Review of Need for SESRO following the Gate 3 SESRO Report

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GARD
Rivendell
142 The Causeway
Steventon
Oxfordshire OX13 6SJ
www.gard-oxon.org.uk
gard.chair@gmail.com

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Contents

Figures

Tables

Summary

This report reviews the need for the SESRO reservoir in the light of the trebling of its estimated capital cost from £2.2 billion in the Gate 2 report in November 2022 to about £6.6 billion in the Gate 3 report in August 2025. This large cost increase affects the need for the reservoir in several ways:

1. It affects the benefit-cost assessments of the large, planned abstraction reductions for 'Environmental Destination', which comprise about half of the estimated water supply deficits to be met by the reservoir. In effect, the costs of these abstraction reductions have also trebled, probably making many disproportionately costly and calling into question their value for money and affordability to customers.

2. Similarly, it affects the value for money justification for the Thames to Southern transfer, for which about 30% of the deployable output of SESRO is allocated, to allow reduced abstraction from the Rivers Itchen and Test in droughts.

3. It affects the economics of leakage reduction measures because the replacement of some old mains pipes will now be more cost-beneficial than SESRO, particularly if savings in future capital maintenance are taken into account. More leakage reduction will reduce the need for SESRO.

4. It affects the choice of SESRO as the best value option – other options like the Severn to Thames transfer, wastewater recycling and desalination may now be better value than SESRO, particularly when taking account of SESRO's inability to adapt to uncertain future needs for more water.

Therefore, GARD proposes that the regulators should instruct the water companies to undertake a comprehensive and transparent review of the need for new sources in the WRSE area. The review should include re-assessments of the amount of abstraction reductions required to achieve 'Environmental Destination', the amount of economically justified leakage reduction, the need for the Thames to Southern transfer and a re-assessment of the range of future deficits to be used in adaptive planning. This should be followed by a comprehensive up-dating of the assessment of the best value programme for water resource development in the South East, taking account of the need for adaptability to cope with the continuing uncertainty in future deficits.

The re-assessment of the need for new sources in the South East should be completed before any decision on the Development Consent Order for SESRO and should be linked to the programme for the draft WRMP29s.

In addition, it is proposed that RAPID should take the following actions in their oversight of the 'Gate' process for the strategic resource options:

1. The draft decision on the SESRO Gate 3 report should require the development programme for SESRO to be adjusted so that the re-assessment of the need for SESRO is completed before any decision on the Development Consent Order.

2. There should be urgent action to bring forward the completion of the Severn to Thames Transfer Gate 3 report, which has been allowed to languish because of misplaced confidence that SESRO is the best value option for immediate implementation.

3. The water companies should be required to issue an addendum to the documents issued for the statutory consultation on the DCO for SESRO, launched on 28th October, stating that, following the trebling of the cost of SESRO, the need for the reservoir is being re-assessed.

In GARD's opinion, there should be an immediate and public statement that the huge escalation of costs between the SESRO Gate 2 and Gate 3 reports has undermined the credibility of the resource development proposals in the water companies' WRMP24s and necessitated a comprehensive and transparent review of the need for the reservoir.

1.Introduction

1.1 Purpose of this report

This report reviews the need for the SESRO reservoir in the light of the trebling of its estimated capital cost from £2.2 billion in the Gate2 report in November 2022 to about £6.6 billion in the Gate 3 report[1] in August 2025.

Although the need for SESRO has supposedly been established by the Government's approval of Thames Water and Affinity Water's Final WRMP24s (but not yet Southern Water's Final WRMP), the trebling of the estimated cost of SESRO between Gate 2 and Gate 3 has cast major doubts on both the selection of SESRO as the next major new source and the need for any major new source.

Therefore, this report makes the case for a thorough and transparent review of the need for SESRO, before any decision is made to proceed with the scheme.

1.2 Re-statement of need for SESRO in Gate 3 reports

The main Gate 3 document, Table 2.1, provides a summary of the need for SESRO, referring to the four main drivers of the need for new sources identified in water company WRMPs, as below:

Table 2.1 Primary water resource drivers for increased demand for water

Driver	WRSE Implication
Future Population Growth	Results in the need to supply water to more customers. Forecast methodologies are contained in the UK Government's Water Resources Planning Guidance[3]. The impacted companies should plan for future population growth. WRSE uses the latest regional forecasts produced by the Office of National Statistics, local authority housing plans and estimates of the significant additional potential growth between Oxford and Cambridge.
Impacts of climate change	Forecast reductions in available flows in rivers or groundwater recharge, reducing the amount of water that can be supplied from existing water sources during droughts.
Impacts of existing abstractions	Taking water from rivers, streams and underground sources during periods of lower flow can cause damage to the environment. Water companies need to reduce how much they take from some of their most sensitive water sources to prevent damage in the coming years and help improve them. This reduces available supply. Under the Environment Agency's National Framework for Water Resources', regional water resource groups are required to explore and implement the steps required to achieve a shared Environmental Destination to reduce the most environmentally unsustainable abstractions.
Improved drought resilience	The Environment Agency's National Framework for Water Resources', requires companies to plan for a higher level of resilience to drought, so that restrictions such as rota cuts and standpipes will be needed no more than once every 500 years on average.

Table 1 - Gate 3 summary of drivers of need for SESRO

The drivers of need for SESRO shown in Table 1 were critically reviewed in GARD's responses to Thames Water, Affinity Water and Southern Water's consultations on their draft WRMP24s.

[1] We note that this cost is at 2022-23 prices (report's statement). If one adds the 7.5% inflation on construction costs, then the 2024-25 equivalent figure is around £7.1 billion.

The following sections of this response summarise GARD's previous criticism of the SESRO need case, taking account of the new information on the vastly increased cost of SESRO.

A fundamental part of GARD's criticism of the case for the need for SESRO is failure to follow the WRMP24 Water Resource Planning Guidelines' recommendation for adaptive planning to deal with uncertainties, with preferred programmes based on the most likely future[2]:

> *"When you produce a preferred plan, there are uncertainties. We therefore recommend using adaptive planning. In this concept, when we refer to a preferred programme, this can also be referred to as representing the 'most likely' future (based on the uncertainties) and the pathway through it. That is, the route through the adaptive planning you will most likely follow."*

In GARD's opinion, rather than producing preferred plans based on the "most likely" future, the water companies' preferred plans for WRMP24 were based on assumptions for environmental destination, population growth and climate change which are close to worst case scenarios, and which are highly unlikely to materialise. This will lead to gross over-provision of new supplies, with consequent high costs, unnecessarily high customer bills and irreversible environmental impacts from the new supplies. The failure to produce adaptive plans for the "most likely" future is a recurring theme in our comments on the various drivers of the need for SESRO in the following sections.

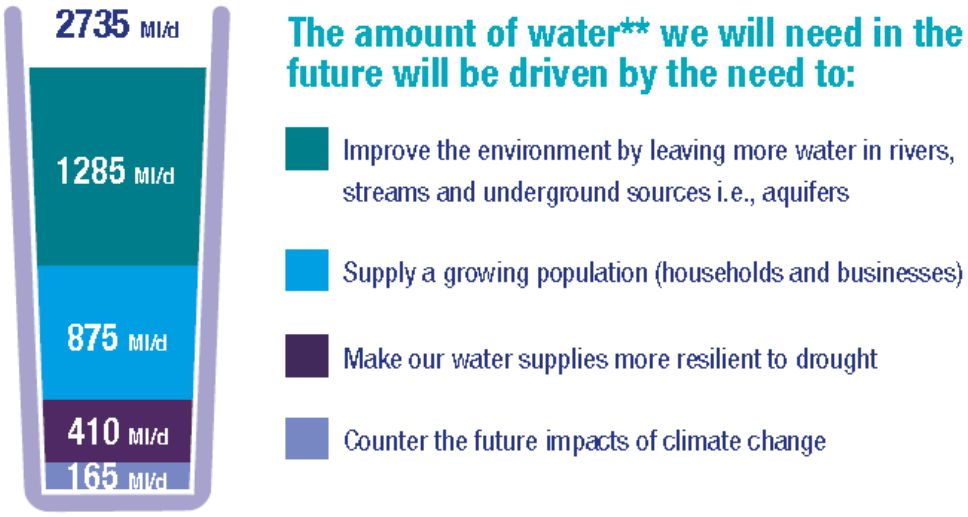
2. The need for SESRO to enable abstraction impact reductions

2.1 Abstraction reductions planned for WRMP24 in the South East

Abstraction reductions to improve river flows and ecology account for 1,285 Ml/d out of the total 2,735 Ml/d of the WRSE's forecast water supply deficits in the South East, as shown below[3]:

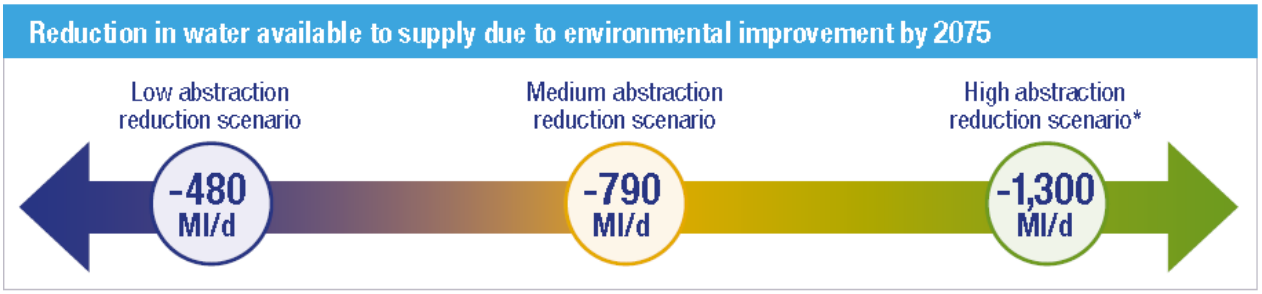
[2] Water Resource Planning Guidelines, page 3 https://www.gov.uk/government/publications/water-resources-planning-guideline/water-resources-planning-guideline

[3] Upper graphic and notes from page 4 of WRSE's Non-Technical Summary to their Final Plan, June 2025; lower graphic and notes from page 5 https://www.wrse.org.uk/media/opanojjv/wrse-final-regional-plan-non-technial-summary-june-2025.pdf



* By 2075, we need to find alternative sources for 1.2 billion litres of this water to protect the environment and an additional1.5 billion litres of new water to secure the region's public water supplies.

* * The figures used in this graphic represent the pathway of our adaptive plan that aligns with the requirements of the Water Resources Planning Guideline (WRPG)



* The high abstraction reduction scenario reflects the Environment Agency's BAU+ projection plus locally agreed reductions in certain zones.

Figure 1 – Drivers of demands for more resources in WRSE's Final Regional Plan

The 1,285 Ml/d of abstraction reduction scenario assumed by WRSE and the water companies in their Final Plans is at the upper end of the range of reduction scenarios considered. Much of the reduction would be in areas which would be served by SESRO. The 1,285 Ml/d of lost supply is equivalent to nearly five SESROs, with a cost of about £33 billion, based on the Gate 3 SESRO cost of about £6.6 billion.

The High abstraction reduction scenario is based on the Environment Agency's assessment of the potential need for abstraction reductions to achieve compliance with Environmental Flow Indicators (EFIs), whilst saying it is the water companies' responsibility to decide what abstraction reductions to include in their plans, taking account of costs and benefits[4]. However, the water companies have included all the EA's potential reductions, saying they have followed EA guidance that full EFI compliance is necessary for Water Framework

[4] EA response to GARD FoI request for details of abstraction reductions, 3rd June 2024, page 4, email reference NR355420

Directive (WFD) compliance[5].

There was no benefit-cost assessment to justify the new resources needed to replace the 1,285 Ml/d of abstraction reductions in the water companies' Final WRMP24s. Moreover, the EA state in the Government's Environmental Destination technical report - June 2025[6]

"*There has been no assessment of the actual ecological benefits that flow compliance* [abstraction reductions] *would deliver, or of their total cost, best value timing or affordability*."

The trebling of the costs of SESRO in the Gate 3 report has made the need for a proper benefit-cost of the abstraction reductions even more urgent.

The need for consideration of lower abstraction reduction scenarios (Environmental Destination) is reflected in WRSE's July 2025 letter to the Environment Agency on the recently published revised National Framework for Water Resources, which said this[7]:

> *"We will be submitting separate feedback to your colleagues on the draft Environmental Destination guidance. Given the scale of investment that the Environmental Destination scenarios have and could continue to drive, we believe the guidance could be enhanced by allowing more flexibility in approach, and that by considering different scenarios will enable the identification of better long-term solutions for the environment."*

WRSE's follow-up letter to the Environment Agency about its guidance on Environmental Destination includes these statements[8]:

> *"we feel the guidance could be enhanced by setting out … which element of the bundled up Environmental Destination scenarios are subject to cost benefit analysis, and which are legally required"*
>
> *"There should also be a clear and transparent process for incorporating the findings from these [individual reduction] investigations into the finalisation of the Environmental Destination programme, to ensure that investments are justified and provide tangible benefits."*
>
> *"We consider that it is important for the EA to share the underlying information and calculations [on amounts of ED] with all abstractors so the data is used is transparent and they can scrutinise it and check it against their own understanding."*
>
> *"It is essential to understand this breakdown [whether or not reductions are legal requirements] to provide companies and regional groups with the necessary information*

[5] TW Final WRMP main report paragraph 5.19
[6] Appendix C to National Water Framework 2025, page 35.
[7] WRSE letter to Environment Agency on the new National Framework for Water Resources, page 2, 18th July 2025 https://www.wrse.org.uk/media/xh2f10nd/wrse_natioanal_framework_2025_response_final.pdf
[8] WRSE letter to Environment Agency on Environmental Destination Guidance, 18th July 2025 https://www.wrse.org.uk/media/dhaali02/wrse_ed_guidance_response_letter_finalplusdate.pdf

to allow them to undertake cost benefit analysis where necessary.

If this information is not available, then it will introduce a vulnerability into all the investment decisions that follow on from complying with these targets. We consider that this legal vulnerability could be reduced, if not eliminated, by clearly setting out a better breakdown of the ED numbers per category of driver stating which are a legal requirement and which are subject to a cost benefit analysis."

"We are concerned that, under the current guidance, there is a risk that most abstraction reductions will default to the "fastest technically possible" pathway. This could overlook important considerations such as cost, affordability, and uncertainties in existing information."

GARD wholeheartedly supports the sentiments in WRSE's letter. However, regarding whether or not abstraction reductions are legal requirements (eg compliance with Water Framework or Habitats Directives), we believe that the matter of disproportionate costs will also need to be considered, even for the reductions deemed to be a legal requirement. The need to consider disproportionate costs has become much more relevant with the Gate 3 trebling of SESRO costs.

2.2 GARD assessment of need for abstraction reductions

GARD totally supports the urgent need to re-naturalise flows in iconic chalk streams, especially those that have been severely impacted in the Chilterns, the Darent catchment and to the west of London. However, the High scenario abstraction reductions in WRMPs go far beyond these iconic rivers, often including canalised, lower reaches of rivers in urban environments, where the river ecology is not dependent on river flow. In total, GARD considers that it would be appropriate to allow for a total 255 Ml/d of net deployable output loss from the Thames valley supplies of Thames, Affinity, South East and Sutton & East Surrey water companies. This compares with WRSE's allowance of 758 Ml/d deployable output loss for these four companies from their Thames valley supplies. Hence, the amount of required abstraction reduction in the SESRO supply areas has probably been over-estimated by about 500 Ml/d (excluding the areas supplied by the Thames to Southern transfer)[9].

GARD's anticipates that the "most likely" abstraction reductions, after proper assessment of costs and benefits would include all the proposed High scenario abstraction reductions for ecologically sensitive rivers in the SESRO supply areas, comprising the Colne and Lea tributary chalk streams, the upper and middle River Lea, the upper and middle River Darent, the Thames tributary chalk streams and Cotswold limestone rivers. However, the cost-

[9] GARD response to WRSE's consultation on their draft regional plan, pages 30-31 https://groupagainstreservoirdevelopment.org/wp-content/uploads/2025/06/Final-GARD-Response-to-WRSE-22-2-23.pdf

benefit assessment is likely to exclude the large reductions planned for the lower reaches of the Rivers Colne, Lea and Darent, and in other locations where we think it unlikely that the reductions would be justified by a proper benefit/cost analysis, taking account of the environmental impact of replacement sources.

Even for the proposed reductions in potentially iconic chalk streams, there are likely to be constraints on how much abstraction can be reduced, because of the risk of groundwater flooding, particularly in catchments where there has been a lot of recent housing development in the bottom of valleys. This adds to the likelihood that abstraction reductions will turn out to be a lot less than indicated by strict compliance with EFIs.

A reassessment of planned abstraction reductions should also take account of the environmental impact of replacement sources. In our opinion, it defies common sense to suggest that the currently planned abstraction reductions, mostly affecting rivers that are not iconic chalkstreams, bring more benefit than the environmental impact of five SESROs or other equivalent water sources.

GARD believes that a detailed and transparent review of the need for abstraction reductions should be a key part of the review of need for SESRO that is needed before any decision to proceed with reservoir. We propose that inclusion of this review into the SESRO development programme should be specified in RAPID/Ofwat's decision on the draft Gate 3 report.

3. The need for the Thames to Southern transfer

GARD recognises that the Rivers Itchen and Test are the crown jewels of England's iconic chalk streams. However, that should not mean that any impact on the rivers, however slight or temporary, must be prevented regardless of cost. The trebling of the cost of SESRO is, therefore, highly relevant to the justification of the Thames to Southern transfer.

The T2ST is not needed to deal with public supply shortages due to population growth, climate change or local reductions in chalk groundwater supplies (particularly for Portsmouth Water) – these needs are to be met by leakage reduction, demand management (eg smart metering) and the new 60-90 Ml/d Havant Thicket reservoir combined with a new scheme using recycled Portsmouth sewage effluent. The Havant Thicket/recycling scheme will also allow substantial reductions in the Rivers Itchen, Test and other chalk streams at all times, including severe droughts. The T2ST is only needed to allow discontinuation of use of drought orders and permits, perhaps once in 50 years[10].

Southern Water's only justification for not continuing to use drought orders is an incorrect

[10] GARD response to Southern Water's consultation on their revised draft WRMP24, October 2024, https://groupagainstreservoirdevelopment.org/wp-content/uploads/2025/11/GARD-response-to-SW-rdWRMP24-v3-4.12.24-1.pdf. pages 23-24

assumption that it is required by the Water Resource Planning Guidelines[11]. They have ignored Ofwat warnings of the excessive cost of abandoning use of drought orders and the impacts of replacement supplies like the T2ST and SESRO, as below:[12]

> *"It [Ofwat] considered that WRSE should explore the cost, benefit and option selection impact of retaining the use of some drought orders and permits beyond 2040. It stated this was important to avoid unnecessary costs from resource development and to avoid the associated environmental impact that the additional development likely to arise from ruling out the use of drought orders and permits could bring."*

The trebling of SESRO costs has made the abandoning the Test and Itchen drought permits even more questionable.

When pressed for evidence of impacts of continuing to use drought orders, Southern Water provided reports showing that the impacts would be mostly rare, minimal and temporary. Only a relatively minor drought order for the Candover drought scheme carried enough risk to justify its discontinuation[13].

The T2ST scheme and Southern Water's 30% share in SESRO, at its greatly increased Gate 3 cost, would have a capital cost of about £3 billion. WRSE's assessed benefits for the Rivers Itchen and Test are only £29 million[14]. The T2ST pipeline would have adverse impacts on the North Wessex AONB, several protected sites and a number of ancient woodlands, which offset the minimal benefits achieved for the Rivers Itchen and Test[15].

The existing lower Itchen abstractions affect river flows for about 10 km downstream of Winchester, all of which is heavily used for salmon spawning. These impacts, and general impacts on the lower river ecology, could be entirely eliminated, in times of normal operation as well in droughts, by moving all the lower Itchen abstractions down to Gaters Mill. The cost of this would be a fraction of the £3 billion for the T2ST plus SESRO. The benefits to the Itchen SAC would be much greater than those of the T2ST, because they would be all year, every year and not just for a few months perhaps once in 50 years[16].

In GARD's opinion, the Thames to Southern transfer scheme should be abandoned because of its small benefits and excessive cost. The rare, minimal and temporary impacts of using drought orders should be mitigated by habitat and water quality improvements and moving some Itchen abstractions downstream, using some of the £3 billion saved by scrapping the

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[11] Ibid, page 48
[12] WRSE response to Consultation on Emerging Regional Plan, May 2022, paragraph 13.4, page 40 https://www.wrse.org.uk/media/wbdj0jdd/wrse-emerging-regional-plan-consultation-response-document-may-2022.pdf
[13] https://groupagainstreservoirdevelopment.org/wp-content/uploads/2025/11/GARD-response-to-SW-rdWRMP24-v3-4.12.24-1.pdf, pages 48-57
[14] Ibid, page 61
[15] Ibid, pages 63-69
[16] Ibid, pages 79-80

T2ST.

We propose that the regulators should now call for a transparent review of the need for the T2ST. RAPID should insist that this is allowed for, prior to the SESRO DCO, in the development programme for the reservoir. The review should include a proper assessment of the impacts of future water supplies on the flows in the lower Rivers Test and Itchen, with the continued use of drought orders and permits, but taking account of optimised use of the Havant Thicket/recycling scheme to reduce the need for abstraction from the rivers. The review of the need for the T2ST review should be undertaken before any decision to proceed with SESRO.

4. Population growth

In 2024, GARD commissioned a review of Thames Water and Affinity Water's WRMP24 population forecasts from Mr Neil Tiley of Pegasus Group. A copy of Mr Tiley's report is available from GARD on request. Mr Tiley's report showed that the population forecasts are flawed because:

- They are based on local authority plan housing growth forecasts which have been repeatedly shown to substantially exceed actual delivery of new housing.
- They don't allow for reduced housing occupancy as more homes become available.

They don't take account of plans for "levelling up" that will focus housing and population growth away from the South East.

Mr Tiley's report proposed that population growth forecasts should be based on the Office of National Statistics 2018 population forecast data, with consideration of a range of forecasts for adaptable planning, as for Thames Water's total population below:

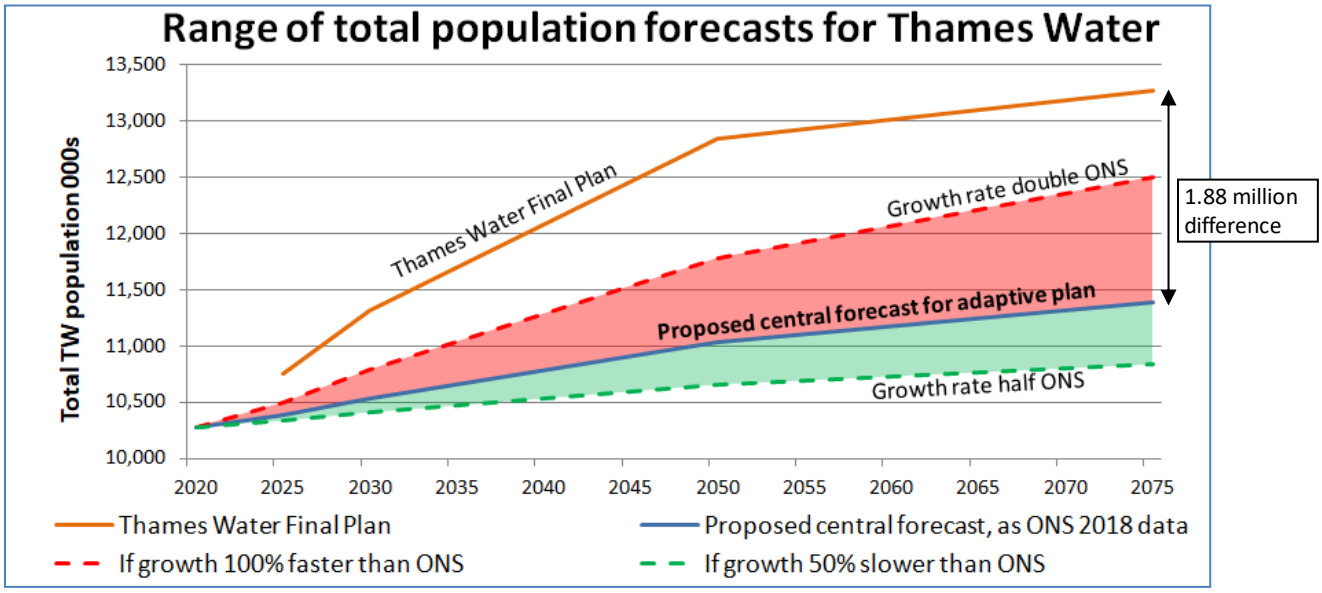

Figure 2 - Potential range of total population forecasts for Thames Water

This graph shows the extent by which population forecasts based on local authority planned housing growth would exceed the official ONS forecasts. The 1.88 million population difference in 2075 is equivalent to 225 Ml/d of household supply. There is a similar pattern in all Thames Water and Affinity Water's supply zones potentially served by SESRO, as shown in Table 1 below:

Water resource zones	2075 population over-forecast 000s	Demand over-forecast Ml/d
TW London WRZ	1,397	168 Ml/d
TW SWOX WRZ	267	32 Ml/d
TW Thames Valley WRZs	216	26 Ml/d
Total for all Thames Water zones	1,880	226 Ml/d
Affinity Water WRZs 1-6	748	90 Ml/d
Totals for zones supplied by SESRO	**2,627**	**315 Ml/d**

Table 2 - Over-forecasting of population and household demand in zones served by SESRO

Assuming a per capita consumption of 120 litres per head per day, the total over-forecasting is equivalent to a household demand of 315 Ml/d, which is well in excess of Thames Water's estimated 271 Ml/d deployable output of Abingdon reservoir.

Although there is considerable uncertainty in the population forecasts – upwards pressure from immigration and downwards pressure from declining birth rates – in GARD's opinion, the forecasts used in Thames Water and Affinity Water's Final Plans greatly exceed the "most likely" future, which the Water Resource Planning Guideline says should be the basis of preferred plans.

5. Climate change

In their Final WRMP24, Thames Water considered a range of scenarios for climate change impacts on their existing supplies, as below[17]:

Total 64 Ml/d difference between High and Medium impact scenarios

	London	SWOX	SWA	Kennet Valley	Total
High Impact (Ml/d)	-168	-13.2	-0.4	-4.7	-186.3
Medium Impact (Ml/d)	-110	-7.9	-0.2	-3.8	-121.9
Low Impact (Ml/d)	-39	-5.4	-0.1	-3.1	-47.6

Note: TW assumed zero climate change impact for Henley and Guildford zones, which are mainly supplied by groundwater

Table 3 - Scenarios for 2070 climate change impacts on existing DO in TW's Final WRMP

In the Final WRMP24, Thames Water described their selection of climate change scenario for

[17] TW Final WRMP24, Table 4-19

planning future supplies as follows[18]:

> *"Thames Water, aligned with the WRSE Regional Group, has considered a 'median' climate change scenario as the central forecast"*

Selection of the Medium Impact scenario for climate change would have been consistent with the Water Resource Planning Guideline advice to plan for the most likely future. However, for the actual deficit forecasts in the WRMP Tables, Thames Water assumed the High Impact climate change scenario from 2040 onwards[19], contrary to the WRPG advice. The assumption of the High climate change scenario after 2040 adds 64 Ml/d to Thames Water's 2070 deficit. The same use of incorrect climate change scenario was shown in Thames Water's earlier draft WRMPs. In GARD's opinion, this is a serious error in Thames Water's plan that should have been picked up by the regulators.

In GARD's opinion, even the Medium Impact scenario shown in the above Table 3 is likely to be a substantial over-estimate of the climate change impact on Thames Water's supplies. Although we believe unreservedly that major climate change has already occurred and will continue to be a worldwide threat, it does not necessarily mean that the impact on all water supplies is negative. In fact, evidence suggests that climate change to date has increased the availability of water supplies for London.

Thames Water's modelling of existing London supplies shows that the three most severe droughts of the past 100 years, in terms of impact on London's supplies, were in 1921, 1934 and 1944 – all at least 80 years ago[20]. Thames Water's most severe drought of the past 80 years, 1976, was appreciably less severe than the earlier droughts, in terms of its impact on London's supplies. Droughts since 1976, including those of the past decade, have all had relatively little impact on Thames Water's supplies. Droughts of the type that would affect London's supplies, ie two summers and a winter, have become less frequent and less severe, because winters are becoming wetter, as is widely perceived from increased winter flooding and shown by rainfall data such as the example below[21]:

[18] TW Final WRMP24, paragraph 4.191
[19] TW Final WRMP24, WRMP Tables, rows 33 in zonal balance tabs
[20] GARD response to TW's draft WRMP24, Section 2.4.2 and Figure 10 https://groupagainstreservoirdevelopment.org/wp-content/uploads/2025/06/GARD-response-to-TW-WRMP-21-3-23.pdf
[21] Carbon Brief, February 2024 https://www.carbonbrief.org/analysis-how-uk-winters-are-getting-warmer-and-wetter/

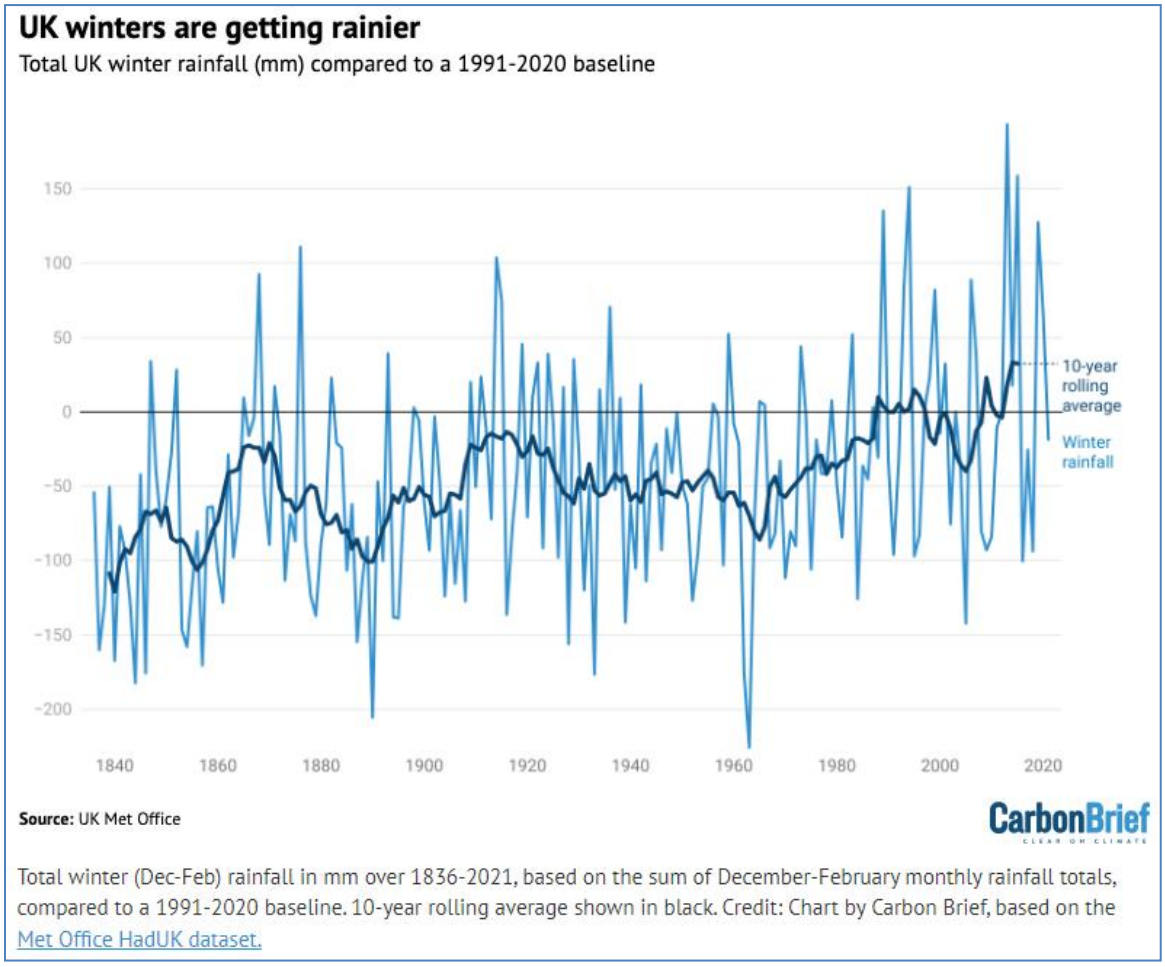

Figure 3 - Winter UK rainfall trend since 1840

The Carbon Brief report referred to above also notes that 7 of the 10 wettest winters in the UK have occurred in the past 35 years and comments that this makes sense because, as the atmosphere heats up, it is able to hold more moisture, which can then fall as rain. The increasing trend in winter rainfall improves the resilience of London's supplies in the multi-season droughts which govern their deployable output. The winter rain is stored in the chalk aquifer and released slowly through the summer, raising drought flows and reducing the rate of depletion of the London reservoirs.

If the deployable output of London's existing supplies is determined only using the 80 years of river flow records since the 1940s, modelling shows that it increases by more than 200 Ml/d, compared with the deployable output assessed using historic records since 1920[22].

In GARD's opinion, the realistic range of climate change impact on the deployable output of Thames Water's supplies can lie between a gain of 200 Ml/d and the High Impact scenario loss of 186 Ml/d. By adopting the High Impact scenario loss in their preferred plan, Thames

[22] GARD response to TW's draft WRMP24, page 39 and Figure 12 https://groupagainstreservoirdevelopment.org/wp-content/uploads/2025/06/GARD-response-to-TW-WRMP-21-3-23.pdf

Water has assumed a highly improbable worst case.

The large conceivable range of climate change impacts on Thames Water's supplies is a strong argument for selecting a highly adoptable scheme like the Severn to Thames transfer as the next major source for the South East, rather than the totally inflexible 150 Mm^3 SESRO.

6. Economic case for more leakage reduction

The trebling of SESRO cost affects the comparative economics of leakage reduction versus SESRO, thereby justifying more mains replacement, more leakage reduction and, therefore, less need for SESRO.

In considering the economics of mains replacement, there ought to be recognition that the pipe networks have a finite life (and a lot of existing pipes are more than 100 years old), so sooner or later all pipes will need to be replaced as part of "capital maintenance". Therefore, if pipes are being replaced to reduce leakage, there is a saving in future capital maintenance cost which should be credited to the leakage options when comparing with SESRO.

If this is properly taken into account in the water companies' "best value" programmes, there will be more leakage reduction justified and a corresponding fall in the need for SESRO.

7. Uncertainty and the need for adaptability

The preceding sections have highlighted the large uncertainty in the estimates of the drivers of need for new resources due abstraction reductions, population growth and climate change. In GARD's opinion, the lower ends of the ranges for these drivers are the most likely outcome. We think that the upper ends of these ranges, as adopted in the water companies' WRMP24s, are extremely unlikely to occur, especially in combination. Therefore, the present WRMPs, which have determined the supposed need for SESRO, have utterly failed to follow the Water Resource Planning Guidelines advice to plan for the "most likely" future.

The estimates of need for abstraction reductions, including the need for the Thames to Southern transfer, are a particular concern because of the trebling of the cost of SESRO in Gate 3. This has fundamentally affected the benefit-cost and customer affordability of the planned abstraction reductions.

The recent letters from WRSE to the Environment Agency calling for clarification of the legal requirement for Environmental Destination and associated benefit-cost analysis, referred to in Section 2.1 above, is an indication that water companies are pushing back against the blanket imposition of abstraction reductions based on the Environment Agency's EFI methodology. There are also growing concerns about the effect that the planned abstractions will have on groundwater flooding in urban areas. In our opinion, the most

likely outcome of all this is that the eventually agreed abstraction reductions will turn out to be far less than currently planned.

The trebling of the cost of SESRO will also have a fundamental effect on the economics of mains replacement for leakage reduction, especially if the savings in future capital maintenance are considered in best value assessments. This will further reduce the need for SESRO.

In these circumstances, we think it is essential that a review of the need for SESRO, should be part of the process of deciding whether to proceed with the scheme. The Government and regulators have urged the water companies to be adaptable in their plans. The trebling of the cost of SESRO should trigger a re-think by the water companies in the development of their next draft WRMPs due by the end of 2028, affecting the need, timing and choice of new resources. We propose the RAPID/Ofwat should recognise this in their draft decision on Gate 3 by calling for the SESRO development programme to include the review of need prior to the formal DCO process. The timing should be linked to the programme for the draft WRMP29s.

8. The need for re-evaluation of the STT vs SESRO choice

The uncertainty in future needs for water highlighted in the previous sections has demonstrated the importance of having a resource development programme that is adaptable to uncertain needs. In our opinion, the choice of the 150 Mm^3 SESRO as the next major new source in the Thames valley only makes sense if there is a high degree of confidence that the deficit forecasts in current WRMP24s are genuinely the "most likely" future. In the light of the trebling of SESRO costs and its effect on the benefit-cost of planned abstraction reductions and leakage reductions, this is no longer the case (if it ever was).

The Severn to Thames transfer scheme is far more adaptable than SESRO to uncertain future needs – an initial scheme of, say, a 300 Ml/d aqueduct with some support from Netheridge effluent recycling could be followed by successive increments of support from redeployment of Vyrnwy reservoir and recycled Minworth effluent.

Trebling of the cost of SESRO will fundamentally change the comparison of its costs with the STT scheme. Therefore, we propose that RAPID/Ofwat's decision on SESRO Gate 3 should include a requirement for the reassessment of the cost and benefits of SESRO vs STT prior to any decision on the reservoir.

There should also be urgent action to bring forward the completion of the STT Gate 3 report, which appears to have been allowed to drift due to mistaken water company and regulator confidence in the previous estimates of SESRO costs.

9. Proposed actions by Regulators and RAPID

9.1 Proposed actions by EA and Ofwat

This report has provided evidence that the case for the need for SESRO, as presented in the water companies' recent WRMPs and WRSE's regional plan, has been fundamentally changed by the trebling of the capital cost of the reservoir, as shown in its Gate 3 reports. Therefore, the Regulators should instruct the water companies to undertake a comprehensive and transparent review of the need for new sources in the WRSE area. The review should include:

1. **A re-assessment of the amount of abstraction reductions required to achieve 'Environmental Destination'** in the South East, which should take account of:

    - The much higher cost of replacement water sources due to the trebling of SESRO's cost and its effect on the benefit-cost of 'Environmental destination', with due consideration of possible disproportionate costs of compliance with the Water Framework Directive and the Habitats Directive legislation.

    - The impact of the abstraction reductions on customer bills and the acceptability of bill increases to customers.

    - The potential groundwater flooding caused by rising groundwater levels following abstraction reductions, particularly on post-World War II housing developments in valley bottoms.

    - The environmental impact of replacement sources like SESRO, when compared with the environmental benefits of the abstraction reductions.

    The Regulators should issue guidance to water companies on how this review is to be undertaken including the assessment of benefit-cost, the applicability of Water Framework Directive and Habitats Directive legislation, the criteria for 'disproportionate cost' and the determination of acceptability to customers. The timing of the review should be linked to the timetable for production of the water companies' draft WRMP29s.

2. **A re-assessment of the amount of economically justified leakage reduction,** particularly of mains replacement, should be done as an alternative to SESRO, allowing for the trebling of SESRO costs. This assessment should take account of the expected life span of existing aged pipe networks and the saving in future capital maintenance cost due to early replacement of potentially leaky mains pipes.

3. **A re-assessment of the need for the Thames to Southern transfer**, which should include a proper assessment of the impacts of the continued use of drought orders

and permits on the river flows and the ecology of the lower Rivers Test and Itchen, taking account of:

- optimised use of the Havant Thicket/recycling scheme to reduce the need for abstraction from the rivers at all times, not just in droughts
- the reduction of impact on the lower River Itchen by moving the existing abstraction near Winchester down to Gaters Mill
- the potentially disproportionate costs of abandoning the use of drought orders and permits, aggravated by the trebling of Southern Water's share of SESRO
- the environmental impacts of construction of SESRO and the T2ST pipeline, in comparison with the environmental benefits of abandoning use of drought orders and drought permits
- the impact of the T2ST on Southern Water customers' bill and the acceptability to customers

4. **A re-assessment of the 'most likely' future deficits and the range of future deficits to be used in adaptive planning**, which should take account of:
    - the uncertainty in the abstraction reductions required for 'Environmental Destination' after allowing for continuing concerns over affordability, potential groundwater flooding and customer acceptability
    - the uncertainty of climate change impacts on source deployable outputs, taking account of evidence that increasingly wet winters are leading to more over-winter recharge of the chalk aquifers that provide a lot of the supplies in the South East and much of the summer base flows used to fill reservoirs.
    - the uncertainty in the population forecasts – upwards pressure from immigration and downwards pressure from declining birth rates – as well as the large difference between ONS forecasts and the local authority forecasts mostly used in current WRMPs
5. **A comprehensive up-dating of the assessment of the best value programme for water resource development in the South East**, which should focus on the supply zones previously intended to benefit from SESRO.

The re-assessment of the need for new sources in the South East should be completed before any decision on the Development Consent Order for SESRO and should be linked to the programme for the draft WRMP29s.

9.2 Proposed actions by RAPID

In addition to the Regulators' actions proposed above for re-assessment of the need for SESRO, it is proposed that RAPID should take the following actions in their oversight of the 'Gate' process for the strategic resource options:

1. The draft decision on the SESRO Gate 3 report should require the development programme proposed for SESRO to be adjusted so that the re-assessment of the need for SESRO is completed, including public consultation on it, before any decision on the Development Consent Order.

2. There should also be urgent action to bring forward the completion of the Severn to Thames Transfer Gate 3 report, which appears to have been allowed to drift due to mistaken water company and regulator confidence in the previous estimates of SESRO costs.

3. The water companies should issue an addendum to the documents issued for the statutory consultation on the DCO for SESRO, launched on 28th October, stating that, following the trebling of the cost of SESRO, the need for the reservoir is being re-assessed. The addendum should explain the reason for the re-assessment, highlighting the significance of the increased cost of the reservoir and other matters raised in this report.

In GARD's opinion, RAPID should recognise that the 'Gate' investigations for the strategic resource options are closely linked with the development of the statutory water company WRMPs. There should be an immediate and public statement that the huge escalation of costs between the SESRO Gate 2 and Gate 3 reports has undermined the credibility of the resource development proposals in the water companies' WRMP24s and necessitated a comprehensive and transparent review of the need for SESRO.