

Regulators' Alliance for Progressing
Infrastructure Development

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Strategic regional water resource solutions: Standard gate one final decision for London Effluent Reuse



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1. Introduction

The purpose of this publication is to set out our final decision in respect of the London Effluent Reuse strategic regional water resource solution submitted for the standard gate one assessment by solution sponsor Thames Water¹. The solution includes the following four options; the Mogden South Sewer scheme providing up to 50Mld, the Mogden Effluent Reuse scheme providing 50–200 Mld, the Teddington DRA scheme providing 50–150Mld and the Beckton Effluent Reuse scheme providing 100–300 Mld. Further information concerning the background and context of the Thames Water London Effluent Reuse strategic regional water resource solution can be found in the London Effluent Reuse SRO publication document on the [Thames Water website](#)².

This publication should be read in conjunction with the final decision letter issued to each solution sponsor. Both this document and final decision letters have been published on our website today.

The assessment process is overseen by RAPID, with input from the partner regulators Ofwat, the Environment Agency and the Drinking Water Inspectorate. The Environment Agency together with Natural England and, where a solution impacts Wales, Natural Resources Wales, have reviewed the environmental sections of the submissions, and have provided feedback to RAPID. The Consumer Council for Water provided input to the assessment on customer engagement.

The solution sponsors and other interested parties had the opportunity to respond to the draft decision during the representation period, which followed the publication of the draft decisions on 14 September 2021. We have taken all relevant representations into account in making our final decision.

We would like to thank Thames Water for the level of engagement, collaboration, and innovation that it has exhibited during this stage in the gated process.

¹ Referred to in PR19 final determination as “London Effluent Reuse”

² [gate-one-submission-london-reuse.pdf \(thameswater.co.uk\)](#)

2. Solution summary

The London Effluent Reuse SRO aims to provide a reliable, sustainable supply of water to support the flow in the River Thames. It does this by treating effluent and discharging it to the River Thames or to the River Lee diversion where it can be abstracted as a raw water resource at water treatment works downstream, and possibly to support the Thames to Affinity Transfer (T2AT SRO).

There are four feasible sub-options summarised below. The capacity of each option will be investigated further after gate one. A schematic showing the transfers is included in Figure 1 below.

There are 4 sub options for this SRO:

- **1: Teddington DRA** – up to 150Mld final effluent discharged into the River Thames at Teddington Weir and/or discharged into the Thames Lea Tunnel (TLT) to support NE London.
- **2: Mogden South Sewer Scheme (MSS)** – up to 50Mld recycled water with additional treatment discharged into the River Thames at Walton.
- **3. Mogden Effluent Reuse Scheme (MOG)** – up to 200Mld recycled water into the River Thames at Walton.
- **4. Beckton Effluent Reuse Scheme (BEC)** – up to 300Mld recycled water conveyed by pipe to King George V reservoir in the Lea Valley to support North East London.

Figure 1 – London Re-use Schematic



3. Summary of representations

3.1 Representations received

We have received the following representations relevant to London Effluent Reuse strategic regional water resource solution.

Table 1 Summary of representations

Representation from	Summary of representation
Oxfordshire County Council	<p>Oxfordshire County Council agreed that the London Effluent Reuse proposal should be progressed to gate two.</p> <p>Raised concern with the maximum cost being very high. They also noted that the minimum cost is very low and that it could be that not all the four potential schemes are needed.</p> <p>Acknowledged that the proposal has no impact on Oxfordshire.</p>
Group Against Reservoir Development (GARD)	<p>Transparency of cost estimates GARD cited concerns over a lack of transparency in solution cost estimates generally, requesting further detail to the level that was included in the Fens reservoir gate one report.</p> <p>Deployable output and stochastic flow data GARD expressed concern about a lack of transparency in deployable output (DO) assessments, suggesting the evidence should be made available for scrutiny of the assumptions, data, and outputs of the modelling.</p> <p>GARD raised concerns over the reliability of stochastic river flow data, such as: inaccurate weather data for groundwater-dominated catchments; the stochastic weather base period not containing any long duration droughts; the base period excluding weather since 1997; and the geological difference in catchments not being reflected in the generated Thames and Severn flows.</p> <p>Carbon costing GARD asserted that the gate one reports are poor on the subject of carbon costing of strategic options and have shortcomings in the data presented.</p> <p>Mogden source capacity GARD disagreed with limiting the Mogden reuse option to a maximum of 200Ml/d. GARD recommended that a larger reuse</p>

	<p>option, around 450Ml/d, based on recorded effluent outflows from Mogden STW 2013–2016, be considered.</p> <p>Extra allowance for emergency storage GARD enquired if extra allowance for emergency storage has been made for the London reservoirs to allow for uncertainty in the reuse output.</p>
Port of London Authority	<p>Stated that they responded to the initial draft of the gate one report and have no further comments, but that issues they raised such as the operation of Richmond Lock and Weir and the physical/biological impacts from changes to salinity and temperature, were excluded from the gate one review and are being undertaken in gate two.</p>
Thames Water	<p>Confirmed that total expenditure has been reduced by 41% of the gate one allowance. Commented that there may still be minor amendments following the final settlement of supplier accounts.</p>

3.2 Our Response

We have taken the representations into account in our final decisions and set out below our response to the key points and issues raised.

3.2.1 Transparency in cost estimates

We do not consider information about solution costs to be material to gate one decisions. Gate one is a checkpoint and is the first opportunity to check the progress made by solution owners on investigations and development of solutions in the gated process. At gate one, all solutions were expected to progress to gate two and continue to receive ring-fenced funding unless there was a clear reason why they should not.

Solution costs will be considered further from gate two onwards and in regional plans and water resource management plans. We will provide companies with guidance on presenting and publishing solution costs in their gate two submissions.

3.2.2 Deployable Output assessments and stochastic flow data

The DO assessment is sufficient for gate one. The water companies will continue to develop the solutions and the evidence surrounding them. Guidance will be provided on our expectations for a more detailed examination of deployable output at gate two. The use of stochastic flow data reflects the requirement to test droughts larger than those observed in the historic record, such as drought events with 1:500 year return periods. Solutions generation of stochastic flow data is expected to follow Water Resource Planning Guidelines Supplementary Guidance: Planning to be resilient to a 1 in 500 drought (England), and

Supplementary Guidance: Stochastics. We will pass on the specific points raised to solution owners for consideration as they develop their deployable output assessments further.

3.2.3 Carbon costing

Gate one assessment of solution submissions took account of the fact that assessments of the carbon implications of the solution would inevitably contain a significant degree of uncertainty given the stage of solution development. We consider that the level of information presented on carbon was sufficient for gate one. Solution development to gate two should follow the Water Resources Planning Guidelines for WRMP24 section 8.3.2 which states expectations for accounting for and reducing greenhouse gas emissions. The design should consider; build nothing, build less, build clever and build efficiently throughout the development of the solution, with offsetting only as a last resort. We expect all direct mitigations to be included in the solution costs. The solution should also be considered by the water company within their wider carbon plans.

We will require any carbon assessment annexes to be published alongside the submission at gate two.

3.2.4 Mogden Reuse Option Capacity

In response to GARD's comment that an output of 450ML/d from Mogden should be considered, the capacities of options considered within the RAPID process were developed by solution owners, taking into account feasibility, output and environmental assessments in order to progress delivery of water resource management plans at WRMP19. We expect that any larger capacity options would be identified and assessed through the regional and company planning process at WRMP24 and an update to be provided on option capacities at gate two.

3.2.5 Extra Allowance for Emergency Storage

We will ask the company to clarify if extra allowance for emergency storage has been made for the London reservoirs to allow for uncertainty in the reuse output as part of their investigations going into gate two.

3.2.6 Utilising gate one underspend at gate two

Some solution owners raised concerns in their representations regarding whether gate two allowances would be sufficient for completion of gate two activities and suggested that gate one underspend should be carried forward to gate two. The percentage allocations to each gate in our Final Determination at PR19 were inherently imprecise and were based on our understanding of likely profile of activities to be carried out in progressing the development and investigation of solutions taking into account companies' proposals in this respect. We

now have an improved understanding of the activities to be carried out at gate two and consider that it will be beneficial to allow funding allowance that has not been used at gate one to be made available to solution owners for carrying out gate two activities.

We have therefore decided to merge gate one and gate two allowances for this solution. This will allow any underspend on gate one activities to be used for gate two activities. We will continue to scrutinise expenditure to ensure that it is appropriate and efficient. Companies remain responsible for management of cost risk to meet gate requirements.

4. Solution assessment summary

Table 2 Final decision summary

Recommendation item	London Effluent Reuse
Solution sponsors	Thames Water
Should further funding be allowed for the solution to progress to gate two?	Yes
Is there evidence all expenditure is efficient and should be allowed?	Yes
Delivery incentive penalty?	N/A
Is there any change to partner arrangements?	No
Is there a need for a remediation action plan?	No

4.1 Solution progression and funding to gate two

The evidence suggests that the solution is a potentially valuable way of supplying water to customers. Based on our assessment of the potential solution costs and benefits we have concluded that the solution should progress through the gated process to gate two, and that further funding be allowed.

We have decided to merge the gate one and gate two allowances. This results in a total allowance of £13.20m being available at gate two. Companies remain responsible for management of cost risk to meet gate requirements.

4.2 Evidence of efficient expenditure

The PR19 final determination specified that any expenditure on activities outside the gate activities for the identified solutions (or solutions that transfer in) will be considered as inefficient and be returned to customers. We will consider whether gate activity is efficient by considering the relevance, timeliness, completeness, and quality of the submission which should be supported by benchmarking and assurance.

Our assessment of the efficient costs as spent on gate one activities results in an allowance for this solution of £2.54 (of £2.54m claimed). These costs reflect final and reconciled costs.

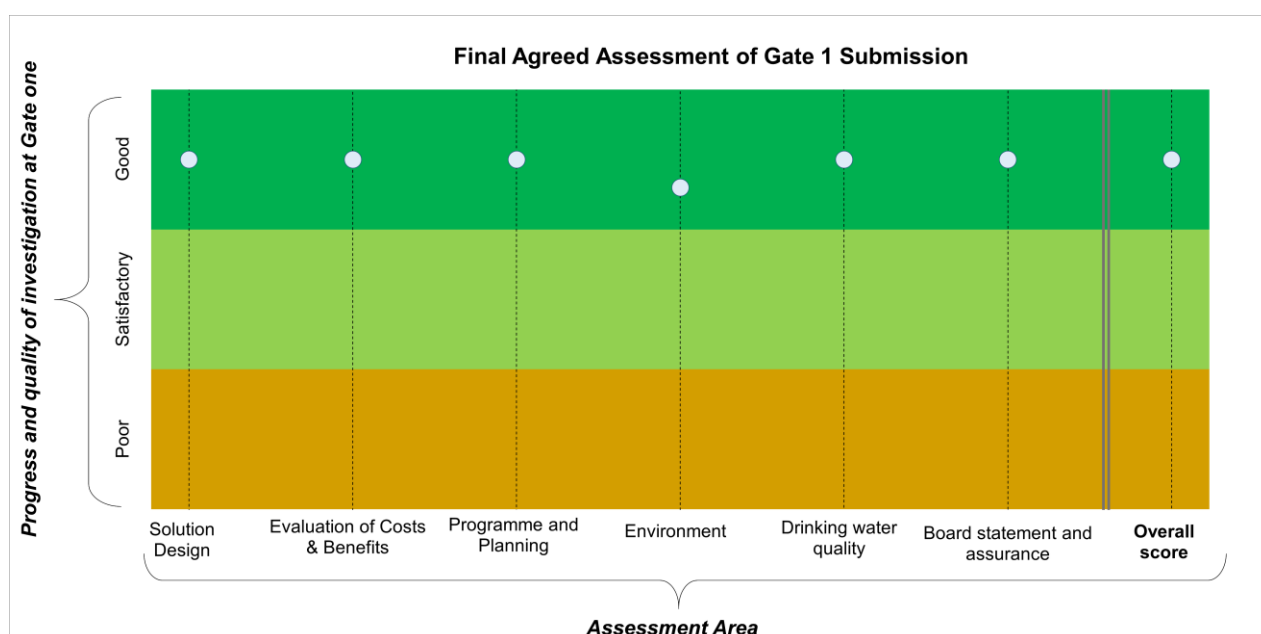
We have made no adjustments to the costs claimed.

4.3 Quality of submission

The aim of the assessment was to determine whether appropriate progress has been made towards delivery of the solution. We recognise at this stage solutions may be at different development points and the assessment takes this into account.

Figure 2 shows our assessment of the work completed on the solution, which was presented in the submission. Our assessment was made against the criteria of robustness, consistency and uncertainty to grade each area of the submission as good, satisfactory or poor in accordance with [our guidance published on 22 February 2021](#)³. We also assessed the Board assurance provided.

Figure 2 – Submission Assessment



Our overall assessment for the solution submission is that it is good (meets expectations).

4.3.1 Solution Design

Our assessment of the solution design considered the quality of the evidence provided on the initial solution and sub-options; the anticipated operational utilisation of solutions; the interaction of the solution with other proposed water resource solutions and stakeholder and customer engagement. The assessment also considered whether information was provided on the context of the solution's place within company, regional and national plans.

³ <https://www.ofwat.gov.uk/publication/rapid-strategic-regional-water-resource-solutions-guidance-for-2021/>

We consider that Thames Water provided good evidence of progress in developing the solution design for gate one, although we expect to see this expanded upon with more detail in the gate two submission.

4.3.2 Evaluation of Costs & Benefits

Our assessment of the evaluation of costs and benefits considered the quality of the information provided on initial solution costs; the societal, environmental, and economic cost and benefits, water resource benefits and wider resilience benefits. The assessment also considered whether evidence was provided on how the solution delivers a best value outcome for customers and the environment.

We consider that Thames Water's evaluation of the costs and benefits of the solution for gate one has been good, although we expect to see this expanded upon with more detail in the gate two submission.

Natural Capital Assessments, and Biodiversity Net Gain assessments need to be reassessed at gate two. Wider benefits will need to be refined for the preferred sub-option and the size and yield of the option will need to be confirmed following outcome of regional plans.

4.3.3 Programme and Planning

Our assessment of the programme and planning considered whether Thames Water presented a programme with key milestones and whether its delivery is on track. The assessment also considers the quality of the information provided on risks and issues to solution progression, the procurement and planning route strategy and subsequent gate activities with outcomes, penalty assessment criteria and incentives.

We consider the progress and quality of the gate one investigation completed by Thames Water regarding the programme and planning, risks and issues and the procurement and planning route strategy for London Effluent Reuse has been good. Going into gate two, a full risks register should be shared with the National Appraisal Unit to ensure a work programme is in place to address environmental risks.

4.3.4 Environment

Our assessment of environment considered the initial environmental assessment; the identification of environmental risks and an outline of potential mitigation measures; the detailed programme of work used to address environmental assessment requirements and the initial outline of how the solution will take into account the carbon commitments.

We consider that the progress and quality of the gate one submission provided by Thames Water regarding the environmental assessment, potential mitigations, future work programmes and embodied and operational carbon commitments has been good and expect to see this work expanded upon for gate two.

Environmental assessments should be refined for gate two, including a review of scopes and further monitoring.

4.3.5 Drinking water quality

Our assessment of drinking water quality considered drinking water quality and risk assessments; evidence that the solution has been discussed with the drinking water quality team and a plan for future work to develop Drinking Water Safety Plans (DWSPs).

We consider that the information provided in this submission on drinking water quality risks, stakeholder engagement and DWSPs for gate one was good. We expect to see further development of DWSPs, water quality monitoring, including for emerging contaminants, and wider stakeholder engagement with ongoing dialogue with the respective water quality teams in gate two.

4.3.6 Board Statement and assurance

The evidence provided relating to assurance has been assessed as good.

The solution sponsor has provided a Board statement that indicates:

- its support of submission recommendations for solution / option progression;
- it is satisfied that progress on the solution is commensurate with the solution being construction ready for 2025–30;
- it is satisfied the work carried out to date is of sufficient scope, detail and quality as would be expected for a large infrastructure project of this nature at this stage; and
- that expenditure has been incurred on activities that are appropriate for gate one and is efficient.

This statement is accompanied by an explanation of the approach to assurance and a description of the evidence and information that the Board has relied on in giving the statements.

5. Proposed changes to partner arrangements

There are no proposed changes to partner arrangements.

6. Actions and recommendations

Where the submission has not been assessed as ‘meeting expectations’ we have provided feedback on where we will seek remediation of the issues. We have also identified specific steps that solution owners should take in preparing for gate two.

We have categorised the remediation issues into priority actions, actions and recommendations.

Priority actions are those that should have been completed at gate one and must now be addressed on a short timescale in order to make sure the solutions stay on track. They require urgent remediation in full and for this reason directly relate to the assessment of delivery incentives set out in this publication. The response to the priority actions will determine whether a delivery incentive is imposed; and the extent to which the delivery incentives can be mitigated by the solution sponsors. If all priority actions are satisfactorily completed, then the penalty will not be imposed. If one or more of priority actions are not satisfactorily completed, then the whole of the penalty will be imposed.

We have also identified actions that should be addressed in full in the gate two submission. The response to these actions will influence the assessment of the gate two submission.

Recommendations are issues where additional information or clarification could improve the quality of future submissions.

No priority actions have been identified for London Effluent Reuse and therefore we do not require the solution sponsors to provide us with a remediation action plan. The full list of other actions and recommendations can be found in the Appendix.

7. Gate two activities

The solution will continue to be funded to gate two as part of the standard gate track.

For its gate two submission, we expect Thames Water to complete the activities listed in [PR19 final determinations: strategic regional water resources solutions appendix](#) as expanded on in section 15 of its gate one submission.

8. Incentives for gate two

For gate two we maintain the same arrangements for incentives as applied in gate one – that is, a maximum penalty of 30% of company's total efficient gate funding that could be applied to solutions that have not made adequate progress, where work is of inadequate quality, or the submission deadline is missed.

Penalties will be determined on a case by case basis taking into account:


- the level of completeness and the overall quality of the work carried out in investigating and developing the solution based on the evidence summarised in the submission;
- the evidence and justification provided where aspects of the work carried out fall short of expectations; and
- the impact on the decisions and delivery of solutions, including the extent to which deficiencies adversely impact customers.

Penalties will be applied through the PR24 reconciliation mechanism, as described in '[PR19 final determinations: Strategic water resource solutions](#)'.

There will be no opportunity to remediate deficiencies identified at the assessment in order to defer penalties.

Appendix: Actions and Recommendations

Actions – to be addressed in gate two submission		
No	Section	Detail
1	Solution Design	Develop utilisation figure to be determined by regional modelling and to consider impacts of in-combination effects.
2	Costs and Benefits	Use outcomes from the regional Modelling to determine drought resilience.
3	Costs and Benefits	Ensure a best value analysis, following relevant guidelines and including environmental/social/economic costs, is undertaken and presented for all of the sub-options within this SRO.
4	Environment	Review the scope of environmental impacts and ensure engagement with regulatory partners to identify where mitigation can be built into solution design.
5	Environment	Review the scope of any future statutory Strategic Environmental Assessment (SEA) to agree objectives and recommendation additions/subtractions (for example, the guide questions in SEA focus on reducing carbon emissions and the longevity of the option, and less so on the impacts on the environment in light of climate change).
6	Environment	Update environmental annexes to reflect comments and agreed actions as a priority, including consideration of Swanscombe MCZ in the SEA.
Recommendations		
Number	Section	Detail
1	Stakeholders	Produce a detailed stakeholder engagement plan, including identification of wider / local stakeholders.
2	Costs and Benefits	Further consider social and amenity value, if this is limited due to type of solution, this can be explained in the submission.
3	Planning	Carry out a detailed assessment of interdependencies and in combination impacts with other SRO and non-SRO options, including Deephams reuse, following outputs of regional modelling.
4	Environment	Explain how Thames Water will seek to influence the supply chain to reduce scope 3 carbon emissions and outline how the root cause of the issues ties in with the SRO behaviour change/consumption/wastewater disposal etc
5	Water Quality	Particular attention should be paid to the recommendations and learning from previous DWI events where effluent discharge impacted on drinking water supplies.



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