Gate two query process

Strategic solution(s)	Fens Reservoir
Query number	FEN001
Date sent to company	06/12/2022
Response due by	08/12/2022

Query

Planning

1. Please provide an assessment of the key risks & issues, for example, the top ten strategic risks, related to land and planning. Please explain how your planning/land strategy supports the mitigation/management of the risks.

Solution owner response

The table below sets out the project's top ten strategic land and planning risks, and how they are being managed and mitigated. The strategic approach to consenting and land, as outlined in the Gate 2 submission at section 7.2, together with the overarching programme (section 7.1), takes account of these issues.

	Risk	Risk level	Risk summary	Mitigation and management	Residual risk
1	Risk of misalignment with RAPID gate process	High (4,4*)	The proposed consenting, consultation, environmental impact assessment or land acquisition activities could become misaligned with the RAPID gates, giving rise to the risk of ineligible expenditure or programme delay.	This risk can be effectively managed through prior agreement of gate activities. The G2 submission in respect of subsequent gate activities addresses this risk at Section 7.4. The Gate 3 submission will address possible residual issues, particularly in respect of land acquisition.	Medium (2,3)

			The timely funding of a property support scheme and the land acquisition process is particularly important to reduce consenting risk and assist residential occupiers directly affected by the project proposals.	Discussions with RAPID on the appropriate timing and level of funding to manage land risks are ongoing.	
2	Risk of misalignment with WRMP	High (5, 3)	The DCO process needs to be aligned with and informed by a published final WRMP. There is a risk that significant delay to the WRMP could slow down the consenting process. The project's design and site selection methodology, including transfer optioneering, need to be well-aligned with the WRMP conclusions and supporting methodologies.	Legal advice has been sought in respect of the alignment of the processes and the risks of challenge to the WRMP. The SRO team worked closely with the WRMP teams during site selection to ensure alignment and continues to engage on core issues. Back checking of the site selection methodology against the final WRMP conclusions will take place.	Medium (3.3)
3	Site selection risk	High (3,4)	There is a risk that site survey findings or consultation responses give rise to new information which may affect the findings of the site selection process, potentially undermining the robustness of the DCO application or adversely affecting programme.	Building on the stakeholder engagement and desk-based studies carried out during site selection, additional engagement with stakeholders, including landowners is underway. A "back checking" process will be adopted during the design process and review of consultation responses to ensure consistency with the site selection principles	Medium (2,3)
4	Design risk	Medium (4,2)	There is a risk that failure to evolve the project design to an appropriate standard could give rise to the need for additional consultation during the DCO process, delay grant of consent or incur additional development expenditure.	A robust design process is being developed, including an AWS and CW commitment to “good design” aligned with the NPS and NIC guidance and the ACWG design principles. Appropriately experienced consultants have been appointed to support this process and AWS will appoint a board champion as recommended by the NIC guidance.	Low (2,1)
5	Risks surrounding transfer infrastructure and abstraction locations	High (3,4)	Details of the transfer elements of the project are less well-defined than the reservoir, particularly in respect of abstraction locations, routeing, land ownership and environmental investigation. There is a risk that this lower level of data could delay engagement with landowners, access for surveys and EIA activities, potentially impeding project progress.	This risk has been mitigated by early site selection work on transfer infrastructure routing, including on alternatives. The second stage of consultation will present transfer corridor details, drawing on comprehensive site selection process. Landowner engagement on the route options will commence early in 2023.Engagement with the Environment Agency and other stakeholders on the abstraction locations is ongoing.	Medium (3,3)
6	National Policy Statement remains in draft	Medium (4,3)	The National Policy Statement (NPS) which the DCO application will rely on has been in draft form for four years. DEFRA have not indicated whether revisions will occur to the NPS or when it will receive parliamentary scrutiny. There is a risk that delays to	AWS and ACWG to increase level of engagement with DEFRA on this issue, including communication about the risks to the project which continued delay creates.	Medium (3,3)

			the issue of the NPS will adversely affect the consenting programme or new requirements require additional expenditure.	Site selection assumptions to be backchecked against any future NPS revisions.	
7	Land access	High (4,4)	Where land access for surveys cannot be negotiated then powers of entry can be requested from DEFRA. However, the process in this respect is untested and likely to be onerous. There is a risk that where access cannot be negotiated delay to the programme and/or increased expense may be incurred.	Early engagement with landowners has taken place and a programme of ongoing engagement is in place for early 2023 AWS will engage with DEFRA on how the entry powers process can operate in an efficient manner.	Medium (4,3)
8	Water Framework Directive (WFD)	Very High (4,5)	As discussed in section 3 of the EAR accompanying the gate submission, it is possible that the application for the DCO will require a derogation from the requirements of the Water Framework Directive, without which the project could not be lawfully consented. This is an onerous requirement.	Following procurement of appropriate support, a detailed programme for the assessment of WFD issues is being developed Engagement will take place with key stakeholders, most notably the Environment Agency and Natural England, to develop a strategic plan to manage this issue	High (4,4)
9	Habitats Regulation Assessment (HRA) - potential operational impacts	Very High (4,5)	The abstraction of water to service the project will require Habitats Regulation Assessment for both the abstraction licence and DCO. As discussed in section 3 of the EAR accompanying the gate submission, a strong and robust evidence base will be required to conclude that there will be no adverse effects on the integrity of any designated site. The level of detail available at this stage (which is considered proportionate) means that such effects cannot currently be ruled out.	Following procurement of appropriate support, a detailed programme for the assessment of HRA issues is being developed. Engagement will take place with key stakeholders, most notably the Environment Agency and Natural England, to develop a strategic plan to manage this issue, drawing on the evidence plan process described in the Planning Inspectorate Advice Note 11.	High (4,4)
10	Habitats Regulation Assessment (HRA) – Goose and Swan Functional Land	High (3,4)	As discussed in section 3 of the EAR accompanying the gate submission, the proposed reservoir site lies approximately 200m outside of Natural England's *Goose and Swan Functional Land Impact Risk Zone (IRZ)* for the Ouse Washes Special Protection Area. There is the risk that land forming the proposed reservoir site could provide important habitat for relevant species. The level of risk cannot be ascertained until ecological surveys have been carried out, however if the land was found to be ecologically important then mitigation, including design and footprint changes could be required.	Following procurement of appropriate support, a detailed programme for the assessment of HRA issues is being developed. Bird surveys are programmed to commence in 2023 (subject to land access, see risk 7 above). Engagement will take place with Natural England to develop a strategic plan to manage this issue, drawing on the evidence plan process described in the Planning Inspectorate Advice Note 11.	Medium (2,4)

*This table has adopted the same methodology applied at Section 7.3 of the gate submission with probability and impact scores shown in the brackets

above being applied to provide a consistent risk scoring in accordance with the matrix below

Probability	Impact				
	1	2	3	4	5
5	Medium	Medium	High	Very High	Very High
4	Low	Medium	Medium	High	Very High
3	Low	Low	Medium	High	High
2	Low	Low	Medium	Medium	Medium
1	Low	Low	Low	Low	Medium

Date of response to RAPID	08-12-2022
Strategic solution contact / responsible person	Richard Myerscough rMyerscoug2@anglianwater.co.uk

Gate two query process

Strategic solution(s)	Fens Reservoir
Query number	FEN002
Date sent to company	06/12/2022
Response due by	08/12/2022

Query

Procurement:

1. In section 7.5.1 you identify the Fens Reservoir as suitable for delivery by DPC. Please provide:
    a. Your technical discreteness assessment
    b. The results from the value for money analysis including confirming modelling assumptions used. Where these deviate from the prescribed Ofwat assumptions please explain the rationale for using different assumptions and evidence to support the alternative approach.

2. Please provide an assessment of risks & issues associated with the preferred delivery route for example, risks around capacity in the market, procurement timelines, SIPR etc.

Solution owner response

1. **In section 7.5.1 you identify the Fens Reservoir as suitable for delivery by DPC. Please provide:**
    a. **Your technical discreteness assessment**

The discreteness and VfM analysis presented in this response was undertaken on the basis of the whole SRO including all asset components.

Ofwat's technical guidance sets out a potential framework for identifying DPC projects against four key criteria: Stakeholder interactions and statutory obligation; Interactions with the network; Contributions to supply/capacity and ability to specify outputs; Asset and Operational failure.[1] Table 1 presents the potential framework for identifying DPC projects as set out in Ofwat's technical guidance, published alongside PR19.

Table 1: DPC Discreteness Methodology

Criterion	High discreteness	Low discreteness
Stakeholder interactions and statutory obligations	• Limited or marginal impact on the appointees' ability to meet its statutory obligations (e.g. non-potable or raw water sources).	• Asset materially contributes towards appointee meeting statutory obligations.
Interactions with the network	• Assets where there are limited economies of scale and scope with the rest of the appointee's network system OR where those economies of scale or scope could be maintained through contracts. • Simple or limited, well understood and manageable interactions with the appointees' network. • Separate non-contiguous networks or assets within the appointee's area. • Assets where capacity is shared by multiple appointees. • More 'passive' assets (e.g. network enhancement pipes) that are not actively managed as part of the overall system.	• Assets where there are material economies of scale and scope with the rest of the appointee's network system OR where economies of scale or scope cannot be maintained through contracts. • Significant, complex and frequent interactions with the appointees' network. • Assets that are actively managed as part of the overall system operation of the network.
Contributions to supply/capacity and ability to specify outputs	• Assets where capacity is regularly needed and contracting requirements can be more easily defined and priced. • Schemes where outputs can be clearly defined and are not subject to substantial change from other factors or difficult to predict in the future (e.g. around asset condition at asset hand back).	• Assets where capacity is rarely needed (e.g. resilience schemes) and contracting requirements difficult to specify. • Assets where capacity requirements are not well understood/highly uncertain. • Schemes where outputs cannot be clearly defined.
Asset and operational failure	• Assets where operational failure risk is well understood, and mitigations well established for similar assets.	• Assets where operational failure risk is not well understood with limited track record of effective mitigations.

1 https://www.ofwat.gov.uk/wp-content/uploads/2017/12/DPC-A-technical-review-FINAL_08.12.17.pdf

	• Well-developed market or technical supply chains with strong experience of similar project delivery.	• Weak market or technical supply chains with limited experience of similar project delivery. • Assets where there are no alternative back-up supplies.

The scoring system adopted for the purpose of the Gate 2 report (and consistent with our Gate 1 submission) is a three-grade scale (high, medium and low). High and low discreteness when the asset information is clearly in line with the methodology above. A factor is given a medium discreteness score when the asset information is neither clearly a high or low level of discreteness. The final score for each scheme is the mean of all the scores assigned to each of the four categories and rounded to the first decimal point to assign the grading as per the scoring system below.

High = 3, high/medium = 2.5, medium = 2, medium/low = 1.5 and low = 1.

We have assumed that each of the four criteria are equally weighted and that the overall score is based on an average of the scores. An overall medium score indicates that the scheme is broadly suitable for DPC.

Fenland Reservoir (FR) Discreteness Assessment

This section sets out the results of the discreteness assessment based on the methodology and approach set out in section above.

Table below sets out a summary of the detailed assessment of the suitability of the FR solution for delivery under a DPC model:

Table 2: FR Discreteness Assessment

Key Criteria	Asset information	Discreteness assessment
Stakeholder interactions and statutory obligations	Strong opposition from local community expected and a large degree of stakeholder interactions There are environmental concerns about moving invasive species and flow levels of the impacted rivers	– **Medium (2)** There are a large number of interested stakeholders, which must be addressed pre-tender or through a detailed CAP agreement.
Interoperability considerations	Outflow point is the only interface with the wider network. The interface between the treated water treatment works (WTW) and associated transfers assets are of vital importance to the wider network.	– **Low (1)** – Despite the limited network interactions, the combination of abstraction point management alongside other active assets would require very complex contractual arrangements. In particular, the strategic importance of the actively managed treated water WTW to the wider network suggests the SRO should be considered broadly not discrete.

Key Criteria	Asset information	Discreteness assessment
Output type and stability	Based on current modelling of the resilience of sources, the four inputs being considered can adequately meet the transfer needs for this solution. The output required from Fens Reservoir is well understood. Analysis for gate 1 has updated the hydrology with the most up to date information and advanced modelling approaches	– **High (3)** – well understood supply sources. Stable supply should not require detailed complex arrangements.
Asset and operational service failures	Reservoir are considered complex infrastructure with significant construction risks. Projected CW demand is around 83-84Ml/d and this solution would supply c52% (43.5 Ml/d) of this demand. Therefore, failure of the FR would cause significant strain on CW's system.	– **Medium (2)** – size and complexity of reservoir will require detailed contractual arrangements and will carry significant risk. Impact of failure could cause network outage for project sponsors so it is likely that contractual development and management costs would be significant.
Summary	Overall key asset information for the discreteness analysis is (1) high-level of stakeholder scrutiny due to impact of scheme (2) minimal interface points with the wider network but the supply makes a significant proportion of total demand (3) output type and stability is fairly well understood and constant. Main challenge will be managing the input flow from the rivers. (4) key operational failures should be manageable and the highest risk is highly unlikely	– **Medium (2)** – Overall FR is broadly suitable for DPC. It is not a highly discrete asset due to the scale, impact on wider network and high level of scrutiny. The scale relative to the project sponsors makes the risk substantial. But based on the limited network interface and stable output type it can be viewed as broadly discrete.

As with SLR, while the overall SRO appears to be reasonably well suited to DPC, the project sponsors observe that the FR SRO contains multiple assets which are functionally different natures and with varying levels of discreteness.

Table 3 below sets out key differences for the asset components against the four key criteria. This consideration doesn't supersede the analysis set out above, instead it seeks to clarify where elements of low discreteness are present across the asset components.

Table 3: FR Discreteness by Component

Key Criteria	Raw water abstraction, treatment and transfer	Reservoir	Treater water assets including WTW and potable transfer
Overall Discreteness	– **Neither clearly discrete or not discrete**, with active management of abstraction and ecological responsibilities	– **Somewhat discrete**, with some consents needed and EA engagement over ecological responsibilities and flood risk.	– **Somewhat less discrete**, due to interoperability considerations and risk of operational failure. FR will be of crucial important for CW which will require very high level of assurance that the supply quantity and quality is being delivered.

Overall, the discreteness of FR varies across the three asset components and is notably less discrete with the water treatment works and transfer included in scope.

2. The results from the value for money analysis including confirming modelling assumptions used. Where these deviate from the prescribed Ofwat assumptions please explain the rationale for using different assumptions and evidence to support the alternative approach.

To assess VfM for FR, the gate 2 cost estimate has been run through a VfM model. The model compares the net present value (NPV) of the factual (DPC) against the counter-factual (in-house). The project sponsors have not sought to adjust any of the standard assumptions set out by Ofwat, with the exception of forward rates which have been smoothed over a 2-year period given the recent volatility in debt markets.[2] Notably we have not sought to test the cost efficiencies set out in Ofwat's standard assumptions which are key value drivers.

These assumptions are subject to the development of project risks and views of the market and will be updated as part of subsequent gate and control point submissions with project-specific assumptions. Sensitivity analysis has been conducted using the high and low ranges from Ofwat's standard assumptions to ensure the project offers best value under a range of scenarios and therefore represents a low regret option under DPC.

The VfM analysis for this submission is based on a 6-year construction period with a total estimated construction capex of £2,187m followed by a 25-year operations period and periodic renewal capex. Under this scenario, delivering the project under DPC would result in lower costs to customers than if the project was delivered under the PR19 framework. The cost to customers in NPV terms under the factual scenario (DPC) is £1,313m compared with £1,433m under the counterfactual (PR19). The difference in the costs to customers is £120m. The benefits from opex and capex efficiencies are partially offset by the additional bidder and procurement costs incurred under the DPC model. The higher financing costs are driven by the current market rates which are not reflected in the PR19 WACC. For example, when doing VfM analysis for Middlegate DPC the overall cost of capital for DPC was lower than PR19.

Figure 1 below represents the results of the VfM analysis under the Mid case assumptions highlighting the various value drivers between the two delivery models (hereinafter all figures represent £ million net present value of costs to the customers, lower value is better).

[2] Anglian-Water-Direct-procurement-for-customers-detailed-actions.pdf (ofwat.gov.uk)

Figure 1: FR VfM analysis results (Mid case)

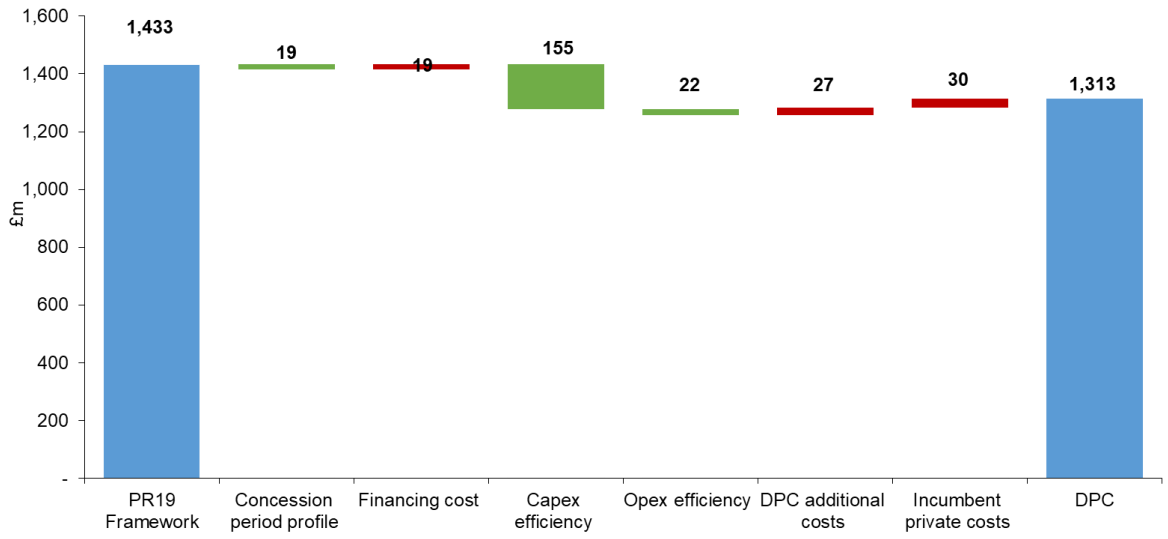

Table 4 below shows the results of the sensitivity analysis. Under all scenarios, delivery of FR is shown to have greater value for customers under DPC delivery model based on Ofwat's framework and assumptions.

Table 4: FR – VfM sensitivity analysis results

Variables		Assumptions under different cases*			DPC compared with in-house NPV (£m)	
		Low	Mid	High	Low	High
0	Base Case				IH: 1433, DPC: 1313 Diff.: 8.4%	
1	Contract length (years)	20	25	40	IH: 1259 DPC: 1152 Diff.: 8.5%	IH: 1714 DPC: 1577 Diff.: 8.0%
2	Equity IRR, real (%)	10	8	7	IH: 1433 DPC: 1432 Diff.: 0.1%	IH: 1433 DPC: 1253 Diff.: 12.6%
3	Gearing (%)	80	85	90	IH: 1433 DPC: 1415 Diff.: 1.3%	IH: 1433 DPC: 1213 Diff.: 15.4%
4	Depreciation rate (%)	+25% faster	Company policy		IH: 1433 DPC: 1313 Diff.: 8.4%	
5	Capex efficiency (%)	5	10	15	IH: 1433 DPC: 1394 Diff.: 2.8%	IH: 1433 DPC: 1233 Diff.: 14.0%
6	Opex efficiency (%)	5	10	15	IH: 1433 DPC: 1324 Diff.: 7.6%	IH: 1433 DPC: 1302 Diff.: 9.1%

7	Procurement costs (% of Capex)	2	1	0.5	IH: 1433 DPC: 1340 Diff.: 6.5%	IH: 1433 DPC: 1300 Diff.: 9.3%
8	Bidder costs (% of Capex)	3	2	1	IH: 1433 DPC: 1327 Diff.: 7.4%	IH: 1433 DPC: 1300 Diff.: 9.3%
9	Contract mgmt. costs (annual)	300k	150k		IH: 1433 DPC: 1316 Diff.: 8.1%	

*Scenarios as specified in Ofwat assumptions within IAP 'Direct Procurement for Customers detailed actions'

DPC worse than in-house

DPC slightly better than in-house (<5%)

DPC definitely better than in-house (>5%)

The high-case used in the scenario testing was 40 years. However, rates used for the bullet bond are for a 35-year tenor, this is due to rates for over 50 years in the future not being available at this time. A 40-year operation period has still been used in the model to show a long contract term as it is assumed the difference between rates for 35 years and 40 years is likely to be minimal.

The VfM is most sensitive to the equity IRR, gearing and capex efficiencies. It should be noted that the model uses the standard assumption of 2% inflation each year, given this the nominal equity IRR for the DPC model may be higher. However, this could be counter balanced by an equal increase in the cost of equity for an in-house procurement.

Whilst the cost of debt assumptions under the DPC model have been updated, the WACC as per Ofwat's PR19 Final Determination has been applied throughout the contract period for the in-house delivery model and has not been updated for cost of debt indexation or future price controls. We note that the PR19 methodology was finalised when the market rates were significantly lower and less volatile than the current environment. The PR19 regulatory framework, including the WACC, do not reflect current market conditions.

Overall, based on Ofwat's standard VfM assumptions for the IAP and current cost projections for FR, DPC would deliver greater value for customers from a VfM standpoint.

Note that we have not sought to model the VfM of delivery of the scheme via SIPR rather than DPC but instead undertook an assessment similar to TTT of VfM as presented in the note to Ofwat. We would expect many of the benefits of DPC to be achievable under a SIPR model.

Although this analysis shows that FR is suitable for DPC our preferred delivery model for FR is via SIPR as set out in the paper shared with Ofwat in October 2022.

3. Please provide an assessment of risks & issues associated with the preferred delivery route for example, risks around capacity in the market, procurement timelines, SIPR etc.

FR was assessed against the three tests of Ofwat's PR19 DPC eligibility framework: size, discreteness and VfM. The scheme meets the size test, can largely be described as discrete and using Ofwat's standard assumptions and sensitivities is in most cases better value for customers than in-house delivery.

The project sponsors also assessed FR against the SIPR conditions which are (1) that the project is of size and complexity to threaten the undertaker's ability to provide services to its customers and (2) the specification of the infrastructure project would result in better value for money that would be the case if delivered in-house. As set out in the paper shared with Ofwat in October 2022 this assessment concluded that FR meets both the SIPR conditions and that SIPR is the preferred delivery route.

As part of the detailed analysis assessing the eligibility for competition, commercial strategy and procurement strategy for Gate 2 a number of key risks and issues with the SIPR and DPC model were identified. These were presented in either the Gate 2 submission or the note to Ofwat on SIPR suitability. A summary of the key risks and issues are presented below.

Ground risk

As presented in the Gate 2 submission a detailed analysis of risk was undertaken to identify the risks to be allocated under the contractual arrangements. Internal engineering and construction experts and the market engagement undertaken to date identified the key risk for FR as ground risk (specifically hydraulic uplift and archaeology). There are plans to undertake detailed ground investigations studies as part of the preparation for the tender.

Providing bidders with detailed technical information will be critical to enable them to price the risk. Sophisticated, appropriately calibrated and reasonable commercial, regulatory and financial mechanisms are also required to manage this risk. This will be a key focus area as part of Gate 3.

Packaging

As mentioned above a key area that the project sponsors need to determine is what the scope of the SIPR tender is. There are several dimensions which need to be considered to determine this including (1) market appetite and capacity (2) value for customers (3) interoperability (4) overall allocation of risk and (5) DCO alignment.

Another key factor is the timing of construction and pricing. The transfer and treatment water works components of the project will not start construction until several years into the construction of the reservoir so that all assets are commissioned simultaneously. There is no value to customers in having a treatment works completed and dry commissioned if there is no water to treat. If all assets are delivered under a single SIPR framework they are taking a risk of pricing works several years in the future.

Current market conditions

As part of the early market engagement undertaken to support the Gate 2 submission, we engaged with several construction contractors in the market. They noted a number of major challenges facing construction in the water sector currently including supply chain vulnerability, price volatility, a tight labour market and competition with other sectors which are prioritising delivery speed over efficiency e.g. energy and transport. As part of the design of the detailed commercial and tender arrangements we will need to continually engage with the market to ensure that they reflect the current market conditions and are sufficiently attractive to create competitive tension.

Water trading arrangements

The structuring of the water trading arrangements between the three (or more) parties need to also develop an approach to bulk supply charges, water trading incentives and set robust, fair and prescriptive operational procedures for drought and operational events. This is particularly complex for FR as the overall scheme involves raw water abstraction, INNS treatment, raw water transfer, reservoir operations, drinking water quality treatment and transfer of treated water across a wide geographical area. A limitation on the water which can be abstracted may have knock on effects across the asset.

Another component to this is which party holds and manage the water abstraction licences, what the contractual provisions are for changes to those licences and how the risk is managed.

Procurement timeline interdependencies

Tender launch is dependent on the time required to complete pre-tender activities, which are subject to a variety of factors including the capacity of the market, Secretary of State approval of SIPR designation, potential design changes, review and acceptance of submissions to Ofwat, delays to the DCO process, or land purchase and other enabling works (e.g. ground investigations).

There are two hard dependencies with the DCO process (1) tender launch and DCO submission (as the bidders will require certainty of the scope of the project) and (2) contract award, financial close and sufficient discharge of DCO conditions to provide comfort to lenders.

It also assumes that a similar gated process to the DPC control point process would be in place for SIPR. The key interdependency in the process with the RAPID programme is the DCO award, discharge of conditions and the preferred bidder stage.

The project sponsors are also considering the alignment between the FR with SLR tenders, as both projects are assumed to be delivered under similar arrangements and at similar times. Across the pre-tender activities for SLR/FR and A2AT, synergies can be obtained but it will be highly dependent on the timing/effort (e.g. being able to submit joint proposals to the same management board), and ability to reuse thinking/analysis

(e.g. apply the same approach to manage and mitigate geological complications risk for both schemes).

Impact of DPC on accounting treatment and credit ratings

There has not yet been a DPC project which has reached financial close, so the accounting treatment and formal views of the credit rating agencies are not available. To assess the impact of DPC on appointees' ability to service debt, the final allocation of risk needs to be understood. Credit rating agencies are not beholden to the accounting treatment if they view the arrangements as being a risk to the appointee's ability to service debt.

Initial work undertaken by the project sponsors suggest that DPC is likely to be treated as debt on the balance sheet even if delivery is by a third party. The impact on the appointees' credit rating of the reservoirs will depend on the allocation of risk between AWS, CW, the CAP, customers and any multi-sector parties. It will be dependent on several complex contractual arrangements.

Recognition as debt on the sponsors' balance sheet will have serious implications for AWS' Whole Business Securitisation (WBS) debt structuring. The scale of this project relative to the RCV's of AWS or CW means that any risk to them will have a huge impact on credit ratings. This will also be of concern to the bidders who will want to understand the contract counterparty risk of the arrangement.

SIPR was designed to financially insulate Thames Water from Thames Tideway Tunnel (TTT) due to the threat it posed to Thames Water's ability to serve its customers through its other activities. SIPR is a proven framework which has achieved this and will provide comfort to sponsor appointees' shareholders, lenders and potential bidders. This will mitigate the risk to normal operations of the project sponsors if FR runs into unexpected delivery difficulties, ensuring that customers are protected.

The credit rating impact on the sponsor companies and the accounting treatment of the SIPR arrangements will depend on the final allocation of risk between AWS, CW, customers and the CAP/IP.

Reservoir Act 1975 and designation of water undertaker

Under RA75 the 'undertakers' are defined as the party who are responsible for meeting the obligations under the act. 'Undertakers' can commit certain offences such as failure to comply with statutory provisions, prepare a flood plan, carry out visual inspection. These offences are potentially subject to an unlimited fine in the crown court.

If the scheme was delivered under DPC our current view is that AWS would be the undertaker and would be exposed to that liability as AWS are not delegating AWS's functions to the CAP. This would have implications for AWS' credit rating. To be able to successfully manage that risk AWS would require: (1) legal provisions in the contract with the CAP to manage that risk which could be viewed as a risk by the market; and

(2) a regulatory allowance to fund the activities associated with that risk. There is a question as to whether a separate sponsor appointee as a water taker could also be recognised as an undertaker under RA75 i.e. CW.

Under SIPR the IP could be designated as the undertaker and take on that responsibility which would significantly simplify this complexity. Although there is some legal ambiguity as a project licence is not named as an undertaker in the Water Industry Act 1991. The project sponsors are seeking further legal advice on this point.

Multi-sector and multi-company

DPC is set up for a single revenue stream based on typical project finance principles. SIPR is in effect corporate finance in perpetuity and can more easily take on revenue risk from multiple parties. SIPR can support multi-party or multi-sector benefits better than DPC due to the more restrictive structure of the DPC model including the finite contract length.

The CEPA report commissioned by RAPID broadly confirms this conclusion.[3] It noted that under the SIPR model the retrofitting of additional use cases could be managed through the regulator price control process. Whereas under DPC this would need to be through contractual variations. Project finance contracts inherently includes less flexibility and is constrained by the contract length.

DWI enforcement powers

As noted by Ofwat in the 'Stocktake for competition' an issue with the DPC framework is that the DWI do not have the legal authority to take enforcement action against the CAP. The incumbent appointee would be the only party the DWI could take enforcement action against. Therefore, the DWI may be apprehensive of a DPC arrangement that would weaken the accountability of the appointee. Under a SIPR arrangement, it may be possible for the DWI to take enforcement action against the IP as a licence holder, although this requires further legal analysis.

Date of response to RAPID	8th December 2022
Strategic solution contact / responsible person	Alexa Sherry, SLR Project Manager asherry2@anglianwater.co.uk

[3] Developing a commercial and legal model for multi-sector reservoir systems - CEPA/Agilia report for RAPID - Ofwat

Gate two query process

Strategic solution(s)	Fenland Reservoir
Query number	FEN003
Date sent to company	14/12/2022
Response due by	16/12/2022 extended to 20/12/2022

Query

1. Can you please provide us with more detail as to how indirect costs have been calculated within your CAPEX costs?
2. Are the tables used to calculate Optimism Bias available to send?
3. Do you have a quantiative risk register that is available to view?
4. Have activites been planned post Gate 2 to inform risk assessment?

Solution owner response

1. The indirect cost element included within the CAPEX Construction costs have been calculated as

- 38% Contractor Costs
- 24% Client Costs
- totalling 62%

This aligns to Anglian Waters business as usual CAPEX forecasts within their C55 unit cost platform.

2. Our Optimism Bias (OB) assessment was developed using the assessment tables that show an initial assessment output of 49.65%. Following a collaborative review of scheme development and risk this was then reduced to the current assessment of 37.38% used in the gate two submission. The OB

assessment tables are provided attached and show the initial assessment and the assessment following review.

3. The Risk Register at this stage of development is based upon a detailed Qualitative analysis rather than Quantitative analysis. At the time of submission, the Qualitative risk register included 176 risks, each of which were assessed in terms of the impact and probability they posed to the project. Recognising that the level of design at this stage of the project lifecycle is not suited to a Quantitative approach to risk management, we have rather applied individual risk values as a % of the CAPEX estimate, in order to develop an appropriate risk budget. This was then tested to ensure that the overall risk percentage (20%) aligns to expected norms at this stage in the project lifecycle. We are satisfied that this is the case, and is comparable to other SROs within the RAPID process. We can share further detail to evidence this data and approach if required.

4. Our G3 programme involves a ramp-up across several functions such as design and environment, stakeholder, planning and procurement, and including project management and commercial capabilities. Our project management capability incorporates risk management in support of the various technical functions, and including the activity to further develop the Qualitative Risk Register into a Quantitative Risk Register as the scheme design is matured.

Date of response to RAPID	20.12.2022
Strategic solution contact / responsible person	Alexa Sherry, Project Manager

Option Name	Fens
Option Reference	Preferred Site
Date of OB Review 1	27/07/2022
Date of OB Review 2	17/08/2022

INITIAL RUN OF OPTIMISM BIAS BEFORE COLLABORATIVE REVIEW 17 AUGUST 2022, PROVIDED FOR REFERENCE

Contributory factors	Confidence Grade Criteria: High Confidence	Confidence Grade Criteria: Medium Confidence	Confidence Grade Criteria: Low Confidence	Additional Guidance	Combined Upper Bound Optimism Bias (%)	Non-Standard Civil Engineering: Proportion of Non-Standard Civil Engineering Capex 80%	Non-Standard Civil Engineering: Upper Bound 66%	Non-Standard Civil Engineering: Lower bound 6%	Standard Civil Engineering: Proportion of Standard Civil Engineering Capex 20%	Standard Civil Engineering: Upper Bound 44%	Standard Civil Engineering: Lower bound 3%	Adjusted Optimism Bias (%)	Check whether cost proportions have been provided across the required confidence bands		July & August 2022 Review Commentary for adjustment of Optimism Bias assessment for Gate Two submission
						Proportion of cost in each confidence band: Non-Standard Civil Engineering Components included - therefore proportion of cost required to be assigned to confidence bands in these columns			Proportion of cost in each confidence band: Standard Civil Engineering Components included - therefore proportion of cost required to be assigned to confidence bands in these columns						
						Required	Required	Required		Required	Required	Required				
					61.60%	High	Medium	Low	Mitigation Factor	High	Medium	Low	Mitigation Factor	**49.65%**	Check for Non-Standard components	Check for Standard components	
Procurement						Required	Required	Required		Required	Required	Required					
Complexity of contract structure	Clear, well establishment procurement route and processes and/or detailed procurement plan or full commercial business case in place.	Contract strategy or outline commercial business case in place, but details still to be developed.	No contract strategy or commercial business case in place.	*For business as usual options that will be procured through existing water company frameworks then these may be assessed as high confidence. Options should score low confidence where they involve multiple water companies / asset owners, or may be procured through Direct Procurement for Customers, and where detailed procurements plans have not been developed.*				1	0			1	0		OK	OK	The next phase of work will need to establish contract and procurement strategy. An emerging strategy and identification of preferred delivery options is currently in progress, but will be finalised in subsequent phases.
Late contractor involvement in design	Design is business as usual and costs are based upon accurate cost models, or significant contractor involvement in design.	Design is business as usual and costs are based upon cost models with medium confidence, or initial contractor involvement in key aspects of design.	Design is not business as usual for company and the contractor has not been involved in design.	*Where there has not been early contractor involvement then low confidence should be assigned, unless the confidence in the cost models gives an equivalent level of confidence in the estimate.*				1	0			1	0		OK	OK	The next phase of work will need to establish contract and procurement strategy. Engagement with the supply chain will be developed in subsequent phases.
Poor contractor capabilities	Contractors and suppliers expected to bid for work have recent experience of similar construction projects and supply of similar process plant and equipment.	Contractors and suppliers expected to bid for work have limited recent experience of similar construction projects and supply of similar process plant and equipment.	Contractors and suppliers expected to bid for work have little/no recent experience of similar construction projects and supply of similar process plant and equipment.	*Option types where there is limited recent experience in the UK (including large reservoirs, reuse and desalination options) should be scored as medium/low confidence.*				1	0		1		0.5		OK	OK	The work is standard, however the scale of the work is not standard. Few reservoir projects have been completed in the UK in the last 30 years.
Government guidelines	There are multiple recent precedents of procuring projects of a similar nature and detailed procurement guidance is in place.	Some recent precedents of procuring projects of a similar nature and detailed procurement guidance is in place.	There is limited recent experience of procuring projects of a similar nature and detailed procurement guidance is not in place.	*Where an option may be implemented though Direct Procurement for Customers, or other less well established procurement routes then low confidence should be assigned.*				1	0			1	0		OK	OK	Procurement Strategy DPC (Direct procurement for Stakeholders). Procurement route presumed at present to follow DPC, in subsequent phases.
Disputes & claims occurred	Scope and payment mechanism clearly defined in contract and no dependencies on third parties.	Scope and payment mechanism partially defined and there are no major dependencies on third parties.	Scope and payment mechanism currently ill-defined and/or there are significant dependencies on third parties.					1	0			1	0		OK	OK	Projects of this magnitude are at risk from significant disputes and claims.
Information management	Information management systems between key stakeholders are in place, clearly defined and effective (e.g. project specific, or already existing for a project under an existing framework).	Some key stakeholders for procurement identified and information management system has been initiated, but details are still to be developed before it can be effective.	Key stakeholders for procurement not identified, or information management systems not in place and effective (e.g. project specific, or already existing for a project under an existing framework).	*Where information management systems for contract and stakeholder management have not been initiated then assign low confidence.*			1		0.5		1		0.5		OK	OK	Information management is critical from the early stages of the project lifecycle. Key areas of concern remain with multiple stakeholders, logistics and integration with infrastructure assets.
Other													0			NOT OK - must sum to 1	
Procurement combined					**8.01%**	Average Mitigation Factor			0.083	Average Mitigation Factor			0.143	**7.336%**	Average Mitigation Factor		
Project specific						Required	Required	Required		Required	Required	Required					
Design complexity	Design is business as usual or design contains complexities but these are well understood and detailed plans and designs are in place to address them.	Design is not business as usual due to several complexities. The design mitigations to address these complexities have only been partially understood and addressed.	Design is complex, for example due to the nature of the project or interfaces with existing assets, or constraints. Design mitigations are not yet in place.	*Options with significant design complexities, or constrained sites, and significant integration with existing operational infrastructure may be assigned low confidence. Options that are business as usual, on greenfield, unconstrained sites may be assigned high confidence.*				1	0		1		0.5		OK	OK	Due to the scale and the environmental complexities, the full scope of the impact on other assets and stakeholders is to be further developed in the next phase. The work will Impact multiple land owners and will require working with other schemes.
Degree of Innovation	Design is business as usual and/or innovations are well developed and tested for the specific application.	Design incorporates technology / innovations that have been partially tested and proven for the specific application.	Design incorporates new technologies and these have not yet been fully tested and proven for the specific application.	*Options using technologies that are well established in the UK should be assigned high confidence. Options where technologies, or the application of technologies, is less well established in the UK (e.g. reuse, desalination) should be assigned medium confidence.*			1		0.5	1			1		OK	OK	Due to the scale of the project it cannot be considered as Business As Usual (BAU) However technology is not considered frontier. Although the magnitude of the project provides opportunities to explore low carbon approaches, the confidence in these will be lower than traditional approaches.
Environmental impact	Environmental impacts well understood (e.g. impact on receiving water bodies, noise, INNS transfer, designated sites, visual amenity etc), mitigations identified where required and included in costs.	Some assessment of environmental impacts has been carried out and mitigations have been identified and costed to address the most significant of these. Other mitigations will be required that have not yet been built into the costs.	Environmental impacts poorly understood (e.g. impact on receiving water bodies, noise, INNS transfer, designated sites, visual amenity etc), or significant environmental issues identified without agreement on mitigation to be built into costs.	*Except for options that are free from environmental constraints/risks it is unlikely that options at Gate 1 would achieve a higher level of confidence than medium at Gate 1 unless environmental risks have been identified, detailed and costed in the QCRA. For options with significant environmental risks that require investigation a low confidence score would be more applicable before accounting for the QCRA.*			1		0.5		1		0.5		OK	OK	Environmental assessments have been carried out. However solutions are subject to further development of the scheme. Consideration of Biodiversity Net Gain critical to further progress.
Other																	
Project specific combined					**19.10%**	Average Mitigation Factor			0.333	Average Mitigation Factor			0.667	**12.441%**	Average Mitigation Factor		
Client specific						Required	Required	Required		Required	Required	Required					
Inadequacy of the Business Case	Needs have been clearly identified. Key stakeholders needs identified and included in scope where applicable.	Partial identification of needs and initial engagement with stakeholders to refine requirements.	Initial identification of needs and output specification, without engagement with stakeholders to refine requirements.	*Confidence likely to be low at Gate 1 unless initial stakeholder requirements identified and reflected in option scope and/or specifically accounted for in QCRA.*				1	0			1	0		OK	OK	Adequacy of business case to be clearly defined against stakeholder interests and wider considerations. Risks and stakeholder objectives to be further analysed at Gate 3.
Large number of stakeholders	Stakeholder approvals not required, or key stakeholder approvals obtained, or key stakeholders largely supportive.	Some key stakeholders identified and views obtained, however some other stakeholders remain unidentified.	Stakeholders not clearly identified, views not known or some stakeholders are in active opposition.					1	0			1	0		OK	OK	Reservoir's key /Statutory stakeholders have been identified and contacted, however landowner sentiment will require further detailed investigation.

INITIAL RUN OF OPTIMISM BIAS BEFORE COLLABORATIVE REVIEW 17 AUGUST 2022, PROVIDED FOR REFERENCE

	Contributory factors	Confidence Grade Criteria			Additional Guidance	Combined Upper Bound Optimism Bias (%)	Non-Standard Civil Engineering				Standard Civil Engineering				Adjusted Optimism Bias (%)	Check whether cost proportions have been provided across the required confidence bands		July & August 2022 Review Commentary for adjustment of Optimism Bias assessment for Gate Two submission
							Proportion of Non-Standard Civil Engineering Capex			80%	Proportion of Standard Civil Engineering Capex			20%				
							Upper Bound			66%	Upper Bound			44%				
							Lower bound			6%	Lower bound			3%				
							Proportion of cost in each confidence band				Proportion of cost in each confidence band							
							Non-Standard Civil Engineering Components included - therefore proportion of cost required to be assigned to confidence bands in these columns			Mitigation Factor	Standard Civil Engineering Components included - therefore proportion of cost required to be assigned to confidence bands in these columns			Mitigation Factor				
							Required	Required	Required		Required	Required	Required					
		High Confidence	Medium Confidence	Low Confidence		61.60%	High	Medium	Low		High	Medium	Low		49.65%	Check for Non-Standard components	Check for Standard components	
38	Funding availability	Funding for the project is secure (e.g. project fully funded through price review / pass through arrangement).	Project funding uncertain e.g. project subject to efficiency challenges at price review which may require business case to be revisited	Project funding not secure, e.g. project dependent in part on partnership funding which is not secure.	*For options to be funded through the RAPID gated SRO process, or through a price review, a medium confidence score is considered appropriate.*			1		0.5		1		0.5		OK	OK	Funding is not fully secured at this time.
39	Project management team	Scope of work is business as usual for company delivery teams.	Company delivery team has some experience in implementing projects of this nature, but their relevant experience is not extensive.	Company delivery teams are not experienced in implementing projects of this nature.					1	0		1		0.5		OK	OK	Assessed as Medium for Standard approaches There is experience within the team for up to 1000mm dia pipes, therefore medium scoring - However little recent experience in large raw water reservoirs.
40	Poor project intelligence	Good understanding of key project data and no key assumptions made where there is significant uncertainty (e.g. ground conditions, condition of existing assets, treatment requirements).	Partial understanding of key project data and there has been some work undertaken to reduce the uncertainty around key assumptions (e.g. ground conditions, condition of existing assets, treatment requirements).	Significant gaps in project data and key assumptions made where there is significant uncertainty.					1	0		1		0.5		OK	OK	Design stage and the scale of the work the level of detail is to be developed in the next phase.
41	Other																	
42	Client specific combined					20.94%	Average Mitigation Factor			0.100	Average Mitigation Factor			0.300	18.476%	Average Mitigation Factor		
43	**Environment**						Required	Required	Required		Required	Required	Required					
44	Public relations	Project business as usual and not expected to raise local opposition, or local stakeholders aware and largely primarily supportive, no protest expected.	Project could lead to some local opposition, however there has been some engagement with key stakeholders and it is likely that the major concerns raised can be resolved.	Project could lead to local opposition once local stakeholders aware, or stakeholders aware and evidence of significant local opposition.					1	0			1	0		OK	OK	Land owner and stakeholder support critical. Potential threat that this can represent a significant opposition.
45	Site characteristics	Site information well understood (e.g. archaeology, heritage assets, contamination etc.), mitigations identified where required and included in costs.	Site information partially understood (e.g. archaeology, heritage assets, contamination etc.), mitigations identified where required and included in costs.	Site information poorly understood (e.g. archaeology, heritage assets, contamination etc.) and mitigations not identified.					1	0			1	0		OK	OK	British Geological Society Ground Information Records (BGL ASTM) have been reviewed against selected regional boreholes; however, this could be subject to change in subsequent phases. Desktop study carried out to date.
46	Permits / consents / approvals	No permits and consents required, or permits and consents obtained.	Permits and consents required, but regulators, planning authorities and Government supportive.	Permits, consents and approvals required from regulators, planning authorities and/or Government and obtaining these presents a material risk.	*Confidence likely to be low at Gate 1 unless option is business as usual or risks well developed and costed in QRA.*				1	0		1		0.5		OK	OK	Reservoir development may expect challenge due to the level of uncertainty of support by the authorities and general public and due to significant land take and scale of the DCO application.
47	Other																	
48	Environment combined					5.24%	Average Mitigation Factor			0.000	Average Mitigation Factor			0.167	5.120%	Average Mitigation Factor		
49	**External influences**						Required	Required	Required		Required	Required	Required					
50	Political	Project is either unlikely to attract political attention, or political stakeholders are supportive.	Project could attract political attention, while there is not cross-party political support the majority of political stakeholders are likely to be supportive.	Project has the potential to attract political attention and lacks cross-party political support.	*Projects that are high profile and considered likely to be controversial should be assigned low confidence.*				1	0		1		0.5		OK	OK	Project will attract political attention, however it is considered unlikely that there will be significant political opposition. Local MP response will potentially focus opinion.
51	Economic	Project has a short lead time and is less vulnerable to changes in funding and input costs.	Project has a medium lead time so there is some risk that a change in the economic environment could impact demands and / or input costs.	Project has long lead time and change in economic environment could impact demands and/or input costs.	*When considering lead times (including planning and development time) assume short for ≤5 years, Medium for 6-10 years, Long for >10years.*				1	0			1	0		OK	OK	Current economic uncertainty has a significant impact on this project.
52	Legislations/regulations	Project is business as usual and /or required standards and regulations are well established and unlikely to change.	Required standards and regulations are relatively new and therefore less well established.	Key standards and regulations are under development, or subject to change.	*For new technologies or novel applications of existing technologies in the UK that potentially require regulatory approvals (e.g. for environmental or drinking water quality reasons) then a medium or low confidence should be applied. High confidence should be applied for business as usual schemes where no regulatory or legislative risks are envisaged.*				1	0		1		0.5		OK	OK	For Standard Civil Engineering there exists well established legislation and guidance in place. Non Standard scoring is associated with the reservoir legislation - 20 July 2022 the secretary of state for Rural affairs has made a statement that they want to make changes. Regulation is changing for the transfer and treatment [illegible]
53	Technology	Technology (e.g. treatment processes, smart metering technology) is well established, accepted by regulators and unlikely to change during the project lead time.	Technology (e.g. treatment processes, smart metering technology) is relatively new. While it has not yet been accepted by regulators, it is likely to be and therefore a change in the requirements is unlikely.	Technology (e.g. treatment processes, smart metering technology) is new and/or is subject to rapid innovation which may lead to changes in requirements.	*Treated water transfers and conventional treatment processes should be scored high confidence. For novel treatment processes or novel application of tested treatment processes (e.g. for INNS transfer mitigation, desalination or reuse) medium confidence is considered appropriate.*		1			1		1		0.5		OK	OK	Work with Key Subject Matter Experts required in order to leverage appropriate technologies to deliver efficient solutions.
54	Other																	
55	External influences combined					8.32%	Average Mitigation Factor			0.250	Average Mitigation Factor			0.375	6.281%	Average Mitigation Factor		

Option Name	Fens
Option Reference	Preferred Site
Date of OB Review 1	27/07/2022
Date of OB Review 2	17/08/2022

OPTIMISM BIAS ASSESSMENT FOLLOWING COLLABORATIVE REVIEW ON 17 AUGUST 2022, REPRESENTING GATE TWO SUBMISSION

Contributory factors	Confidence Grade Criteria: High Confidence	Confidence Grade Criteria: Medium Confidence	Confidence Grade Criteria: Low Confidence	Additional Guidance	Non-Standard Civil Engineering Components included - therefore proportion of cost required to be assigned to confidence bands in these columns: Required High	Required Medium	Required Low	Mitigation Factor	Standard Civil Engineering Components included - therefore proportion of cost required to be assigned to confidence bands in these columns: Required High	Required Medium	Required Low	Mitigation Factor	Check whether cost proportions have been provided across the required confidence bands: Check for Non-Standard components	Check for Standard components
Combined Upper Bound Optimism Bias (%)					Non-Standard Civil Engineering: Proportion of Non-Standard Civil Engineering Capex			80%	Standard Civil Engineering: Proportion of Standard Civil Engineering Capex			20%	Adjusted Optimism Bias (%)	
					Upper Bound			66%	Upper Bound			44%		
					Lower bound			6%	Lower bound			3%		
Result from: OPTIMISM BIAS ASSESSMENT FOLLOWING COLLABORATIVE REVIEW ON 17 AUGUST 2022, REPRESENTING GATE TWO SUBMISSION					Proportion of cost in each confidence band				Proportion of cost in each confidence band				Result from: OPTIMISM BIAS ASSESSMENT FOLLOWING COLLABORATIVE REVIEW ON 17 AUGUST 2022, REPRESENTING GATE TWO SUBMISSION	
61.60%					Required High	Required Medium	Required Low		Required High	Required Medium	Required Low		37.38%	
Procurement					Required	Required	Required		Required	Required	Required			
Complexity of contract structure	Clear, well establishment procurement route and processes and/or detailed procurement plan or full commercial business case in place.	Contract strategy or outline commercial business case in place, but details still to be developed.	No contract strategy or commercial business case in place.	*For business as usual options that will be procured through existing water company frameworks then these may be assessed as high confidence. Options should score low confidence where they involve multiple water companies / asset owners, or may be procured through Direct Procurement for Customers, and where detailed procurements plans have not been developed.*			1	0			1	0	OK	OK
Late contractor involvement in design	Design is business as usual and costs are based upon accurate cost models, or significant contractor involvement in design.	Design is business as usual and costs are based upon cost models with medium confidence, or initial contractor involvement in key aspects of design.	Design is not business as usual for company and the contractor has not been involved in design.	*Where there has not been early contractor involvement then low confidence should be assigned, unless the confidence in the cost models gives an equivalent level of confidence in the estimate.*			1	0			1	0	OK	OK
Poor contractor capabilities	Contractors and suppliers expected to bid for work have recent experience of similar construction projects and supply of similar process plant and equipment.	Contractors and suppliers expected to bid for work have limited recent experience of similar construction projects and supply of similar process plant and equipment.	Contractors and suppliers expected to bid for work have little/no recent experience of similar construction projects and supply of similar process plant and equipment.	*Option types where there is limited recent experience in the UK (including large reservoirs, reuse and desalination options) should be scored as medium/low confidence.*			1	0		1		0.5	OK	OK
Government guidelines	There are multiple recent precedents of procuring projects of a similar nature and detailed procurement guidance is in place.	Some recent precedents of procuring projects of a similar nature and detailed procurement guidance is in place.	There is limited recent experience of procuring projects of a similar nature and detailed procurement guidance is not in place.	*Where an option may be implemented though Direct Procurement for Customers, or other less well established procurement routes then low confidence should be assigned.*			1	0			1	0	OK	OK
Disputes & claims occurred	Scope and payment mechanism clearly defined in contract and no dependencies on third parties.	Scope and payment mechanism partially defined and there are no major dependencies on third parties.	Scope and payment mechanism currently ill-defined and/or there are significant dependencies on third parties.				1	0			1	0	OK	OK
Information management	Information management systems between key stakeholders are in place, clearly defined and effective (e.g. project specific, or already existing for a project under an existing framework).	Some key stakeholders for procurement identified and information management system has been initiated, but details are still to be developed before it can be effective.	Key stakeholders for procurement not identified, or information management systems not in place and effective (e.g. project specific, or already existing for a project under an existing framework).	*Where information management systems for contract and stakeholder management have not been initiated then assign low confidence.*		1		0.5		1		0.5	OK	OK
Other														
Procurement combined					Average Mitigation Factor			0.083	Average Mitigation Factor			0.167	Average Mitigation Factor	
8.01%													7.310%	
Project specific					Required	Required	Required		Required	Required	Required			
Design complexity	Design is business as usual or design contains complexities but these are well understood and detailed plans and designs are in place to address them.	Design is not business as usual due to several complexities. The design mitigations to address these complexities have only been partially understood and addressed.	Design is complex, for example due to the nature of the project or interfaces with existing assets, or constraints. Design mitigations are not yet in place.	*Options with significant design complexities, or constrained sites, and significant integration with existing operational infrastructure may be assigned low confidence. Options that are business as usual, on greenfield, unconstrained sites may be assigned high confidence.*		1		0.5		1		0.5	OK	OK
Degree of Innovation	Design is business as usual and/or innovations are well developed and tested for the specific application.	Design incorporates technology / innovations that have been partially tested and proven for the specific application.	Design incorporates new technologies and these have not yet been fully tested and proven for the specific application.	*Options using technologies that are well established in the UK should be assigned high confidence. Options where technologies, or the application of technologies, is less well established in the UK (e.g. reuse, desalination) should be assigned medium confidence.*		1		0.5	1			1	OK	OK
Environmental impact	Environmental impacts well understood (e.g. impact on receiving water bodies, noise, INNS transfer, designated sites, visual amenity etc), mitigations identified where required and included in costs.	Some assessment of environmental impacts has been carried out and mitigations have been identified and costed to address the most significant of these. Other mitigations will be required that have not yet been built into the costs.	Environmental impacts poorly understood (e.g. impact on receiving water bodies, noise, INNS transfer, designated sites, visual amenity etc), or significant environmental issues identified without agreement on mitigation to be built into costs.	*Except for options that are free from environmental constraints/risks it is unlikely that options at Gate 1 would achieve a higher level of confidence than medium at Gate 1 unless environmental risks have been identified, detailed and costed in the QCRA. For options with significant environmental risks that require investigation a low confidence score would be more applicable before accounting for the QCRA.*		1		0.5		1		0.5	OK	OK
Other														
Project specific combined					Average Mitigation Factor			0.500	Average Mitigation Factor			0.667	Average Mitigation Factor	
19.10%													9.961%	
Client specific					Required	Required	Required		Required	Required	Required			
Inadequacy of the Business Case	Needs have been clearly identified. Key stakeholders needs identified and included in scope where applicable.	Partial identification of needs and initial engagement with stakeholders to refine requirements.	Initial identification of needs and output specification, without engagement with stakeholders to refine requirements.	*Confidence likely to be low at Gate 1 unless initial stakeholder requirements identified and reflected in option scope and/or specifically accounted for in QCRA.*	1			1	1			1	OK	OK
Large number of stakeholders	Stakeholder approvals not required, or key stakeholder approvals obtained, or key stakeholders largely supportive.	Some key stakeholders identified and views obtained, however some other stakeholders remain unidentified.	Stakeholders not clearly identified, views not known or some stakeholders are in active opposition.			1		0.5		1		0.5	OK	OK

OPTIMISM BIAS ASSESSMENT FOLLOWING COLLABORATIVE REVIEW ON 17 AUGUST 2022, REPRESENTING GATE TWO SUBMISSION

	Contributory factors	Confidence Grade Criteria			Additional Guidance	Combined Upper Bound Optimism Bias (%)	Non-Standard Civil Engineering				Standard Civil Engineering				Adjusted Optimism Bias (%)	Check whether cost proportions have been provided across the required confidence bands	
							Proportion of Non-Standard Civil Engineering Capex			80%	Proportion of Standard Civil Engineering Capex			20%			
							Upper Bound			66%	Upper Bound			44%			
							Lower bound			6%	Lower bound			3%			
						Result from: OPTIMISM BIAS ASSESSMENT FOLLOWING COLLABORATIVE REVIEW ON 17 AUGUST 2022, REPRESENTING GATE TWO SUBMISSION	Proportion of cost in each confidence band				Proportion of cost in each confidence band				Result from: OPTIMISM BIAS ASSESSMENT FOLLOWING COLLABORATIVE REVIEW ON 17 AUGUST 2022, REPRESENTING GATE TWO SUBMISSION		
							Non-Standard Civil Engineering Components included - therefore proportion of cost required to be assigned to confidence bands in these columns			Mitigation Factor	Standard Civil Engineering Components included - therefore proportion of cost required to be assigned to confidence bands in these columns			Mitigation Factor			
							Required	Required	Required		Required	Required	Required				
		High Confidence	Medium Confidence	Low Confidence		61.60%	High	Medium	Low		High	Medium	Low		37.38%	Check for Non-Standard components	Check for Standard components
38	Funding availability	Funding for the project is secure (e.g. project fully funded through price review / pass through arrangement).	Project funding uncertain e.g. project subject to efficiency challenges at price review which may require business case to be revisited	Project funding not secure, e.g. project dependent in part on partnership funding which is not secure.	*For options to be funded through the RAPID gated SRO process, or through a price review, a medium confidence score is considered appropriate.*			1		0.5		1		0.5		OK	OK
39	Project management team	Scope of work is business as usual for company delivery teams.	Company delivery team has some experience in implementing projects of this nature, but their relevant experience is not extensive.	Company delivery teams are not experienced in implementing projects of this nature.					1	0		1		0.5		OK	OK
40	Poor project intelligence	Good understanding of key project data and no key assumptions made where there is significant uncertainty (e.g. ground conditions, condition of existing assets, treatment requirements).	Partial understanding of key project data and there has been some work undertaken to reduce the uncertainty around key assumptions (e.g. ground conditions, condition of existing assets, treatment requirements).	Significant gaps in project data and key assumptions made where there is significant uncertainty.					1	0		1		0.5		OK	OK
41	Other																
42	Client specific combined					**20.94%**	Average Mitigation Factor			0.400	Average Mitigation Factor			0.600	**12.743%**	Average Mitigation Factor	
43	**Environment**						Required	Required	Required		Required	Required	Required				
44	Public relations	Project business as usual and not expected to raise local opposition, or local stakeholders aware and largely primarily supportive, no protest expected.	Project could lead to some local opposition, however there has been some engagement with key stakeholders and it is likely that the major concerns raised can be resolved.	Project could lead to local opposition once local stakeholders aware, or stakeholders aware and evidence of significant local opposition.				1		0.5		1		0.5		OK	OK
45	Site characteristics	Site information well understood (e.g. archaeology, heritage assets, contamination etc.), mitigations identified where required and included in costs.	Site information partially understood (e.g. archaeology, heritage assets, contamination etc.), mitigations identified where required and included in costs.	Site information poorly understood (e.g. archaeology, heritage assets, contamination etc.) and mitigations not identified.				1		0.5		1		0.5		OK	OK
46	Permits / consents / approvals	No permits and consents required, or permits and consents obtained.	Permits and consents required, but regulators, planning authorities and Government supportive.	Permits, consents and approvals required from regulators, planning authorities and/or Government and obtaining these presents a material risk.	*Confidence likely to be low at Gate 1 unless option is business as usual or risks well developed and costed in QRA.*			1		0.5		1		0.5		OK	OK
47	Other																
48	Environment combined					**5.24%**	Average Mitigation Factor			0.500	Average Mitigation Factor			0.500	**2.848%**	Average Mitigation Factor	
49	**External influences**						Required	Required	Required		Required	Required	Required				
50	Political	Project is either unlikely to attract political attention, or political stakeholders are supportive.	Project could attract political attention, while there is not cross-party political support the majority of political stakeholders are likely to be supportive.	Project has the potential to attract political attention and lacks cross-party political support.	*Projects that are high profile and considered likely to be controversial should be assigned low confidence.*			1		0.5		1		0.5		OK	OK
51	Economic	Project has a short lead time and is less vulnerable to changes in funding and input costs.	Project has a medium lead time so there is some risk that a change in the economic environment could impact demands and / or input costs.	Project has long lead time and change in economic environment could impact demands and/or input costs.	*When considering lead times (including planning and development time) assume short for ≤5 years, Medium for 6-10 years, Long for >10years.*				1	0			1	0		OK	OK
52	Legislations/regulations	Project is business as usual and /or required standards and regulations are well established and unlikely to change.	Required standards and regulations are relatively new and therefore less well established.	Key standards and regulations are under development, or subject to change.	*For new technologies or novel applications of existing technologies in the UK that potentially require regulatory approvals (e.g. for environmental or drinking water quality reasons) then a medium or low confidence should be applied. High confidence should be applied for business as usual schemes where no regulatory or legislative risks are envisaged.*			1		0.5		1		0.5		OK	OK
53	Technology	Technology (e.g. treatment processes, smart metering technology) is well established, accepted by regulators and unlikely to change during the project lead time.	Technology (e.g. treatment processes, smart metering technology) is relatively new. While it has not yet been accepted by regulators, it is likely to be and therefore a change in the requirements is unlikely.	Technology (e.g. treatment processes, smart metering technology) is new and/or is subject to rapid innovation which may lead to changes in requirements.	*Treated water transfers and conventional treatment processes should be scored high confidence. For novel treatment processes or novel application of tested treatment processes (e.g. for INNS transfer mitigation, desalination or reuse) medium confidence is considered appropriate.*		1			1	1			1		OK	OK
54	Other																
55	External influences combined					**8.32%**	Average Mitigation Factor			0.500	Average Mitigation Factor			0.500	**4.523%**	Average Mitigation Factor	

Gate two query process

Strategic solution(s)	Fens
Query number	FEN004
Date sent to company	14/12/2022
Response due by	16/12/2022

Query

Efficiency of Spend

The same categories for site selection have also been included in the SLR submission. Please provide information about how these costs were shared.

The proportional spend on Planning Strategy is high compared to other SROs. Please provide more information on why this is.

Please provide more information on early Gate 3 spend. (Scoping workshops and hydroecology).

Solution owner response

Site selection costs

Site selection was a four stage process, with stages 1 and 2 completed during gate one and stages 3 and 4 during gate two. Whilst we adopted the same site selection methodology for both Fens and SLR, the process for SLR took longer and involved additional work establishing the MCDA process and engaging with stakeholders in stage 3. Associated site-specific technical and environmental studies to support the site selection process varied between the schemes. Efficiency of spend was achieved through sharing the costs of methodology development (taking learning from stage 3 for SLR into the Fens site selection process); sharing decision-making workshops; sharing lessons learnt through

the process; and having the same team with technical experts and advisors. The efficiencies achieved were split between SLR and Fens.

	SLR	Fens
Site selection – Stage 3	£0.42m	£0.17m
Site selection – Stage 4	£0.47m	£0.39m
Concept design – reservoir	£0.44m	£0.27m
Concept design – transfers and treatment	£0.06m	£0.03m

Planning advisor

A total of £90k has been spent on planning advice between July 2021 and November 2022, across both SLR and Fens. This cost covers a Planning Advisor who has been embedded within the team and provided valuable advice throughout site selection to ensure the process is robust, and developing the project's consenting strategy. Site selection underpins the Development Consent Order (DCO) process, with consideration of alternatives forming a key element of the Environmental Impact Assessment, compulsory acquistion, flood risk sequential test and Habitats Regulation Assessment process. Ensuring that the site selection process (including selection criteria and associated environmental assessments) have been aligned with the Planning Act 2008 and the requirements of the draft National Policy statement has also been an important responsibility of the Planning Advisor.

Expertise and advice has also been drawn on when developing the DCO programme and as part of stakeholder engagment to ensure that stakeholders fully understand the DCO process. Our Planning Advisor has also presented at RAPID meetings and ACWG meetings to share expertise and lessons learned from other projects, including in respect of the principles of Good Design. The DCO process also has significant implications for the procurement process and the Planning Advisor has also engaged with the commercial team to develop a

process of design evolution and consenting which is capable of attracting competitive funding and delivery partners.

The complexity of the two reservoirs is signficantly higher than other SRO projects, particularly in respect of land acquistion. As the planning risk register highlights (ref. gate two query response FEN001), the Planning Act 2008 presents particularly significant risks to these two projects.

We believe that per £ of predicted capital expenditure the level of planning advice is proportionate and appropriate, given the complexity of the projects from a planning perspective.

Early gate three spend

A series of intensive scoping workshops were carried out to provide a greater level of granularity of the scope that informed both the gate three cost estimates, and the definition of scope for gate three work packages. These workshops were then followed up by working groups for the following 3 months, focussed on the scope definition for the main asset groups, across the design and environmental functions. We maximised the opportunity to engage our supply chain throughout these activities, bringing together potential partners to collectively discuss scope, challenges, and structure for the forward programme. These provided significant insight and expertise to the programme, and enabled early supply chain co-operation and buy-in. As a result we are now in the process of entering long-term contracts with delivery partners to achieve our tight programme through gates three and four, in an effective and efficient way, and with a capable set of delivery partners.

The hydroecology work package is a study to understand the potential impacts of the abstraction associated with the Fens Reservoir on the Wash. Initial data collection and analysis will assess the current flow and salinity patterns in the Wash; and will establish which habitats may be impacts by any changes related to the proposed abstraction. The work also requires river walkover surveys to collect information on barriers to fish passage and wetland connectivity. Hydrodynamic modelling of the Wash area will allow simulation of salinity and any impacts of the reservoir development, including climate change scenarios. This work is essential to support ongoing abstraction licence discussions with the Environment Agency, but was not completed before the gate two submission. This work is time critical and will form an important basis for ongoing environmental assessment works, and so was identified for early gate three spend.

Date of response to RAPID	20/12/2022
Strategic solution contact / responsible person	Alexa Sherry, SLR Project Manager

Gate two query process

Strategic solution(s)	Fens Reservoir
Query number	FEN005
Date sent to company	15/12/2022
Response due by	19/12/2022

Query

Is there any difference between the best value solution option and the least cost solution option? If yes, please indicate where we can find the comparison between best value and least cost solution option.

Solution owner response

The best value and least cost plans were determined through WRE's and draft WRMP best value planning processes.

The purpose of these processes from an SRO perspective was primarily to determine the need, size and timings of regional options. A range of options for the Fens Reservoir was modelled and evaluated within the Regional and Company Plans, and the preferred option was selected in both the least cost and best value plans.

The option developed within gate two reflects the level of scope deemed necessary to be successfully taken through the consenting process. As such, there is no difference between our best value solution option, and least cost solution option.

Where additional value can be delivered, not least to other sectors, this has been set out in the Systems Annex D, which identifies both the costs and benefits of this additional scope. These are not currently included in the project.

Many of these interventions in the system report will be best funded by others, and will likely be additive in the future, in which case a seperate business case and strategy will need to be developed to instigate these. Where targeted interventions are demonstated (over the course of gate three) to add value to the water customer, these will then be incorporated into the project, including best value assessments. This cost benefit analysis in currently underway for the the open channel transfer opportunity; work which is only possible now that the reservoir locations have been identified.

Date of response to RAPID	19th December 2022
Strategic solution contact / responsible person	Alexa Sherry, SLR Project Manager

Gate two query process

Strategic solution(s)	Fenland reservoir
Query number	FEN006
Date sent to company	16/12/2022
Response due by	20/12/2022

Query

The spend for EA and Natural England contributions is listed as £310k but EA estimates that EA and NAU costs for this solution are £430k. Please explain how these costs have been calculated and provide details around or reason for the differences. Please note - the estimated costs from the EA, do not include contributions to Natural England.

Solution owner response

The build-up to the declared £0.31m for this Activity is shown in Table 3 below.

Table 1 – View of expenditure at time of finalising forecast pre G2 submission

Activity	**17/18 pricing (£)**
NAU	102,374.46
EA	159,527.44
Natural England	34,231.93
Historic England	13,866.47
Total	**310,000.31**

The efficient spend table was collated prior to the formal gateway 2 submission in order to go through internal quality assurance checks. At this time, the best known information was used to collate a forecast of Gate 2 expenditure; the below table contains data that had been provided as a forecast of known Fens associated costs from the Environment Agency from the Environment Agency prior to our gate two submission:

Table 2 –EA expenditure & forecast at time of finalising forecast pre G2 submission

		NAU Gate 2 costs	**EA Area Lincs & Northants Gate 2 costs**	**Deflation metric**	**17/18 pricing**
Invoiced	Q2 2021/22	-	45,023.70	0.927935943	41,779.11
	Q3 2021/22	17,869.20	43,692.60		57,125.41
	Q4 2021/22	17,332.80	43,692.60		56,627.66
Invoiced total		**35,202.00**	**132,408.90**		**155,532.18**
Estimated	Q1 2022/23	20,937.60	42,565.50	0.861271676	54,693.42
	Q2 2022/23	20,000.00	TBC		17,225.43
	Q3 2022/23	20,000.00	TBC		17,225.43
	Q4 2022/23	20,000.00	TBC		17,225.43
Estimate		**80,937.60**	**42,565.50**		**106,369.72**
Total			**291,114.00**	**17/18 total:**	**261,901.90**

For the Natural England and Historic England contribution to this spend 'activity', the following data had been used:

Table 3 – Natural England Gate 2 expenditure

Financial Year	**Historic England**	**Natural England**	**Deflation metric**	**17/18 pricing**
21/22	-	20,940.00	0.92793594	19,430.98
22/23	16,100.00	17,185.00	0.86127168	28,667.43
Total:	**16,100.00**	**38,125.00**		**48,098.41**

As detailed above, a revised forecast has since been provided by the EA, and as such, an updated view of EA expenditure and forecast expenditure is available This is shown in Table 4.

Table 4 – Revised EA expenditure and forecast

		NAU Gate 2 costs	EA Area Lincs & Northants Gate 2 costs	Deflation metric	17/18 pricing
Invoiced	Q2 2021/22	-	45,023.70	0.92793594	41,779.11
	Q3 2021/22	17,869.20	43,692.60		57,125.41
	Q4 2021/22	17,332.80	43,692.60		56,627.66
	Q1 2022/23	20,937.60	42,565.50		58,926.81
	Q2 2022/23	21,109.20	45,472.50		61,783.55
Invoiced total		**77,248.80**	**220,446.90**		**276,242.54**
Estimated	Q3 2022/23	20,000.00	TBC	0.86127168	17,225.43
	Q4 2022/23	20,000.00	TBC		17,225.43
Estimate		**40,000.00**	**TBC**		**34,450.87**
Total			**337,695.70**	**17/18 total:**	**302,021.40**

Whilst this revised forecast does show an increase in the total anticipated Gate 2 expenditure to c.£338k (today's pricing), this does not yet align to the £430k referenced in the RAPID response above, albeit forecast expenditure from EA is outstanding. We recognise that if EA propose a level of spend that is commensurate with quarterly spend to date, moving forwards into Q2 2022/23, then this will begin to close the gap on forecast and EA's headline estimate of £430k quoted in the query above.

Based on Table 4, the current view of expenditure relating to this category, and based on EA estimates is shown in Table 5.

Table 5 – comparison of activity spend (17/18 pricing)

Activity	Original (£)	Updated (£)	Variance (£)
NAU	102,374.46	103,329.79	955.33
EA	159,527.44	198,691.61	39,164.17
Natural England	34,231.93	34,231.93	0.00
Historic England	13,866.47	13,866.47	0.00
Total	**310,000.30**	**450,119.80**	**40,119.50**

For clarity, the variance identified between the two EA forecasts, in 17/18 pricing, is £40,119.50. We recognise that this results in a higher spend than quoted in our G2 submission, and plan to undertake a full reconciliation once the invoices have been received and approved, and the full forecast is avaiable to the project.

Date of response to RAPID	20 December 2022
Strategic solution contact / responsible person	Alexa Sherry, Project Manager

Gate two query process

Strategic solution(s)	Fens reservoir
Query number	FEN007
Date sent to company	16/12/2022
Response due by	20/12/2022

Query

Please indicate in your plan where we can find information on:

A discussion on the selection process of potential materials and how lowest carbon options have been, and will be, considered.

Solution owner response

The focus of work to date has been on the reservoir site selection, preliminary transfer route assessments and water treatment process requirements; the designs are not yet sufficiently advanced to consider the potential material selection in any significant detail. At this stage the assessment has focussed on identifying the 'hotspots' where material selection could inform future mitigation opportunities.

That said, we have discussed material selection in the carbon assessment as presented in Appendix A.4 of the Environmental Appraisal Report (Annex E).

The capital and whole life carbon assessment in Annex E highlights that the majority of carbon emissions from the Fens Reservoir are associated with initial construction with earthworks activities, including importing material to site; excavating material from the borrow pit; and moving / placing material on site.

Carbon was an important criteria in the site selection process, and the best performing site chosen for the Fens Reservoir was one that was able to achieve a cut fill balance, thereby reducing the need for imported materials or disposal of surplus materials.

Our carbon assessment followed the guidance set out in the ACWG study identifying potential decarbonisation opportunities. The assessment determined that there are opportunities associated with the reservoir construction to reduce capital carbon by up to 59%, pending design development. We have highlighted the need for further work as the scheme develops, looking in particular at the transfer and water treatment works designs.

The assessment recognises that there are significant carbon emissions associated within the embodied carbon of the materials used in construction (*see Table 10 in the gate two submission*). This is particularly the case for substantial civil structures associated with the WTW and also temporary and permanent road structures. We will be seeking the opportunity to work with our supply chain to identify low carbon alternatives for concrete, steel, pipelines and other construction materials which we expect to help significantly reduce the carbon impacts of the scheme. We will also be developing a transport strategy which will assess opportunities to reduce the carbon impacts assocated with construction traffic (including alternate transport options such as rail or water) and ongoing operational and visitor traffic.

Overall, the scheme at its current stage of design has looked to minimise carbon impacts whilst maximising water supply and wider environmental benefits within the region. This has included some consideration of the potential materials to be used during construction (primarily associated with the reservoir embankment), however, there are still significant opportunities available to further mitigate the whole life emissions associated with the scheme. As the scheme progresses to gate three and beyond, it is expected more mitigation measures will be embedded into the scheme design and costing. The scheme carbon assessments will continue to be updated as the design evolves.

Date of response to RAPID	20th December 2022
Strategic solution contact / responsible person	Alexa Sherry, Project Manager