



The countryside charity  
Oxfordshire

Campaigning to protect our rural county

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Dear Sir/Madam

## **REF: Strategic Regional Water Resource Solutions: Standard Gate 2 Draft Decisions**

This is our response to the 'Draft Decisions' on the Strategic Regional Water Resource Solutions which were published on RAPID's website on 30 March 2023 (particularly in relation to the Thames Water to Southern Water transfer, the South East Strategic Reservoir Option and the River Severn to River Thames transfer).

CPRE (the Countryside Charity) is a nationally federated organisation within which CPRE Oxfordshire is an independent charity, working locally and with our partners regionally and nationally, to protect and enhance the countryside and rural life.

CPRE Oxfordshire fully supports the detailed critique by the Group Against Reservoir Development (GARD) of the 'Draft Decisions' and we highlight particular issues below.

### **1. Exaggerated and out of date demand forecasts.**

#### *Population projections*

Many of the projects are only justified on the basis of outdated (and inflated) population forecasts, a flawed adjustment for climate change and over-estimates of the abstraction reductions required from chalk streams (which are more realistically estimated in the report produced by Chalk Streams First).

**Adaptability is key to ensuring that capital projects are incremental and can be implemented to meet actual demand not inappropriate and inaccurate projections.**

Water Resources South East (WRSE) used 21 population projections for the south-east region. The projected increases in population from 2020 to 2050 range from 400,000 to over 5 million. The 'reported pathway', used in the subsequent plan development, uses one of the very highest projections, i.e., the housing plan which has a population increase of 4.5 million (an increase of 23% on the 2020 figure). We understand that the 'housing plan' is the guidance from the Environment Agency but it must be appreciated that its use poses a considerable risk of overestimating future demand and to base major funding and resource decisions on such flawed projections seems irresponsible. Even taking the median



of the 21 population projections (although this still involves attracting 2 million people into the region) would halve the future demand from 600 to 300 Ml/d.

The housing demand scenario is a sum of the individual housing growth projections of the local authorities. These plans have been calibrated to achieve the Government target of 300,000 new houses a year – a target not achieved in the UK in the last 60 years. We know from the experience of the CPRE Branches in the South-East that the local authority targets are nearly all aspirational and are unlikely to be achieved. In fact, recent announcements from the Department for Levelling Up, Housing and Communities suggest the 300,000 target is likely to be abandoned.

An analysis of the Office for National Statistics (ONS) 2018 population projection shows that the ‘natural’ growth of the population (births minus deaths) becomes negative for the South-East in 2029. Over the 25 year 2018 to 2043 period the overall natural change is in fact negative. This part of the ONS projection is reasonably robust, the females likely to have children in the next 20 years are already born and there is a world-wide trend towards lower fertility rates which is unlikely to be reversed. The big uncertainties in all the projections are inward migration rates (both internal and international). If the population of the South-East is to increase by 4.5 million those people must come from overseas or from other regions of the UK. Both movements would be contrary to current Government policies. It is worth noting that moving millions of people from the north of England would have very serious social and economic consequences.

In conclusion it must be recognised that it is very likely that the reported pathway considerably overestimates future population growth. It must also be recognised there are considerable uncertainties in population projections, arising from uncertain future migration patterns. There are thus considerable dangers in assuming one of the highest population growth scenarios for planning purposes. These large uncertainties, exacerbated in the last few years by BREXIT, Covid and the economic slowdown, point to a need for adaptable and scalable solutions.

### *Chalk streams*

CPRE Oxfordshire supports the restoration of our internationally unique chalk streams and some reduction in groundwater extraction is needed. We note that, as with the population increase estimates, there is considerable uncertainty in the new water resource required to return the chalk streams to a pristine state, ranging from 520 Mlt/day to 1360 M Lt/day. The preferred pathway chooses the largest number, as with the population projection. We also note WRSE acknowledge that: ‘*The investigations carried out by water companies over the next 10 years will provide the evidence base for the future reductions in abstraction*’. There are clearly many gaps in our knowledge about the best way to restore our chalk streams. We would particularly like to highlight uncertainties in:

1. The level of reductions in abstraction required to produce acceptable flows in the chalk streams.
2. The amounts of additional water available in the lower reaches of the streams which is then available for extraction. (We note that the ‘Chalk Streams First’ analysis suggests this is considerably higher than estimated by WRSE.)



3. To what extent additional pollution prevention interventions and catchment management (restricting agricultural and sewer outfalls) would be more effective in restoration.

It is absolutely clear that we cannot wait 10 years to answer these questions before we embark on a programme of restoration. So (along with immediate action on the most vulnerable streams). It is clear there is not a one size fits all solution and work needs to be done on a stream-by-stream basis. We **strongly support the Chalk Streams First and the DEFRA-sponsored 'Catchment Based Strategy' which recommends priority for streams where abstraction exceeds 10% of recharge (A10%R). Such a strategy requires much lower resource requirements to regenerate the priority streams. We would urge, as a matter of urgency, that work to investigate the best and most cost-effective strategies to restore our chalk streams is expanded.** We note that the recent Chalk Streams First report provides the first step in this process, and we believe further work should be based on this report.

**The current plans focus wholly on water extraction but pollution (sewage and agricultural) is a bigger factor for the lower reaches of the rivers. Resources may be better redirected from supply of new water infrastructure to sewage treatment and ameliorating agricultural pollution.** This just illustrates why we need more joined up thinking in our water provision planning.

#### *Climate change*

According to Ofwat: climate change impacts should be investigated for 'upper quartile' and 'lower quartile' effects. Upper quartile represents essentially no efforts to ameliorate Greenhouse gases. As we understand it, the climate change requirement is based on the IPCC RCP8.5 scenario. This scenario is the highest emission scenario tested and it is now regarded as unrealistically high. In fact, a recent article in the journal Nature (vol. 577, pages 618-620, January 2020) recommends: '*Stop using the worst-case scenario for climate warming as the most likely outcome*'.

In the last IPCC AR6 report the RCP8.5 scenario gives a mean global temperature increase of 4.4°C (with a range of 3.3 to 5.7°C). The 2015 Paris agreement, signed by the UK Government, commits to a maximum temperature increase of 2°C (with an aspiration of 1.5°C). The National commitments made at the Glasgow COP26 suggest we are on track for a global heating of about 2.5°C, further illustrating that the high climate change scenario used by WRSE is unrealistic.

WRSE takes the highest climate change scenario as its 'reported' pathway. CPRE Oxfordshire's view is to take the median – leading to a 125 MI/day deficit instead of 240 MI/day.

**CPRE Oxfordshire contends that it is perverse that the headline demand scenario used by WRSE is within 5% of the very highest of the nine scenarios presented. CPRE Oxfordshire ask for a more honest assessment of the uncertainties in the demand forecasts and the target scenario closer to the average.**



## 2. Alternative proposals

CPRE Oxfordshire supports GARD's proposal that the Severn-Thames Transfer (STT) infrastructure should be built as quickly as possible, initially with only a modest amount of support sources, but with the capability of adding new sources if needed. The first phase of the scheme should be to provide up to the 300 MI/d STT (not the 500MI/d in the current plans), based on support from Netheridge and both phases of the 115 MI/d support from treated Minworth WWTW effluent. This would give a deployable output of 195 MI/d, using Thames Water's own figures.

Given Thames Waters record of not achieving leakage and household usage reduction targets we support the development of the following schemes:

- The Teddington DRA scheme (67 MI/d), already planned to be due by 2031.
- The first phase of the GUC transfer (50 MI/d), already planned to be due by 2031.
- The 50 MI/d Thames to Affinity transfer to allow early chalk stream restoration.

And by 2035/36:

- 1st phase of Severn-Thames transfer, only 300 or 400 MI/d aqueduct, with Netheridge and, possibly, Minworth support
- 2nd phase of GUC transfer, or possibly included in the first phase GUC transfer.

This full programme would achieve about 300-400 MI/d of 'over-provision' which enable the environmental benefits, including lower priority abstraction reductions, to be brought forward and to provide a large 'hedge' against climate change or population growth being substantially higher than the ONS forecasts.

## 3. The 'Draft Decisions' on the Strategic Resource Options

### A. South-East Strategic Reservoir (SESRO)

#### Water Quality

The first paragraph of 2.1 of the RAPID document states that the SESRO is a raw water storage option in the upper catchment of the River Thames. Given that our local treatment works regularly dump raw sewage into the rivers and brooks which flow into the upper Thames, and that the worst months for sewage pollution in the Thames are exactly those winter months when it is envisaged that the reservoir will be refilled, there is a risk of the reservoir being filled with water of highly unsatisfactory quality.

There is nothing in Thames Water's plans relating to the upgrade of our sewage works, yet major house building projects in the area continue unabated.

The Environmental Assessment Report (EAR) released for Gate 1 recognised the danger of poor water quality in the reservoir, especially algal growth, and the potential impact from regulation water releases. The conclusions in Section 6.5 of the EAR state that:



*‘Current nutrients levels in the River Thames are likely to result in algal growth within SESRO. In addition there is a further risk of nutrients added by wildfowl. ‘*

We have, however, seen nothing since to allay our concerns. This is unacceptable and the possible impact of algal laden-reservoir releases is a major issue which should have been addressed prior to Gate 2.

### **Environmental and Social Impact**

Thames Water suggests that the Leisure and Amenity possibilities of the new reservoir have a ‘Major Beneficial’ rating but does not explain how this would be achieved. We understand that the ‘new’ recreation opportunities which the reservoir could bring would be water-based but given that this will be “raw” water (containing diluted sewage), we are very uncertain about the viability of leisure facilities in this environment. We believe water-based leisure activities may be severely curtailed by:

- Significant coverage by solar panels. These are not new and cannot be considered a benefit, as they simply replace existing solar farms which will have to be removed.
- Security issues that may limit general public access to the area.
- Concerns over the introduction of invasive species.

Given that the recreational benefits of the reservoir seem to be such a large part of the justification for building a bunded reservoir, it seems that to get past Gate 2 without any detail of how these will be introduced places significant doubt on the ability of the SESRO to deliver recreation, attracting development and increasing tourism potential in the local and wider area.

We are concerned that even the very optimistic Environmental Assessment presented still indicates a Trading Error with regards to high distinctiveness Lowland Mixed Deciduous Woodland.

### **Landscape impacts**

We note that the Terrestrial Environmental Appraisal Report included as part of the Gate 2 submission points out that the landscape character of the AONB would be eroded as the views from and towards the AONB form an important, valued aesthetic component of the AONB. This major impact on an internationally important historic landscape (including the Ridgeway and the White Horse) appears to be accorded very little weight.

It also suggests that there would be positive contributions to the landscape character within the floodplain – given that most of the flood plain will be covered in “raw” water (containing diluted sewage), we do not see the justification for this view.

The reservoir would be the largest development in the Vale of the White Horse and could have a significant effect on the lives of the 50,000 residents who live here. No mention is made of the impact of the very high volume of housing development taking place in the villages around the edge of the proposed reservoir or the many thousands of new homes planned and being built in the rest of the OX12 postcode area. 25 years ago Thames Water identified this area as being suitable for a reservoir because it



was a sparsely populated area, this is no longer the case. In its place is an area crammed with some of the most intense levels of housebuilding in England.

The actions to be addressed in the Gate 3 Submission refer only to reviewing and updating the landscape and visual impact assessment (LVIA) methodology with Natural England not with the people most affected by the reservoir, including those whose homes may lie within a few metres of the 'wetland habitat'.

### **Reliability and adaptability**

We note that there is no reference to reliability or adaptability in the draft decision document. We assume that this means that it is accepted that the SESRO cannot be considered as adaptable?

The plan is not adaptive – the Severn Thames Transfer infrastructure would be much more flexible to changes in demand and changing population need and should be built first, and in stages, before the reservoir, given the considerable variation in population forecasts (discussed above).

An infrastructure project of this scale is not adaptable. Unlike flooding a valley, this huge construction would take as long to remove as to install and the cost of removal would be similar to the cost of construction. The consequential damage to the area cannot be undone, without huge cost, once construction has started.

### **Impact on flooding**

We have two types of clay subsoil in the Vale of the White Horse, which are relatively impermeable, and greensand, which is very permeable. Part of the reservoir will be built over greensand so would be taking away over one square mile of the land that soaks up flood water, which may increase the flood risk in the rest of the Vale.

Additionally, the weight of the water on the substrata could also affect the water table in the surrounding area. Equally important, if water from the reservoir could leak into the greensand below it, it could create a river leading straight to Steventon, Drayton and Abingdon and on into the Thames. As far as we know, Thames Water has not yet done any detailed designs to show the extent of these flooding and leakage risks, and how they could mitigate them.

The Concept Design Report included in the Gate 2 Submission states that the reservoir would lead to the loss of flood plain, and therefore the reservoir may contribute to flood risk. This includes impacts to water bodies to the north, such as Hanney Ditch, Childrey Brook and the River Ock. It goes on to say that in operation, the presence of the reservoir would create a small reduction in potential flood flow under the A34 into Abingdon.

Yet in the reports prepared for Thames Water, supporting the WRMP19 submission, the reservoirs above 75 Mm<sup>3</sup> in size received a 'Red' rating as it was stated that there was insufficient flood storage area on the reservoir site to compensate for the loss of floodplain.

There needs to be a comprehensive flood assessment before this proposal is taken forward.





## **B. Thames Water to Southern Water Transfer**

The Gate 2 submission for the Thames Water to Southern Water Transfer (T2ST) states that this is a long-term resilience option that could form a key strategic link within the South East region. T2ST would enable available water from Thames Water's Swindon and Oxfordshire (SWOX) water resource zone in Oxfordshire to be transferred to Southern Water's Hampshire area. The preferred options would transfer water from SESRO and/or STT, treated to potable standards by a new treatment works west of the A34 at Drayton (built as part of the SESRO infrastructure), and then pumped via a pipeline through parts of Oxfordshire and Berkshire to Southern Water in Hampshire.

The document states that T2ST, is required as a result of abstraction reductions planned to deliver additional environmental protection. However, the Chalk Streams Catchment Based Approach (CaBA) report concluded that no groundwater abstraction reductions were needed in the Itchen and Test catchments. For both rivers, licensed abstraction is less than 10% of average recharge (the CaBA group proposed benchmark for acceptable abstraction). Therefore, the 59 Ml/d of deployable output loss planned for Test and Itchen groundwater sources is unnecessary and should be dropped, or at the very least be given a low priority.

The submission also states that the need and timing of T2ST will also depend on other schemes within Southern Water's supply area, including the AMP7/8 Water for Life Hampshire schemes and the Hampshire Water Transfer and Water Recycling Strategic Resource Option (SRO) scheme and that the utilisation of the T2ST during drought events will be provided after Gate 2. Therefore, at the current time, the requirement for this option does not appear to be proven.

## **C. River Severn to River Thames Transfer (STT)**

We are pleased to see that in the Draft Decision Document relating to the STT it states that 'the evidence suggests that the solution is a potentially valuable way of supplying water to customers'. We support this statement for the reasons shown below.

It should be recognised that there is a strategic need to transfer water from the relatively wetter and less populated north and west of the country to the dry and heavily populated South East. This need has been a primary conclusion of every strategic water resource study of the past 50 years including the strategies of the Water Resources Board in the early 1970s, the National Rivers Authority in 1994, Water UK in 2016 and the National Infrastructure Commission in 2018.

The STT pipeline would be very flexible to changes in demand and population and should be built first before the SESRO given the very large uncertainties in population projections and the high likelihood that the demand forecasts are vastly overstated. To quote Thames Water "STT provides a modular, adaptable



source of water, whereby water from support sources can be introduced as and when necessary, rather than being relied upon to provide a large ‘baseload’ source”.

The National Infrastructure Commission’s report in 2018 advocated that priority should be given to water transfers such as the STT. This is cheaper, faster, more environmentally friendly and most importantly is adaptive both in terms of managing water flows and in terms of graduated investment options. The pipelines needed for the National Water Grid, such as the STT and its associated transfers from water-rich areas can be scaled up or down even when the project is well advanced.

We believe that this should be given priority over the development of the SESRO as it provides a much more adaptable solution which can respond to the level of demand.

The Gate 2 Submission for the STT refers to the minimum or “sweetening” flow required to ensure efficient and effective operation of the Interconnector and to avoid stagnation of the water. It states that as the unsupported flow is not always guaranteed, the Netheridge support flow has been selected as the sweetening flow source providing 20 million litres per day. It is important to note that this support would only be needed in extreme drought conditions, as overwhelmingly, the unsupported Severn flow is sufficient to meet this small extraction requirement.

The Gate 2 Submission for the Minworth Strategic Resource Option (SRO) also states that this offers a robust and reliable source of raw water support to the Grand Union Canal SRO and the Severn Thames Transfer SRO. Therefore, it has to be included in the assessment of either of the options. The evaluation for this project is currently being performed by three separate projects (Severn Thames Transfer, the Minworth Water Treatment Works Study and the Severn-Trent ‘strategic sources’ study), therefore the options and benefits are difficult to assess objectively.

It is evident that many of the capital projects assessed in the Draft Decisions are interconnected. The Thames Water to Southern Water Transfer can’t proceed without either the SESRO or the STT being in place. The Severn Thames Transfer is interconnected with the Minworth SRO and the Severn Trent Sources and any overall comparison of the strategies is therefore impossible.

The carbon footprint, financial cost, return on value, cost to the consumer, recreation and amenity value, and environmental impact of any integrated solution is impossible to define from the fragmentation of the strategies. Although there is some detail available to justify the strategic options, there are no option comparisons to justify the selection of options and their sequence of development.

As the Gate 2 Draft Decision document states ‘the Severn Trent Sources (STS) uses treated final effluent from Netheridge wastewater treatment works at a location near to Deerhurst, currently identified as Haw Bridge. This will provide raw water support to the Severn to Thames Transfer (STT). STT will abstract the same volume of water and transfer it to the River Thames. The solution forms part of the wider River Severn to River Thames Transfer system composed of STS River Severn to River Thames Transfer (STT) and North West Transfer (NWT)’.

This water would normally be discharged into the River Severn and effectively wasted.

The document also states that ‘There is insufficient evidence to determine whether the solution has the





potential to provide similar or better value compared to other options. The best value decision making and justification for solution option selection and timing is not clearly presented. There is insufficient evidence to determine whether Severn Trent Water have considered a wide range of metrics, risks and values supported by data, analysis and customer/stakeholder support.

The Gate 2 Submission states that ‘In terms of raw water support to the wider STW region, Netheridge WwTW is of limited value, due to its location close to the southern boundary of the region and at the foot of the River Severn catchment. STS SRO will discharge a volume of treated final effluent to a location near to Deerhurst, currently identified as Haw Bridge. The STT SRO will abstract the same volume of water and transfer it to the River Thames.’

This STT can not be considered in isolation and can only be reviewed and evaluated as part of the solution including the various sources of water in the River Severn (STS).

#### **4. Concluding remarks**

In summary CPRE Oxfordshire concludes that the future demand forecasts are exaggerated – with large, unrealistic population projections, a blanket reduction of groundwater extraction and unlikely climate change scenario. There are considerable uncertainties in all these projections, and this suggests strongly that any strategic water resource project needs to be scalable and adaptable. We contend that the proposed reservoir can not be scalable or adaptable, in contrast to the proposed recycling water transfer schemes.

We are concerned that the environmental and landscape damage of the proposed strategic reservoir has been underestimated and its benefits, in terms of recreation, exaggerated. In contrast the proposed Severn-Thames Transfer scheme would make minimal long-term environmental damage and provide a scalable solution to anticipated water deficit in the South-East.

We are concerned that the plans appear very fragmented and ignore the pressing need to invest to improve water quality across the rivers in the South-East. We call for a more holistic analysis of water across the region.

Yours faithfully

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