Gate 1 queries process

Strategic solution(s)	Grand Union Canal
Query number	GUC004 version 2
Date sent to company	10/08/2021
Response due by	12/08/2021

Query

1) Please could you provide a detailed description and calculation for the impact of different levels of utilisation on this SRO
    a What percentage was used as the minimum utilisation?
    b What assumptions and methodologies were used for deriving the values reported under minimum and maximum utilisation?
    c Is it possible to provide a comparison of minimum and maximum utilisation for total planning period indicative Capex of option (NPV) and total planning period indicative Opex of option (NPV) (and not only average incremental cost)?
2) Please could you provide further detail regarding conjunctive use and interaction with other sources within and outside the WRE supply area
3) Please clarify whether the stated DO values are calculated under a 1:200 or 1:500 event
4) Please state the methodology and tools used to derive the DO values and what assumptions have been used
5) Please expand on the methodology used to derive carbon costs
6) Please can you provide more detailed discussion around how this SRO is aligned with the sector's net zero target by 2030.

Solution owner response

In all cases the documents submitted to RAPID contain information that is commercially confidential. Please ensure that appropriate steps and safeguards are observed in order to maintain the security and confidentiality of this information. Any requests made to RAPID or any organisation party by third parties through the Freedom of Information Act 2000, the Environmental Information Regulations 2004, or any other applicable legislation requires prior consultation and consent by each of Affinity Water Limited, Severn Trent Water Limited, and the Canal & River Trust in relation to the Grand Union Canal Strategic Transfer Project before information is released as per the requirements under the respective legislations.

Query 1

Please could you provide a detailed description and calculation for the impact of different levels of utilisation on this SRO.

- What percentage was used as the minimum utilisation?
- What assumptions and methodologies were used for deriving the values reported under minimum and maximum utilisation?
- Is it possible to provide a comparison of minimum and maximum utilisation for total planning period indicative Capex of option (NPV) and total planning period indicative Opex of option (NPV) (and not only average incremental cost)?

Query Response

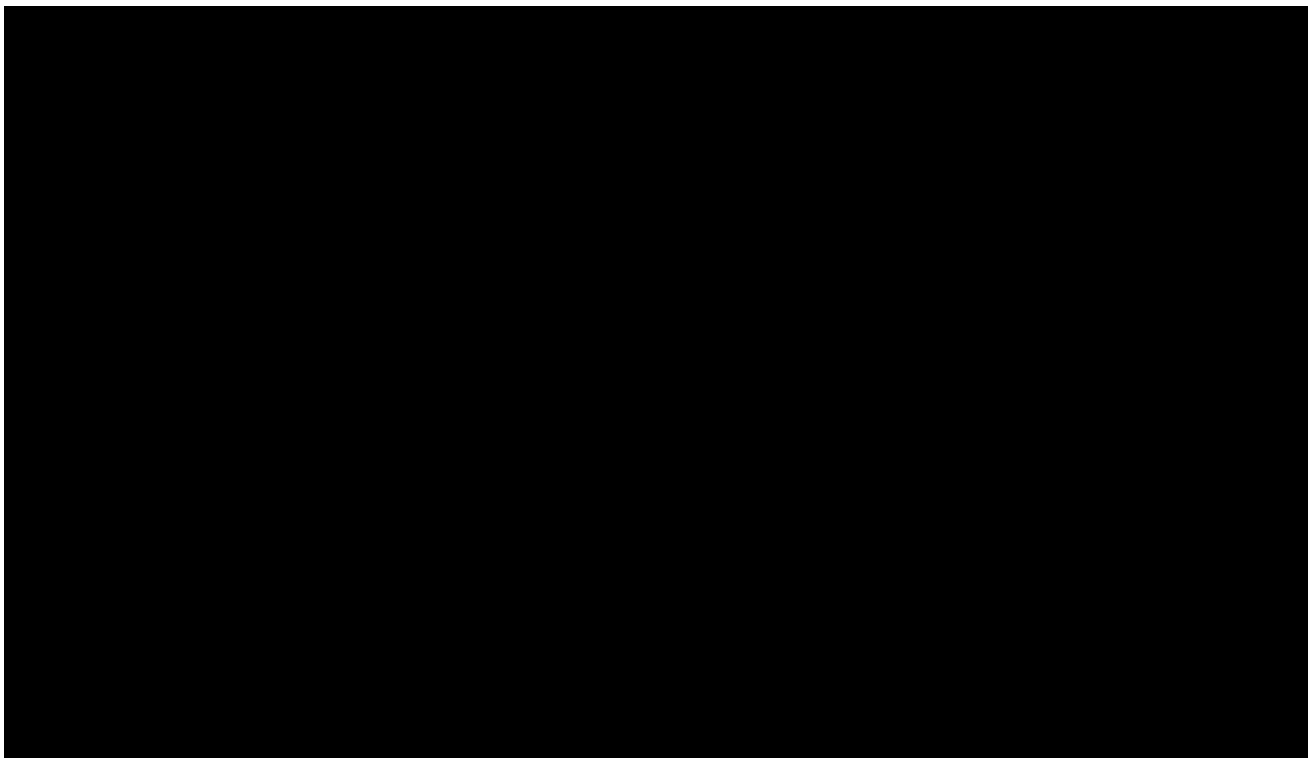
Following our conversation with RAPID to clarify this point (11.08.2021) we understand the question refers to the impact upon the AIC/NPV calculation output, rather than the impact of different levels of utilisation on stakeholder perception or environmental impact for example.

Q1a & Q1b)

The AICs are presented in Table 10.1 as a minimum & maximum utilisation. The minimum utilisation used in this calculation was 0Ml/d. i.e. assuming the scheme was not in use. The maximum utilisation used was 100Ml/d owing to the fact this is the maximum DO associated with the scheme (see answer for Q3 and Q4 below for more). We followed the ACWG generated methodology to calculating AIC and NPV figures, and aligned with all other SROs in the presentation and content of our Table 10.1 i.e. showing min and max AICs and NPV figures.

Q1c)

The figures presented in Table 10.1 of our Gate 1 submission are calculated using the ACWG generated template and include Opex values for the entire planning period (year 1 to year 80). For full transparency, please see the following summary tables which highlight all calculated NPV values for each of the sub-options we are promoting past Gate 1.



Query 2

Please could you provide further detail regarding conjunctive use and interaction with other sources within and outside the WRE supply area.

Query Response

At this stage the implications of the GUC transfer on the WRE schemes that rely on refill via the River Trent has not been explicitly modelled. This is because at this stage we do not have clarification on environmental constraints other than the existing Hands off Flow (HoF) at North Muskham.

For Gate 1 we carried out initial Aquator modelling within the Minworth SRO programme to assess how much impact different levels of usage of Minworth effluent would have on number of days below the HoF at North Muskham, and then compared that against modelled outputs from the Affinity Water Pywr behavioural model. This showed that, in the absence of additional environmental constraints, there is unlikely

to be a significant negative impact between the use of Minworth discharge for GUC, and the abstraction required for the WRE schemes (South Lincs Reservoir or Rutland refill options) This is simply because the WRE schemes require water outside of the HoF period, whereas the GUC tends to use water during the summer period where the HoF acts as a constraint on abstraction for the WRE schemes

In terms of conjunctive use benefits, these are very limited because of the 'negative' interaction with the WRE schemes – i e if the spare capacity on the GUC is used when Affinity Water does not require the transfer, then this would tend to directly take water away from the South Lincs Reservoir or Rutland options Given the large costs associated with transferring across from the GUC to the Great Ouse, this option was not investigated further, although we note that there is a scoping assessment being carried out by WRE to consider this option further as an incidental benefit of the Bedford-Milton Keynes Waterway project

Conjunctive use benefits within WRSE were not modelled as this would require that transferred water is deliberately released down the River Colne (and Bulbourne tributary) for abstraction by Thames Water when the transfer is not being used by Affinity Water Liaison with the local EA office concluded that this is unlikely to be acceptable and could jeopardise the core (Affinity Water ADO) scheme if it is pursued further

Additional interaction with WRE schemes comes in the form of Minworth and SLR teams working collaboratively to deliver Gate 1 projects in an efficient way with regards to time and cost, most notably the Environmental Gap Analysis Project on the Rivers Tame and Trent

Query 3

Please clarify whether the stated DO values are calculated under a 1:200 or 1:500 event

Query Response

The DO of the scheme is unaffected by drought severity and is valid across any drought scenario

Query 4

Please state the methodology and tools used to derive the DO values and what assumptions have been used

Query Response

The evaluation of DO was carried out using outputs from the Pywr WRSE behavioural model The quoted ADO is based on a standard 'Scottish Method' approach to behavioural modelling, where the constraint in this case is the number of times that level 4 restrictions are incurred (which must remain below a 1 in 500 year frequency)

The ADO is slightly less than the transfer capacity because the critical period in this case (i e the point where supply fails to meet demand) tends to occur during the summer, when demand levels are higher than the annual average That means that ADO benefits, which are a reflection of the annual average demand met, are only around 90% of the absolute level of demand benefit observed during the summer event (i e a 50Ml/d increase in summer demand with TUBs and NEUBs in place represents an average demand increase of 45Ml/d, assuming summer to winter usage ratios remain the same in future)

The ADO benefits will be reviewed and refined during Gate 2 once potential environmental constraints and process losses are better understood as a result of the pound characterisation, environmental monitoring and conceptual design activities

Query 5

Please expand on the methodology used to derive carbon costs

Query Response

In gate-1, different methods were used for calculating carbon costs for the transfer from Minworth to the GUC and for the abstraction and treatment in the AfW supply area The methods were appropriate for the option selection purposes, as described below:

Transfer:

The Environment Agency carbon calculator tool was used to measure the greenhouse gas impacts of construction activities in terms of carbon dioxide equivalency (CO2e) It does this by calculating the embodied CO2e of materials plus the CO2e associated with their transportation

Abstraction & Treatment:

Bionova Oneclick LCA software was utilised to carry out a Whole Life Carbon (WLC) comparison between sites based on carbon database values for individual materials and products

The carbon assessment work in Gate 1 is for regional planning comparison purposes and is not intended to form a baseline against which design decisions are made. It therefore does not represent a carbon target for the project. We will look to establish a range of baseline carbon targets in Gate 2.

Query 6

Please can you provide more detailed discussion around how this SRO is aligned with the sector's net zero target by 2030.

Query Response

Our Gate 1 carbon assessments were undertaken to provide inputs for the WRSE Regional Investment Model and should not be seen as either a target or a baseline.

As detailed in our gate-1 submission, our Gate 2 activity will evaluate the carbon footprint of our proposals without any carbon reduction activity. We will identify a balanced suite of mitigation measures to ensure we meet our own Scope 1 & 2 net-zero carbon emissions commitment and consider options for Scope 3 emissions. Using a recognised framework such as PAS2080, carbon reduction opportunities will be identified through a range of measures including design and innovation, renewable energy and green removal.

The cost and benefit of each individual mitigation measure will be presented including any additional costs beyond the level that would normally be submitted for our WRMP. This will give clear visibility of the net cost impact (gross cost less OPEX savings) of the measures as part of the SRO assessment process at Gate 2.

Date of response to RAPID	12/08/2021
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