 4.1: STS SRO - Mythe WTW reduced abstraction
(Diagram for illustrative purposes only)



4.2. Mythe WTW can abstract and treat raw water near to the 120 Ml/d limit, but only for short durations due to restrictions in the treatment process. These restrictions limit the sustainable output of the works to 105 Ml/d and consequently limit the deployable output benefit contribution to the Strategic Grid Water Resource Zone (WRZ). This zone supplies water to a population of over five million people, with a deployable output in excess of 1,400 Ml/d.

4.3. By offering a temporary transfer of the 'spare' 15 Ml/d to support the proposed STT SRO abstraction located downstream of Mythe WTW, the raw water will remain available for abstraction at Mythe WTW when STT SRO is not operating.

4.4. To ensure STW customers are not financially penalised by the proposed licence transfer, we have made an allowance to cover the cost of backfilling the 15 Ml/d in the water trading charge submitted for this option. The scheme that will ultimately deliver the 15 Ml/d backfill will be identified as part of the WRMP24 analysis, or beyond. This will require a review of the water trading charge immediately prior to the formal offer to Thames Water (TWUL), to ensure that neither company's customers are financially penalised.

4.5. Given the nature of this source, we consider the steps required to make it available for use by STT SRO to be predominantly administrative. This will be achieved through compliance with the operating rules associated with the 'Put and Take' arrangement that will need to be agreed with the EA.

Netheridge WwTW - river flow augmentation with treated wastewater

4.6. River flow augmentation with treated wastewater is the process of diverting treated wastewater from its existing discharge point to a new discharge point. This can either improve the environmental status of the receiving waterbody, or increase the amount of water available for direct abstraction to increase potable water supply

4.7. The diversion of treated wastewater discharges must not be detrimental to either the waterbody which currently receives the discharge, or the waterbody being considered for augmentation. The environmental and navigational status and the drinking water quality considerations of existing downstream abstractors must not be affected. These factors have formed a large part of the investigations completed within the STT System by the STT SRO.

Treated wastewater source

4.8. Two WwTWs were originally considered as potential sources of treated wastewater: Hayden WwTW and Netheridge WwTW.

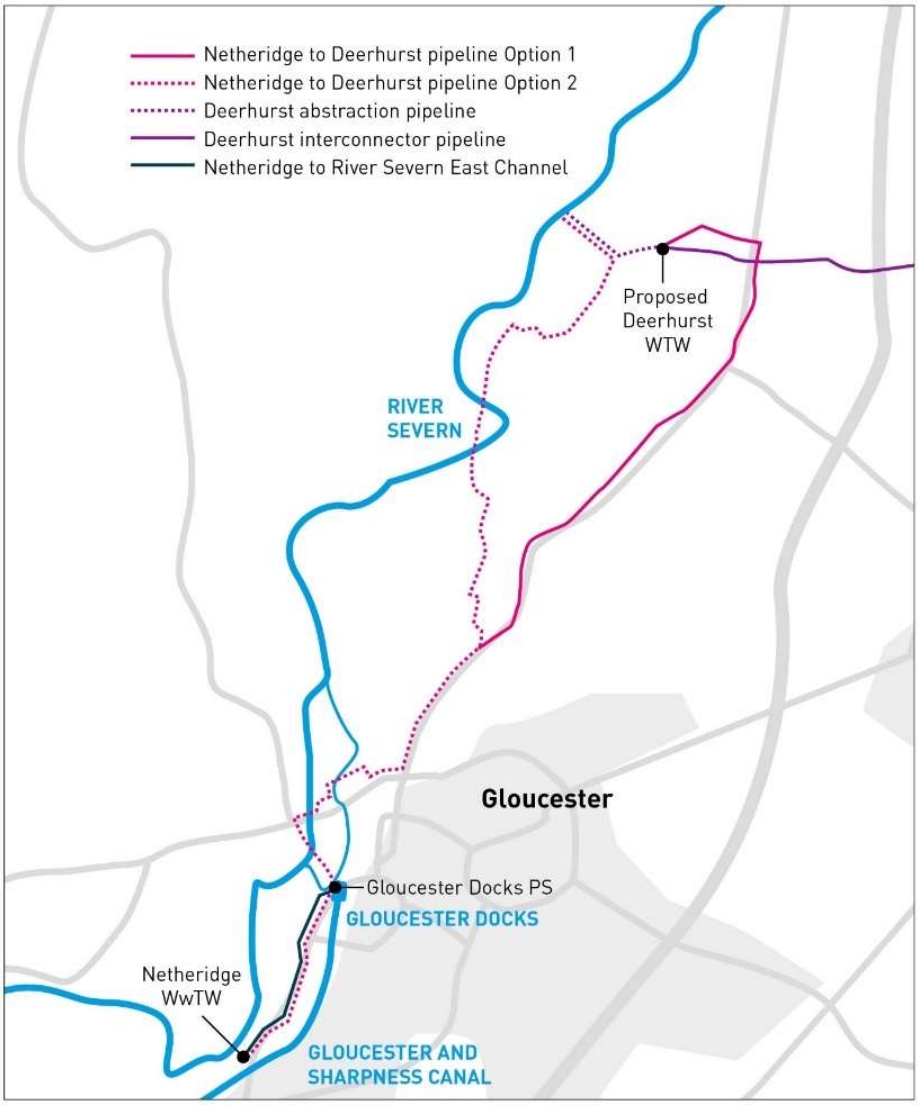
4.9. Although Hayden WwTW is closer to the STT SRO proposed Deerhurst WTW abstraction point, the DWF available for diversion is only 20 Ml/d. More importantly, the impacts on the receiving waterbody, the River Chelt, likely to be caused by the proposed reduction in flow were considered to be significant. The Hayden WwTW option was therefore discounted prior to the PR19 submission.

4.10. The Netheridge WwTW submitted as part of STW's PR19 submission, was based on the diversion of 35 Ml/d treated wastewater for discharge directly to the proposed STT SRO WTW at Deerhurst WTW.

4.11. The scheme did not include additional treatment processes at Netheridge WwTW. STW assumed the STT SRO WTW would be designed to treat a 35:65 treated wastewater / River Severn water blend to a standard allowing discharge to the River Thames.

4.12. We have now considered two main options for Netheridge WwTW, one for each of the STT SRO interconnector options with separate conveyance pipeline options shown in Figure 4.2.

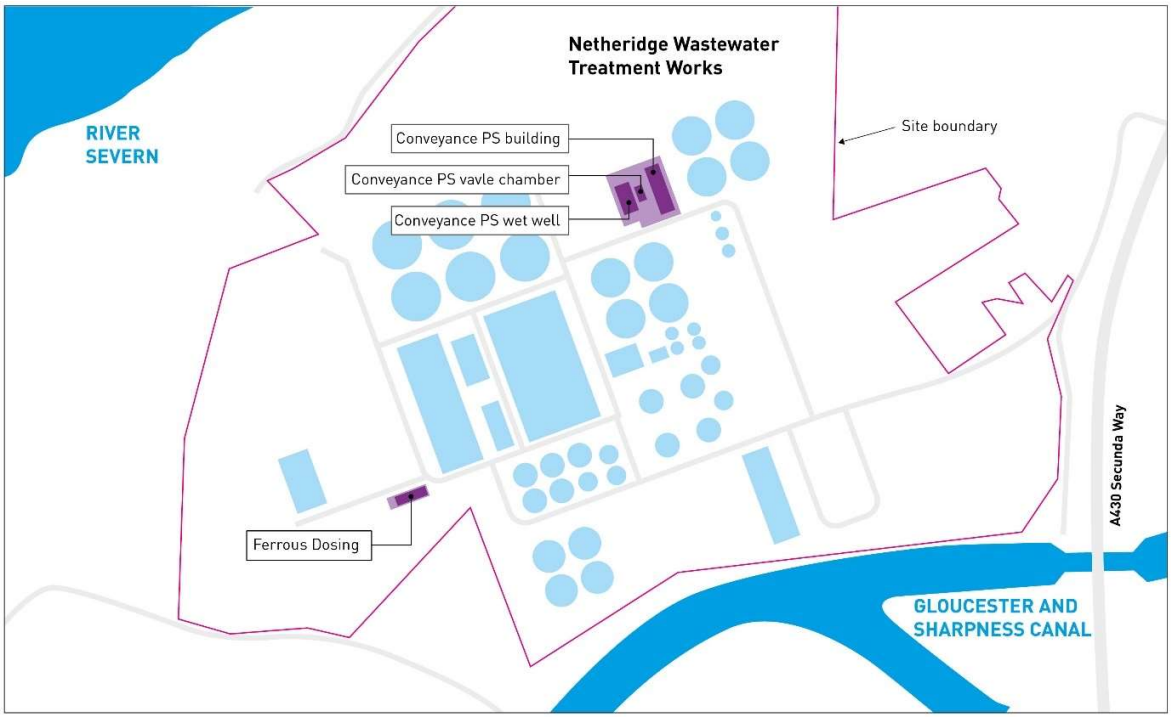
Figure 4.2: STS SRO - Netheridge WwTW conveyance pipeline options
(Diagram for illustrative purposes only)



4.13. Following analysis and review of available treated wastewater quality and receiving water quality data, we have determined that an additional tertiary treatment process will be required at Netheridge WwTW for both options. This will be necessary in order to maintain the current WFD status of each receiving waterbody, and has been confirmed by the EA. The additional treatment process is shown in Figure 4.3.

4.14. It may be that this additional treatment process will not be required for the direct discharge to the proposed STT SRO Deerhurst WTW. This will require further analysis and discussion with TWUL about the potential connection from the Deerhurst WTW pipeline into their Swindon & Oxfordshire WRZ.

Figure 4.3 STS SRO: Netheridge WwTW treatment for STT SRO
(Diagram for illustrative purposes only)



Operations and Maintenance Considerations

4.15. TWUL has stated that normal operation of the STT SRO will only be required under drought scenarios, although these could be for durations of up to 18 months under the worst historical drought conditions. The STT SRO System will not be operated as either a 'business-as-usual' primary supply, or a second source resilience supply to cover asset failure or pollution scenarios.

4.16. For the purposes of this submission, and input to the Water Resources South East (WRSE) water resource modelling, we have assumed we will maintain a 10% sweetening flow to maintain the Netheridge WwTW in a state of readiness. OPEX costs, electricity, chemical use and operational carbon have been stated on this basis.

4.17. We may be given sufficient notice to allow the Netheridge WwTW assets to be recommissioned on an as-needed basis, avoiding the need for a 'hot standby' (rapid ramp-up of output) or cold standby (sweetening flow mode of operation). This will be considered in detail as part of the overall STT SRO System Operational Strategy for the gate-2 submission.

Design Life of the Asset

4.18. Details of the design life of the asset assumptions included in cost estimates are detailed in Table 4.1. These generally align with the ACWG Cost Consistency Methodology.

Table 4.1: Design life of asset assumptions

Design life of asset groups			
Instrumentation, control & automation	Mechanical & electrical	Building & civils	Pipelines
10-year replacement	20-year replacement	60-year replacement	80-year replacement

Initial Costing and Benchmarking

4.19. As stated in Chapter 10, CAPEX estimates were produced using a combination of STW cost models and bottom-up cost estimation by our cost consultant.

4.20. The STW cost model for the pipelines was developed for the submission of our PR19 WRMP and Resilience Programme, which collectively totalled £676m. The model was assured as part of our PR19 governance process and independently benchmarked by our PR19 cost consultant.

4.21. The only amendment to the cost model has been the price base uplift to account for inflation, and the model continues to be used as part of our Green Recovery and WRMP24 submissions.

4.22. As a further check on the validity of our pipeline cost model, we compared the Minworth SRO conveyance pipeline to the River Avon, to the forecast outturn cost for our AMP6 Birmingham Resilience scheme. This showed a variance of 9%, with the SRO costs being higher. We consider this variance to be reasonable at this stage of the project and will continue to improve certainty of cost during gate-2.

Initial Water Resource Benefit

4.23. Netheridge WwTW offers a robust, reliable, and resilient source of raw water to support the STT SRO. Mythe WTW will always be available as there is no HoF clause associated with the licence.

4.24. As stated in Section 2.4, the water resource deployable output benefit assessment is detailed in the STT SRO's gate-1 submission.

4.25. The two sources will contribute to an increase in the receiving water company's deployable output in drought scenarios.

Initial Data Provided to Regional Groups

4.26. The following information was provided to WRSE for the March 2021 water resource modelling exercise:

- Fixed annual charge £m
- Variable OPEX charge £/Ml
- Variable electricity kWh/Ml
- Fixed embodied carbon tCO_2e
- Variable operational carbon tCO_2e/Ml
- Construction duration
- Scheme capacity
- Resilience metrics (please refer to Section 10.5 for details)
- Environmental metrics

4.27. The same information will be submitted for the Water Resources West (WRW) regional plan through our WRMP24 company submission.

5. Environmental and Drinking Water Quality Considerations

High Level Environmental Statement

5.1. Our studies in gate-1 have shown the key environmental consideration is the new Netheridge WwTW discharge point. We will do further work through gate-2 to determine the best discharge location for each interconnector option.

5.2. Due to their linked nature, the environmental assessments for STS SRO have largely been carried out within the STT SRO. The environmental investigations for Mythe WTW currently focus on the WFD implications of the licence transfer, which is addressed in Section 5.33. The remainder of this section therefore focuses on the Netheridge WwTW transfer.

5.3. The majority of the environmental investigations on the effects of the movement of Netheridge WwTW discharge within the River Severn sit within the STT SRO. These investigations and stakeholder engagements have not revealed any showstoppers for the transfer to Deerhurst WTW or the Cotswold Canals. The environmental impacts associated with the construction and operation of Netheridge WwTW are taken into account by the Strategic Environmental Assessment (SEA) in Section 5.7.

5.4. This chapter sets out the findings of the initial option-level environmental investigations, including:

- SEA, Habitats Regulations Assessment (HRA), WFD assessment and water quality assessments.
- Invasive Non-Native Species (INNS) risk assessment.
- Environmental, social & economic valuations, including carbon accounting and natural capital including Biodiversity Net Gain potential.

Environmental Investigation

5.5. The ACWG Environmental & Raw Water Quality Methodology requires SEA, HRA, Water Framework Directive (WFD), Biodiversity Net Gain (BNG) and Natural Capital assessments.

5.6. The gate-1 environmental investigations have not discovered any showstoppers that would prevent delivery of these schemes, but the studies have identified some areas of uncertainty that require further investigation for gate-2.

Strategic Environmental Assessment

5.7. An SEA is a high-level appraisal that covers pre- and-post mitigation risks for the environment, as well as the social and economic effects of the scheme. At gate-1, we have carried out an SEA-style appraisal, following the ACWG approach, rather than a formal SEA. The outputs will be utilised when considering construction operational effects during gate-2. SEA scores 14 criteria from 'Major Positive' to 'Major Negative', with 'Moderate' 'Minor' or Neutral' impacts also attributable.

5.8. The following high-level summary of the SEA conclusions highlights the 'Major' and 'Moderate' assessment conclusions identified, following consideration of embedded mitigation measures. The highlighted risks will be used to inform the engineering work packages in gate-2, to reduce the potential effect in future designs.

5.9. The SEA assessment has been carried out for the three STS SRO options (Mythe WTW, Netheridge WwTW to Deerhurst WTW, and Netheridge WwTW to Cotswold Canals). Table 5.1 shows the outputs of the SEA with the currently designed mitigations (embedded). The table also highlights where the next phases of detailed design for gate-2 will need to include additional mitigation measures to minimise environmental impacts.

Table 5.1: Outputs from the SEA with the currently designed mitigations (embedded)

Effect description	Embedded mitigation	Further mitigation	Relevant SRO	Stage impacted
Potential effects on WFD compliance during operation in terms of impacts on water quality and available wetted habitat.	Major Negative	Neutral	Netheridge WwTW to Cotswold Canals 35	Operation
Effects associated with soil as the proposed route crosses a landfill site and is within proximity of others. There therefore exists the potential for contaminated land, and associated risks to health and environment, during construction.	Major Negative	Minor Negative	Netheridge WwTW to Deerhurst WTW 35 Netheridge to Cotswold Canals 35	Construction

Effect description	Embedded mitigation	Further mitigation	Relevant SRO	Stage impacted
Potential effects on surface water quality in the eastern channel of the lower River Severn during operation due to the unknown dilution capacity at this location to manage inputs.	Major Negative	Neutral	Netheridge WwTW to Cotswold Canals 35	Operation
Potential effects on WFD compliance during operation in terms of water quality, aquatic ecology and chemical status targets in the eastern channel of the lower River Severn.	Major Negative	Neutral	Netheridge WwTW to Cotswold Canals 35	Operation
Effects on heritage assets during construction due to the proximity of scheduled monuments, listed buildings and conservation areas.	Moderate Negative	Minor Negative	Netheridge WwTW to Deerhurst WTW 35 Netheridge WwTW to Cotswold Canals 35	Construction
Potential effects on the health and wellbeing of the local community during construction of the proposed development.	Moderate Negative	Minor Negative	Netheridge WwTW to Deerhurst WTW 35	Construction
Contributing to a resilient water supply. The additional water resource from this scheme will provide essential water supply infrastructure to help support a sustainable socio-economy.	Moderate Positive	Moderate Positive	Netheridge WwTW to Deerhurst WTW 35	Operation
This scheme provides additional water resource and will during operation assist the reliable transfer of water. It will therefore reduce the vulnerability to drought risks associated with climate change and improve resilience to the likely effects of climate change.	Moderate Positive	Moderate Positive	Netheridge WwTW to Deerhurst WTW 35	Operation
Potential economic opportunities during construction.	Moderate Positive	Moderate Positive	Netheridge WwTW to Deerhurst WTW 35	Operation

5.10. In line with the requirements set out by RAPID, this SEA for gate-1 does not take in to account the combined effects with other SROs, plans being developed as part of water companies' WRMPs, or third-party plans. The SEA will be revisited at gate-2 and updated to include combined effects.

Habitats Regulations Assessment

5.11. The HRA screening concluded no risk of 'Likely Significant Effect' for elements associated with the STS SRO. The HRA assessment will be refined and updated through gate-2 as our understanding of the canal environment improves and the engineering designs progress.

5.12. As there has been shown to be no risks of 'Likely Significant Effect', there has been no requirement to carry out the Level 2 Appropriate Assessment on any features of STS SRO.

Natural Capital, Biodiversity Net Gain and Environmental, Social & Economic Net Gain

5.13. The assessment for gate-1 applies the principles of net gain, by taking a hierarchical approach to mitigation. It identifies the loss of key habitats and opportunities for biodiversity benefits to

protect, enhance and provide resilience. It provides early identification of the possible requirement for significant compensation, such as for impacts on Priority Habitats, and assists with the identification of lower-impact alternatives.

5.14. The assessments for gate-1 apply the principles of biodiversity net gain and natural capital, as set out in the Water Resource Planning Guidelines for WRMP24. These take a high-level prescriptive approach to the habitat loss due to construction impacts and the expected time for the recovery of habitat loss. The assessment provides guidelines on how biodiversity net losses can be offset to create a 10% increase in biodiversity when implemented.

5.15. We have carried out assessments for each of the STS SRO options to identify the net biodiversity unit loss. The potential habitat loss has been used to calculate the offsetting requirements to achieve an approximate 10% net gain for habitats and hedgerows for each grouping. This has found that Netheridge WwTW to Deerhurst WTW requires 236 ha of habitat and 7.4 km of hedgerows to be replaced to provide a 10% BNG uplift, whilst Netheridge WwTW to Cotswold Canals requires 209.9 ha of habitat and 1.04 km of hedgerow creation.

5.16. As the Mythe WTW element of the STS SRO is a licence trade, there is minimal opportunity for direct environmental, social or economic gain. As such, the net gain benefits will be realised as part of in-combination improvements with the STT SRO.

5.17. The footprint of the Netheridge WwTW source is small, with a pipeline connection to the River Severn to Deerhurst WTW or the Cotswold Canals. The scope for environmental, social or economic net gains, which includes natural capital benefits, will largely be realised through in-combination effects with the STT SRO, due to the limited scope for improvements within the footprint of this source.

5.18. It is anticipated that additional opportunities for benefits will be identified as the design progresses. Potential areas of risk to the environment have been flagged within the SEA. These will be removed or mitigated through the design process and opportunities for off-site offsetting of environmental deterioration, where unavoidable, will be considered if necessary.

5.19. We will use the outputs of these assessments to minimise the impact of construction and to help with further optioneering in gate-2. They also provide a guide on the degree of offsetting that is required for the chosen route.

INNS Assessment

5.20. A high-level INNS screening has been carried out as part of the environmental assessments within STT SRO. This meets the National Appraisals Unit's (NAU) request of January 2021. Data was requested from the Environment Agency (EA) and other relevant groups, and we have created heatmaps to show INNS prevalence on the relevant reach of the River Severn. However, there is a lack of up-to-date INNS reports around the transfer area, so key areas have been identified for targeted field surveys. This will allow a pathway assessment to be carried out for gate-2.

Carbon Assessment

5.21. The carbon ambition has been set by an SRO-led task-and-finish group, consisting of the water companies with SROs, Water UK, RAPID and Ofwat. The STS SRO will be aligned with this stretching target. The ambition covers Scope 1, 2 & 3 carbon:

- Scope 1 & 2 aligns with the Water UK ambition to 2030.
- Scope 3 aligns to the UK's 2050 ambition, but recognises there is more to do on standardisation.

5.22. Calculation of the embodied carbon has been carried out for the STS SRO and takes into account the carbon embedded in construction, as well as operational carbon for the next 80 years. The assessment provides a starting point, and we will reduce carbon through design and mitigate through future gates as necessary.

5.23. The Mythe WTW option has a negligible carbon impact as it only constitutes a licence transfer. However, when identified, the carbon impact of replacing the water will need to be taken into account.

5.24. The Netheridge WwTW to Cotswold Canals has a lower predicted carbon impact than the Deerhurst WTW route due to the smaller distance, which affects operation as well as

construction. The carbon contribution will be significantly less than many of the elements within STT, and we will continue to design the scheme to minimise carbon impact.

Resilience

5.25. Netheridge WwTW offers a robust, reliable, and resilient source of raw water to support the STT SRO. Mythe WTW will always be available as there is no HoF flow clause associated with the licence. Both sources are, therefore, highly resilient.

5.26. For Mythe WTW, the licence is accounted for within the River Severn Regulation and, as described in Section 2.32, is only constrained during very high tides at Sharpness, of 9m or over. Once transferred, it will always be available for utilisation outside of these infrequent occurrences.

5.27. Netheridge WwTW treats wastewater for Gloucester, which is supplied from Severn Trent Water's (STW's) Strategic Grid and is considered a very resilient source of water supply. The DWF from Netheridge WwTW will be available under all drought and climate change scenarios.

Water Quality Considerations

5.28. There is no need to carry out a water quality assessment of the Mythe WTW licence transfer at this time, as there will be no change within the River Severn.

5.29. The Netheridge WwTW option will redirect the treated wastewater further upstream in the River Severn, so there are water quality considerations that need to be taken into account. From a drinking water perspective, the site has been included in the ACWG Treated Water Methodology assessment for the STT SRO. As the preferred discharge location will be downstream of the abstraction point, there is no risk to the drinking water from Netheridge WwTW.

5.30. By relocating the Netheridge WwTW discharge upstream, the treated wastewater will no longer enter the tidal section of the River Severn. This could result in more stringent water quality constraints on the discharge permit. Ongoing monitoring of Netheridge WwTW discharge and the River Severn will further define these requirements.

5.31. A further ACWG Treated Water Methodology assessment has been carried out on Bristol Water's Purton WTW. This is because the deployment of Netheridge WwTW into the River Severn for either the Deerhurst WTW abstraction or the Cotswold Canals would be upstream of the offtake for Purton WTW. The assessment has not shown any increased risk or new treatment requirements for Purton WTW.

5.32. As described in the STT SRO gate-1 submission, the water quality monitoring programmes associated with the STS SRO have been designed in conjunction with the EA and Drinking Water Inspectorate (DWI), and utilising the outputs from the ACWG Treated Water Methodology. The programme will produce a minimum of 12 months of monitoring that will be used to inform the drinking water treatment needs, as well as any environmental mitigations that may need to be developed.

Water Framework Directive

5.33. We have carried out a WFD assessment in line with the ACWG Environmental & Raw Water Quality Methodology, completing the two-level screening (Level 1 basic screening, Level 2 detailed screening) for Netheridge WwTW. The only STS SRO option that is required to have a Level 2 screening is Netheridge WwTW to Cotswold Canals. This scheme has been flagged as potentially not compliant with WFD objectives. Further investigation into the aquatic habitat, water quality monitoring and water quality modelling is planned for gate-2 to allow better understanding of the impact on the River Severn's East Channel of receiving this discharge.

6. Initial Outline of Procurement and Operation Strategy

Procurement

6.1. Guidance provided by RAPID is that all schemes are assumed to meet the PR19 criteria for DPC. If they do not, this has to be explained[1].

6.2. DPC is a set of changes to a water company's conditions of appointment (Licence) to support the competitive procurement of infrastructure from a third party (the Competitively Appointed Provider or CAP). The CAP is awarded a contract to design, build, finance, operate and maintain (DBFOM) the asset for a set period of time, before the residual asset (if any) is taken in-house by the water company.

Assessment for DPC

6.3. The diversion of water at Netheridge WwTW is considered to be a key component of the scheme and it will require works on the existing site only. Based on the above, we considered a single option for DPC – the treatment of 35 Ml/d of water for diversion to the STT SRO.

6.4. Ofwat provides a methodology for assessing schemes for DPC in their guidance on what constitutes an eligible DPC project[2]. The assessment is in three stages:

- Test 1: Size – is the scheme above the £100m whole-life TOTEX threshold?
- Test 2: Discreteness – can the scheme be considered 'discrete'?
- Test 3: Value for money – does the scheme delivered under DPC represent value for money against the 'in-house' delivery counterfactual?

6.5. For the size test, TOTEX estimates will be developed at a later stage, once the scheme utilisation can be determined following a new Water Resources South East (WRSE) case of need. However, initial CAPEX estimates can provide some guidance as to the likely outcome. The CAPEX estimate for the STS SRO is £3m. This indicates that the STS SRO will not pass the size test under any option currently under consideration.

6.6. For the discreteness test, we considered six criteria to determine the potential impact of a third party (the CAP) on existing assets and operations. The criteria are: the physical asset location; the number of interfaces; the overlap in processes; the impact on service delivery; the flexibility of the asset; and the control required over the asset. Based on the information currently available, the STS SRO may or may not pass the discreteness test.

6.7. There are concerns around overlapping operations with the existing assets and the need for high levels of coordination and monitoring. This is balanced by the new assets being relatively self-contained and situated at the end of the process, with a single connection to the existing assets. Further work needs to be undertaken to understand the technical solution to validate the discreteness test.

6.8. As agreed with RAPID, we have not undertaken the value for money test at gate-1.

6.9. Figure 6.1 below summarises the results of the initial assessment.

Figure 6.1: DPC eligibility assessment

Test 1: Size	Test 2: Discreteness	Test 3: Value for Money	Result: Suitability for DPC
Does not pass based on current information	Requires further scheme development	To be tested	Not suitable for DPC based on size

[1] https://www.ofwat.gov.uk/publication/rapid-standard-gate-one-submission-template/

[2] https://www.ofwat.gov.uk/publication/delivering-water-2020-final-methodology-2019-price-review-appendix-9-direct-procurement-customers/

6.10. In summary, we have welcomed the opportunity to consider a DPC procurement route. STS SRO fails Test 1 and is marginal for Test 2. As a result, it is not suitable for DPC. We will continue to review our procurement options prior to gate-2.

Tender point

6.11. Ofwat has identified four potential points in the scheme's lifecycle where it may be appropriate to put a DPC project out to tender: 'very early'; 'early'; 'late'; or 'split' with separate CAPs appointed at the 'early' and 'late' stage[3].

6.12. Based on precedents from other infrastructure procurements, we consider that an 'early' or 'late' tender may be the most applicable models. An 'early' tender may provide for greater innovation but comes with potentially longer lead times. A 'late' tender may better fit with the current RAPID gate process. Further consideration as to the appropriate tender point will be given at future gates.

Alternatives to DPC

6.13. Should, ultimately, STS SRO not be considered suitable for DPC, we have considered a range of alternative procurement options:

- Non-DPC DBFOM: the scheme could be procured through a third party under a DBFOM contract but outside of the DPC framework. This would remove the DPC approval process and potentially simplify the procurement, but it would add a number of risks. In particular, it could lead to a potential mismatch in appointing water companies' revenues, both for the life of the contract and on termination or expiry.
- New licensed entity: an alternative to a DBFOM contract (either DPC or non-DPC) could be the creation of a new licensed entity to finance, construct and operate the asset. This may help reduce the risk to the appointing water company by having the New Licence Co.'s revenues (subject to its own price control) as a pass through and the licence remaining in place for the life of the asset.
- In-house delivery: the scheme could also be procured by a water company using existing procurement processes and funding arrangements. Based on a TOTEX allowance, the water company could appoint a contractor and fund milestone payments by raising additional debt on its balance sheet.

6.14. In Chapter 3, we set out an indicative programme for procuring the scheme in-house. We will continue to review this, and the appropriate procurement route and programme impact will be confirmed at gate-2 once further information on the solution is available.

Ownership

6.15. For the STS SRO, the water company whose customers benefit from the works, Thames Water (TWUL) is to be joined by an additional company to help facilitate the scheme, Severn Trent Water (STW). This gives rise to the question of where the ownership of the asset sits, or (if the asset is procured through a project company) who contracts for the service the project company provides.

6.16. Under any of the procurement routes set out above there are a number of possible alternative arrangements for the STS SRO. These include:

- Ownership / project company appointed by TWUL: TWUL or the project company may then contract with STW for any licences, works or other items it requires to help deliver the scheme.
- Ownership / project company appointed by STW: TWUL would pay STW for the total cost of the services provided by STW or the project company, potentially incorporated into any Bulk Supply Agreement.

[3] Ofwat, Delivering Water 2020: Our methodology for the 2019 price review, Appendix 9: Direct procurement for customers (December 2017)

- Ownership / project company appointed by a joint venture: TWUL and STW could establish a joint venture to own the asset or contract with a project company, with TWUL making payments to STW for any costs of the scheme directly incurred.

6.17. In all cases, the contractual arrangements would need to be such that TWUL customers ultimately pay for the full cost of the scheme.

6.18. These ownership options and their suitability will be explored further, if required, in preparing for gate-2 as the STS SRO is further developed.

Operations

6.19. As raw water sources to support the STT SRO, utilisation of STS SRO will be dictated by TWUL's need to operate STT SRO under drought scenarios. For details of the expected STT SRO utilisation, please refer to Chapter 4 of the STT SRO gate-1 submission.

6.20. The operational strategy for Mythe WTW is an administrative exercise, for reasons detailed in Chapter 4.

6.21. We have not yet determined the exact mode of operation for Netheridge WwTW. We will continue to refine the operational strategy with the STT SRO project team to ensure that deployment of the source can be achieved in the required timescales to meet the STT SRO System control requirements.

6.22. We will consider the following modes of operation:

- Normal Operation: assets operating in automatic control delivering raw water to meet TWUL's supply requirements.
- Cold Standby: assets operating such that they can be returned to normal operation within a few days. This may involve a minimum sweetening flow being produced to maintain a state of readiness.
- Maintenance: assets are not operating to allow scheduled maintenance activity to be undertaken.
- Non-operational: assets out of service requiring recommissioning to return to normal operation in a few weeks.

6.23. Given the nature of the supply need, to date we have not considered a 'hot standby' mode, under which a proportion of the output would be constantly maintained allowing a rapid increase to full output. This mode is generally operated to cover short-duration peak demands or emergency deployment in the event of asset failure.

6.24. For the purposes of our cost submission, we have assumed we will maintain the assets in 'cold standby' mode with a 10% sweetening flow. This will be reviewed for gate-2, when we have finalised the STT SRO requirements and undertaken a best value analysis if 'non-operational' mode is acceptable.

Supporting evidence:	References/hyperlinks only
1. https://www.ofwat.gov.uk/publication/rapid-standard-gate-one-submission-template/	2. https://www.ofwat.gov.uk/publication/delivering-water-2020-final-methodology-2019-price-review-appendix-9-direct-procurement-customers/
3. Ofwat, Delivering Water 2020: Our methodology for the 2019 price review, Appendix 9: Direct procurement for customers (December 2017)	

7. Planning Considerations

7.1. We have looked at the possible consenting routes for treatment and discharge to the canal or cross-country transfer to Deerhurst WTW. Submitting planning applications and/or relying on permitted development rights under the TCPA is the typical consenting route for new water infrastructure.

7.2. However, the national significance of the STT SRO means that the consenting options for Nationally Significant Infrastructure Projects (NSIP) need to be considered. The options for this

SRO do not automatically meet the NSIP criteria, but the national significance of the STT SRO does provide some potential to use this consenting regime.

7.3. The preferred consenting route at this stage, for both options, is to use the TCPA unless further feasibility requires options under the NSIP regime to be considered. The consenting routes for each option are discussed below

Treatment and Discharge to Canal

7.4. Our preferred route is to deliver this option via the TCPA.

7.5. We would expect permission to be granted within six months of submission of a planning application with minimal risk of refusal and/or being 'called in' by the Secretary of State.

7.6. An alternative would be for this to be delivered as 'associated development' to the STT.

Treatment and Pipeline to Deerhurst WTW

7.7. Our preferred route is to deliver this option via the TCPA. This option involves a circa 12km pipeline around the Western edge of Gloucester before travelling cross-country to Deerhurst WTW. Although more complex than the canal option, similar and longer pipelines are regularly delivered via the TCPA route.

7.8. We would expect permission to be granted within nine months of submission of the required planning application(s). We see the risk of refusal and/or call in by the Secretary of State as low.

7.9. The three consenting options identified are:

- Preferred option: planning permission under the TCPA.
- Alternative option 1: a DCO under the Planning Act 2008, after seeking designation of the project by DEFRA under Section 35 of the Act as an NSIP.
- Alternative option 2: associated development of the STT SRO DCO under Section 115 of the Planning Act 2008.

7.10. If needed, alternative option 1 would be preferred by Severn Trent Water (STW).

7.11. The final decision on the consenting route(s) will take account of numerous considerations, including evaluation of the specific consenting risks of delivering the project, the comparative timescales, stakeholder relationships and landowner considerations regarding access to land. It is expected that any project that is part of a NSIP could be involved in a process lasting up to three years and this will be factored into decision-making on the best approach.

8. Stakeholder Engagement

8.1. This chapter summarises the results of the customer and stakeholder engagement conducted in the approach to gate-1.

Listening to Customers

8.2. We participated in a research programme coordinated by Water Resources South East (WRSE), in collaboration with other SROs and involving ten water companies, to examine customers' understanding of water resources and the need for regional solutions. This approach ensured cost efficiency and comparability of feedback across regions and solutions. We sought feedback on the scope and the approach from representatives from the participating water companies' Customer Challenge Groups (CCGs), the Consumer Council for Water (CCW) and RAPID.

8.3. A summary of the main findings from the research, with a specific focus on STS SRO, is presented in Section 8.4, and an outline of further work planned to gate-2 is presented in Chapter 15.

Customers' feedback – headline messages

8.4. The research provided evidence of customers' understanding of the need for regional water resource solutions and their level of support, in principle, for sharing water resources and the STS SRO.

- Proposals to share water between regions are seen in a positive light by customers. It was highlighted by customers that they need to view SROs in the context of other options and schemes, and with a general understanding of the regional planning context.
- Participants in the Severn Trent Water (STW) group were supportive of the proposed transfers to the South East as they felt they could help others with little detriment to their own supply. However, some customers reacted strongly to the possibility of changes in taste and water hardness because of a switch to alternative sources. Engagement on these concerns will be key to gaining customer support.
- Recycling schemes draw mixed views from customers. In general, the more informed customers become, the more they recognise the benefits of water recycling. But even with a positive framing around recycling water, customers have concerns over impacts. There is a strong requirement to provide appropriate information and assurances that these issues will be addressed.

Stakeholder Engagement at a Regional Level

8.5. STS SRO is a key component of the work of the Water Resources West (WRW) regional plans. For gate-1, we have focused our stakeholder engagement on these regional groups, to ensure stakeholders are fully informed of the wider context of the schemes, and to minimise stakeholder fatigue.

8.6. WRW is building an ambitious, long-term, multi-sector adaptive water resources plan that will be shaped by consultations with stakeholders and customers. It has developed an innovative online portal to facilitate ongoing consultations and gather quantitative and qualitative data. In 2020/21, this portal has been utilised to engage on the building blocks of the plan. Further consultation is planned throughout 2021/22.

9. Key Risks and Mitigation Measures

9.1. The risk scoring is completed based on the definitions given in Table 9.1. The mitigation status column in the risk register has adopted the RAPID report definitions shown in Table 9.2.

9.2. We actively maintain a project risk register for the STS SRO, which records risks and tracks mitigation actions. Key risks, defined as those with a high residual risk or those where mitigation plans are off-track, are reviewed at the project control meeting on a monthly basis. Progress updates are produced by each workstream lead, providing a formal mechanism for updating risk status and escalating new risks.

9.3. We have chosen to highlight those risks which we believe could impact on delivery of this SRO in future. Key risks are highlighted in Table 9.2 below. The project risk register is the source of the quarterly risk update provided to RAPID, which includes the key risks identified below.

9.4. Construction risks were also considered using industry standard Monte-Carlo approaches. Since these are accounted for in the scheme costs, they are not incorporated into the key risks below.

Table 9.1: Risk score matrix

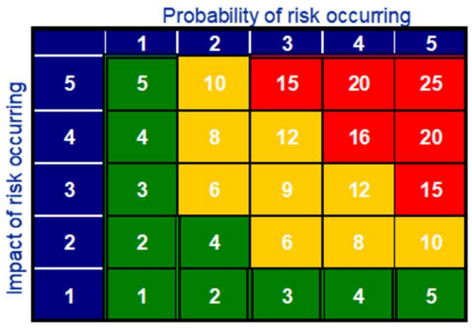


Table 9.2: Key risks

RAPID Report Reference	Short Description	Detailed Description	Risk Score	Mitigation Strategy	Category	Mitigation Status	Residual Risk
RSK003	Regional Plan Reconciliation	Risk that the regional plans will not align, and that a difference will exist in the selection of SROs across the regional plans. This is a gate-2 risk, but one we believe is essential to start thinking about now.	16	Active engagement with regional groups. Scenario planning work is currently being undertaken in case this risk is realised.	Planning	Stable	12
RSK005	Cost benefit analysis and social net gain valuations	Risk that current cost benefit analysis methodology does not adequately account for emerging views on social net gain valuation.	9	Continue to engage with ACWG to ensure that consistent approach is taken to this.	Environment	Stable	6
RSK009	Carbon Neutrality approach	Lack of clarity around carbon neutrality requirements could lead to inconsistent costing across SROs and deliverables that do not meet RAPID's expectations.	12	This is being managed by a task-and-finish group, to provide a consistent approach.	Environment	Stable	6
RSK012	Dependency on STT SRO System modelling and appraisal	Dependency on the outcome of STT SRO analysis: There is a need to model the system at the upstream end of the interconnector to calculate the yield for various source configurations with associated cost, resilience and environmental characteristics.	9	STT SRO is planning to develop a system model over the coming months. This risk should be mitigated once the model is available to remove uncertainty.	Other	Stable	6

RAPID Report Reference	Short Description	Detailed Description	Risk Score	Mitigation Strategy	Category	Mitigation Status	Residual Risk
RSK007	Regulatory acceptance of the principles for licensing abstraction from the River Severn	The principle of a permitted 'Put and Take' STT SRO abstraction licence, allowed losses and alignment to the HoF is fundamental to the viability of the STT SRO. Good engagement between STT SRO, Natural Resources Wales and the EA (both local and NAU) has taken place in the period. Current indication from the EA is that 'Put and Take' will be accepted in principle.	10	Continue regular engagement with STT SRO and EA to ensure that we can effectively monitor this risk.	Environment	Stable	5
RSK008	COVID-19 Impact	The potential for impact upon water company staff, contractor availability and the provision of resources. In the event of future waves, this may become an impact upon delivery to the programme timeline.	12	Mitigation involves early identification of resources required and trying to ringfence supplier resources where possible. Working systems put in place to allow working from home to continue. Continue to monitor risk.	Planning	Stable	6

10. Option Cost/Benefits Comparison

Summary of Solution Costs

10.1. CAPEX and OPEX cost for the treatment and pipeline elements of Netheridge WwTW were produced in accordance with the ACWG Cost Consistency Methodology Revision C. This included the assessment of project risk and optimism bias in line with the HM Treasury Green Book.

10.2. CAPEX estimates, including the ongoing capital maintenance component, were produced using a combination of Severn Trent Water (STW) cost models where appropriate, and bottom-up cost estimation by our cost consultant. These were based on industry benchmark models, as-built construction costs of similar scheme elements, supplier quotations and quantity take-off calculations.

10.3. OPEX costs associated with each of the newly constructed assets were estimated and include labour, power and chemicals.

10.4. CAPEX and OPEX costs are combined to produce the NPVs based on an 80-year contract period.

10.5. CAPEX and OPEX cost estimates have been converted to a fixed annual charge and a variable charge based on actual support flow deployed. These charges, along with scoring of agreed resilience metrics detailed below, are incorporated into the Water Resources South East (WRSE) cost modelling exercise to identify the best value plan for customers.

10.6. Table 10.1 summarises costs for the individual option configurations attributable to each of the two transfer SROs.

Table 10.1: Option NPVs and Annual Incremental Costs (AICs)[1]

Option Name	Units	Mythe WTW Both Interconnectors	Netheridge WwTW STT SRO Pipeline	Netheridge WwTW STT SRO Canal
Option benefit	Ml/d	15	35	35
Total planning period option benefit (NPV)	Ml	160,406	374,281	374,281
Total planning period indicative capital cost of option (CAPEX NPV)	£m	0.0	55.5	24.2
Sweetening Flow				
Total planning period indicative operating cost of option (OPEX NPV)	£m	27.3	15.0	4.3
Total planning period indicative option cost (NPV)	£m	27.3	70.5	28.5
Average Incremental Cost (AIC)	p/m³	17.0	18.8	7.6
Maximum Flow				
Total planning period indicative operating cost of option (OPEX NPV)	£m	27.3	25.0	11.9
Total planning period indicative option cost (NPV)	£m	27.3	80.5	36.1
Average Incremental Cost (AIC)	p/m³	17.0	21.5	9.6
Carbon				
Embodied carbon	(tCO_2e)	0	6,478	1,580
Operational carbon - Maximum flow	(tCO_2e)	0	98	98
Operational carbon - Sweetening flow	(tCO_2e)	0	10	10

Options Considered

10.7. Whilst the sources offered can be used either independently or in combination, there is otherwise a limited degree of optionality available. The STT SRO has determined that the sources form part of the best value solution to provide the level of additional resource offered to the WRSE regional plan. Please refer to Chapter 10 of the STT SRO gate-1 submission.

10.8. Whilst there are options available in terms of treatment process and discharge locations, the scope of the Netheridge WwTW option is predominantly dictated by the STT SRO. STS SRO options must be selected based on the STT SRO choice of interconnector and the absolute requirement to cause no deterioration to the WFD status of the receiving waterbody. We believe the options submitted represent the best value solution to support the STT SRO.

10.9. The benefits offered by each source represent an absolute maximum supply capacity which cannot be increased. The newly constructed assets at Netheridge WwTW will include a control system allowing flow variations up to its maximum output of 35 Ml/d. Mythe WTW licence transfer

will be variable within the constraints of the agreed STT SRO 'Put and Take' arrangement up to its maximum of 15 Ml/d.

10.10. The Netheridge WwTW element of STS SRO could be delivered as a standalone scheme within a single AMP and could therefore be operational by Q1 2031, if required. Mythe WTW licence transfer would be available as soon as the STT SRO 'Put and Take' arrangement is formalised. There is no benefit delivery until STT SRO is commissioned. We assume that STS SRO will be timed to coincide with STT SRO so that Thames Water (TWUL) customers are not charged for unusable assets.

10.11. Investigations regarding the application of DPC and DCO arrangements are ongoing, including the possibility of these being applied at either element or system level. Please refer to Chapter 6 and Chapter 7 for details.

10.12. All solution costs have been developed in line with the ACWG methodologies, which include the HM Treasury Green Book guidance.

Resilience Benefits Metrics submitted to WRSE

10.13. The WRSE regional modelling team produced an initial assessment of the resilience benefits of each SRO based on the generic type of solution. These were then adjusted after discussion with each SRO project team to reflect the specific details of each SRO. The final assessment of each metric for STT SRO is in Table 10.2 below.

Table 10.2: Resilience Benefits Metrics for STS SRO raw water sources

Resilience Metric	STT SRO Interconnector	Mythe WTW Score	Netheridge WwTW Score
R1 - Uncertainty of option supply/demand benefit	Pipeline	**3**	3
	Canal	**3**	3
R3 - Vulnerability to physical hazards	Pipeline	**2**	2
	Canal	**1**	-1
R5 - Catchment/raw water quality risks (incl. climate change)	Pipeline	0	3
	Canal	2	2
R7 - Risk of failure due to exceptional shocks	Pipeline	**3**	3
	Canal	**2**	1
A3 - Operational complexity	Pipeline	**2**	2
	Canal	**1**	1
E1 - Scalability and modularity	Pipeline	**3**	2
	Canal	**2**	2
E3 - Reliance on external bodies	Pipeline	**2**	2
	Canal	**1**	1

Supporting evidence:	References/hyperlinks only
1.	NPVs & AICs are based on whole-life CAPEX & OPEX estimates used to derive the fixed annual and variable charges for water trading. These charges are derived from the STW Water Trading Model based on an 80-year contract period.

11. Impacts on Current Plan

Current Supply-Demand Balance Impacts

11.1. The impact of the STT SRO System on the receiving water company's current supply-demand balance is detailed in Chapter 11 of its gate-1 submission. As robust, reliable and resilient sources of raw water, STS SRO will increase the deployable output of the receiving water company as part of the transfer SRO.

11.2. There are no impacts on the Severn Trent Water (STW) current supply-demand balance detailed in WRMP19. The raw water sources were not considered as a feasible option for development in STW's WRMP19, as there was no deficit forecast in these geographical areas.

11.3. The scheme has no impacts on other solutions contained in STW's existing AMP7 delivery plans.

12. Board Statement and Assurance

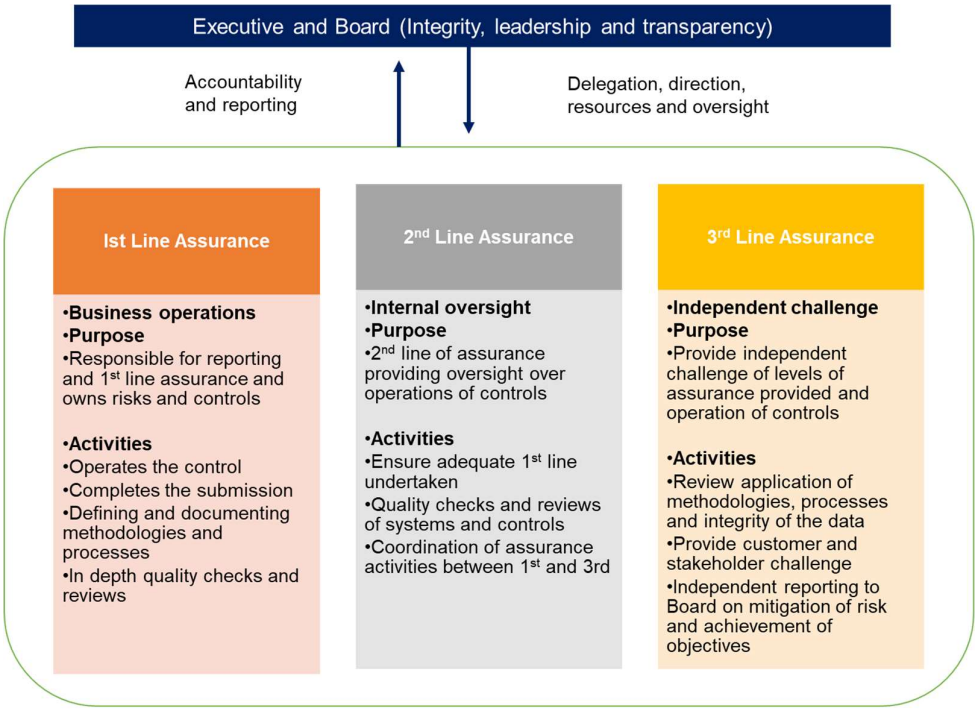
Assurance Approach

12.1. The Board Statement is provided in the covering letter to this gate-1 submission. The board supports our recommendation for progression of this SRO.

12.2. We have used Severn Trent Water's (STW's) assurance framework for this submission.

12.3. The risk-based assurance approach is consistent with that documented in our statement of reporting risks, strengths, and weaknesses and Appendix A1[4] of our Business Plan for 2020 to 2025, and is based on the three lines of assurance model shown in Figure 12.1.

Figure 12.1: Our risk assessment and assurance approach



[4] STW: Risks, Strengths and Weaknesses in regulatory reporting and assurance plan; STW: 2020-2025 Business Plan: Appendix A12

12.4. It is also consistent with the assurance requirements laid out in Ofwat's Company Monitoring Framework[5].
12.5. This approach provides an effective programme of assurance which considers areas that we know are of prime importance to our customers and regulators, or may have a significant financial value, alongside the likelihood of reporting issues. Areas of higher risk receive three lines of assurance while other areas, where the risk is lower, receive first and second line only.
12.6. Following a competitive tender we appointed an external assurer. The third-line assurance statement confirms it is satisfied that, on the basis of the evidence presented and the limitations and scope of the assurance activities, the submission is suitable for progression through gate-1. The board statement is supported by the assurance statement, and there are no outstanding material issues to be resolved prior to gate-1. The company boards are satisfied that progress to date allows the scheme to be construction ready by AMP8.Our approach was augmented by experience that the companies gained through the PR19 assurance process and the sharing of best practice (e.g. use of the STW risk assessment framework).
12.7. We constantly look to improve our assurance approach and will conduct a 'lessons learnt' exercise before we finalise our assurance approach for gate-2.

Supporting evidence:	References/hyperlinks only
4. STW: https://www.stwater.co.uk/content/dam/stw/regulatory-library/stw-risks-strengths-weaknesses-assurance-plan-20-21-final.pdf	5. The latest iteration of Ofwat's Company Monitoring Framework can be found on their website through the following link: http://www.ofwat.gov.uk/publication/company-monitoring-framework-final-position/

13. Solution or Partner Changes

13.1. There are no proposed changes to the scheme solution partner organisations.
13.2. There are no proposals for a solution substitution.

14. Efficient Spend of Gate Allowance

Evidence of Efficient Spend to Submission on Gate Activities

14.1. The Final Determination allowance for STS SRO was £5.3m (in 17/18 prices), with a 10% allocation to gate-1, equating to £530k. We anticipate that our gate-1 outturn will be £324k, based on actual costs incurred to 31 March 2021, combined with forecast expenditure to 05 July 2021. This equates to £308k in 17/18 prices, providing a saving of 42% compared with the Final Determination.
14.2. Care has been taken to ensure efficient and relevant spend on agreed activities to advance this project.
14.3. We can confirm that our gate-1 expenditure has been assured by our external assurance providers.
14.4. To achieve this saving, opportunities have been sought to:

- Undertake work internally where appropriate. Severn Trent Water (STW) has established a small team working full-time across the four SROs for which we are partners, with support from other specialist staff as required. Internal recharging to the scheme has been proactively monitored and robustly challenged to ensure that the SRO has not paid business-as-usual costs. The internal staff costs are £150k, 6% of which is for specialist staff time, with the

[5] The latest iteration of Ofwat's Company Monitoring Framework can be found on their website through the following link: http://www.ofwat.gov.uk/publication/company-monitoring-framework-final-position/

remainder allocated to staff working full-time across the four SROs. We have applied a zero-overhead rate to these costs.

- Utilise established STW supplier frameworks which have previously been competitively tendered to establish pre-agreed rates. This approach allows access to specialist advice from professionals who are already familiar with our existing assets. 74% of possible external spend (e.g. excluding third-party costs) has been through established STW Supplier Frameworks.
- Identifying opportunities for collaborative procurement with other SROs where appropriate. Examples of this include aspects of environmental work, taking advantage of synergies with the STT SRO, and customer research undertaken collaboratively.

Table 14.1: STS SRO expenditure summary

Description	Cost £k	Comments
Gate-1 allowance at 17/18 prices	£530k	10% of total allowance
Gate-1 external spend	£143k	Based on actuals to February 2021 and forecast to gate-1
Third-party costs	£31k	Funding for EA, NE, NAU, WRSE and WRW regional groups, and ACWG.
Internal staff cost forecast	£150k	Includes core team working on delivering the SRO (including all project management costs) and internal specialists.
Total gate-1 cost forecast	£324k	Forecast elements from gate-1
Total gate-1 cost forecast at 17/18 prices	£308k	Deflated by consumer price index
Variance	-£222k	Forecast expenditure is 42% less than the allocated funding
Forecast gate-2 costs at 17/18 prices	£795k	

Forecast Spend to Gate-2

14.5. Our Final Determination allowance to gate-2 is £795k, based on a 15% allocation of £5.3m total funding.

14.6. We have developed a gate-2 budget through engagement with workstream leads and external stakeholders including the Environment Agency (EA), the National Appraisals Unit (NAU), Natural England and the Drinking Water Inspectorate (DWI). We have referenced the gate-2 requirements published in the Final Determination, and mapped activities and deliverables to achieve those outcomes. A detailed programme for gate-2 can be viewed in Chapter 15.

14.7. It should be noted that this is a forecast and is based upon a number of assumptions, dependencies and risks (as referenced in Chapter 9).

15. Proposed Gate-2 Activities and Outcomes

Penalty Assessment Criteria, Incentives and Consideration of Solution Delay Impact

15.1. This gate-1 submission meets the quality and timescale requirements as set out by RAPID in the PR19 Final Determination Strategic Regional Water Resource Solutions appendix.

15.2. Whilst there are a number of environmental and engineering aspects which require further development, at this stage we do not anticipate any solution delay impacts and are confident that the gate-2 delivery date of October 2022 can be achieved.

15.3. We do not propose any changes to the outcomes, penalty assessment criteria and incentives proposed by RAPID and set out in the PR19 Final Determination.

Proposed Gate-2 Activities

15.4. Our overarching objective for gate-2 is the efficient production of a gate-2 submission that meets the quality and timescale requirements set out by RAPID.

15.5. The outcome of our gate-2 activity will be a detailed concept design report, which will allow us to move forward to gate-3 if the scheme is selected to progress.

15.6. Working collaboratively with our transfer SRO partners, we will undertake further data collection to support more detailed modelling and engineering feasibility work. These further investigations will allow us to confirm the resource benefit assessed by the Water Resources South East (WRSE) water resource modelling.

15.7. Our gate-2 activities will improve certainty of outcome and cost estimates, and develop a detailed programme for delivery.

15.8. The workstreams and key activities we plan to undertake to achieve our objective are detailed in Table 15.1 below.

Table 15.1: Work Breakdown Structure for gate-2

Level 1 - Workstream	Level 2 - Key activities	Level 3
Governance	Programme management	
	Procurement for gate-2	
	Assurance	
	Board Approvals	
Environment	Environmental assessment - STT	
	Environmental monitoring - STT	
	Water resources analysis - STT	
	Treated water methodology gate-2 update	
	Environment & raw water quality methodology – gate-2 update	
	Completion of all studies to support gate-2	
	Narrowing the corridor further investigations (if required)	
	Investigations required to support stakeholder consultation	
Engineering	Procurement for engineering reports	
	Capital works	Ground investigations
		Site surveys
		SEA
		Report
	Pipeline route	Pipeline route optimisation
		Site walkover
		Tunnel alignment
		Flood risk assessment
		Archaeological assessment
		Land assessment
		Cost - updated estimate
	Wastewater treatment plant	Power assessment

		Proposed operations review
		Update tertiary treatment requirements
		Costing update
	Climate change mitigation proposals	
	Analysis/review of reports	
	Utilisation planning	
	Narrowing the corridor further investigations (if required)	
	Investigations required to support stakeholder consultation	
Stakeholder	Customer research (Incl. Tier 2)	
	Engagement re regulatory plans, selection and prioritisation of solutions	
	Engagement with EA, DWI, and Natural England	
	Engagement with Consumer Council for Water (CCW) / Customer Challenge Groups (CCGs) re customer engagement	
	Further engagement with Historic England	
	Early engagement with local authorities re planning and other issues	
Planning & Consents	Route investigations including land referencing, land & planning constraints, stakeholder engagement	
	Design & feasibility input, pre application stakeholder engagement	
	Further advice on planning / consenting route	
Procurement/DPC	Further advice on DPC Procurement options	

Gate-2 Customer and Stakeholder Engagement

Stakeholder engagement activity to gate-2

15.9. To date, stakeholder engagement has focused on Tier 1 stakeholders' areas of concern. For gate-2, the focus will widen to include Tier 2 stakeholders, and include the following activities, as illustrated in Figure 15.1:

- Continued engagement with the wider stakeholder population regarding the development of the regional plans, the selection and prioritisation of solutions, and the reconciliation of plans across the region.
- Continued engagement with the Environment Agency (EA) and Drinking Water Inspectorate (DWI) on the technical studies underway. More detailed engagement with Natural England as scheme specifics become more established.
- Continued engagement with the Consumer Council for Water (CCW) and Customer Challenge Groups (CCGs) to share the planned customer engagement work.
- As more details of the design of the schemes are developed, early engagement with local authorities will focus on concerns such as planning applications.

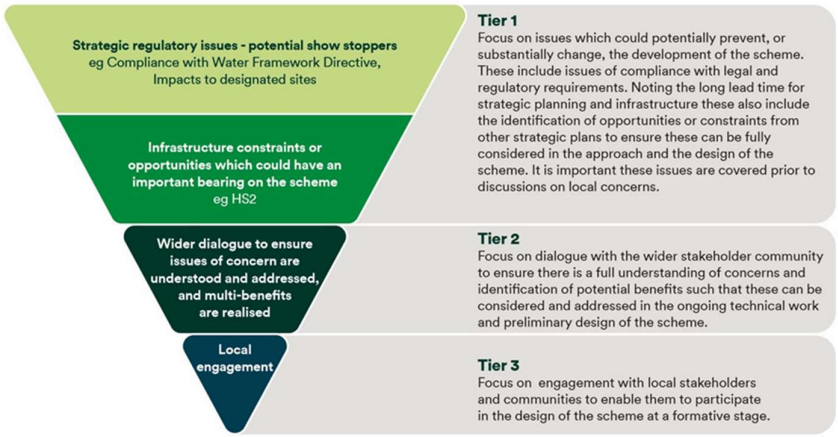
Customer engagement activity to gate-2

15.10. Further research to gate-2 is planned to address the issues and concerns raised by customers. It will likely include the following topics:

- Efficient use of resources: information on current and future levels of leakage and water use will be shared to help inform future communications.
- Service levels: customers in provider companies want reassurance that the long-term viability of sharing water does not come at the expense of deteriorated service levels.

- Water quality: for recipients, assurances are needed about the safety of transferred water. For providers, they want to understand if there will be potential changes to their water supply.
- Scheme design, construction and operation: customers want more information on the design; including costs, transfer routes, operational strategy, as well as environmental impact and opportunities. However, this might be for later than gate-2.

Figure 15.1: Tiered approach to engagement



16. Conclusions and Recommendations

Conclusions

16.1. Scheme costs have increased as a result of more detailed investigations into the scope of work required to deliver the benefits of the scheme.

16.2. Our work in gate-1 has shown the key environmental consideration is the proposed Netheridge WwTW discharge location. We will undertake further work through gate-2 to determine the best Deerhurst WTW discharge location.

16.3. Netheridge WwTW will be construction ready in AMP8, as per the Final Determination requirement, with the earliest DO of Q1 2031. No construction is required for Mythe WTW.

16.4. The new assets required at Netheridge WwTW can be constructed quicker than the STT SRO. Mythe WTW is a licence transfer and can be made available whenever required.

16.5. Netheridge WwTW offers a robust, reliable, and resilient source of raw water to support the STT SRO. Mythe WTW will always be available as there is no HoF clause associated with the licence.

16.6. Care has been taken to ensure efficient and relevant spend on agreed activities to advance this project. At gate-1 we have spent 58% of our budget. We are demonstrating efficient spend through our third-line assurance.

16.7. We have welcomed the opportunity to consider a DPC procurement route. Having carried out Test 1 (size) and Test 2 (discreteness) this SRO fails Test 1 and is marginal for Test 2. As a result, it is not suitable for DPC. We will continue to review our procurement options prior to gate-2.

16.8. Further investigations are required to determine the exact discharge location for each of the two STT SRO interconnectors (Deerhurst WTW pipeline and Cotswold Canals).

Recommendation

16.9. Through gate-1 we have not discovered any showstoppers and recommend that this SRO proceed to gate-2.

16.10. The board supports the recommendation for solution progression made in this submission.