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## Gate 1 queries process

<b>Strategic solution(s)</b>	South East Strategic Reservoir
<b>Query number</b>	SER002
<b>Date sent to company</b>	19/07/2021
<b>Response due by</b>	21/07/2021 [extended to 23/07/21]

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### Query

- 1) Please provide further detail on the assessment referenced in section 2.14 of the submission, specifically the method used and the opportunities identified.
- 2) Please indicate whether any further information on scheme utilisation is available, for example based on the modelling undertaken to determine the DO as set out in section 4.13 of the submission, and provide this information.
- 3) Please confirm the underlying methodologies used for carbon footprinting and the uncertainty range in carbon footprint.

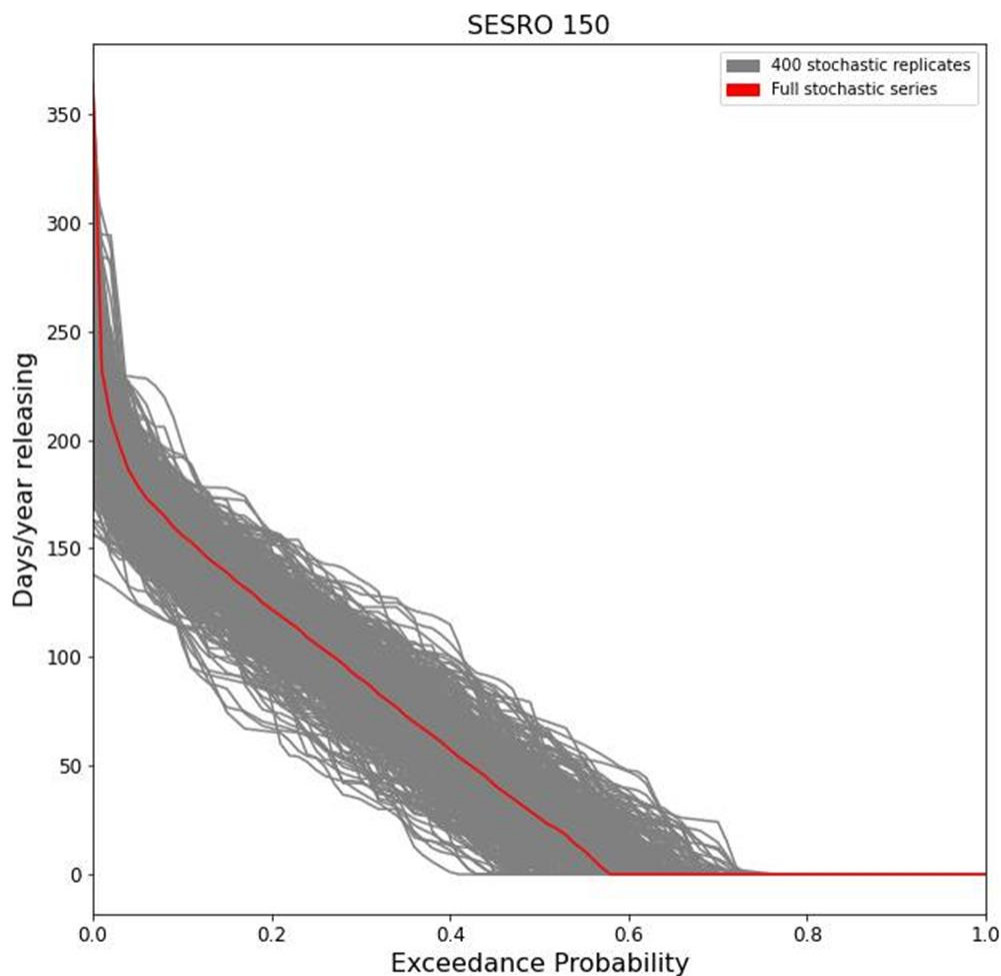
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### Solution owner response

- 1) The wider benefits assessment for SESRO is provided in Section 11.2 of the Environmental Assessment Report supporting technical document. This was provided to RAPID under response to query SER001.
- 2) We have provided information in Section 6.6 of the Gate 1 submission regarding the expected utilisation of the SESRO scheme under different future scenarios.

DO modelling is a theoretical construct to identify the maximum output from a scheme during particular design drought conditions. Deployable Output is not a function of utilisation. However, the modelling used for DO can be used to extract information on the frequency of discharge from the reservoir during the range of long-term stochastic hydrological sequences

used to derive the DO. This has been done in terms of numbers of days / year that the reservoir was discharging to the River Thames (hence supplying water for reabstraction downstream), for each of the 400 stochastic flow sequences (each of 47 years duration) used for the DO assessments. This provides a dataset that, therefore, spans a theoretical period of 18,800 years. The results are illustrated below, for the 150 Mm<sup>3</sup> option using the 1 in 500 year DO model run, showing the number of days per year that the reservoir is releasing (being used) as a probability.



As a summary, across the 400 hydrological replicates:

- Releases are triggered on average 41 times over the 48 years (i.e. almost every year)
- The reservoir is releasing (i.e. being utilised) on average for 56 days per year but there is a large range in this value for the different hydrological sequences
- The 50<sup>th</sup> percentile value (i.e. this value would be expected to be equalled or exceeded for 50% of the time) is for release of approximately 25 days / year or more. The 10<sup>th</sup> percentile value rises to approximately 150 days / year.

The initial modelling suggests that once the full capacity was being used, Affinity Water would need to use the reservoir most years, but at a relatively low level outside of dry years, with large summer transfers under dry year high demand events. The Gate 1 modelling showed that utilisation is expected to be in the order of 25% for the 50MI/d scheme, and higher for the

100MI/d, but it is very dependent on the balance between peak and average DO reduction within the Environmental Ambition scenarios. If reductions affect peak more than average, then the utilisation will tend to increase as a percentage. These scenarios need to be set before a detailed understanding of utilisation can be gained, using the tools developed in Gate 1.

We would also like to note that under a number of the environmental destination scenarios defined by the Environment Agency, the utilisation of SESRO is likely to increase in the future from the position modelled above. This is because it will be providing water in replacement for some of Thames Water's existing abstraction licences which would be reduced or revoked. As such, potentially even in normal years, it could be providing a source of water for some of the Upper Thames and Slough Wycombe and Aylesbury groundwater sources. In a more extreme environmental destination scenario if we were to lose some of our existing surface water abstractions in the lower Lee then again that water could be replaced with increased abstraction from the River Thames via the Thames Lee Tunnel. Hence, the utilisation will be a function both of the demand profile facing both companies and also the operational rules defining the use of the scheme between the partners.

- 3) The methodologies for carbon footprint analysis are documented in the Carbon Report support technical document. This was provided to RAPID under response to query SER001.

We have calculated the carbon impact of the scheme in accordance a calculation process that complies with the PAS 2080 global reporting standard for carbon management in infrastructure. We do not have any more specific information on the uncertainty range for the SESRO carbon footprint analysis.

<b>Date of response to RAPID</b>	23/07/21
<b>Strategic solution contact / responsible person</b>	<i>[text redacted, personal information]</i> SRO Programme Manager <i>[text redacted, personal information]</i> <i>[text redacted, personal information]</i>