



Strategic Solution Gate One Submission:
Query Responses

Fens Reservoir

August 2021



Gate 1 queries process

Strategic solution(s)	Fens Reservoir
Query number	FEN001
Date sent to company	13/07/2021
Response due by	21/07/2021

Query

We request copies of the following documentation.

1. Environmental Assessment
 2. Strategic Environmental Assessment
 3. Habitats Risk Assessment
 4. Water Framework Directive Assessment
 5. Natural Capital and Biodiversity Net Gain Assessment
 6. Carbon Assessment (any carbon related assessment material, additional to that presented in the PFA)
 7. Invasive Non-Native Species Risk Assessment
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Solution owner response

Please find attached the below document as requested:

1. Annex 2 Environmental Assessment Report
 2. Strategic Environmental Assessment
 3. Habitats Risk Assessment
 4. Water Framework Directive Assessment
 5. Invasive Non-native species risk assessment
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Please note these documents are drafts and have not been checked for SEMD requirements.

In all cases the document submitted to RAPID following request under query FEN001 contains information that is commercially confidential and in draft form. 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 Anglian Water and Cambridge Water before information is released as per the requirements under the respective legislations.

The content of the documents is draft and relates to material or data which is still in the course of completion in travel to gate two and should not be relied upon at this early stage of development. We continue to develop our thinking and our approach to the issues raised in the document in preparation for gate two.

Date of response to RAPID	21 July 2021
Strategic solution contact / responsible person	[redacted]

Gate 1 queries process

Strategic solution(s)	Fens Reservoir
Query number	FEN002
Date sent to company	20/07/2021
Response due by	22/07/2021

Query

Section 3 Outline project plan

In figure 3 you show different options for construction timescales. Could you please confirm what assumptions and dependencies are underpinning each timescale shown.

Solution owner response

A key assumption of the project is that Fens Reservoir is selected by WRE's regional system simulator. This, along with the regional reconciliation process, will ascertain the proposed output of the reservoir and its expected recipients. This assumption will be revisited before gate two when the draft regional plans are available.

Using the assumption that the project will be selected, three indicative timescales are shown in the outline project plan. These illustrate how the project's timescales are dependent on the outputs of the WRE and individual company's WRMP EBSD models; these will determine when the reservoir needs to be operational, thus informing its construction programme. The EBSD process is due to occur in the latter part of 2021/early 2022, allowing the project's timescale to be refined before gate two.

There is also an assumption that the project will become a Nationally Significant Infrastructure Project, as set out in the Planning Act 2008, and will require a Development Consent Order (DCO). The three timescales highlight the uncertainty around how swiftly the project will gain a DCO, as well as how long it may take to discharge any planning conditions prior to construction. There is also the dependency on the purchase of land, as well as procurement being in place.

The same construction programme assumptions have been made for each of the timescales: 12 months of enabling works, 42 months of construction works for the reservoir and associated infrastructure, 12 months of commissioning, 32 months of reservoir filling and 14 months of optimisation. This is an iterative process and we expect to refine the accuracy of these timescales, and construction programme assumptions, prior to gate two. This will be aided by early contractor involvement.

Date of response to RAPID	22 July 2021
Strategic solution contact / responsible person	[redacted]

Gate 1 queries process

Strategic solution(s)	Fens Reservoir
Query number	FEN003
Date sent to company	30/07/2021
Response due by	03/08/2021

Query

1. Please clarify the difference between capex estimates reported in Table 1 and those reported in Table 6.

Solution owner response

Table 1 presents the overall capital costs of the scheme as if built in the base year (2017/18), including all costs from planning, development and construction to get the asset operational. In turn, Table 6 presents the net present value (following the WRSE AIC template) of those capital costs considering a calculation period of 80 years from 2017/18 and:

- The distribution of planning and construction costs through time (eg construction occurs during years 7-16)

- Replacement costs, based on standardised asset classes and replacement periods based on the “Cost Consistency Methodology” technical report (eg power supply elements are replaced every 25 years)
- Discounted costs using the Treasury green book standard discount rate.

Date of response to RAPID	3 August 2021
Strategic solution contact / responsible person	[redacted]

Gate 1 queries process

Strategic solution(s)	Fens reservoir
Query number	FEN004
Date sent to company	26/08/2021
Response due by	03/09/2021

Query

1. Please share the evidence to explain why Fen reservoir was chosen and not other solutions in the adaptive programme (Kings Lynn reuse, Ipswich reuse, Felixstowe desalination, ASR, SVE trade – PR19 funding £4.261 million) or any other regional solution identified since?
2. What is the next best solution and how does the cost compare?
3. What extra benefit would be added from developing the Fenlands reservoir within the gated process compared to doing so outside of it? In particular, how much earlier would it be ready? What other benefits would there be? What would be the difference in cost?
4. Has this option been included in company or regional modelling, in particular to inform the initial regional plan entering the reconciliation process? How does it perform to other options?
5. How much did preparing the gate 1 submission cost, with a breakdown? (for information purposes, not for funding)

Solution owner response

1. The potential resource benefit of Fens Reservoir is considerably greater than the other options being developed; recent studies for Fens Reservoir have

suggested a potential benefit of 99MI/d which is not comparable to other options as shown in the table below. Aquifer Storage and Recharge (ASR) offers the second highest benefit potential at 40MI/d but this is a drought benefit not average benefit. In addition to this, the Average Incremental Cost (AIC) for Fens Reservoir is considerably less than other options.

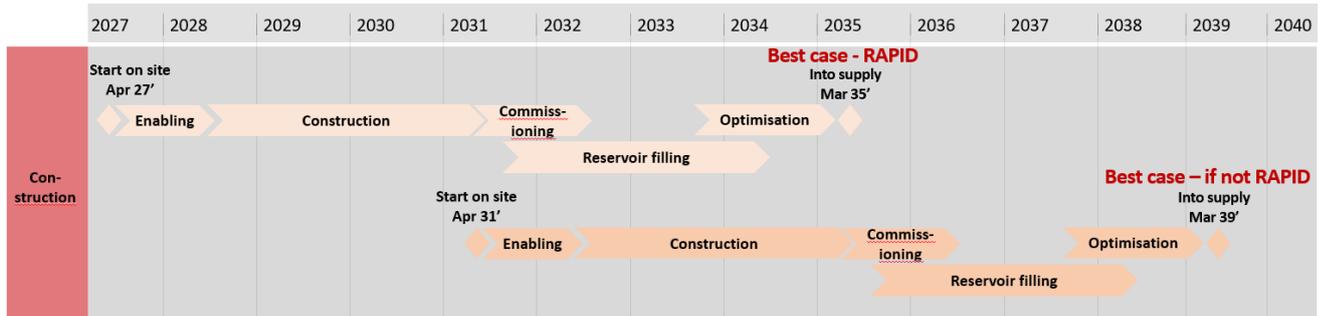
Fens Reservoir also has the benefit that it is located closest to the demand, both for Cambridge Water and Anglian Water (where it would primarily be used to meet deficits in Norfolk). The option is exclusive to the smaller Cambridge Reservoir options due to utilising similar water sources, yet this has the potential to benefit both water company regions.

Adaptive planning option	Average MI/d benefit	Estimated capex (£k)	AIC (p/m3)	Comment
Fens Reservoir (gate one)	99	1,207	201	<i>Based on 100% utilisation over 80 years</i>
North Fenland Reservoir (WRMP19)	41.6	561.8	391.42	<i>No transfer included</i>
Kings Lynn Reuse	15.8	119.2	291.29	
Ipswich Reuse	10.7	80.2	281.07	
Felixstowe desalination	25	61.3	126.95	
ASR	40* <i>(*drought benefit not average benefit)</i>	TBC	TBC	<i>Option wasn't included in WRMP19 due to uncertainty around potential benefit, so AIC has not been calculated</i>
Trading options with Severn Trent Water	No longer under consideration as per Severn Trent's request			

- If considering resource benefit and AIC, the next best option is ASR. However, there is high uncertainty around the Deployable Output (DO) benefits of ASR as a supply demand option (as opposed to a drought only option) and how the aquifer will react to a forced recharge and recovery cycle. There are also significant water quality considerations and further investigation is required, working closely with the Environment Agency, to ensure that geochemical mixing does not lead to deterioration of water quality or clogging issues.

We will be investigating this further over the coming years as a lengthy pilot study will be required to confirm the DO benefit and assess the water quality issues as well as borehole performance. However, based on preliminary work undertaken in AMP6 with WRE, the DO benefit of the option is likely to be small in comparison to the Fens Reservoir.

- If Fens Reservoir becomes a RAPID solution, the additional funding available would enable the programme to be fast tracked so that the solution could be 'shovel ready' for AMP 8. Without this, we will not be able to progress with developed design or site investigations this AMP and the DCO process will be on hold until next AMP. This has the potential to delay the programme provided in Figure 3 of the main report by 4 years, pushing back the potential start-on-site date to 2031 and therefore the earliest supply date on 2039, as shown in the figure below.



The long-term programme is not the only benefit of Fens Reservoir becoming a RAPID scheme. If the solution can be developed in parallel with the South Lincolnshire Reservoir solution there are efficiencies to be realised. Many work packages can be combined; knowledge can be shared across the solutions; and the project management costs can be split across the two.

Anglian Water and Cambridge Water are committed to co-develop this option together as a potential supply option for both regions. The additional governance and structure around the RAPID process would benefit both companies. In addition, if both companies were developing options in this area independently, this has the potential to increase overall cost to customers.

- Fens Reservoir has been included in both the WRE regional modelling process and water company modelling. On 11th and 20th August, two WRE planning conferences took place to agree a preferred portfolio for the regional reconciliation process. On the River Ouse, a number of reservoirs were included comprising three small Cambridge Water only reservoirs and the Fens Reservoir. The preliminary portfolio of options that will be taken forward into the regional reconciliation process includes the Fens Reservoir, in addition to the South Lincolnshire Reservoir, ASR, desalination and a number of intra-regional transfers.
- The cost of developing Fens Reservoir this AMP to inform our gate one submission was £633k (£592k in 2018/19 rates), a breakdown is provided

below. This is considerably lower than the costs involved with progressing the SLR to the same stage for a number of reasons:

- The level of detail carried out for Fens Reservoir is not as in depth as for the South Lincolnshire Reservoir, for example we have not yet carried out in depth water quality investigations or flood risk work.
- Due to the similarities in the initial concept designs for the SLR and Fens, we have been able to share learning and utilise advice received for the SLR on Fens, specifically on DCO planning advice and procurement strategy.
- The breakdown does not include any EA costs; an agreement is in place for funding gate two support.
- We have not included any contribution to regional modelling from this budget; .
- We have not carried out any external assurance of our gate one submission, but instead utilised advice received on the processes via the SLR assurance. We have an assurance plan to implement for gate two.
- Due to fewer work packages, the associated project management costs have been lower.
- It also doesn't include any allowance for Cambridge Water costs.
- The stakeholder engagement has been more complex for the SLR where we have co-created with an established group of stakeholders which has involved extensive engagement on various work packages.

The bottom-up budget for gate two which is detailed in the main report, allows for the additional background work needed to develop Fens Reservoir to the same level of detail as the SLR, however, there are additional costs likely to be incurred, such as a contribution to the regional modelling.

Deliverable		Actual cost (£k)	2017/18 rates (£k)
1.2	Source of water Includes baseline hydrology and hydrogeology studies, and some modelling	167,021	157,309
1.2.1	Monitoring Includes some ecology monitoring	18,443	17,099
1.3	Site selection Includes initial coarse screening process and scoping for MCDA project	148,407	138,138
1.4	Concept design Includes initial concept design of one option, costing and participatory systems mapping	130,561	121,785
1.5	Environmental considerations Includes a baseline environmental study, INNs risk assessment and initial environmental assessment of the gate one concept design	36,174	33,776
1.6	Flood risk considerations Includes FMRC review and preliminary flood risk assessment	28,275	26,214

1.7	Water quality considerations Includes a baseline raw water quality study	-	-
2	Initial outline of solution procurement strategy No costs associated with this as report used from SLR study	-	-
3 and 6	DCO planning advice and customer and stakeholder engagement Minimal costs to cover early stakeholder engagement. No costs associated with DCO planning advice, as knowledge shared from SLR report	5,980	5,717
4	Contribution to regional planning No contribution attributed to Fens Reservoir to date	-	-
5	External assurance No external assurance took place for gate one	-	-
7	Environment Agency and Natural England support Includes costs agreed with Natural England so far. No NAU costs have been incurred yet, and EA local office costs will be applied from gate one	6,160	5,711
8	Contribution to ACWG consistency studies No contribution attributed to Fens Reservoir to date	-	-
9	Project management This does not include Cambridge Water staff costs	92,143	86,379
	Total spend for gate one	633,165	592,127

Date of response to RAPID	3 rd September 2021
Strategic solution contact / responsible person	[redacted]