

STRATEGIC REGIONAL WATER RESOURCE SOLUTIONS

Gate one submission for Mendip quarries – new solution

Queries raised by RAPID and Solution owner responses

February 2022

Gate one queries process

| | |
|------------------------------|------------------|
| Strategic solution(s) | Mendips Quarries |
| Query number | MEN001 |
| Date sent to company | 08/12/2021 |
| Response due by | 10/12/2021 |

Query

Please confirm that the total NPV for the combined resource and transfer in Table 10.1 is the sum of the separate elements (e.g., the NPV of the combined resource and transfer assuming 87 MI/d resource and equivalent volume of transfers for the outlet transfer to Chewton Mendip is £623m + £32m = £655m). If not, please populate the section of the table for the total NPV of the combined elements and provide in response to this query.

Solution owner response

The NPVs shown in Table 10.1 for the resource elements (reservoir and inlet conveyance) include capital costs for conveyance and treatment from Newton Meadows as well as operating costs for full utilisation at the stated reservoir water resource benefit. Two reservoir options have been developed for 29 or 87 MI/d benefit. The NPV for the reservoir and the transfer can be summed, but for combinations of reservoir and transfer where the total transfer capacity is lower than the reservoir benefit, then the NPV for the reservoir will be an over estimate due to oversizing of the capital works and overestimate of the operating costs. In Gate 2 further work will be undertaken, in conjunction with regional plans, to refine transfer capacities required and also to refine the reservoir yield estimates. Combinations of resource and transfer elements can then be developed with matching capacities.

We have summed the AICs in the table as they get around this issue by normalising the costs by m³, and therefore the AICs can be for comparison purposes.

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| Date of response to RAPID | 9 Dec 2021 |
| Strategic solution contact / responsible person | Julian Welbank Julian.welbank@wessexwater.co.uk |

Gate one queries process

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|------------------------------|------------------|
| Strategic solution(s) | Mendips quarries |
| Query number | MEN002 |
| Date sent to company | 16/12/2021 |
| Response due by | 20/12/2021 |

Query

Thank you for making a proposal for gate costs for future gates for the large solution using the lowest capital cost estimate for the large solution.

1. Do these costs tie to the costs in Table 10.1 of the main submission or have these been calculated using a different methodology?
2. Please provide the entire range of capital cost estimates.

Solution owner response

1. The capital cost estimates that has been used to calculate the proposed gate costs are the same as those used to calculate the NPVs and AICs presented in Table 10.1.
2. Range of capital costs

As explained in our response to query MEN001, the transfer options have been developed to illustrate the range of potential transfers and we haven't yet developed a set of transfers which in aggregate match the resource yield; this will be done in Gate 2. Furthermore the estimated water resource yield is an average yield and as explained in section 4 of the Gate 1 report (last paragraph on page 12) the peak summer output could be significantly higher. This would be beneficial for meeting peak summer demands when groundwater sources may be constrained.

Table 10.1 included six transfer elements as follows:

| Ref | Element and Sub Option | Capacity (MI/d) |
|--------------------------|--|-----------------|
| Transfer elements | | |
| 1 | Outlet transfer to Chewton Mendip | 16 |
| 2 | Outlet Transfer to SR near Warminster & WTW 30MI/d | 30 |
| 3 | Outlet Transfer to SR near Warminster & WTW 90MI/d | 90 |
| 4 | Outlet transfer to R. Stour | 30 |
| 5 | Outlet transfer to K&A canal 30 MI/d | 30 |
| 6 | Outlet transfer to K&A canal 50MI/d | 50 |

Capital cost estimates for the strategic reservoir option (87 MI/d) including the inlet conveyance and INNS treatment and various combinations of transfers (using the reference numbers from above) are as set out in the table below.

| Strategic resources and combinations of transfers | Total transfer capacity MI/d | Capex £m @ 2017/18 prices | |
|---|-------------------------------------|----------------------------------|-----------------------------------|
| Mendip Reservoir (including inlet conveyance and INNS treatment) plus Transfers 1, 2, 4 | 76 | 557 | In region option |
| Mendip Reservoir (including inlet conveyance and INNS treatment) plus Transfers 2, 4, 5 | 90 | 663 | In region and inter-region option |
| Mendip Reservoir (including inlet conveyance and INNS treatment) plus Transfer 3 | 90 | 610 | In region option |
| Mendip Reservoir (including inlet conveyance and INNS treatment) plus Transfers 2 and 6 | 80 | 497 | In region and inter-region option |
| Mendip Reservoir (including inlet conveyance and INNS treatment) plus Transfers 1, 2 and 6 | 96 | 654 | In region and inter-region option |
| Mendip Reservoir (including inlet conveyance and INNS treatment) plus Transfers 1, 2, 4 and 5 | 106 | 685 | In region and inter-region option |

Based on the draft regional plan for West Country, the in-region option with transfers to Bristol Water, Wessex Water and Bournemouth Water (via R Stour) appears to be one of the most likely combinations. The best value use of the resource will be considered further in Gate 2, as explained in our response to query MEN006.

We trust this provides the information you require.

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| Date of response to RAPID | 10 January 2022 |
| Strategic solution contact / responsible person | Julian Welbank Julian.welbank@wessexwater.co.uk |

Gate one queries process

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|------------------------------|-----------------|
| Strategic solution(s) | Mendip Quarries |
| Query number | MEN003 |
| Date sent to company | 17/12/2021 |
| Response due by | 21/12/2021 |

Query

Section 3: Outline project plan

Could you provide further information/clarification on several areas of your project-level plan in figure 3.1:

- The procurement timeline shows a CAP agreement phase which extends beyond FBC. Could you explain what this phase is, how it aligns to contract award, and why it is required.
 - The plan shows FBC to occur mid 2029 with the DCO decision following towards the end of 2029. Could you explain the rational for this approach?
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Solution owner response

The purpose of our Gate 1 submission was to summarise the solution and present initial assessments on all the key issues in order that RAPID can accept the solution into the gated process. The assessments and proposed options in the Gate 1 report, including the project plan and initial procurement strategy, are preliminary and will be revisited in future gates should funding be allowed for the solution to progress to the next stage.

However in response to the specific queries:

- The outline project plan envisages that the business case would be revisited once the CAP tenders have been received and are under evaluation.
-

Tendered costs could then be compared with previous estimates and used by the project sponsors to confirm the business case. This will include confirming that the procurement approach delivers best value (e.g. compared to in-house procurement). The outline project plan envisages that contract award would take place towards the end of the CAP agreement period, after the DCO decision has been made. There are however aspects of the FBC (e.g. around management arrangements) which may need to be updated to reflect the agreed contract, in which case the FBC would be updated and finalised to coincide with contract award.

- Although the approach above is depicted in the outline project plan, alternative procurement options will also be considered and a definitive recommendation has not yet been made. It is intended to conduct further work during future gates to develop a more detailed procurement strategy and programme.

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| Date of response to RAPID | 10 January 2022 |
| Strategic solution contact / responsible person | Julian Welbank |

Gate one queries process

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|------------------------------|-----------------|
| Strategic solution(s) | Mendip Quarries |
| Query number | MEN004 |
| Date sent to company | 17/12/2021 |
| Response due by | 21/12/2021 |

Query

Section 6: Initial outline of procurement and operation strategy

Please could you provide us with your current analysis regarding the most appropriate DPC tender model for this scheme, e.g., very early, early, late, split model etc.

Solution owner response

The purpose of our Gate 1 submission was to summarise the solution and present initial assessments on all the key issues in order that RAPID can accept the solution into the gated process. The assessments and proposed options in the Gate 1 report, including the project plan and initial procurement strategy, are preliminary and will be revisited in future gates should funding be allowed for the solution to progress to the next stage.

However in response to the specific query:

- Due to the early development of the scheme we still recommend this is looked at further in Gate 2. However, based on our considerations of the scheme so far, a late DPC tender model appears to be the most appropriate, as assumed in our outline project plan, as it reduces risk to tenderers around the planning process and approvals, while giving project sponsors greater control around design and stakeholder engagement in the pre-construction phase. However, as part of further consideration of the procurement strategy we will consider

how the envelope used for the DCO application can be kept sufficiently flexible to allow potential innovation by bidders during the CAP tender development and delivery.

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| Date of response to RAPID | 10 January 2022 |
| Strategic solution contact / responsible person | Julian Welbank |

Gate one queries process

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|------------------------------|-----------------|
| Strategic solution(s) | Mendip Quarries |
| Query number | MEN005 |
| Date sent to company | 17/12/2021 |
| Response due by | 21/12/2021 |

Query

Section 9: Key risks and mitigation measures

You have not provided a scored risk assessment showing the original and residual risk scores post mitigation, as required. Could you please update table 9.1 Key programme risks with this information?

Solution owner response

Our key risks and mitigation measures register with the risk scores included is pasted overleaf.

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| Date of response to RAPID | 10 January 2022 |
| Strategic solution contact / responsible person | Julian Welbank |

| ID | Risk Status | Risk Category (Level 1) | Risk Category (level 2) | Element | Description | Risk Likelihood Score | Risk Impact Score | Risk Score | Mitigation Plan | Post mitigation Risk Likelihood Score | Post mitigation Risk Impact Score | Risk Score |
|----|-------------|-------------------------|---------------------------------------|----------------------------|--|-----------------------|-------------------|------------|--|---------------------------------------|-----------------------------------|------------|
| 1 | L = Live | External | Planning and approvals | Quarry Reservoir | Quarry Decommissioning There is uncertainty around the quarry owner's plans. Therefore, the risk remains that quarrying does not cease by 2040, or that the owners are not willing to sell the site at an acceptable price when quarry operations cease. | 3 | 5 | 15 | Continued enagement with the quarry owner to discuss technical and commercial matters as well as timescales. Review if there are alternative quarries in the Mendip area due to be decommissioned circa 2040. Obtaining agreement with owners early in the programme would mitigate this high-impact risk. | 2 | 4 | 8 |
| 2 | L = Live | Technical | Design uncertainty / complexity | Newton Meadows Abstraction | Deployable output benefit An initial assessment of DO benefit has been conducted informed by historical drought events, but a full stochastic assessment has not been carried out, nor have opportunities for conjunctive use with existing resources in receiving WRZs been explored. | 5 | 3 | 15 | A full assessment of the 1-in-500 yield is proposed for Gate 2. This will include rainfall-runoff modelling and the use of stochastic datasets. Inclusion of the options in water company water resource system models so that potential conjunctive benefits for each WRZ can be estimated. | 2 | 2 | 4 |
| 3 | L = Live | External | Planning and approvals | Whole Scheme | External Challenge (Planning) There is a risk of an external challenge (such as a legal challenge, judicial review or public enquiry) that may affect delivery and programme. | 2 | 5 | 10 | Ensure robust process and programme, which is evidenced. Continue stakeholder engagement to manage project queries during project development stages. | 2 | 3 | 6 |
| 4 | L = Live | External | Stakeholder | Newton Meadows Abstraction | Stakeholders on the River Avon Enhanced abstraction at Newton Meadows may lead to unacceptable navigational and/or environmental impacts on the River Avon. Other river stakeholders may oppose to enhanced abstraction. | 3 | 3 | 9 | Continued engagement and consultation with Bath & North East Somerset Council, Avon Navigation Trust, the Environment Agency and other stakeholders for the River Avon. | 2 | 2 | 4 |
| 5 | L = Live | Technical | Site characteristics and project data | Whole Scheme | Water Quality There is uncertainty in the River Avon water quality, and in the water quality requirements at both the Mendip Reservoir and in the receiving water bodies. Treatment requirements are therefore unconfirmed at this stage, and more extensive treatment maybe required. | 3 | 3 | 9 | Sample and model water quality in the River Avon; understand mitigation measures required to manage water quality in the Mendip reservoir; investigate baseline conditions in receiving watercourses/waterbodies, including those linked to the reservoir through groundwater connectivity. | 2 | 2 | 4 |
| 6 | L = Live | Technical | Design uncertainty / complexity | Whole Scheme | Transfer conveyance & existing infrastructure The capacity in the existing infrastructure downstream of the transfer is not understood at this stage, including the capacity of pipeline networks, abstraction points and treatment works. For each transfer option, the related uncertainties and risks differ; for example, the capacity of the Kennet & Avon Canal is to be assessed. | 3 | 3 | 9 | Further work is required to understand the capacity envelopes for each transfer corridor, supply network and water treatment capacities. Engagement with the relevant water companies, Environment Agency and the Canal and River Trust. | 2 | 2 | 4 |
| 7 | L = Live | Technical | Environmental constraints | Whole Scheme | Environmental - INNS The conveyance of raw water from Newton Meadows to the Mendip Reservoir and the onward transfer(s) opens a new pathway for the potential spread of invasive species into the new reservoir. Therefore, there is a risk of spread of invasive species. | 4 | 3 | 12 | Undertake INNS transfer risk assessment, covering the raw water transfer to the reservoir and to receiving water courses, the proposed INNS treatment and transfers to receiving water courses. Identify further mitigation measures if required. | 2 | 2 | 4 |
| 8 | L = Live | Technical | Environmental constraints | Whole Scheme | Environmental There is a risk that ecological receptors will be affected, and habitats disrupted by changes in water chemistry, quality, levels and flows because of abstraction from the River Avon, changes in water levels in the reservoir, and transfers into receiving watercourse/waterbodies. there is a risk that abstraction and/or discharge may be unacceptable due to environmental restrictions. | 4 | 3 | 12 | Undertake baseline studies to assess the watercourses/waterbodies impacted, and investigations into the potential changes from changes in the groundwater levels and from the transfers. Build mitigation measures identified into the project programme and scheme design as more specific environmental risks are identified through further investigation and more detailed assessment. | 2 | 2 | 4 |
| 9 | L = Live | Technical | Design uncertainty / complexity | Quarry Reservoir | Reservoir Leakage Due to the advantageous geological properties at the reservoir, at this stage of investigation leakage is considered manageable under the current proposals. Further quarrying would increase the conductivity and leakage of the reservoir. There is a risk that if lining is required then the option is commercially unviable. | 3 | 5 | 15 | Continue to develop understanding of hydrogeology (including using hydrogeological modelling) and keep under review through engagement with geologists at quarry. | 2 | 3 | 6 |
| 10 | L = Live | Technical | Design uncertainty / complexity | Quarry Reservoir | Reservoir water quality There is a risk of stratification of the water in the reservoir depending on the incoming water quality and the degree of turnover. Algal growth could lead to die back and the formation of taste and odour pre-cursors. | 2 | 3 | 6 | Concept design has included for pre-treatment of incoming water to remove nutrients that might encourage algal growth; and a reservoir mixing system. | 1 | 1 | 1 |

Gate one queries process

| | |
|------------------------------|-----------------|
| Strategic solution(s) | Mendip Quarries |
| Query number | MEN006 |
| Date sent to company | 21/12/2021 |
| Response due by | 10/01/2021 |

Query

From an initial comparison of the costs and benefits of the different options which of the solution options, or combination of options, are considered to provide best value for customers?

Solution owner response

The purpose of our Gate 1 submission was to summarise the solution and present initial assessments on all the key issues in order that RAPID can accept the solution into the gated process. The assessments and proposed options in the Gate 1 report, including the best value recipients of the water, are preliminary and will be revisited in future gates should funding be allowed for the solution to progress to the next stage.

However we respond below to the specific query.

The transfer options provide water to different WRZs spanning several companies and two regions. Regional planning processes and reconciliation between regions will identify which transfer options provide best value in terms of utilising the potential resource available from the Mendip quarries. This will be influenced by the size of the need in each WRZ and the costs and benefits of the Mendip options as well as the costs and benefits of alternative options available for each WRZ.

The WCWR Regional plan, which will be issued for consultation on 17 January 2022, will show a large regional deficit ranging from 42 MI/d to 277 MI/d, depending on the

scenario considered. Therefore the prime use for the water should be in-region. This would also align with customer preference, which is for water within the region to be prioritised for local use if required. On this basis the options which would keep water within the West Country region are expected to provide better value. These would include:

- Potable water transfer to Wessex Water SR near Warminster
- Raw water transfer to the River Stour
- Raw water transfer to Chewton Mendip

Mendip Quarries could address a large proportion of the potential regional deficit, which would suggest the larger enhanced licence option at Newton Meadows would be more likely required and as per the AICs in our report, would be more cost efficient per Ml.

Given the potential deficit in the West Country the primary driver will be to address the needs in-region. However, subject to confirming the feasibility of the scheme and its yield, the potential scale of the resource means it could also be used for an inter-regional transfer at peak periods. It is proposed that the Mendip quarries transfer options to WRSE will be included in the WRSE investment modelling at the next upload and subsequent analysis would confirm whether or not they would be included in any of the best value scenarios.

It will be necessary to work closely with the water companies' WRMP teams to understand the needs better so that the optimum combination of transfers can be determined. This will be explored further in Gate 2. Given the AIC scores are comparable between the raw water options to Chewton Mendip and the River Stour, and the potable transfer value is reasonable, the magnitude of needs in the receiving zones and the comparison with potential alternative options will be key in deciding which options represent best value.

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| Date of response to RAPID | 10 January 2022 |
| Strategic solution contact / responsible person | Julian Welbank |

Gate one queries process

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|------------------------------|----------------|
| Strategic solution(s) | Mendips Quarry |
| Query number | MEN007 |
| Date sent to company | 24/12/2021 |
| Response due by | 10/01/2022 |

Query

1. Please provide separate Capex and Opex NPVs that make up the Total NPV reported in Table 10.1.

Solution owner response

| Element | Water resources benefit (MI/d) | NPV (£) | | | |
|---|--------------------------------|-------------|------------|-------------|-------------|
| | | Capex | Opex min | Opex max | Total |
| Resource elements | | | | | |
| Mendip Reservoir (including inlet conveyance and INNS TW) | 29 | 221,271,023 | 38,865,702 | 89,842,507 | 311,000,000 |
| Mendip Reservoir (including inlet conveyance and INNS TW) | 87 | 437,468,207 | 73,532,795 | 185,183,201 | 623,000,000 |
| Transfer elements | | | | | |
| Outlet transfer to Chewton Mendip | 16 | 18,273,190 | 1,773,869 | 13,661,450 | 32,000,000 |
| Outlet Transfer to SR near Warminster & WTW 30MI/d | 30 | 179,295,145 | 22,449,527 | 95,481,218 | 275,000,000 |
| Outlet Transfer to SR near Warminster & WTW 90MI/d | 90 | 342,139,006 | 44,321,712 | 263,090,719 | 605,000,000 |
| Outlet transfer to R. Stour | 30 | 44,154,977 | 3,130,272 | 19,324,217 | 63,000,000 |
| Outlet transfer to K&A canal 30 MI/d | 30 | 109,295,311 | 8,848,595 | 74,316,218 | 184,000,000 |
| Outlet transfer to K&A canal 50 MI/d | 50 | 126,776,061 | 11,409,942 | 121,399,848 | 248,000,000 |

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| Date of response to RAPID | 10 January 2022 |
| Strategic solution contact / responsible person | Julian Welbank |

Gate one queries process

| | |
|------------------------------|------------|
| Strategic solution(s) | Mendips |
| Query number | MEN008 |
| Date sent to company | 24/12/2021 |
| Response due by | 10/01/2022 |

Query

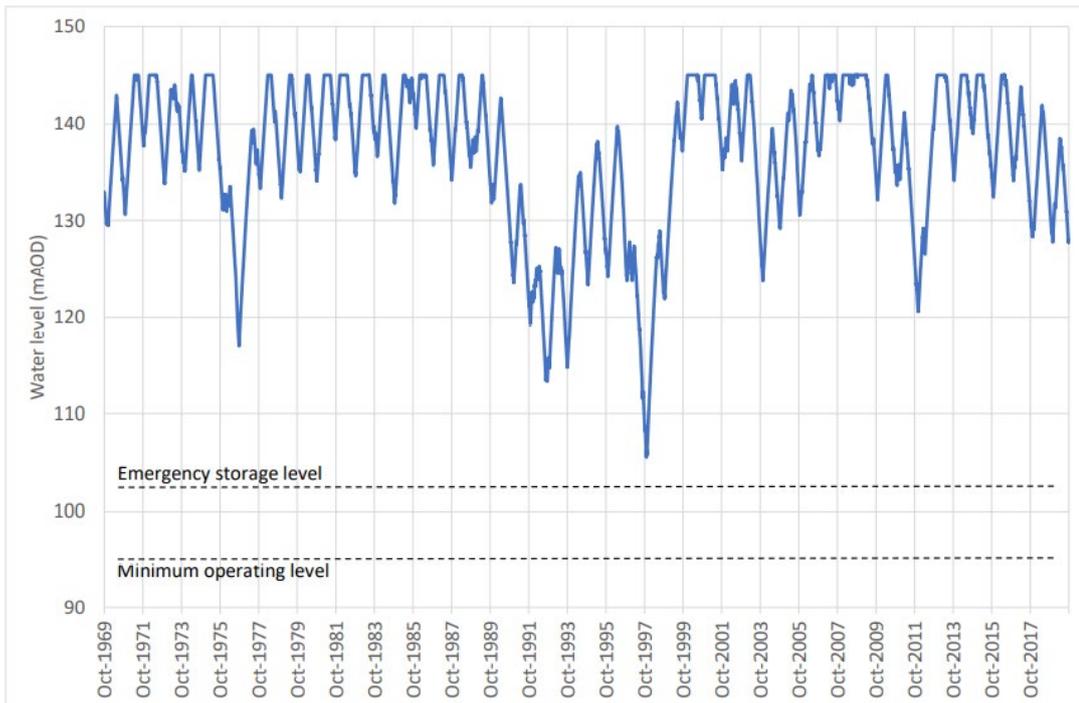
1. Please expand on the assumptions behind the extreme droughts tested in establishing the solution's water resource benefit, and how this provides confidence that the solution is resilient to a greater than 1:500 year event.
 2. Please clarify the annual average and peak deployable output for the solution, against historic and extreme drought events tested.
 3. To what extent has the impact been investigated of the unlined nature of the quarry on the solution's sustainable yield.
 4. What engagement has taken place so far on the feasibility of altering annual licences and hands-off-flows on the Avon?
 5. What detail has been explored on wider resilience benefits, for those mentioned in the submission, but also others that could be associated with a reservoir type solution?
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Solution owner response

The purpose of our Gate 1 submission was to summarise the solution and present initial assessments on all the key issues in order that RAPID can accept the solution into the gated process. The assessments and proposed options in the Gate 1 report, including the solution description and technical information, are preliminary and will be revisited in future gates should funding be allowed for the solution to progress to the next stage.

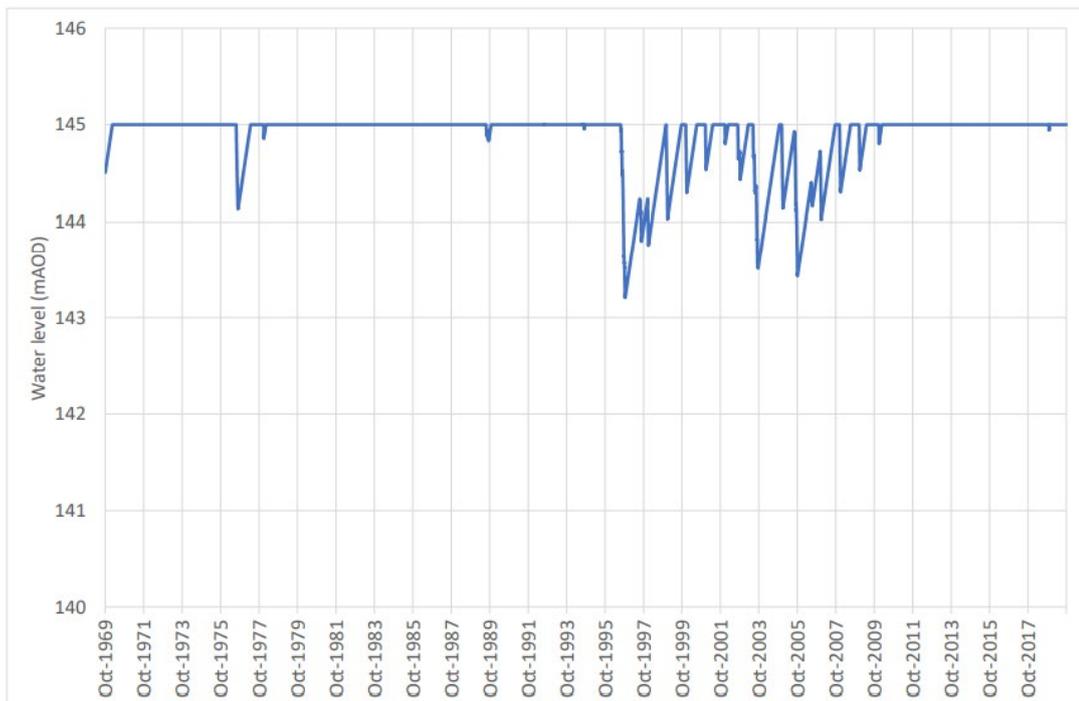
However in response to the specific queries:

1. A range of alternative flow series were reviewed as a stress test, with the wettest year of the critical drawdown period replaced by a drier year. This showed resilience to more severe conditions, with the reduction in yield being quite small even if the most severe drought year in the historic record were to be incorporated. However, it is not possible to equate this to a specific return period. A preliminary assessment was undertaken to produce an 8-year series (duration based on the historical critical drawdown period) that might correspond to a 1:500 year event; this suggested a yield of 87MI/d. Whilst this shows resilience, much more detailed study is proposed in order to provide confidence that the solution is resilient to a 1:500 year event. Events greater than 1:500 year are not being considered.
2. Our current analysis has calculated the reservoir could support a demand of maximum 29/89MI/d based on annual averages and the two abstraction rate options from the River Avon. Simulations of the reservoir level using the potential enhanced and current Newton Meadows licence have been carried out. The graphs are included below for information. These include the 18-month historic drought period in 1975/76 and a more extended dry period between 1989 and 1997.



Note: Max abstraction 150MI/d (all-year), demand 89MI/d

Simulated reservoir water level – existing Newton Meadows licence (demand 29MI/d)



We have provided yields for the reservoir with no transfers coming into the reservoir and purely using the 24.8MCM storage capacity to simulate a drought event, this is provided as 23 MI/d for a 3 year period or 70 MI/d for a 1 year period.

Information is awaited from the potential recipient water companies to understand peak demands and time periods so that the peak deployable output can be assessed. This modelling is currently planned in early in Gate 2.

3. Our initial assessment looked at the hydraulic connectivity of the site and estimated leakage as 12.5MI/d once the quarry has been filled to its anticipated final water level of 135-145mAOD. The quarry will leak predominately eastwards due to a combination of local topography and lithology and disposition of the surrounding bedrock. Leakage is anticipated to be offset by inflows from rainfall, sinking streams (stockers) and cross-fault leakage.

We plan to create a groundwater model in Gate 2 for the site to model the reservoir under various climatic conditions, water levels and to undertake a sensitivity analysis to inform estimates of leakage and the impact on the surrounding groundwater table. We will continue to cross-reference the results and impacts to the monitoring data collected by the quarry as they dewater to our proposed max drawdown level.

4. Discussions were held with the Environment Agency on 11th May 2020 at which the concepts were discussed. There was an agreement that there is water available at higher flows, although there was a query about possible limits related to the CRT abstraction at Claverton (just upstream of Bath), with mention of some agreement to share cutbacks if required, but the final view was that this should not be a significant issue as water pumped into the canal at Claverton should return to the Avon via the locks upstream of Newton Meadows.

We discussed discharges (particularly from quarry dewatering) that may be a significant contributor to low flow in the Avon, so there would be a need to assess artificial influences and exclude those that might not apply in future, this is planned to be undertaken in a Gate 2 hydrological assessment. Current details of abstraction rates or hands off flows used in our concept design are from our initial assessments of the likely availability of water and likely acceptable hands off limits. Further engagement with the EA and stakeholders on the River Avon is planned in Gate 2.

5. The environmental assessment guidance available to support the RAPID Gate process for the development of SROs does not include guidance on wider benefits assessments to be undertaken at each Gate of the process. Therefore, the scope of the wider benefits work for Gate 1 was limited to preparing commentary aimed at differentiating between the options.

Opportunities for wider benefits were identified for biodiversity net gain, positive social outcomes and improved climate resilience. For a reservoir type solution, the options-level SEA predicted beneficial impacts for the Population and Human Health objective on health and wellbeing during operation as it is understood that the reservoir will be open to the public, creating new recreational opportunities, of which there are limited current options in the region at this scale. Further investigation will be required at Gate 2 to identify opportunities to deliver wider benefits such as; a review of current restoration plans for the quarry in order to integrate the scheme with current plans; and a review of Mendip Quarries SRO interaction with regional plans and of in-combination effects with plans or projects identified in the regional plans.

Wider benefits of reservoir storage can include the potential to attenuate flooding by storing water at peak flows. There are properties at risk of flooding downstream of Newton Meadows that could potentially benefit, however to provide a meaningful impact on flood risk a very substantial increase in pumping capacity would be needed, above what is needed for water resources purposes and alternative flood management measures (such as natural flood management) are expected to be more cost effective. Therefore flood alleviation would not form part of the wider benefits of this scheme.

The primary benefits of the option are the provision of greater drought resilience and enabling potential environmental ambitions to be achieved where groundwater and river abstractions need to be reduced. In particular there is an opportunity to help with environmental ambitions on the Hampshire River Avon, by augmenting flows into the River Stour which would provide an opportunity to reduce abstractions on the River Avon.

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| Date of response to RAPID | 10 January 2022 |
| Strategic solution contact / responsible person | Julian Welbank |

Gate one queries process

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|------------------------------|---------------|
| Strategic solution(s) | Mendip Quarry |
| Query number | MEN009 |
| Date sent to company | 27/01/2022 |
| Response due by | 31/01/2022 |

Query

A. In relation to new solution criteria:

- 1. Is there value in accelerating the solution's development to be 'construction ready' for the 2025-2030 period?**

Figure 3.2 shows quarry decommissioning in 2042 with partial water resource availability in 2045 and full water resource availability in 2046. However, Section 16 states the quarry would be worked out by around 2040 and that this date is based on the assessment of the market demand for aggregate so it could be sooner or later depending on market conditions and the geological challenges as the quarry goes deeper. Section 16 also states the solution would be operational around 2042. Please could you confirm the dates that the quarry will be decommissioned, construction completed, and the solution operational along with the uncertainty range and confidence levels around these dates.

- 2. Does the solution need the additional enhancement funding for investigations and development?**

Please can confirmation be provided that the project is on track to meet all guidance requirements for the Gate 2 submission by the standard track deadline of October 2022 and that the project is tracking ahead of broader WRMP and regional plan solutions. This is to establish whether there is a need for additional enhancement funding for investigations and development beyond base WRMP and regional plan funding.

B. What extra benefit would be added from developing Mendip Quarries within the gated process compared to doing so outside of it? In particular:

- 1. How much earlier would it be ready?**
- 2. What other benefits would there be?**
- 3. What would be the difference in cost?**

Solution owner response

A. In relation to new solution criteria:

A1. Is there value in accelerating the solution's development to be 'construction ready' for the 2025-2030 period?

The decommissioning date of the quarry site is not fixed. The owner has planning permission to excavate mineral resources up to 2040. It is possible that decommissioning will be sooner than this depending on market conditions and the geological challenges as the quarry goes deeper. It can only be later if planning permission is obtained. Figure 3.2 of the Gate 1 report shows the impact of an early or late decommissioning date. We plan to mitigate this uncertainty by proactive engagement with the quarry owner and investigating other potential quarries which could be restored in a similar way.

In response to the specific query, the table below shows the range of potential dates.

| | Short programme | Long programme |
|---|------------------------|-----------------------|
| Excavation of the quarry / water storage | Already commenced | Already commenced |
| Abstraction and inlet conveyance | 2031 | 2034 |
| In-reservoir works (which have to be designed, constructed and commissioned before quarry dewatering is switched off) | 2037 | 2040 |
| Quarry decommissioning | 2038 | 2042 |
| Construction complete | 2041 | 2045 |
| Partial resource availability | 2041 | 2045 |
| Full resource availability | 2042 | 2046 |

As noted in the Gate 1 report the programme has significant flexibility and the potential to be phased, provided the detailed feasibility, revisions to the restoration plans, environmental assessments and commercial negotiations etc. are completed well in advance.

The scheme appears to have significant deliverability advantage over other schemes that seeking to construct new reservoirs of a similar capacity, because the water storage element already has planning permission and is under construction.

The key driver should be securing schemes that can provide new water resources to a timeline that meets the regional plan requirements. The Mendip quarries SRO achieves this objective, subject to completing further studies.

We note that other similar SROs have timelines that are not very different given the challenges over their deliverability:

| SRO | Resource available | | |
|-----------------------|--------------------|------------|--|
| Fens reservoir | Best case | March 2035 | Subject to site selection, DCO approval, public consultation etc. |
| | Option 2 | March 2038 | |
| | Option 3 | March 2040 | |
| SESRO | 2038 | | Subject to DCO approval, EIA and procurement, as well as resolving stakeholder concerns. |
| South Lincs reservoir | Best case | March 2035 | Subject to site selection, DCO approval, public consultation etc. |
| | Option 2 | March 2038 | |
| | Option 3 | March 2040 | |

A2. Does the solution need the additional enhancement funding for investigations and development?

We will be able to make a Gate 2 submission by the due date. We note that the final Gate 2 guidance has not yet been issued and the October deadline may change to November.

Tenders for the consultancy studies were returned on 21st January, and we would hope to award the contracts shortly, subject to receiving some initial feedback from RAPID.

We plan to focus the studies on the issues that are most significant to the solution's overall feasibility and viability. A later Gate 2 submission date, such as March 2023, would enable us to consider some aspects in more detail.

We confirm that the project is tracking well ahead of broader WRMP solutions. The project features as one of the main regional solutions in the West Country Water Resources Regional plan that was published for consultation on 17 January 2022, <https://www.wcwr.org/siteassets/document-repository/reports/emerging-regional-plan-stakeholder-summary-1.pdf>

As explained in section 11 (page 31) of the Gate 1 report the water resources position in the West Country has changed significantly between 2019 when the WRMPs were showing small surpluses and 2022 when the regional plan indicates significant deficits in excess of 100 MI/d. Thus in addition to the strategic schemes set out in the Regional plan, each company is reviewing their lists of feasible options as part of their WRMP preparation. The proposed studies into the Mendip quarries SRO are in addition to WRMP19, in addition to PR19 schemes and in addition to WRMP and regional planning. Therefore additional enhancement funding is required this AMP and in AMP8 to develop the scheme.

B. What extra benefit would be added from developing Mendip Quarries within the gated process compared to doing so outside of it?

We consider that the main extra benefits of progressing the project within the gated process would be as follows:

- As the regional plans are still in development, there is a need to be able to compare Mendip Quarries to other SROs in WCWRG and WRSE on a similar basis. Keeping Mendip Quarries within the gated process will ensure the project is developed to a similar level, increasing confidence in the options information used as a basis for decision making in regional plans.
- At PR19, it was not envisaged that a project of this scale would be needed as the previous forecasts had shown the region in surplus. We are now forecasting a deficit for which Mendip Quarries is currently one of our preferred options for a West Country strategic water resource. Keeping Mendip Quarries within the gated process will provide a collaborative environment both with the regulators and the region's water companies for the option to be developed with its own funding route.
- As a new solution in WRMP24, Mendip quarries is not as developed as other SRO options. It is an innovative alternative solution to reservoir development and as such during Gate 2 we plan to investigate further the risks around technical feasibility and interaction with the environment and communities. This will also allow for engagement with statutory stakeholders to understand their requirements for further studies and evidence gathering to enable a robust project plan to be developed.
- As proposed in our Gate 1 submission, we believe there is benefit from developing the option to the RAPID timescales up to Gate 2; however to enable efficient spend, we have proposed alternative Gateway dates for Gates 3-5. As you have highlighted, construction would not start until AMP9 and as such if the scheme is developed too quickly information would be outdated by the time we would apply for consents which would then require rework and inefficient spend. On the other hand, an agreement needs to be reached with the land owner and the EA much earlier to secure the water source and quarry as an available option for the regional plan and significant further project development is needed to enable these these agreements to be reached.
- The RAPID process provides a clear framework for National Water Resource option development, addressing many of the key front-end issues in major infrastructure projects as set out by the ICE ([Major Infrastructure Projects: Key Front-end Issues](#)). It ensures there is a clear and robust purpose for the option development, leadership through project sponsors and a clear governance mechanism, a standard approach to option development and appraisal and exploration of alternative SRO solutions. Developing Mendip Quarries at the company level might be achievable (as demonstrated by Thames Tideway), however this solution has multiple water company sponsors which adds an additional complexity to ensuring clear leadership and governance. We believe Mendip Quarries will benefit from engaging with the integrated multi-regulator function provided by RAPID, bringing together EA, Ofwat and DWI, helping ensure appropriate and integrated regulatory scrutiny of the option.
- Keeping the project within the RAPID process will maintain project momentum, continuity and mitigate loss of knowledge. It will also allow for ongoing continuous improvement from capturing learning from other SROs and the ACWG.

With regard to the specific queries:

B1. How much earlier would it be ready?

Without additional enhancement funding and the gated process, the solution would now be put on hold and restarted in the next AMP as part of a WRMP project funded through PR24.

It would be necessary to re-tender the feasibility study work and re-form the project governance and programme management team. Thus the proposed approach should enable the key milestone of establishing project feasibility at least three years earlier.

B2. What other benefits would there be?

As mentioned above, the other benefits include:

- Development to similar standard with comparative data, increasing confidence in the options information as a basis for decision making.
- Collaboration with regulators and the region's water companies
- Development of an innovative alternative solution to reservoir development
- Engagement with stakeholders to understand their requirements for further studies and evidence gathering to enable a robust project plan to be developed.
- Enabling an agreement with the land owner
- Facilitating discussions with the EA for the water source much earlier to secure the solution in the regional plan
- Involvement of two water company sponsors
- Integrated multi-regulator function provided by RAPID, bringing together EA, Ofwat and DWI
- Maintain project momentum, continuity and mitigate against loss of knowledge
- Continuous improvement from capturing learning from other SROs and the ACWG.

B3. What would be the difference in cost?

We do not anticipate any material difference in the total cost for development by proceeding within the gated process compared with the alternative, provided a pragmatic and planned approach is taken.

In order to maximise efficiency, we have proposed alternative dates for Gates 3-5. There is a clear need to develop the detailed feasibility of the scheme, and to collect additional water quality and environmental data; this will be achieved most efficiently by planning the work in advance and spreading it over several years.

In the event that the other strategic options in our region falter due to technical issues or adverse stakeholder feedback, there is the potential that this scheme will be required sooner than currently planned in order to protect the environment and maintain water supply resilience. In such a scenario a stop start approach with later acceleration could well cost more in the long term.

In addition, if further investigation and development is not conducted now then there is a risk that the option is assumed to be viable, when actually it is not, potentially introducing a fundamental flaw in the regional plan. Conversely, it may be assumed that the option is too risky to include in the plan, leading to other (potentially more costly / lower value) options being selected, when actually, further work (such as the proposed groundwater modelling in Gate 2) could have significantly increased confidence in viability of the scheme allowing it to be taken forward.

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| Date of response to RAPID | 31 January 2022 |
| Strategic solution contact / responsible person | Julian Welbank |