

June 2023

**Strategic regional water
resource solutions:
standard gate two final decision
for London Water Recycling
Schemes**

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1. Introduction

The purpose of this publication is to set out our final decision about whether the London Water Recycling Schemes¹ solution should continue to receive development funding². The solution owner Thames Water submitted their standard gate two reports on 14 November 2022 for assessment. Further information concerning the background and context of the Thames Water London Water Recycling Schemes can be found in the solution publication document on the Thames Water website³.

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

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 Natural Resources Wales (for solutions involving Wales), have reviewed the environmental sections of the submissions, and provided feedback to RAPID. The Consumer Council for Water provided input to the assessment on customer engagement.

The solution owners and other interested parties had the opportunity to respond to the draft decision during the representation period, which followed the publication of the decisions on 30 March 2023. 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 they have exhibited during this stage in the gated process.

¹ Referred to in PR19 final determination as London effluent reuse

² [PR19 final determinations: Strategic regional water resource solutions appendix](#)

³ [Strategic water resource solutions | Regulation | About us | Thames Water](#)

2. Solution Summary

2.1 Solution summary

The London Water Recycling Scheme aims to provide a reliable, sustainable supply of water to support river flows in London. It does this by treating effluent and discharging it to the River Thames or the River Lee, where it can be abstracted as a raw water resource to supply water treatment works downstream, and possibly to support the Thames to Affinity Transfer (T2AT solution).

There are four feasible sub-options summarised below which have been further developed since gate one. A schematic showing the transfers is included in Figure 1 below.

The 4 sub options for this solution are:

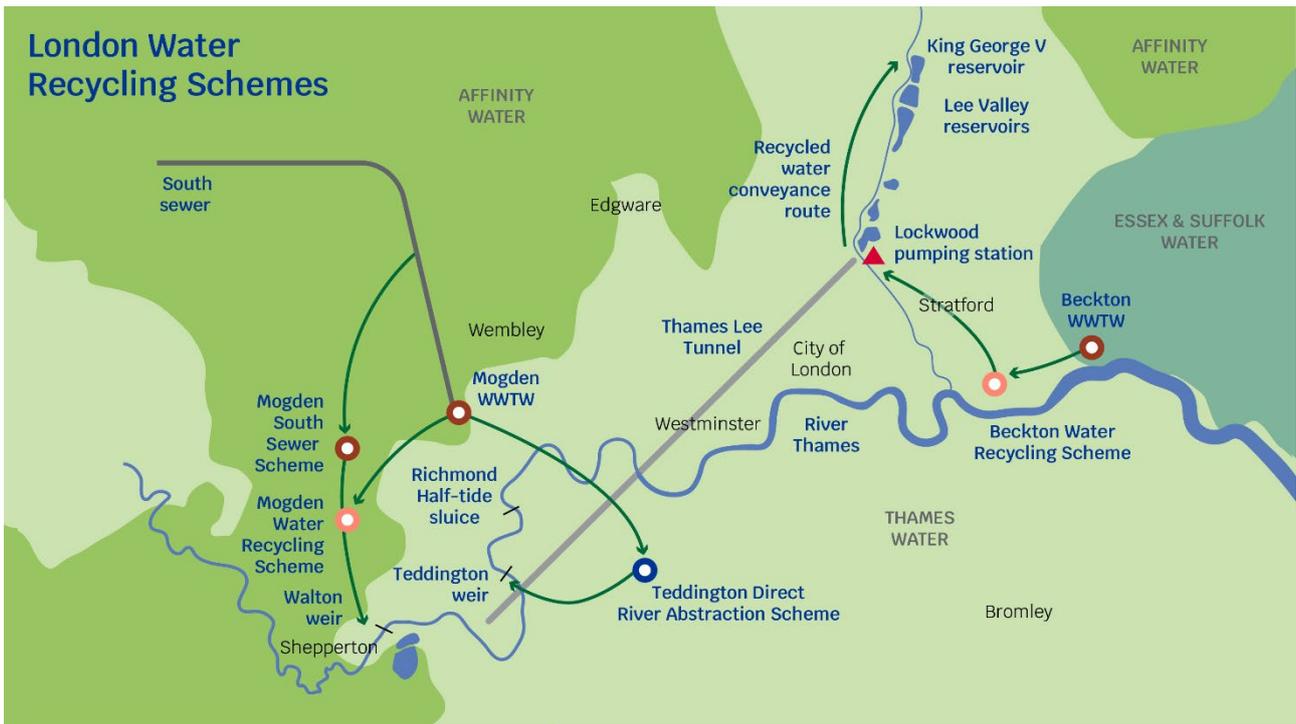
- 1: Teddington DRA – up to 100 megalitres per day (Ml/d) recycled water discharged into the River Thames at Teddington Weir replacing abstraction via the Thames Lea Tunnel (TLT) to support North East London.
- 2: Mogden South Sewer Scheme (MSS) – up to 50Ml/d recycled water with additional treatment discharged into the River Thames at Walton.
- 3. Mogden Effluent Reuse Scheme (MOG) – up to 150Ml/d recycled water into the River Thames at Walton.
- 4. Beckton Effluent Reuse Scheme (BEC) – up to 300Ml/d recycled water conveyed by tunnel to the River Lee diversion for flow augmentation and abstraction to the Lee Valley Reservoirs supporting North East London.

Thames Water have recommended that Mogden South Sewer exits the gated process at this point. Mogden South Sewers' deployable output is reduced based on the available flow, with the proposal that it does not progress into gate three.

As a result of the regional planning process, Teddington DRA has been identified as a preferred option to progress for early delivery.

Thames Water propose that London Water Recycling is split into three solutions, namely Teddington DRA, Beckton Water Recycling and Mogden Water Recycling. We understand the reasoning behind the proposal to change. However, we believe there is merit in keeping them as one solution but accept the need to be flexible in terms of the timescales of progression for the three options.

Figure 1. London Water Recycling Solution Schematic



3. Summary of representations

3.1 Representations received

We have received the following representations relevant to the London Water Recycling Schemes.

Table 1. Summary of representations

Representation from	Summary of representation
<p>Members of the public</p>	<p>Environment</p> <ul style="list-style-type: none"> • Concerns raised on solution development. Noted replacing river water with treated effluent and unregulated levels of chemicals, endocrine disrupters and microplastics. • All are described as a risk to the environment with the extent of the risk unknown. • Highlighted damage from construction works to local wildlife and river sediment and remobilising dangerous pollutants. • Objection to the solution as development of the sites for operation will be on Sites of Importance for Nature Conservation (SINC) and tunnelling shafts are likely to be located in a Metropolitan SINC. • Perceived that limited assessments have been conducted of the impact of the solution to the environment. <p>Best value planning</p> <ul style="list-style-type: none"> • Negative perception of the solution with view that the only advantage to the scheme is that it is the cheapest option available. • A large project to move water from one side of London to another hardly seems like the right cost benefit solution. <p>Water resource planning</p> <ul style="list-style-type: none"> • Members of the public expressed that other less risky options should be considered. It was suggested that a national desalination programme be considered instead to safeguard long term UK water supply. • Members of the public comment that Thames Water should focus on areas such as leakage and metering rather than the Teddington scheme. <p>Social impact/ wider benefits</p> <ul style="list-style-type: none"> • Members of the public also have concerns that the recreational use and amenity value of the River Thames had not been sufficiently taken into account during the assessment of costs and benefits • Opposition to development of the solution, due to development where the community uses space for walks, swimming etc.

	<ul style="list-style-type: none"> Noted the impact of construction to the use of space for the community. Concerns of noise pollution, disruption and damage. <p>Drinking Water Quality</p> <ul style="list-style-type: none"> Members of the public expressed distrust of Thames Water due to the sewage discharges and do not trust the company to treat the water coming into the river. <p>Stakeholder engagement</p> <ul style="list-style-type: none"> Members of the public expressed dissatisfaction with the consultation process and found it inadequate. Members of the public criticised the lack of direct communication from Thames Water and stated that they only heard about the consultation through neighbours and interested groups.
<p>Flood wardens of Trowlock Island</p>	<p>Drinking Water Quality</p> <ul style="list-style-type: none"> Concerns about drinking water quality due to the potential contamination from overtopping of the weir during high tides, carrying effluent towards the extraction point. <p>Social impact/ wider benefits</p> <ul style="list-style-type: none"> Impact on recreational users and the riverbank caused by the proposed outflow location, which is inconvenient for swimmers and visually unappealing. <p>Thames Water Operating Performance</p> <ul style="list-style-type: none"> Noted lack of reliability in Thames Water operating performance, leading to public distrust, and suggestions for continuous monitoring of discharge quality and real-time public access to readings, as well as a mechanism for immediate issue reporting.
<p>Oxfordshire County Council (OCC)</p>	<p>Water resource planning</p> <ul style="list-style-type: none"> OCC are concerned that additional water supply needed in the South East has been seriously overestimated because of incorrect population growth models and poorly evidenced environmental targets. They assert that water companies should do more to reduce leakage and reduce demand and then the need for building new items of strategic infrastructure will be reduced. There are other options which could provide water supply which are not included in the RAPID gated process. The regulators' funding should also support the development of a wide range of options including smaller, more innovative and less environmentally damaging solutions. They state that resilient schemes such as water recycling, water transfers, and desalination should be prioritised so that other options such as the SESRO are not needed. They would like to see funding, for example, of nature-based catchment management schemes where projects are developed to retain water, manage flood risk and create new nature reserves, alongside a much greater focus on aquifer recharging.

	<ul style="list-style-type: none"> OCC state that the top priority needs to be building resilience to unpredictable and rapidly evolving climate impacts. This would result in a fundamentally different prioritisation based on resilience to future water shortages and speed of delivery. Given the urgency of climate change, the need for new items of strategic infrastructure that will take a long time to build is over-estimated relative to the need for smaller schemes that can be brought forward quickly and provide resilient sources of water. They favour the use of existing or refurbished infrastructure, such as the canal transfers, or infrastructure which is underground, such as pipelines. Support the progression of the RAPID recycling schemes, and recommend RAPID does not remove any recycling schemes without sound justification. <p>Gate timing</p> <ul style="list-style-type: none"> RAPID’s draft decisions offer various gate three dates going forward. Query this amendment to the process which previously envisaged that schemes would be able to be compared with one another at the same time. Comparison is made more complicated with timelines dispersed over six years. <p>Decision making</p> <ul style="list-style-type: none"> They expect RAPID will need to review its draft decisions to make sure that the final decisions are consistent with the recently published National Policy Statement. <p>Carbon costs</p> <ul style="list-style-type: none"> The Council believe that RAPID should continue to seek evidence that the companies are embracing innovative designs and opportunities to generate or be powered by renewable energy and/or sequester carbon. The Council believe that a comparable carbon assessment should be undertaken for each solution and that solutions should set out net zero carbon commitments. Believe that RAPID should be clear in their decisions that gate submissions will require solution partners to set out the carbon costs of their proposals in relation to the government’s commitments to reduce carbon emissions, and that the carbon footprint of solutions could be compared when choosing between options.
<p>Group Against Reservoir Development (GARD)</p>	<p>Solution progression</p> <ul style="list-style-type: none"> Support the solution delivering at least 67MI/d. <p>Solution design</p> <ul style="list-style-type: none"> Suggested a larger version of Teddington DRA should be reconsidered, making use of the c. 400MI/d output of Mogden. Propose final gate two decision should require the 100MI/d Teddington DRA scheme to be considered as the first stage of a larger scheme. Propose the gate two decision should include the 45MI/d Deephams scheme as a Strategic Resource Option (SRO) in

	<p>the gate three investigations with a target completion date of 2040. This is from GARD's assessment of the Thames Water supply demand balance, showing headroom to bring forward reductions in Thames Water's Lower Lea abstractions in 2040.</p> <ul style="list-style-type: none"> Noted Thames Water's quoted average incremental cost (AIC) is lower for the Deephams reuse scheme and less than Abingdon reservoir. GARD proposes the 45Ml/d Deephams scheme as an SRO in the gate three investigations with a target completion date of 2040. <p>Solution costs</p> <ul style="list-style-type: none"> Although there is now a fair amount of cost detail available in the gate two reports for the strategic options, there are no option cost comparisons to justify the selection of options and their sequence of development. These comparisons might be expected to be prominently available in regional plans and the Water Resource Management Plans (WRMPs), but there are none to be seen. This is a major failing in transparency which needs to be addressed in gate three.
<p>Thames Water</p>	<p>Gate allowance</p> <ul style="list-style-type: none"> Costs received for gate two draft decision were estimated for final few months of gate two activities. Actual gate two costs are £5.57m. Reduced from £5.71m. Accounting for this underspend and that of gate one (£3.76m), Thames Water project an adjusted gate three allowance of £29.57m. Acknowledged expected adjusted expenditure in future gates due to change in solution scope. Believe scope for gate three remains consistent with PR19 requirements to develop sub-options at Beckton, Mogden and Teddington. Welcome discussion on forecast expenditure and AMP7 reconciliation process. Expect DRA funding for Teddington DRA as part of PR24, despite being delivered directly and not via Direct procurement for customers (DPC). <p>Environment</p> <ul style="list-style-type: none"> With regard to priority action two "Identify mitigation measures for all environmental impacts for each option before final WRMP's are published", Thames Water say that it has been demonstrated through gate one and two that the water recycling schemes are feasible. They also recognise further work is needed on environmental effects and mitigation through gates three and four, however this work should not impede on the finalisation of the WRMP as a strategic plan. They stress that this work is for the consenting and permitting process to address. Action against the priority action will consists of a list of scheme mitigation measures for the main environmental topics that will be included in the scheme design following the

	<p>Environmental Impact Assessment (EIA) process and scheme consultation.</p> <ul style="list-style-type: none"> Request further time to address priority actions for alternative schemes (Beckton and Mogden) as they are on slower programmes to gate three. Propose addressing these respective actions by December 2023. <p>Gate timing</p> <ul style="list-style-type: none"> Noted gate three timing is dependent on the delivery of a number of pre-application planning outcomes (e.g. EIA scoping and scheme consultation). Thames Water are re-evaluating the consenting programme considering priority actions, feedback from Thames Water WRMP24 consultations and new scheme considerations. They will update RAPID on the gate three timetable via regular checkpoints.
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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. For the representations or parts of representations which indicate support, provide information or give an update without raising key points and issues, we do not provide a response below but are grateful for the comments provided and confirm that we have also taken these into account.

RAPID acknowledges the significant public interest generated by the draft decision document outlining the progression of London Water Recycling, specifically Teddington DRA, to meet future water demand. RAPID has received a substantial number of responses from concerned members of the public, with a total of 690 individual representations submitted.

These responses highlight various concerns related to the project's potential impact on the environment, recreational use of the area, and wider considerations such as cost effectiveness. The key points and issues from these representations are included in the summary of representations in Table 1 above. We value the feedback received from all respondents.

We have noted concern expressed in some representations about the process of water recycling. The solutions presented in this submission are all indirect recycling options where treated waste water is discharged into water bodies to augment rivers and reservoirs. Water recycling technology and water treatment processes are well understood, and discharges to watercourses from water recycling processes are regulated through environmental permits issued by the Environment Agency. The Environment Agency will only issue environmental permits for new water recycling schemes if it is satisfied about the effects of discharges on the environment, including water quality and water levels in any watercourses receiving those discharges. All abstracted water for potable use will be fully treated to meet the

requirements of The Water Supply (Water Quality) Regulations 2018 (as amended) and is regulated by The Drinking Water Inspectorate.

3.2.1 Environment

Members of the public and stakeholders have raised concerns about the potential negative environmental impact of the solution including risk of unregulated levels of chemicals, endocrine disrupters and microplastics in the river. The discharge for a Teddington DRA scheme would be made using effluent treated by a new tertiary treatment works at Mogden sewage treatment works. This discharge will be regulated by an environmental permit and will have to be treated to a high standard to protect the environment and human health. RAPID has set a number of priority actions for Thames Water to meet in order to understand the environmental impact of a Teddington DRA. Any identified adverse environmental impacts will need to be addressed and this will be considered through the environmental permitting and planning processes, for which the Environment Agency are the regulator and a statutory consultee respectively.

The Environment Agency and Natural England sit on a number of environmental technical working groups to advise on potential environmental impacts and appropriate mitigation measures.

We understand stakeholders' concerns about the impact construction may have on local communities. These issues will be considered through the planning process and stakeholders should engage with the relevant planning consultations and processes to raise these concerns.

In response to representations made about priority action 2: "Identify mitigation measures for all environmental impacts for each option before final WRMP's are published" in the RAPID gate two draft decision document, RAPID accept that Thames Water will provide a list of scheme mitigation measures for the main environmental topics that will be included subsequently in the scheme design following the Environmental Impact Assessment (EIA) process and scheme consultation. RAPID have removed the requirement 'before final WRMP's are published' in this priority action because the gated process should not impact publication of the final WRMPs.

RAPID also accept the delayed delivery of Beckton and Mogden priority actions to December 2023. Following a letter from Thames Water to RAPID, the delivery date for Teddington DRA's priority actions is now December 2023.

3.2.2 Solution Costs

Water resources infrastructure options are considered and selected as part of regional plans and water resource management plans not the gated process. The gated process provides cost information for other purposes.

3.2.3 Solution Design

Some representations proposed alternatives for the volumes of water delivered by the solution during operation. An uplift to providing 100MI/d from 75MI/d was suggested by GARD. The size of the solution has been determined by the Water Resources South East (WRSE) modelling; therefore, the scheme size is limited to 75MI/d.

Additionally, it was recommended that during the gate three decisions, the Deepham's scheme should be included as an SRO. This scheme currently sits outside of the RAPID gated process in WRMP24 and will not progress as an individual SRO for gate three.

3.2.4 Best Value Planning

Water resources planning at a regional and company level is following a best value approach. This allows consideration of how solutions can best be used to bring about best value at a national and regional scale. London Water Recycling was selected as part of water resource planning at a regional and company level following a best value approach. The need for solutions and the decisions on whether or not solutions ultimately go ahead will be made through water resources planning processes and subsequent applications for planning and environmental consents.

Gate three submissions should include a summary of the best value considerations relevant to the preferred option for each solution included in all the individual company WRMPs and regional plans where the solution appears. This should include the consideration of financial cost and how it will achieve an outcome that increases the overall benefit to customers, the wider environment and overall society. Benefits to consider could include any amenity or recreation value, regional economic impact, multisector benefits, and other societal benefits.

The solution owners will need to justify their site selection through the planning process.

3.2.5 Gate Timing

The solutions are due to start construction at different times, therefore after gate two the solutions need to follow different timetables. Beyond gate two, gate alignment across the whole programme becomes less important. It is more important that gates align with pre-

planning application activities. Beyond gate three, the timings also become more dependent on external factors such as the Development Consent Order (DCO) or planning application process. The need for flexibility and bespoke solution gate timings will be reflected in future decisions.

Thames Water noted the uncertainty on the gate three timing. This is due to the dependence on the delivery of a number of pre-application outcomes. RAPID understand this and expect Thames Water to remain closely engaged with RAPID on updates concerning this. RAPID also propose a regular checkpoint meeting with Thames Water to confirm the finalised delivery dates when they are available.

3.2.6 Social impact/ wider benefits

Thames Water are responsible for developing their supply options, including the location of any infrastructure. Any scheme taken forward will be subject to environmental impact assessment to identify any impacts and mitigation required.

We agree that additional benefits to the local community and the environment are an important aspect of the RAPID solutions. Solution partners will continue to investigate potential impacts on recreational users of the river and also opportunities to realise the wider benefits that could be developed as part of the solution.

During gate three, Thames Water will increase engagement with local stakeholders and residents, and regulators to ensure all concerns are captured. Thames Water will also complete statutory consultations as part of the statutory planning process, which we encourage people to engage with.

3.2.7 Stakeholder engagement

We agree that stakeholder engagement is important. Solutions will need to follow gate three engagement guidance which include:

- Pre-planning statutory consultation as described in The Planning Inspectorate Advice note 11: working with public bodies in the infrastructure planning process and Annexes A-H⁴
- Plans showing ongoing and continued engagement, that have been shared with public and statutory bodies, including any required enhanced advisory services.
- Customer engagement, particularly on changes of source where relevant.

⁴ <https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/>

- Engagement with all stakeholders affected by the solution's development.

3.2.8 Drinking Water Quality

Thames Water are reviewing the potential effects of high tides through the modelling process to better understand and mitigate any risks identified. Through gate three, Thames Water will continue to use raw water monitoring data to inform the company's Drinking Water Safety Plans (DWSPs) to understand the risks presented in the raw water and to ensure adequate treatment of these.

3.2.9 Decision making

The National Policy Statement (NPS) for Water Resources Infrastructure will be used as the primary basis for examination by the Examining Authority of development consent order applications for water resources nationally significant infrastructure projects. It will also be used by the Secretary of State in making decisions on those applications and may be a material consideration in making decisions on water resources infrastructure development that falls within the local authority planning regimes. As such, the solution owners will need to address the NPS for Water Resources Infrastructure in the applications that they make at a later stage for development consent orders or planning consents. However, it is not a relevant consideration for Ofwat's earlier decisions at gate two on the continuation of funding for progressing the solutions to gate three.

3.2.10 Carbon costs

Solution development to gate three should continue to build from the gate two submissions. In particular, in gate three guidance we are asking solutions to continue to follow the Water Resources Planning Guidelines for WRMP24 section 8.3.2 (published in April 2022) which states expectations for accounting for and reducing greenhouse gas emissions. In Wales, expectations are set out in section 3 of the guiding principles (published April 2016) for WRMPs. We are asking companies to reduce and mitigate embodied carbon as much as possible using standard approaches and appropriate frameworks. On 6 January 2022, Ofwat published its net zero principles position paper^[1]. Solutions should be designed in line with these principles. Companies are encouraged to ensure solutions:

- are reflective of national government targets on net zero
- prioritise the reduction of GHG emissions before the use of offsets, doing so in line with the IEMA GHG Management Hierarchy^[2] and;
- clearly address both operation and embedded emissions

3.2.11 Water resource planning

The water resources planning process assesses the need for the solutions and the socioeconomic assumptions such as those around growth underpinning the modelling for these processes.

Company WRMPs and Regional Plans develop their demand forecasts in line with Water Resource Planning Guidelines, which sets out requirements for using Local Plan and Office for National Statistics population growth projections. Ofwat's long term delivery strategies guidance also defines using two population forecasts in low and high population scenarios. We have assessed where companies have adhered to these methods in order to set out the needs case for the RAPID solutions.

Reducing leakage and being more efficient in using water both have a significant role to play but will not be sufficient alone to ensure security of water supplies in the future.

Water resources infrastructure options are considered and selected as part of regional plans and water resource management plans. These plans consider both demand side measures and supply side measures as part of a twin track approach to water resources and determine the need for new water resource infrastructure. Neither Ofwat nor RAPID has a decision-making role in regional plans or water resource management plans.

The anticipated effects from industry measures to reduce leakage and reduce demand are taken into account in water resource planning as part of the assessment of whether new water resource infrastructure is required. The national framework – published by the Environment Agency in 2020 – set out expectations that the industry reduces demand to around 110 litres per person per day and reduces leakage by 50% both by 2050. The conclusion of the water resource management planning process is that, even with these reductions, new water resource infrastructure will be needed to improve drought resilience, reduce the impact of abstraction on the environment, supply a growing population and adapt to climate impacts.

The RAPID programme does include, and has included, different types of solutions such as transfers, water recycling and desalination. The Fawley desalination solution left the RAPID programme in 2021. Several transfer and water recycling solutions continue to be part of the RAPID programme. Additional solutions can enter the RAPID programme if they are proposed by water companies and meet the programme criteria, which are outlined in published guidance. There are also solutions in the RAPID programme that use existing or refurbished infrastructure, such as Grand Union Canal and North West Transfer. There are also several solutions that are considering the use of pipelines to transfer water such as Anglian to Affinity Water.

In terms of non-capital options, Ofwat are encouraging nature-based solutions through PR24 as referred to in PR24 final methodology Appendix 9 Setting Expenditure Allowances.⁵

3.2.12 Gate allowance

We have updated the text in section 4.3 to reflect the change in final gate two expenditure derived from the final gate two accounts.

3.3 Other changes to our draft decisions

3.3.1 Area that we have changed not as a result of a representation

We have corrected the wording in Table 3 to reflect outstanding concerns on environmental issues for which we have set priority actions 2 to 12.

In response to the high number of representations from members of the public, we expect to see an increase in stakeholder and customer engagement relating to these schemes as work progresses through gate three. We have added action 3 in Appendix A to provide for this.

We have made some clarificatory textual amendments to the solution summary in section 2.1 and text in section 4.4.1.

We have removed priority action 2 from the draft decision document because this is covered by priority action 7 and 11 in the final decision document. We have also added clarification to the requirement for priority action 7.

We have removed recommendation 1 from the draft decision document because we already have this information.

⁵ [PR24 final methodology Appendix 9 Setting Expenditure Allowances](#)

4. Solution assessment summary

Table 2. Final decision summary

Recommendation item	London Water Recycling
Solution owners	Thames Water Utilities Limited
Should further funding be allowed for the solution to progress to gate three?	Yes
Is there evidence all expenditure is efficient and should be allowed?	Yes
Delivery incentive penalty?	No
Is there any change to partner arrangements?	No
Are there priority actions for urgent completion?	Yes
Are priority actions and actions from previous gates addressed?	Yes
Suitable timing for gate three has been proposed	Yes, refer to section 8 for details.

4.1 Solution progression to standard gate three

The evidence suggests that the solution is a potentially valuable way of providing an additional source of raw water for abstraction and treatment to supply water to customers during periods of prolonged dry weather. Based on our assessment of a wide range of areas that could concern the progression of the solution, we have concluded that the solution should progress through the gated process to gate three. Figure 2 below summarises the area of any progression concerns, including indication of the significance. The reasons for this assessment conclusion are set out in table 3 below.

Decisions on funding as a result of this progression decision, are set out in section 4.2.

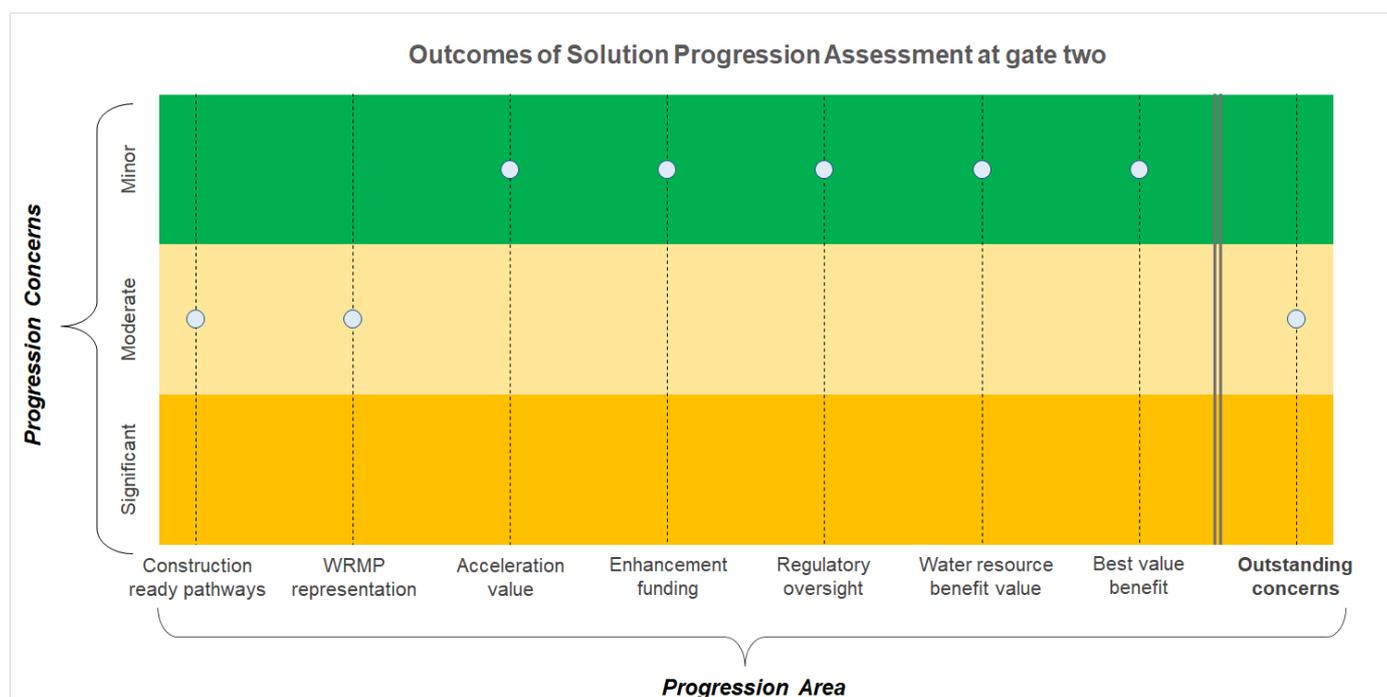


Figure 2. Assessment of solution's progression concerns

Table 3. Final decision progression criteria

Progression criteria	London Water Recycling
Solution owners	Thames Water
Is the solution in a preferred or alternative pathway in relevant regional plan or WRMP (where applicable) to be construction ready by 2030?	<p>Yes, the Teddington DRA solution is selected in Thames Water's draft water resource management plan (WRMP24) as a solution on its preferred pathway, which is the relevant plan for the standard track. The solution is also in the Water Resources South East (WRSE) draft regional plan. The solution will be construction ready by 2027.</p> <p>However, Beckton Water Recycling and Mogden Water Recycling are not selected in preferred or adaptive pathways in Thames Water's dWRMP24. Beckton Recycling option has been selected in WRSE sensitivity runs.</p>
	No further action is required on this progression criteria.
Do regulators have any significant concerns with the solution's inclusion or non-inclusion in a WRMP or regional plan or with any aspects that may impact its selection, to a level that they have (or intend to) represent on it when consulted?	<p>No, the regulators do not have concerns on how the solution is represented, or the information about it, in Thames Water's draft WRMP24, or WRSE's draft regional plan.</p>
	No further action is required on this progression criteria.
Is there value in accelerating the solution's development to meet a company's or region's forecast supply deficit?	<p>Yes, the preferred option of Teddington DRA is already on a tight time schedule for delivery therefore unable to accelerate further. The other options are currently not being selected for delivery before 2040.</p>
	No further action is required on this progression criteria.

Does the solution need continued enhancement funding for investigations and development to progress?	Yes. Continued funding is required to develop a solution to be delivered in time for the planned construction ready date.
	No further action is required on this progression criteria.
Does the solution need the continued regulatory support and oversight provided by the Ofwat gated process and RAPID?	Yes. The solution will continue to benefit from the regulatory support and oversight provided by being included in the RAPID programme.
	No further action is required on this progression criteria.
Does the solution provide a similar or better cost / water resource benefit ratio compared to other solutions?	This solution is expensive if considered on the basis of cost per projected utilisation as it is a drought resilience asset. However, when considered on a capacity basis, solution costs are not unreasonable over the medium to long-term, and the solution can be adapted to provide capacity beyond the immediate resilience requirement.
	No further action is required on this progression criteria.
Does the solution have the potential to provide similar or better value (environmental, social and economic value – aligned with the Water Resources Planning Guideline) compared to other solutions?	This is a recycling scheme to augment the River Thames during prolonged dry weather periods. As such there are no direct societal or social benefits. The solution offers natural capital and opportunities for biodiversity net gain.
	No further action is required on this progression criteria.
Does a regulator or regulators have outstanding concerns that have not been addressed through the strategic planning processes taking into account proposed mitigation?	Yes. We have significant concerns that there are environmental impacts for which there are no current plans for appropriate mitigation. These need to be investigated during gate three through further environmental assessments.
	This progression concern is addressed in actions 2 to 12 in Appendix A of this document.

4.2 Solution funding to standard gate three

We are not changing the funding of this solution at present. This solution’s total allowance and gate allowances remain the same as the final determination. The details of this funding decision are set out in table 4 below, and details on forward programme in section 8.1.

Table 4. London Water Recycling funding allowances (2017/18 Prices)

	Gate one	Gate two	Gate three	Gate four	Total
London Water Recycling gated allowance	£6.29m	£9.44m	£22.03m	£25.18m	£62.94m
Comment	10% of development allowance calculated as 6% of total solution costs	15% of development allowance calculated as 6% of total solution costs	35% of development allowance calculated as 6% of total solution costs	40% of development allowance calculated as 6% of total solution costs	Total development allowance calculated as 6% of total solution costs

As a result of a decrease in scope for the solution, we expect that the reconciliation process will claw back some of the expenditure in future gates.

This funding is allowed in accordance with the conditions and requirements as outlined in the [PR19 final determinations: Strategic regional water resources solution appendix](#).

4.3 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.

London Water Recycling has carried forward £3.76m underspend from gate one, increasing the allowance available to them at gate two to £13.20m.

Our assessment of the efficient costs as spent on standard gate two activities results in an allowance for this solution of £5.56m (of £5.56m claimed). London Water Recycling has therefore underspent its combined gates one and two allowance by £7.64m and may take this underspend forward to gate three, increasing the allowance available to them at gate three to £29.67m.

From gate two, we will move to look at the cumulative gate spend against the cumulative total allowance, across all gates consistent with the activities being undertaken. For example, any gate four allowance that is brought forward towards gate three should be for the purpose of early gate four activities. As London Water Recycling is progressing to gate three, this will apply here.

4.4 Quality of solution development and investigation

The aim of the assessment was to determine whether gate two activities have been progressed to the completion and quality expected, for the continued development of the solution.

Figure 3 shows our assessment of the work completed on the solution, which was presented in the gate two 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 the [standard gate two guidance](#), (updated version published on 12 April 2022). We also assessed the Board assurance provided.

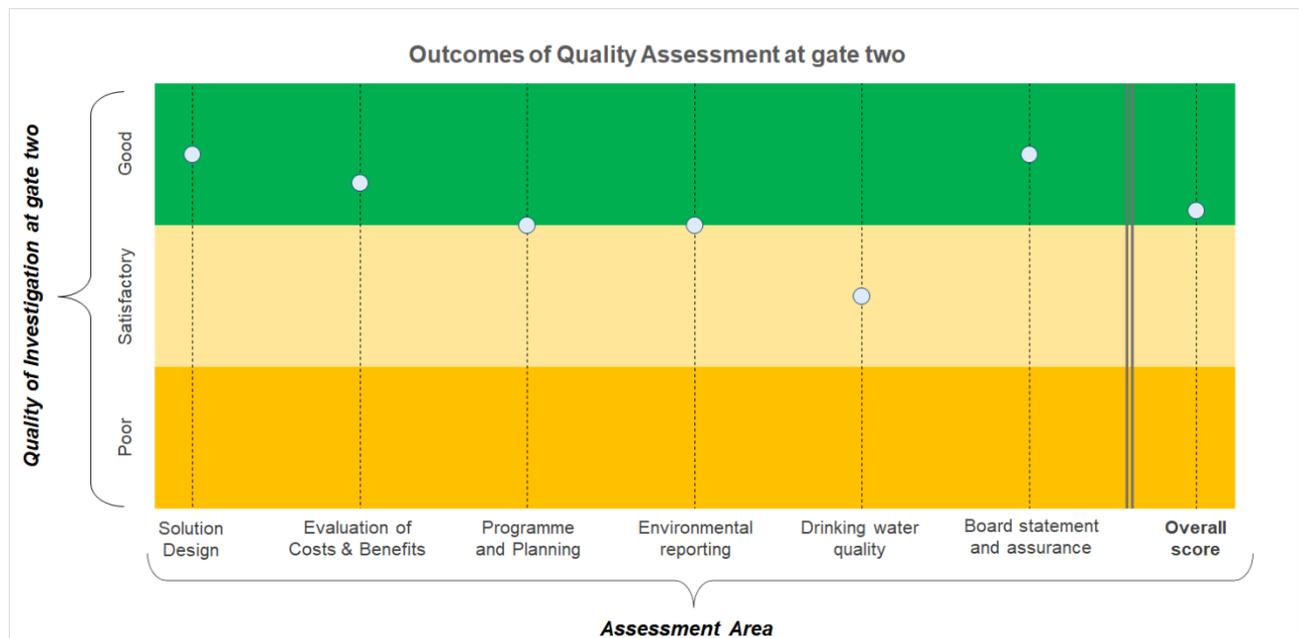


Figure 3. Assessment of quality of investigation

Our overall assessment for the solution submission is that it is a good submission that meets expectations of gate two.

In addition to the overall assessment score, there is some variance in expectations being met across the submission, with drinking water quality falling short of expectations and not as developed as would be expected at gate two.

We explain our assessment of each individual area, including any shortfalls in expectations, in the sections below. We have not applied any delivery incentive penalties as a result of this assessment of quality, as further detailed in section 6.

4.4.1 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.

We consider Thames Water to have provided sufficient evidence of progress in developing the solution design for gate two. The submission falls short of expectations in some areas. Gate two presents detailed information on all four sub-options assessed.

The assessment of London Water Recycling has focused on Teddington DRA 75 Ml/d as that is the preferred option in the plan and we support this sized option progressing to gate three. We also support Beckton (BEC) progressing to gate three as that has been selected in WRSE sensitivity runs. However, Mogden (MOG) is not included in any preferred or adaptive pathways, and it is not selected in sensitivity runs therefore the justification for its progression beyond gate two is unclear. We would like to work with Thames Water to better understand why this is the case.

4.4.2 Solution costs

Our assessment of the unit costs of delivering London Water Recycling finds that the costs presented are reasonable at this stage. Cost changes from gate one to gate two have been sufficiently explained and are as a result of detailed development of the solution or changing market conditions. For instance, capex has increased due to land specifications being updated to match design development. The assessment also considers the use of the solution as a drought resilience asset, and therefore cost per capacity is often a more appropriate metric than cost per projected utilisation. We will continue to scrutinise cost estimate changes from gate two to gate three.

4.4.3 Evaluation of Costs and Benefits

Our assessment of the evaluation of costs and benefits considered the quality of the information provided on initial solution costs; the social, 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 have provided sufficient evidence of evaluating the costs and benefits of the solution to an appropriate standard for gate two.

The submission has included a good assessment of natural capital and opportunities for biodiversity net gain. The water resource benefits are clear and aligned with those presented in WRMP data tables. The solution delivers sufficient wider resilience benefits, as described through the scalability of options is well evidenced. Teddington DRA has been selected through WRSE best value planning as the preferred option.

4.4.4 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.

The submission defines environmental impacts clearly; however, it falls short as mitigation has not been identified for all the risks identified. There is a risk to scheme feasibility if mitigation cannot be provided for water quality, temperature and velocity impacts on fish and the environment. An action has been included in relation to this.

While the programme and planning score has been marked down as requirements that solution owners were funded to meet have not been met, we have made a decision that there is no longer a need for value for money assessments for RAPID solutions and therefore no associated gate two action is required.

4.4.5 Environment

Our assessment of Environment considered the initial option-level 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.

Our assessment of environmental impacts has focused on Teddington DRA 75Ml/d as that is the option selected in the WRSE Plan and WRMP. Extensive environmental assessment and modelling has been undertaken and largely meets expectations for gate two. Whilst this has identified potential risks from the scheme there is still more work required to understand the significance of these impacts and whether they can be mitigated.

Our review of Beckton water recycling has identified issues that need to be resolved, in addition to the work proposed for gate three. This includes water quality modelling of impacts on the freshwater River Lee and Lee reservoirs and any infrastructure designs to manage impacts on the Enfield Island Loop.

For both Teddington DRA 75Ml/d and Beckton water recycling (BEC) priority actions must be completed by December 2023.

The carbon assessment has not been improved through the query process and falls short of expectations. Scoping of future work is well presented and should include improvements to the carbon assessment as required.

4.4.6 Drinking water quality

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

This solution is designed to augment flows in the River Thames to support abstraction downstream for London water treatment works (WTW) and Thames Lee Tunnel to Northeast London. There are no explicit drinking water quality requirements for river augmentation, however we consider the company to have provided sufficient evidence of progress in the water quality risk assessment, and future work around Strategic Water Quality Risk Assessments (SWQRA) for gate two as this resource will feed into the Drinking Water Safety Plans (DWSPs) for downstream water treatment works. We expect to see continued monitoring including for emerging contaminants into gate three.

We consider Thames Water to have provided sufficient evidence of progress in the drinking water quality risk assessment, and future work around Drinking Water Safety Plans for gate two.

4.4.7 Board Statement and assurance

The evidence provided relating to assurance is satisfactory for this stage of the gated process.

We consider that the board of Thames Water has provided a comprehensive assurance statement and has clearly explained the evidence, information, and external/internal assurance that it has relied on in giving the statement.

5. Actions and recommendations

Where the submission has not been assessed as ‘meeting expectations’ in the quality assessment, or progression concerns have been raised, 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 standard gate three.

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

Priority actions are those that should have been completed at gate two 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.

Actions are those that should be addressed in full in the standard gate three submission. The response to these actions will influence the assessment of the gate three submission.

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

We have also assessed progress on actions and recommendations from gate one.

5.1 Actions and recommendations from gate two assessment

Twelve priority actions have been identified for London Water Recycling, which should be delivered no later than the dates specified in Appendix A.

Four actions and recommendations have been identified for London Water Recycling, which should be fully addressed at the gate three submission. Progress against actions will be tracked as part of regular checkpoints the solution holds with us whilst undertaking gate three activities.

The full list of priority actions, actions and recommendation for London Water Recycling can be found in Appendix A.

5.2 Actions and recommendations from gate one assessment

We have assessed whether London Water Recycling has met actions that were set out as a result of our gate one assessment.

No priority actions were identified for London Water Recycling,

Eleven actions and recommendations were identified for London Water Recycling, which were expected to be fully addressed at the gate two submission.

We have decided that the actions have been fully addressed in the gate two submission. Further detail of our conclusion against each individual action is shown in Appendix B.

6. Delivery Incentive Penalty

We have not applied delivery incentive penalties to this solution, as a result of the assessment carried out on the gate two submission.

7. Proposed changes to partner arrangements

There are no changes proposed to partner arrangements from gate two.

8. Gate three activities and timing

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

For its gate three 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 7.1 of the solutions gate two submission. Activities are expected to be completed in line with delivery incentives and expectations set out in [RAPID's gate three guidance](#). We also expect the actions listed in appendix A to be addressed.

8.1 Gate three timing

In the gate two submission and their representation, Thames Water had proposed a date for gate three of November 2023 and additional mid-gate checkpoints for Mogden and Beckton options in May 2024. This is proposed alongside a forward programme of gate four in September 2024, proposed planning application submitted in April 2024, solution construction ready in early 2027, and solution operational in 2031.

Since the representation Thames Water have written to RAPID to request that gate three move to summer 2024. Thames Water noted the exact date depends on the delivery of a number of pre-application outcomes. RAPID understand this, agree to gate three moving to summer 2024 and expect Thames Water to remain closely engaged with RAPID on updates concerning this.

Regarding Thames Water proposal for a mid-gate checkpoint, between gates two and three, in May 2024 for Mogden Water Recycling and Beckton Water Recycling, RAPID has decided that solution owners should bring this discussion to a regular checkpoint meeting at an opportune time and formalise any requests relating to scheme progression with associated reasoning through a letter to RAPID.

We have reviewed your forward programme for gate four. Gate four should be scheduled a minimum of a month after the acceptance of planning applications. Given the move in gate three, RAPID expect Thames Water to remain closely engaged with RAPID on updates concerning timing of gate four.

RAPID also propose a regular checkpoint meeting with Thames Water to confirm the finalised delivery dates when they are available.

The forward programme proposed by the solution is in line with the principles of RAPID's standard programme. Funding arrangements are set out in section 4.2 of this document.

Appendix A: Gate two actions and recommendations

Priority Actions – to be addressed by 31 December 2023		
Number	Area	Detail
1	Solution Design	Provide information as to why Mogden (MOG) should be taken forward beyond gate two when not featured in any plans.
2	Environment	Teddington DRA: Work with the Environment Agency to assess indicative permit limits and design tertiary treatment works to meet permit requirements. Work with the Environment Agency to discuss permit conditions and other temperature mitigation measures required to protect the environment. Undertake bench and pilot testing of treatment works
3	Environment	Teddington DRA: Work with the Environment Agency to scope and progress further work to understand the impacts on Olfactory chemicals from scheme operation and any subsequent impact on migratory fish
4	Environment	Teddington DRA: Improve modelling capability to extend water quality modelling over Teddington weir and into the upper tideway to fully understand any changes to water quality flowing over/down fish passes and into Teddington weir pool and the upper tideway.
5	Environment	Teddington DRA: Work with Environment Agency fisheries teams to design the intakes and outfalls, specifically to work with us to manage and mitigate any impacts on velocity, fish and the environment of scheme operation and the depleted reach.
6	Environment	Teddington DRA: Extend assessment of fisheries impacts to include other migratory fish in the freshwater Thames
7	Environment	Teddington DRA: Work with the Environment Agency to undertake a review of potential environmental impacts and mitigation measures available and then ensure appropriate mitigation measures can be implemented. This is for aquatic environment impacts as a minimum.
8	Environment	Teddington DRA: Provide further information on how operation of the scheme will interface with the Lower Thames Operating Agreement and Teddington Target Flow TTF to ensure that the environment is not impacted upstream in the River Thames.
9	Environment	Teddington DRA: Work with the Environment Agency to scope any further modelling requirements to understand how operation of the scheme may impact on the environment under different environmental conditions – for example consecutive years use or if needed at other times of the year.
10	Environment	Beckton: Work with the Environment Agency to scope environmental assessments required to meet a gate three checkpoint for Beckton and Mogden Water Recycling, ensuring that any further work for Beckton includes water quality analysis and modelling of the freshwater River Lee and Water Framework Directive (WFD) assessment of Lee valley reservoirs

11	Environment	Beckton: Provide information on mitigation measures to be applied at Beckton, including water treatment AWRP, intake/outfall designs, operating regime options and any other mitigation measures required to protect the environment.
12	Environment	Work with the Environment Agency to scope environmental assessments for Beckton and Mogden Water Recycling, ensuring that any further work for Beckton includes water quality analysis and modelling of the freshwater River Lee and WFD assessment of Lee valley reservoirs
Actions – to be addressed in standard gate three submission		
Number	Area	Detail
1	Solution Design	Provide further information on how operation of the scheme will interface with Lower Thames Operating Agreement and treatment to flow to ensure that the environment is not impacted upstream in the River Thames
2	Environment	<p>Revise carbon assessment to address gaps identified by consultancy review:</p> <ul style="list-style-type: none"> • Clear consideration of how whole life carbon (WLC) has been reduced within the design • Use relevant policies, frameworks and approaches to drive down carbon emissions within the design • Embrace innovative designs and renewable energy opportunities or opportunities to sequester carbon • Focus on carbon driven down solution costs • Improve demonstration of scope of 1,2 and 3 emissions • Further explanation of materials selection and whether lowest carbon options have been considered • Further work on how scheme development can help shape availability of low carbon materials in the supply chain • - Improved monitoring and reporting of project emissions during and post project completion
3	Solution Design	Provide evidence of an increased level of stakeholder and customer engagement relating to these schemes as work progresses through gate three.
Recommendations		
Number	Area	Detail
1	Evaluation of Costs and Benefits	Provide total planning period indicative option cost (net present value) figures for each gate to show how solution costs have evolved for the preferred option.

Appendix B: Gate one actions and recommendations

Actions – addressed in standard Gate two submission			
Number	Area	Detail	RAPID assessment outcome
1	Solution Design	Develop utilisation figure to be determined by regional modelling and to consider impacts of in-combination effects.	Complete
2	Costs and Benefits	Use outcomes from the regional Modelling to determine drought resilience.	Complete
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 solution.	Complete
4	Environment	Review the scope of environmental impacts and ensure engagement with regulatory partners to identify where mitigation can be built into solution design.	Complete
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).	Complete
6	Environment	Update environmental annexes to reflect comments and agreed actions as a priority, including consideration of Swanscombe MCZ in the SEA.	Complete
Recommendations			
Number	Area	Detail	RAPID assessment outcome
1	Stakeholders	Produce a detailed stakeholder engagement plan, including identification of wider / local stakeholders.	Complete
2	Costs and Benefits	Further consider social and amenity value, if this is limited due to type of	Complete

		solution, this can be explained in the submission.	
3	Planning	Carry out a detailed assessment of interdependencies and in combination impacts with other RAPID solutions and non-RAPID options, including Deephams reuse, following outputs of regional modelling.	Complete
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 solution behaviour change/consumption/wastewater disposal etc	Complete
5	Water Quality	Particular attention should be paid to the recommendations and learning from previous DWI events where changes in raw water sources impacted on drinking water supplies.	Complete

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