Strategic regional water resource solutions: detailed feasibility and concept design

Gate three submission for South East Strategic Reservoir Option (SESRO)

August 2025

Working with

Disclaimer

This document has been written in line with the requirements of the RAPID Gate Three Guidance (v3, January 2024) and to comply with the regulatory process pursuant to Thames Water's, Southern Water's and Affinity Water's statutory duties. The information presented relates to material or data which is still in the course of completion. Should the solution presented in this document be taken forward, the co-sponsors will be subject to the statutory duties pursuant to the necessary consenting process, including environmental assessment and consultation as required. This document should be read with those duties in mind.

Notice - Position Statement

- This document has been produced as the part of the process set out by RAPID for the development of the Strategic Resource Options (SROs). This is a regulatory gated process allowing there to be control and appropriate scrutiny on the activities that are undertaken by the water companies to investigate and develop efficient solutions on behalf of customers to meet future drought resilience challenges.
- This report forms part of the suite of documents that make up the 'gate three submission.' Gate three of the RAPID programme represents a checkpoint on the way to solutions being prepared for consent applications. The intention at this stage is to provide RAPID with an update on activities being undertaken in preparation for consent application submission; activities' progress including programme through to completion; and consideration of specific activities to address particular risks or issues associated with a solution. The regulatory gated process does not form part of the consenting process and will not determine whether an SRO is granted planning consent.
- Given the stage of the SROs in the planning process, the information presented in the gate three submission includes material or data which is still in the course of completion, pending further engagement, consultation, design development and technical / environmental assessment. Final proposals will be presented as part of consent applications in due course.
- The project information captured in this document reflects a design freeze in October 2024 following the non-statutory consultation, to meet the requirements of RAPID's gated process. Since then, the design has continued to evolve which includes further work with Affinity Water and Southern Water partners to form agreed requirements for the development consent application, such as the incorporation of Southern Water's water treatment works into the SESRO consent. You can find the latest information about the design and development of the project at https://thames-sro.co.uk/projects/sesro/.

Contents

Glossary of Acronyms and Abbreviations

Term	Explanation
Scheme Partners	Affinity Water, Southern Water and Thames Water
AA	Appropriate Assessment (under the Habitats Regulations Assessment)
ACWG	All Company Working Group
AFW	Affinity Water
AIC	Average Incremental Cost
AOD	Above Ordinance Datum
AONB	Area of Outstanding Natural Beauty
BNG	Biodiversity Net Gain
BSA	Bilateral Service Agreement
CAP	Competitively Appointed Provider
CPO	Compulsory Purchase Order
DCO	Development Consent Order
DO	Deployable Output
DNO	Distribution Network Operator
DPC	Direct Procurement for Customers
DWSP	Drinking Water Safety Plan
ECI	Early Contractor Involvement
EIA	Environmental Impact Assessment
ENCA	Enabling a Natural Capital Approach
ES	Environmental Statement
HRA	Habitats Regulations Assessment
ICA	Instrumentation, Control and Automation
IP	Infrastructure Provider
IPA	Infrastructure and Projects Authority
ITT	Invitation to Tender
LSE	Likely Significant Effect
LURA	Levelling-up and Regeneration Act 2023
LWS	Local Wildlife Site
M&E	Mechanical and Electrical
MEICA	Mechanical, Electrical, Instrumentation, Control and Automation
Ml/d	Mega (million) Litres Per Day
NAU	Environment Agency, National Appraisal Unit
NCA	Natural Capital Accounting
NPS	National Policy Statement for Water Resources Infrastructure 2023
NPV	Net Present Value
NSIP	Nationally Significant Infrastructure Project
OA	Operational Agreement
OBC	Outline Business Case (for a DPC process)
Ofwat	Water Services Regulation Authority
PA2008	Planning Act, 2008
PEIR	Preliminary Environmental Information Report
PINS	Planning Inspectorate
PMB	Programme Management Board

Term	Explanation
PS	Pumping Station
PyWR	Python Water Resources Model
QCRA	Quantified Costed Risk Assessment
RFS	Replacement Floodplain Storage
RIBA	Royal Institute of British Architects
RSS	Regional System Simulation model (WRSE)
SAC	Special Area of Conservation
SDLT	Stamp Duty Land Tax
SEA	Strategic Environmental Assessment
SESRO	South East Strategic Reservoir Option
SIPR	The Water Industry (Specified Infrastructure Projects) Regulations 2013
SoR	Statement of Response
SoS	Secretary of State for Environment, Food and Rural Affairs
SRO	Strategic Resource Option
SSSI	Site of Special Scientific Interest
STT	Severn to Thames Transfer SRO
SWOX	Swindon and Oxfordshire Water Resource Zone (Thames Water)
SWS	Southern Water Services
TPO	Tree Preservation Order
T2AT	Thames to Affinity Transfer SRO
T2ST	Thames to Southern Transfer SRO
TTT	Thames Tideway Tunnel
TW	Thames Water
WAFU	Water Available for Use
WFD	Water Framework Directive
WRMP	Water Resources Management Plan
WRSE	Water Resources South East
WRZ	Water Resource Zone
WTW	Water Treatment Works

1. Executive summary

1.1 The South East Strategic Reservoir Option (SESRO) is a raw water storage option in the upper catchment of the River Thames. The SESRO partners, Thames Water (TW), Southern Water (SWS) and Affinity Water (AFW), have worked collaboratively to review this proposal and propose that it should continue to RAPID gate four for further analysis, refinement, consultation and ultimately consent application.

1.2 The resource from SESRO could supply TW customers in Swindon and Oxfordshire, Kennet Valley, Slough Wycombe and Aylesbury and London water resource zones, AFW customers in the Central Region via the Thames to Affinity Transfer and SWS customers via the Thames to Southern Transfer (T2ST) scheme. The estimated indicative sharing of resources is 55% to Thames Water, 30% to Southern Water and 15% to Affinity Water.

1.3 Following completion and publication of the revised draft WRSE Regional Plan, final WRMP24 for TW and AFW, and the development of the revised draft WRMP24 for SWS, the preferred size of SESRO is 150 Mm^3. This configuration forms the basis of this gate three submission.

1.4 Through gate three we have completed the following key milestones for the project:

- Development of the scheme design, including provision for interfacing TW and SWS schemes and addressing feedback from engagement and consultation.
- Updated masterplan with due consideration of landscape and legacy opportunities.
- Submission of the Environmental Impact Assessment ('EIA') scoping opinion to the Planning Inspectorate.
- Procurement and delivery of ground investigations and a clay compaction trial, both of which will continue in gate four.
- A non-statutory public consultation in spring/summer 2024.
- Conditional approval of a Stage 2 submission to Ofwat setting out the preferred procurement strategy, which includes Early Contractor Involvement ('ECI').

1.5 SESRO finances have been carefully managed through gate three, and assurance of this submission has been completed in line with TW's 3-lines of assurance model as set out in section 10 of this report, and in the context of RAPID's assessment criteria for robustness, consistency and uncertainty.

1.6 The recommendations made within our submission is supported by the Partner Boards, evidenced by individual Board Assurance Statements recommending that development should continue to DCO application and RAPID gate four.

1.7 The priority actions and recommendations made in RAPID's final decision at gate two have been addressed through gate three; these are summarised in the Appendix.

Key Facts, "At a Glance"

Item	Details
Scheme type	Raw water storage reservoir
Key assets	150 Mm^3 raw water storage reservoir with associated embankments, a below ground conveyance tunnel (circa 4km long), intake / outfall works on the River Thames, pumping station and emergency drawdown facilities, active and passive provision for interfaces with other projects (T2ST, Swindon and Oxfordshire (SWOX) raw and potential future treated water transfer and Severn Thames Transfer (STT)), conveyance system for inlet / outlet to the reservoir, mixing system, associated recreational and access infrastructure and buildings, environmental mitigation works including replacement floodplain storage, landscaping and habitat creation, temporary rail sidings and provision of renewable energy infrastructure.
1 in 500 year Deployable Output (DO)	271 Ml/d, dry year annual average and peak[17] *(excluding conjunctive use benefits from operating SESRO in conjunction with T2ST, STT or T2AT)*
Requirements met by the scheme	Contribution to water supply security during a 1 in 500 year drought, in accordance with WRSE regional plan and WRMPs for TW, SWS and AFW.
Plans in which the scheme features	• Draft WRSE Regional Water Resources Plan • Thames Water, WRMP24 • Affinity Water, WRMP24 • Southern Water, Revised draft WRMP24
Date by when the scheme is required	2040
Year the scheme can be first operated	2039/40
Key Milestones after Gate 3	• Statutory Consultation - Q4 2025 • SIPR specification completed - Q1 2026 • DCO Submission - Q4 2026 • RAPID Gate 4 Submission - Q1 2027 • Secretary of State's award of DCO - Q1 2028 • Licence Award OFWAT approved - Q2 2029 • Main Works Construction Start on Site - Q2 2029 • Water available for Use - Q1 2040
Scheme Costs	The scheme cost has been revised to £6.6bn, up from £2.74bn at gate two (2022/23 cost base). In line with government guidance on major projects a cost range is provided between £5.5bn and £7.5bn.

Item	Details
Max utilisation average incremental costs (AIC)[1] (with sensitivity test figures)	287.9 p/m^3 (*source: Gate 3 NPV cost template*)
Carbon impact	• Capital carbon of 495,700 tCO_2e (24% increase on Gate 2 estimate), largely due to design changes associated with earthworks and the sizing of major civil assets. • Operational carbon is slightly higher than Gate 2 due to more detailed appraisal of refill pumping power and reduced energy recovery from river release hydroturbines. • Whole life carbon (accounting for operational carbon and replacement capital carbon) of 723,150 tCO_2e, over 80 years (approximately 44% increase on the Gate 2 estimate).
Key project risks	• Delays in environmental permitting consents • Geotechnical design changes • Local stakeholder challenge • Site access delays • Complexity and scale of enabling works • Construction delivery challenges including weather related delays • Policy changes (to NPS) • Main Works Contractor procurement risk and delay • Commercial model complexity and approval • Regulatory funding

[1] The AIC is generated in accordance with the all company working group excel file as (NPV Opex + NPV Financed Capex) / NPV WAFU (refactored to p/m3).

2. Solution design and preferred solution option

Background and objectives

2.1 SESRO is one of the options considered by WRSE and by TW, AFW and SWS, to meet their future demands for water supply. The selection of SESRO is undertaken within the WRMP24 options appraisal and planning process; the preferred configuration presented in this submission is developed on the outcome of that strategic planning process.

2.2 The SESRO option that is included by the scheme partners in their WRMP24[2], and in the draft WRSE Regional plan for the south-east is the 150 Mm^3 storage reservoir, with resources shared between TW's London, Swindon and Oxfordshire and Kennet Valley zones, AFW's Central Region and SWS' Hampshire region. This option is required by 2040.

2.3 The primary drivers for the need for additional water supply (as provided by this and other SROs) are summarised in Table 2.1 below; these are used by WRSE and by the Water Companies in WRMPs to determine the amount of additional water needed to supply customers in the future. The WRSE Regional Plan underpins and informs individual Water Company WRMPs.

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[4], 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[4], 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.

2.4 Reductions to leakage and to water consumption are also applied, as prescribed by the Environment Agency's (EA) National Framework for Water Resources[4]. These aspects are all adopted by WRSE and the partner companies, contributing to the overall future demands for water supply.

[2] noting that Southern Water's WRMP24 was re-consulted upon in September to December 2024 and is still to be finalised

[3] Environment Agency, April 2022, Water Resource Planning Guideline v10

[4] Environment Agency, March 2020, Meeting our future water needs: a national framework for water resources, p6

2.5 There are other objectives that SESRO is aiming to achieve, aligned with other societal requirements. These are aligned to those developed by the National Infrastructure Commission to guide the development of NSIPs[5]. The Design Principles and vision developed for the scheme are described from Section 2.25. The Interim Master Plan for the scheme, as consulted on in summer 2024, shows the development of the scheme against these objectives. The discussion of wider benefits in Table 2.7 show the initiatives that are being explored to help deliver some of these additional objectives.

The preferred solution option

Solution description

2.6 The South East Strategic Reservoir Option (SESRO) is a non-impounding, fully bunded raw water storage reservoir in the upper catchment of the River Thames.

2.7 Water would be abstracted from the River Thames during periods of higher flow and stored in the reservoir. Water would be supplied in three possible ways:

a. released from SESRO back to the River Thames, from which it could be re-abstracted by existing or new infrastructure further downstream to supply customers of Thames Water and Affinity Water;
b. directly from the reservoir for treatment and supply to Southern Water and other companies through the Thames to Southern Transfer (T2ST) SRO;
c. a raw water transfer to Thames Water's Swindon and Oxfordshire (SWOX) zone.

2.8 The key design developments since gate two are outlined in Table 2.2.

Selection of preferred solution

2.9 SESRO is one of various raw water storage reservoirs that have been considered for inclusion in WRMP24 by the scheme partners and by WRSE for inclusion in the regional plan. Alternative options have been passed through an appraisal process and feasible options costed and assessed as part of WRMP24. Building on work undertaken for previous WRMPs, appraisal of alternative reservoir sites has been completed and reported within the document suite for Thames Water's WRMP24, including further work on the sequential testing of flood risk[6].

2.10 The selection of a preferred solution (option type, location and sizing) is all undertaken through the programme appraisal process completed for WRSE and WRMP24. Further details of the appraisal undertaken and the rationale for scheme and programme selection is contained in Thames Water's Final WRMP24[7], summarised below

[5] National Infrastructure Commission, February 2020, Design principles for national infrastructure
[6] Thames Water WRMP24, Reservoir Feasibility Report Update. https://dn9cxogfaqr3n.cloudfront.net/revised-draft/Supplementary+Reports/rdWRMP24+-+Addendum+Report+-+Reservoirs.pdf
[7] https://www.thameswater.co.uk/media-library/home/about-us/regulation/water-resources/wrmp24/technical-report/value-plan.pdf

2.11 This appraisal process has selected the 150Mm^3 SESRO within the best value plan that has been published as the Final WRMP24.

> *11.96 SESRO is our preferred option for delivery in 2040 as it presents the best value solution considering the long-term needs of the region. Plans that do not involve SESRO would be more expensive, would involve greater carbon emissions, and would not deliver the same environmental or resilience benefits.*
> *11.97 Our wider programme appraisal has strengthened our preference for SESRO over STT, as SESRO would be significantly simpler to operate, with water being available in the right location during times of need, and with the Environment Agency having raised concerns over the viability of the STT.*

2.12 The preferred configuration is not considered scalable once constructed due to constraints from surrounding infrastructure and available depths of underlying geological strata. As a result, the 150Mm^3 option is considered the largest reservoir option that could be developed at the SESRO site. The smaller options for SESRO were not selected by the WRSE and WRMP24 best-value planning process.

Solution Configuration

2.13 The combined river intake / outfall structure would be located on the western bank of the River Thames upstream of Culham. Abstracted water would pass through a c. 4km long tunnel and pumping station and be jetted into the reservoir at the base of an inlet tower.

2.14 The gate three configuration is for water to be discharged back into the river through an outlet tower and using the same tunnel, before flowing over a stepped gravity weir at the outfall, which would maximise aeration whilst minimising scour to the River Thames. The number, size and use of the tunnels remains under review, to enable the optimisation of operational and maintenance arrangements.

2.15 The current conceptual design allows for the inclusion of the outfall for the STT SRO project within the SESRO outfall, providing a more efficient combined solution should both schemes be implemented. The STT is a potential additional scheme considered within Thames Water's WRMP24, providing additional resource into the upper Thames catchment.

2.16 The intake for the reservoir would operate under strict conditions imposed by the EA's future environmental permit for the scheme. This would be sought as part of the scheme's consenting strategy. These parameters have been developed in collaboration with the EA and are used as the basis of the water resource appraisal undertaken, with further discussion in later sections.

2.17 The need for water to be released from the reservoir into the River Thames would be triggered by conditions in the lower River Thames, governed by the Lower Thames Operating Agreement – an agreement between Thames Water and the EA regulating licensed abstraction of surface water from the lower River Thames. It is expected that the release would primarily be triggered during periods of low flow. The need for water to be released for the proposed SWOX raw water transfer would be governed by demand and resource availability in Farmoor Reservoir and for the T2ST via the terms of the Bulk

Supply Agreement (BSA) between Thames Water and Southern Water. The BSAs are in development and shall be substantially agreed by gate four.

2.18 The configuration of the scheme for gate three also allows for integration with other water supply routes from SESRO. The approach to design and master planning integrates proposed infrastructure for the T2ST SRO that would be located on the SESRO site. TW and SWS are continuing to explore the consenting responsibilities for this infrastructure.

2.19 The scheme would be operated to enable all these functions to be used in isolation and independently, to provide flexibility and resilience to the solution. However, the refilling of the reservoir could not take place at the same time as resources were being discharged back into the river. This circumstance is considered highly unlikely, as water would generally be discharged during periods of lower flow, when abstraction would not be permitted.

Site selection and optioneering

2.20 Site selection has been completed and reported within the document suite for Thames Water's WRMP24, and reported in the Resource Options – Reservoirs Feasibility Report Addendum[8]. The site selection identifies multiple potential reservoir locations in the TW area and includes various volume variants at the SESRO location. These options formed part of the feasible option list for the regional plan (WRSE) and were available for selection alongside other types of options (such as water recycling, desalination or groundwater options) in the plan optimisation process.

2.21 The site selection process was a region wide appraisal of alternative sites for a raw water storage reservoir using extensive analysis of each against a range of criteria (property & legal, planning, socio-economic & environmental and engineering). The selection of a preferred solution (option type, location and sizing) is undertaken through the programme appraisal process completed for WRSE and WRMP24.

2.22 Building on the WRMP24 preferred option, the SESRO project undertook appraisal of the alternative options for asset configuration on the site. This included options for intake and discharge arrangements, access and highway diversions, rail freight siting and the potential location of the T2ST WTW. The results of this process informed the non-statutory public consultation undertaken in 2024[9]. Further details of the options considered, and the appraisal methodologies applied, can be found in our published reports[10].

2.23 The options appraisal was undertaken to provide the basis for detailed consultation on scheme options, to inform a preferred configuration for gate three and to provide a robust and clear basis for future scheme design. Figure 2.1 summarises the design development and optioneering process as a series of principal steps that can be repeated as the design progresses and increasing design data (including survey work,

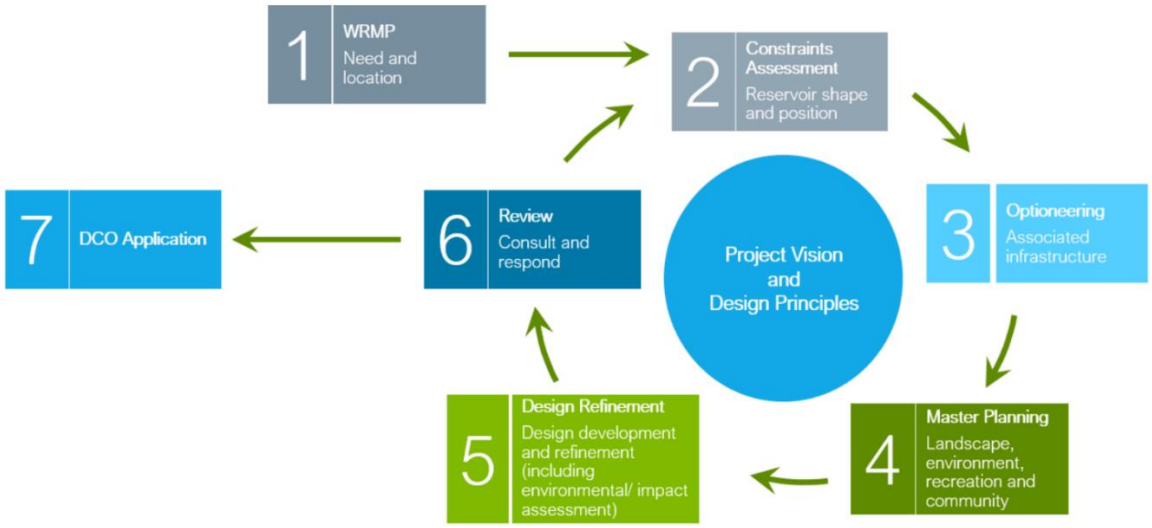
[8] Thames Water WRMP24, Reservoir Feasibility Report Update. https://dn9cxogfaqr3n.cloudfront.net/revised-draft/Supplementary+Reports/rdWRMP24+-+Addendum+Report+-+Reservoirs.pdf.

[9] Document library - Thames Water Resources Management Plan

[10] https://dn9cxogfaqr3n.cloudfront.net/2024/13491+-+TW+SESRO+Technical+brochure_A4_FINAL+AW+REV-LR.pdf

engagements and consultation feedback) becomes available. The process is underpinned by a Project Vision and Design Principles.

Figure 2.1 SESRO, Multi-Disciplinary Design Development Process



2.24 A key part of the consultation in 2024 was to develop the outcome of these various option studies into an integrated Interim Master Plan. Feedback from the 2024 non-statutory consultation, and ongoing site investigations, environmental assessments and design work, will be used to refine future iterations of the design.

Site specific vision and design principles

2.25 Building on the work undertaken to gate two, a design vision and project specific design principles have been developed for SESRO, and consulted on during 2024[11].

2.26 The design vision encapsulates the partners' shared ambitions for the project. The purpose of the design vision is to set the strategic direction of our design development, create a framework for our design principles and help external stakeholders and the public understand the aims of the project. For SESRO, the design vision is:

We will deliver a reservoir for the south-east which will help to protect customers, communities and the environment from drought.

We will provide a safe, sustainable and resilient water supply for future generations whilst delivering new high-quality spaces for nature and recreation, creating a lasting legacy for communities and the environment.

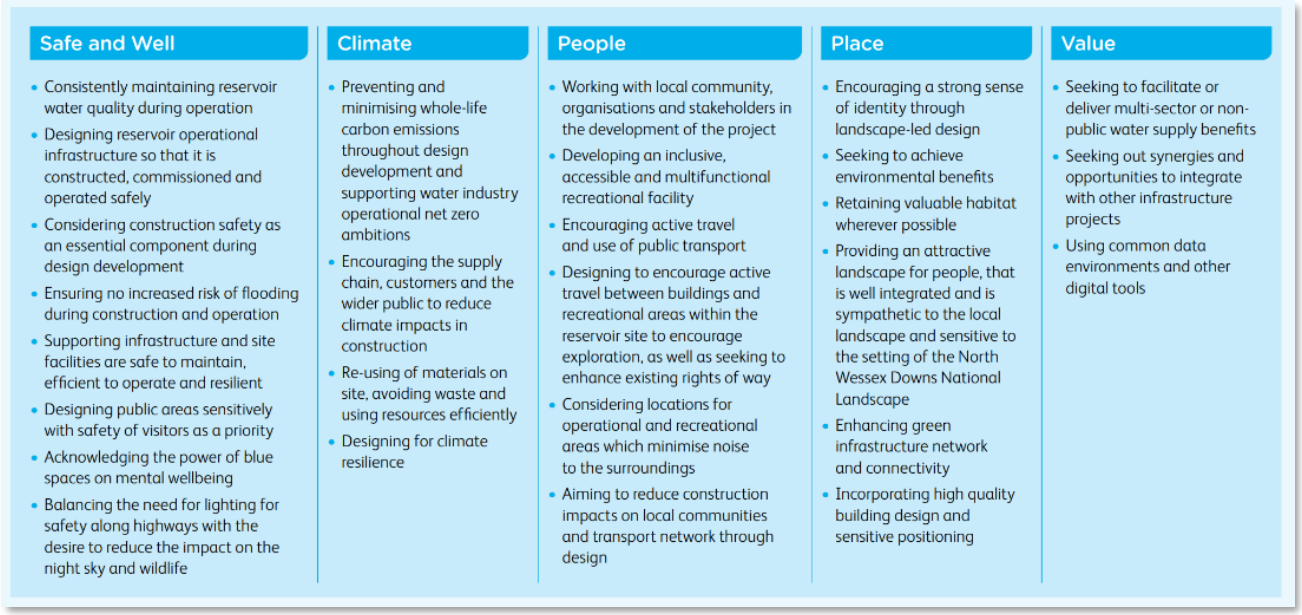
2.27 The draft design principles (see Figure 2.2 below) presented in the non-statutory consultation in 2024 will be developed through engagement with local authorities and other stakeholders. The principles establish parameters that must be met in the final design of the project. The principles serve a number of functions:

- They demonstrate how sustainability objectives will be incorporated into design.

[11] See: https://dn9cxogfaqr3n.cloudfront.net/2024/Design+principles.pdf

- When finalised, they (amongst other controls) are expected to help set the parameters for the detailed design required to satisfy the Requirements (i.e. conditions) that will be attached to the Development Consent Order (DCO).
- Linked to this, it is expected that the finalised principles will be considered by the relevant discharging authorities under the DCO post-consent, in assessing the detailed designs submitted for subsequent approval.
- They will help to illustrate how SESRO has responded to public consultation feedback in relation to design.
- They will help to illustrate how SESRO has taken account of the criteria for good design.

Figure 2.2 SESRO, summary of gate three draft design principles



Key assets

2.28 For gate three, the design has been developed to enable a robust re-estimate of costs and construction schedule, to inform a quantified review of critical risks and to enable the scoping of potential environmental impacts. The updated Interim Master Plan that was published for consultation in 2024[12] is shown in Figure 2.3.

2.29 RAPID's guidance for gate three[13] proposes that *"Solutions should be developed in line with Stage 3 of the RIBA plan of works, and ACWG Design Principles, approaching but not necessarily reaching the extent of RIBA Stage 3 outline design for a planning or DCO application."* The RIBA Plan of Works describes Stage 3 as Spatial Coordination with core tasks including: design studies, engineering analysis, cost exercises and architectural concept, resulting in spatially coordinated design aligned to the cost plan, project strategies and outline specification. The overall gate three design meets these requirements with the development of the design since gate two and consultation on option reports, an interim master plan and draft design principles for the project.

[12] https://dn9cxogfaqr3n.cloudfront.net/2024/Interim+Master+plan.pdf
[13] https://www.ofwat.gov.uk/wp-content/uploads/2024/01/January-2024-Gate-Three-Guidance-Version-3.pdf

2.30 However, at gate three, it is recognised that the project design is not yet sufficient for the DCO application and further design development work is required as described in Supporting Document A1.

2.31 The key assets are listed in Table 2.2, along with details of the level of design development to gate three and the key drivers for this. Further details on the design development at gate three are provided in Supporting Document A1: Basis of Design.

Table 2.2 SESRO, key assets and design activity at gate three

Key asset	Design development at gate three	Key drivers
Reservoir earthworks	• Earthworks and foundation design for critical geotechnical risks, including refinement of embankment geometry and reservoir shape, and development of enhanced instrumentation proposals • Borrow pit design and profile updated, including refined assessment of embankment settlement and associated crest elevations • Integration of earthworks design with tunnel design • Refinement of size and alignment of the embankment chimney drainage proposals and inclusion of a core • Confirmation of security arrangements • Update to riprap sizes on the inner face and the removal of the wave wall • Refinement of downstream face geometry and landscaping details, including floating islands	• Risks associated with embankment stability and ground conditions • Stakeholder representations on safety, security and landscape • Feedback from the Reservoir Advisory Panel (RAP) • Updated climate change allowances on windspeeds and updated fetch lengths.
Intake / outfall tunnel and pumping station arrangements	• Tunnel design for standard operation and emergency drawdown. The preferred option for emergency discharge is currently through the River Tunnel only; the Auxiliary Drawdown Channel (ADC) has been removed. Siphons are retained, discharging into the enlarged pumping station. • Based on options appraisal, the river tunnel internal diameter has increased in size from 4.2m to 6m to facilitate the preferred emergency drawdown option. A 1.4km length of secondary lining has been introduced to the river tunnel. The internal diameter of the shaft at the intake / outfall structure has increased by approximately 2.5m, due to the larger tunnel. • Review and update of the plant / process design. This has included introduction of a method for tunnel dewatering to replace the need for tunnel sweetening flows when the tunnel is not in use. • Completion of initial security reviews (see Supporting Document A1, Section 4.5)	• Optimisation of configuration and integration with options study, particularly preference towards tunnel only solution with no ADC
Intake Pumping Station	• Pumping station general arrangement for all operational modes. Civil design has changed from a rectangular box to three interlinked cells. This provides the space required for the adjustments to the plant / process design for the tunnelling arrangements. The pumping station has increased in size to accommodate the optioneering outputs and integration requirements. • Consideration of security measures required for operational site	• Need for structural optimisation • Need for integration with other SROs and projects

Key asset	Design development at gate three	Key drivers
	• Assets required for integration with other SROs and projects (T2ST, STT, SWOX transfer) • Foundation and structural concept design	
River intake structure	• Optimisation of intake / outfall location for gate three, reflective of options appraisal. • Update to reflect emergency discharge optioneering; as a result, a larger intake/outfall structure shaft and outfall weir have been developed to allow for larger river tunnel diameter and to allow the full emergency discharge flow to be released at this location. • Configuration and general arrangements for intake shaft, modes of operation, screening arrangements and outlet weir. • Assessment of public safety and access arrangements	• Alignment with preferred location from options study • Optimisation of design for latest tunnel configuration • Optimisation of screening arrangements to meet expected EA requirements
Intake tunnel, towers and mixing systems	• The internal diameter of the reservoir tunnel has increased by approximately 1m to 5.8m, to provide space for two 2.2m diameter pipes. This enables a higher proportion of the emergency drawdown flow to pass through the reservoir tunnel. • The diameter of the main reservoir tower is 31m. The design of the tower has been revisited to facilitate the larger diameter (including the addition of piles). • Review and refinement of the offtake and screening arrangements at the secondary towers • The proposed air diffusers and inlet jetting system (with associated recirculation) have been tested through water quality and CFD modelling to confirm the efficacy of the currently proposed system to manage potential temperature stratification and algal growth; the gate two solution is confirmed.	• Water quality compliance • Optimisation of tunnelling and foundation arrangements to ensure structural integrity • To meet updated operational requirements, including pipework arrangements, control valves / flow meters, consideration of access and cranage requirements
Site watercourse diversions and drainage	• Review and re-modelling of the replacement floodplain storage to integrate into the Interim Master Plan, including impacts on the River Thames floodplain due to the intake / outfall structure. • Design and performance specification for watercourse and wetland design within the diverted watercourses and RFS. • Development of the site drainage design, integrated between embankment drainage and flood mitigation. • Embankment toe drain alignment adapted to suit other changes to embankment slopes. Highway drainage added.	• Update for latest WFD requirements and earthworks / embankment design • Update to reflect ongoing development of groundwater flood risk modelling

Key asset	Design development at gate three	Key drivers
	• Surface water and foul drainage concept developed for the site and the design of the groundwater drainage design has been reviewed. • Initial concept design for the integration of the site drainage with safeguarding plans for the Wilts and Berks Canal.	
Rail freight sidings and materials handling area	• Reflect the current preferred location, slightly west of the gate two location, optimised for known environmental issues. • The proposed arrangement of the siding and materials handling area has been developed to suit the current location and agreed with Network Rail as the preferred solution (ES2 design approval stage).	• To reflect outcome from options appraisal process • To reflect discussions with Network Rail.
Roads	• Discussions with OCC regarding junction location, design and modelling, including development of initial highway horizontal and vertical alignments • The alignment and location of the junction of the main access road with the A415 have changed for gate three to reflect the preferred option. • Alignment of the Steventon to East Hanney road diversion was reviewed, but there are minimal changes proposed.	• To reflect Interim Master Plan and latest assessment of market analysis / visitor numbers
Utility diversions and requisitions	• Development of discussions with SSE regarding feasibility concept design(s) for requisition and diversion requirements and confirmation of design changes since gate two.	• To reflect discussions with Statutory undertakers and to reflect Interim Master Plan
Recreation and education facilities and car parking	• Initial zoning, sizing and use based upon Legacy Strategy and Market Analysis, Indicative sketches and setting analysis; initial integration with plans for parking, access and highways • The proposed number and location of recreational buildings has changed through the master planning process and architectural review.	• Development of Legacy Strategy and stakeholder feedback • Integration with emerging plans for the T2ST WTW
Integration with other projects	• Integration with safeguarding plans for T2ST WTW, reflective of Southern Water's revised draft WRMP. • Various other interfaces are built into the SESRO design at gate three to enable integration with other projects within WRMP24 and possible future adaptive planning pathways.	• Final WRMP24

Figure 2.3 SESRO, Gate Three Interim Master Plan

Key interactions

2.32 As a regional resource, SESRO interacts with a range of additional schemes and SROs. This includes either shared resource use, asset integration or passive provision for future uncertainty.

2.33 The resource use of SESRO is shared between TW, SWS and AFW. This means that a range of asset integration is required at the SESRO site to enable all these interfaces to operate effectively. The significant interfaces that are incorporated into the design and estimate at gate three are as follows:

- Safeguarding space within the Interim Master Plan for the Thames to Southern Transfer (T2ST) water treatment works (WTW);
- Design of the SESRO intake pumping station to enable a direct feed of raw water to the T2ST WTW from the reservoir;
- Inclusion of the initial sections of infrastructure (treated water main and waste pipeline(s)) required for the T2ST within the SESRO site boundary;
- Design of the SESRO intake pumping station to enable a direct feed of raw water to Farmoor Reservoir and inclusion of the initial sections of infrastructure required for this raw water transfer within the SESRO site boundary;
- Design of the SESRO intake pumping station and tunnel to enable the future connection of a STT, to provide an additional infill mechanism for SESRO and shared discharge arrangements into the River Thames;
- Safeguarding space within the SESRO site for a future STT main and associated energy recovery turbines;
- Identified possible space within the SESRO site for a potential future additional water treatment works for the Swindon and Oxfordshire zone.

2.34 There are no direct asset interfaces at the SESRO site associated with the Thames to Affinity Transfer (T2AT), as this SRO is facilitated via shared use of the lower Thames Reservoir assets and new infrastructure to link into AFW's supply system. These interfaces are not reported in this submission, as they will be addressed within the T2AT gate three submission.

2.35 The T2ST water treatment works (WTW) is currently part of SWS' scope to consent under the T2ST DCO and construct via the Direct Procurement for Customers (DPC) procurement route. Discussions are ongoing between TW and SWS, about whether it could be beneficial for the T2ST WTW to be consented early under the SESRO DCO but still remain with Southern Water to construct via DPC.

Scalability

2.36 As noted previously, the volume of storage within the preferred configuration is not considered scalable, once constructed, due to infrastructure and geological constraints.

2.37 There is dependency between the different SROs, in terms of phasing and timing, driven by the required outcomes of the WRSE Regional Plan. The Thames to Southern Transfer, raw water transfer to Farmoor Reservoir and SESRO supply to TW in London are

all required by 2040, and hence need to be delivered and commissioned in a wholly integrated way, with the Thames to Affinity Transfer lagging by five years and required by 2045 in AFW's Final WRMP reported pathway.

2.38 The scaling up of resource use over time by these four schemes is addressed in later sections.

Digital Twin Strategy

2.39 The SESRO project presents an opportunity to incorporate a digital twin that leverages industry-leading practices to enhance the design, commissioning, operation, and maintenance of the reservoir. While the project is still in the early stages of defining the problems that the digital twin will address, this submission outlines the potential benefits and pathways to implementation.

2.40 The proposed approach ensures that the development aligns with TW's existing digital ecosystem, and best practice within the industry, while also exploring opportunities to adopt cutting-edge capabilities demonstrated in other sectors.

2.41 Currently, there is no existing digital twin for SESRO, although various elements have been developed that could be used to integrate with a future digital twin, such as BIM models, geotechnical models and water quality and hydraulic models.

2.42 To ensure the digital twin is tailored to SESRO's specific needs, the first step is a thorough requirement definition process. This involves understanding the challenges the digital twin will address, and identifying the objectives it needs to achieve. Guided by design thinking, this step is critical to avoid the common risk of over-engineering a solution that quickly loses alignment with project objectives. The following steps will guide the next stage of project development:

- **Stakeholder Workshops:** Collaborative workshops with stakeholders, to define and prioritise key challenges that the digital twin needs to address.
- **User Journey Mapping:** Map the user journey for different roles interacting with the reservoir, identifying where a digital twin could provide significant value.
- **Design Thinking Sessions:** Identify and prioritise specific user requirements.
- **Review of Site and Data Systems / Plans:** Identify gaps and opportunities for digital twin integration, supported by recommendations for improvements.
- **Scenario Planning:** Working through hypothetical scenarios—such as equipment failure, extreme weather conditions, or increased demand—we can explore how the digital twin could optimise decision-making in real-world situations.
- **Defining Success Metrics:** Establish clear KPIs for the digital twin to help ensure focus remains on solving priority challenges efficiently and cost-effectively.

2.43 Following a thorough understanding of SESRO's needs, we plan to develop a detailed project plan that will allow us to determine the focus for each subsequent phase. From there, we can create clear timelines, define data requirements, and identify key stakeholders, ensuring the digital twin is aligned with SESRO's objectives. This plan will be developed ahead of gate four, to ensure timely and effective deployment to influence detailed design, construction, and operation.

2.44 We anticipate that the digital twin will deliver the following benefits during design, construction and operation:

- **Design** - Pre-Build Scenario Testing (model and test different reservoir designs to a under varying environmental conditions); Sustainability Assessment (optimise the reservoir design for lower carbon emissions); and Site Analysis (combine geological, hydrological and satellite data into a single digital model to optimise assets).
- **Construction** - Construction Sequencing (reduce delays through integrating time-based simulations and monitoring of construction schedules); Risk Management (simulate potential risks during construction); Health and Safety Analysis (simulate worker movements and tasks to minimise safety risks and ensure compliance with regulations); System Integration Testing (validate how different systems will work together in operation); and Virtual Commissioning (to ensure smoother handover).
- **Operations** - Dynamic Water Quality Monitoring (continuously track and predict changes in water quality); Predictive Failure Analysis (identify early signs of potential failures using machine learning models); Energy Optimisation (simulate and monitor energy usage of pumps and other systems to minimise operational costs and reduce carbon footprint); Environmental Compliance (predict and manage impacts on local ecosystems, ensuring compliance with environmental regulations); Drought and Demand Forecasting (model water levels and usage patterns to predict and prepare for droughts or periods of high demand).

2.45 As the project progresses, the roadmap will evolve with insights gained during development. At key stages, our supply chain will introduce innovative partners to integrate advanced AI into the digital twin's design. By aligning with best-in-class principles and leveraging cross-sector innovations, the SESRO digital twin aims to set new benchmarks in reservoir management for efficiency, resilience, and sustainability.

2.46 Work has commenced on the scoping of the digital twin, with a view to deploying this to test the SESRO design ahead of gate four. Partners will remain closely aligned with the ACWG sub-working group on the development of Digital Twins to ensure alignment and consistency with other SROs.

Independent Design Reviews

2.47 Between gate two and gate three, the SESRO project has progressed two key independent design review activities:

- Technical review of critical reservoir safety design elements by the Reservoir Advisory Panel (RAP); and
- Initiation of formal design review by the Design Council.

2.48 The RAP is an independent panel, made up of external and TW subject matter experts who provide design review and advisory services to support the SESRO design team and the appointed independent Construction Engineer. Between gate two and gate three, the RAP has advised on key issues including:

- Optimisation of the design of the tunnel section under the embankment

- Geometry of the embankment, and associated drainage arrangements and slope stability analysis
- Design of the intake / outfall tunnel
- Instrumentation and monitoring of the embankments
- Configuration of the towers and pumping station
- Specification of ground investigations and the Clay Compaction Trial.

2.49 The Design Council (National Strategic Advisor on design) has been commissioned to provide design reviews at key milestones in the process up to DCO submission. The design review for SESRO, undertaken by an experience panel, provides independent scrutiny and support to ensure that the scheme's design vision and principles are integrated with the project management and consulting processes.

2.50 Two sessions have been undertaken to date which provided a positive endorsement of the design at gate three but also provided key recommendations for development. These, alongside responses to non-statutory consultation, will help guide and inform future consultation and submission milestones.

Utilisation

Utilisation Overview

2.51 In the Final WRMP24 and WRSE revised draft Regional Plan, the resources from SESRO are proposed to be shared between three parties, as follows:

- TW would make use of approximately 55% of the Average Deployable Output (DO) in four ways:
  - use of the River Thames to convey water stored in SESRO for re-abstraction and treatment within the London water resource zone,
  - raw water transfer into the SWOX zone[14],
  - abstraction of raw water from the River Thames at Medmenham, to treat and supply the Slough, Wycombe and Aylesbury (SWA) water resource zone and
  - supply of treated water to the Kennet Valley zone, via a connection to the T2ST.
- SWS would make use of approximately 30% of the Average DO (up to a capacity of 120 Ml/d), through treatment of water from SESRO and the transfer of treated water to its Hampshire water resource zone, via T2ST. T2ST has been designed with the potential to provide South-East Water with a small potable water supply (10 Ml/d) through the Northgate connection spur during high-demand drought conditions.
- AFW would make use of approximately 15% of the Average DO, accessing the shared resources through Thames Water's Lower Thames Reservoirs and hence transfer raw water into Affinity Water's supply network via the Thames to Affinity Transfer (T2AT).

2.52 The share of resources between the parties and the choice of receiving zone (and quantity of share) is all based upon the WRSE Best Value Plan. The share of resources,

[14] Primarily to support water supplies in that recipient zone due to future abstraction licence reductions at Farmoor Reservoir which are required for environmental protection under the Environment Agency's, "Water Industry National Environment Programme" (WINEP)

the choice of option and ultimately the impact of that resource on the recipient water resource zone(s) have been derived within the WRSE modelling framework and hence cascaded into the quantified planning tables within the published Final (or revised draft) WRMP24 for the recipient company and water resource zone.

2.53 The use of the scheme by the various parties (and water resource zones) does vary over time, with a summary provided in Table 2.3 below, based upon the dry year annual average utilisation documented in the reported pathway of Thames Water's Final WRMP24.

Table 2.3 Summary of resource sharing for SESRO (Based on Thames Water Final WRMP24, Dry Year Annual Average resource share, reported pathway 4)

Ml/d	Thames Water, London ***	Thames Water, Transfer to SWOX	Thames Water, SWA (Medmenham abstraction)	TW, Kennet Valley (via T2ST)	T2ST*	T2AT**
2040	50	24	0	5	14	0
2050	97	24	16	10	63	58
2060	119	24	15	10	67	73
2075	122	18.1	14	10	70	72

** excl. Thames Water export via spur to Kennet Valley and SEW supply (peak only)*

*** Affinity Water 15% share is based upon utilisation of initial (50 Ml/d) phase of T2AT only. This is due to uncertainty with the scale of abstraction reductions expected by Affinity Water under their future Environmental Destination scenarios. However, the Final WRMP24 reported pathway 4 is based upon the more conservative scenario agreed with the EA, which requires a slightly higher utilisation of SESRO.*

**** the total resource share is more than 271 Ml/d (DYAA DO), as the conjunctive use benefit of the T2AT in London WRZ is accounted for.*

2.54 Utilisation of SESRO under peak demand conditions may also be found in the same section of the WRMP, noting that utilisation of the resources in Thames Water's London WRZ are only included under the DYAA scenario, because a Dry Year Critical Peak (DYCP) supply-demand balance is not calculated for London WRZ.

Utilisation analysis

2.55 The utilisation of the SESRO scheme has been tested and analysed within the WRSE PyWR modelling platform. This involves the integration of the demand profiles for SWS, AFW and TW and the simulation of reservoir operations under different design conditions to mimic the preferred WRMP24 configuration, as outlined previously. These design conditions include drought periods, of varying magnitude, and more normal year and non-peak periods. The following scenarios were considered to explore utilisation uncertainty:

- Baseline current scenario (2024, normal year demand, no SESRO)
- 2040 and 2045 baseline (normal year, no SESRO), under median climate change impact

- 2040 and 2045 with SESRO (normal and dry year demands), under median climate change impact
- 2045 with SESRO (dry year demand), under severe climate change impact
- short-term TW outage scenario: 2045 with SESRO (normal year), under median climate change impact, but with maximum SESRO release and baseload T2ST/T2AT utilisation profiles
- peak long-term scenario: 2065 with SESRO (dry year demand), under median climate change impact

2.56 This more detailed analysis provides our best estimate of the possible long-term abstraction and discharge arrangements, to ensure the accuracy and robustness of gate three environmental impact work, particularly the WFD assessment, and as a guide for the operating cost assessment, and reservoir drawdown analysis.

2.57 Overall, the findings from this modelling are summarised in Table 2.4 below. The preliminary conclusions are similar to those found at gate two, but the magnitude of discharge rates back into the River Thames is now lower, as more resource is provided to SWS and SWOX, direct from the reservoir, rather than all resource being discharged to the River Thames for re-abstraction downstream as was previously simulated. The licence conditions simulated reflect those summarised below.

Table 2.4 SESRO, summary of PyWR utilisation modelling analysis for gate three

Operating Conditions	Summary
Abstraction rates from River Thames	• When the scheme is first commissioned, some level of winter abstraction would be expected to operate for over 50% of the time between October and March, with 13% (i.e. approximately 23 days in this 6 month period) at capacity of 1,000 Ml/d. • As utilisation of the scheme increases from 2045* to 2065 so the percentage of time when winter abstraction is operating at capacity would also be expected to increase, with operation at capacity increasing to approximately 45 days during the same winter period. • Summer abstraction (Apr to Sept) is predicted to be much lower, with abstraction over 100 Ml/d only for 3% of the time in 2045, rising to 8% of the time by 2065. This is driven by the lower percentage of the time that flows are above the Hands off Flow.
Release back to River Thames	• Releases back to the River Thames are seen to occur in both winter and summer periods, driven by demands, for between 25% and 40% of the time. • Releases in 2045 are predicted to be approximately 75 Ml/d, rising to approximately 195 Ml/d in 2065. • As noted previously, release rates are lower than the maximum derived from deployable output analysis (and as reported at gate two) as significant resource is now supplied direct to Farmoor and SWS, rather than via augmentation of the River Thames. • Extreme climate change conditions are predicted to increase release frequency.
Reservoir drawdown	• In 2045, the reservoir would be expected to be full for 85% of summer periods (April to September). This increases to 88% by 2065.

Operating Conditions	Summary
	• However, the frequency of drawdown increases as utilisation of the scheme increases over time and the resource is used more fully. In 2045, only 3% of the modelled days show a drawdown of over 10m. By 2065 this increases to 16%.

N.B. the percentage analysis is based upon an average over 1,008 years model run time (i.e. 21 stochastic hydrology replicates x 48 years each)

** 2045 is used as "baseline" for summary comparative analysis, as this is first year when all supplies from SESRO are operational (i.e. Thames Water, Southern Water (plus South East Water) and Affinity Water.*

2.58 The latest estimate of operating costs for SESRO (see section 8) is based upon a simplified version of this updated estimate of shared utilisation. In due course, as part of the commissioning process for the scheme, asset management plans would be developed by the operating party for SESRO (currently proposed to be Thames Water, in line with our Stage 2 submission to Ofwat). It is expected that such plans would be developed in accordance with Thames Water asset standards, as proposed operating company.

Utilisation risk and uncertainty

2.59 As can be seen in section 5 of the WRSE revised draft regional water resources plan[15] there is uncertainty in the future demand for water. This means that there must therefore be a coincident uncertainty in the future utilisation of any major new resource that is selected to help meet this demand. To better understand this uncertainty, section 10 of Thames Water's WRMP24[9] presents extensive appraisal of alternative scenarios that might be met using the options selected, in order to identify a best value plan. The WRMP is based upon nine alternative "futures" or adaptive pathways, to help manage this future uncertainty.

2.60 Although the future utilisation of SESRO has some uncertainty, it is selected by all nine future adaptive pathways in the revised draft WRSE regional plan[15]. Uncertainties as to utilisation will be mitigated through continued analysis of possible alternative operational scenarios, development of environmental permitting proposals to meet these possible requirements and flexible commercial arrangements between the parties. It should be noted that the procurement and operational plan developed for the Stage 2 submission to Ofwat allows for future changes on resource sharing between the SESRO parties. This approach enables future changes in resource need and utilisation of SESRO to be managed dynamically.

Water resource benefit

Water resource overview

2.61 The Deployable Output (DO) of the preferred scheme has not been reassessed and remains aligned with the data provided for the WRSE Regional Plan and WRMP24. As noted at gate two, the DO was calculated using the WRSE Regional System Simulation

[15] https://wrse.uk.engagementhq.com/20133/widgets/57025/documents/46293, Figure 10.1

(RSS) model. The same approach and methodology developed and adopted by WRSE[16], has been used by the SRO. The DO identifies the amount of water that could be delivered by each of the options during a 1 in 500 year return period drought, with demand restrictions applied to meet agreed levels of service. The stated minimum levels of service applied for TW DO analysis are as quoted in the Final WRMP24 documentation. The recipients of the water resource benefit are as stated in section 2.3.1 above.

2.62 The Dry Year Annual Average (DYAA) DO[17] is derived to take account of the estimated impact of future climate change in the 2070s (see Table 2.5 below). This scenario is the median of the 28 different climate change scenarios from WRSE[18].

Table 2.5 SESRO, 1 in 500 year drought DYAA Deployable Output values for all options

Option	1 in 500 year DYAA DO (Ml/d)
150 Mm³	271

2.63 The conjunctive use benefits of combining SESRO with the STT and T2ST, as stated in the SESRO gate two submission, are realised through the DO values assigned to the options in the WRSE regional modelling. These apply when options are selected in combination, hence not included in the preceding table. The option combination that results in the highest conjunctive use benefit is the combination of the STT, SESRO and T2ST, resulting in a net total additional DO benefit of 19 Ml/d.

2.64 The modelling undertaken for gate two, as reported in the gate two submission for the Thames to Affinity Transfer[19] also confirms a conjunctive use benefit to Thames Water in London. The modelling shows that operating the 100 Ml/d T2AT transfer scheme during a 1 in 500 year drought results in a proportionally smaller loss of DO to Thames Water (less than 50 Ml/d) due to the shared use of the London raw water storage reservoirs.

Environmental Permitting Strategy

2.65 At gate three, the strategy for the abstraction and discharge permits required for SESRO remains under development. As noted in Supporting Document E (Planning and Land Strategy) Environmental Permits such as these are relatively complex and not typically included in DCOs, but rather subject to a separate consenting process. However, to guide the development of the project to gate three, certain principles have been assumed and discussed with the EA, which has guided the assessment work completed to date and now act as the foundation for further analysis and modelling ahead of the DCO submission. These are listed in Table 2.6 below.

[16] WRSE, Aug 2021, Method Statement: Calculation of deployable output, post consultation version

[17] For baseline DO and all options for Thames Water in London, we consider only the DYAA planning scenario. Primary WR risk for London is prolonged drought and resultant impacts on water levels in the storage reservoirs; hence the focus on average dry year conditions rather than peak periods.

[18] Therefore, it does not represent a 'worst case' but is a reasonable mid-point estimate of future water availability from the SRO

[19] https://affinitywater.uk.engagementhq.com/10322/widgets/57830/documents/34741

Table 2.6 Assumptions for abstraction licence and discharge permitting at gate three

Principle	Position at gate three
Abstraction from the river "Hands off Flow" (HoF)	Assumption that the abstraction licence, controlling when and how much water can be abstracted from the River Thames, will be subject to a Hands-off-Flow (HoF) controlled by the Q50 (50th percentile flow) at the Environment Agency flow gauges at both Sutton Courtenay and Kingston. This is the basis for all of the gate three modelling work.
Daily abstraction volume	Assumption that the daily licensed abstraction volume will be a daily average of 1,000 Ml/d, with an instantaneous permitted peak of 13.9 m^3/s (1,200 Ml/d).
Lower Thames Operating Agreement (LTOA)	Assumption that nothing in the modelling work completed to date suggests that changes or updates to the LTOA are required. However, this needs to be further explored and confirmed.
Daily discharge rate	Assumption that the daily maximum discharge volume into the River Thames will be 321 Ml/d. The gate three ecological and water quality modelling is based upon the operational utilisation of the scheme to reflect the Final WRMP24 and this results in a standard operational discharge well below this limit, as resource is now shared directly with Southern Water via T2ST rather than all supply being discharged back into the River Thames. However, the maximum discharge was defined through the optimisation of the scheme DO within the PyWR modelling completed for gate two and hence remains the assumption for the licensing strategy albeit that this maximum is rarely expected.

2.66 All residual issues will need to be resolved, through further modelling and assessment, prior to DCO submission to inform elements such as the scheme description for EIA and operating philosophy for SESRO. These residual uncertainties at gate three include aspects associated with annual abstraction volumes, to ensure the ability to serve all required water resource utilisation, without incurring unacceptable environmental impacts, interactions between SESRO environmental permit and any future abstraction licence changes at Farmoor Reservoir, and agreement over required discharge activity permits depending on the configuration of the final SESRO design. If the water being released from SESRO back into the River Thames is shown to deteriorate water quality, then it could require a discharge activity permit[20]. We will continue to engage with the Environment Agency on this matter. Also, any changes to the existing discharge arrangements at impacted sewage treatment works (e.g. Abingdon STW) will require changes to existing environmental permits.

Outage Strategy

2.67 The strategy for managing outage at SESRO is considered in the same way for any other asset. The supply-demand balance, including outage allowance, is derived at a water resource zone and company level within WRMP24, and not at an asset level. There will be periods when abstraction might not be possible into SESRO, particularly driven by

[20] The WFD assessment may be found in Section 4.1, confirming the acceptability of the current proposals in terms of water quality impacts

high turbidity[21] in the River Thames. However, this is taken into account during standard outage allowance calculations and reflects standard operating procedure for other similar assets in the area (such as Farmoor Reservoir).

Long term opportunities and scalability

Wider benefits

2.68 SESRO has the potential to deliver significant benefits and enhancements, resulting in environmental net gains (ENG). At gate three, a range of shared benefits have been explored and could be integrated into the SESRO DCO submission and ultimately the delivery of the scheme. These vary between those that are integral to the delivery of SESRO, connected to the realisation of the Design Principles for the scheme, and others that are related to the SESRO core scheme, which could be enabled in the future. The range of benefit opportunities are discussed further in Table 2.7 below.

2.69 At gate three, the costs of the "embedded benefit" items are explicitly included in the overall scheme cost at gate three. The estimated costs for the opportunity items will be developed ahead of gate four and included in the overall scheme design for DCO if appropriate.

2.70 The legacy opportunities for recreational, environmental, social and economic benefits have been developed through collaboration with a wide range of stakeholders and future user groups. Further information can be found in Supporting Document G: Customer and Stakeholder Engagement.

2.71 These shared benefits and opportunities are compared to Ofwat's Public Value Principles[22,] as shown in Table 2.8, to ensure that there is alignment between these shared opportunities that are realised through the SESRO design principles, and Ofwat's aspirations for how water companies could facilitate the delivery of social and environmental value through their operations and future plans.

[21] Controls are placed on turbidity since it is easily monitored in real time and tends to be associated with the mobilisation of pollutants from the catchment and river sediments when river flows are high, particularly during the 'first flush' in the autumn. Controls may also be applied to pesticide concentrations at key times in the year.
[22] https://www.ofwat.gov.uk/wp-content/uploads/2022/03/Ofwats-Final-Public-Value-Principles.pdf

Table 2.7 SESRO, shared benefits and opportunities at gate three

Name	Type	Position statement at gate three	Next steps	Potential funding
Recreational legacy	Embedded benefit	Legacy workshops undertaken between gates two and three[23] have identified a range of opportunities for shared recreational use of the SESRO site, enabling the realisation of a number of the Design Principles. The legacy use strategy has integrated the leading options within the aspirations for the project, including water and land based recreational activities and facilities.	▪ Development of design and layout of preferred recreational spaces, assets and buildings ▪ Inclusion in Statutory Consultation.	Assumed 100% funding by SESRO partners
Habitat Creation	Embedded benefit	The Interim Master Plan was developed to ensure delivery of the expected future required level of Biodiversity Net Gain (BNG)[24]. This results in a wide range of created habitats to replace those lost by the creation of SESRO, both terrestrial and aquatic, delivering a high level of Natural Capital value and BNG.	▪ Continued development of environmental mitigation, ENG strategy and BNG estimates.	Assumed 100% funding by SESRO partners
Social and Economic Value	Embedded benefit	The Interim Master Plan has been analysed to identify the level of socio-economic benefit that could be delivered by the scheme, particularly in employment, education and green space sectors. These benefits could be delivered through the scheme (see Section 8) via the construction and operational planning and the enabling infrastructure included within the scheme consent.	▪ Confirm employment benefits. ▪ Development of the design of preferred educational assets.	Assumed 100% funding by SESRO partners
Flood Defence Legacy	Opportunity	At gate three, the SESRO project has continued to consider the opportunity for shared benefits that might accrue from the use of the SESRO access road as a flood defence asset for Abingdon. For avoidance of doubt, this includes the feasibility of developing a dual-purpose access road into SESRO as both: (a) a highway, providing primary access into the SESRO site for construction and operational traffic; and (b) potential future use as an impounding flood risk management embankment. The EA has been investigating large scale flood storage on the tributaries of the River Thames and has identified areas for further investigation[25]. It is understood that flood modelling by the EA has shown that a flood storage area upstream of Abingdon in the catchment of the River Ock is technically viable. There is an opportunity for the EA to deliver this flood storage area by enabling it through the SESRO design, using the SESRO access road as a flood risk management asset for Abingdon. Utilising the SESRO access road as a flood risk management asset would reduce overall costs for the EA increasing the economic viability of finding a sustainable flood risk management scheme for Abingdon. However, even though this proposal carries additional benefits it also carries additional operational cost and engineering complications for the SESRO proposals that require resolution. Within this shared position at gate three, it is accepted that: • the potential for flood storage in this area would be a separate scheme to SESRO; • the need for the flood storage does not arise as mitigation for any increase in flood risk caused by SESRO but could be used in combination with other proposed mitigation measures to provide a longer term overall reduction in the current existing flood risk within this catchment; • the flood storage could be facilitated by development associated with SESRO, given that an access road is required in the same area); • the flood storage would therefore form an additional (albeit unrelated) benefit of the wider development; and • would align with the South Oxfordshire and Vale of White Horse Joint Local Plan 2041 Policy IN7 – South East Strategic Reservoir Option (SESRO) safeguarding bullet point g) provide a flood alleviation scheme for Abingdon in consultation with the EA.	▪ Beyond gate three, the SESRO partners and the Environment Agency will continue to discuss this opportunity, to better understand the issues and benefits. If agreed, further exploration of the cost and environmental implications and the associated integrated consenting strategy will be undertaken.	Assumed contributions from Environment Agency
Wilts and Berks Canal	Opportunity	In accordance with Core Policy 14 within the Vale of White Horse District's Local Plan, 2031[26] the gate three design position for SESRO is to *"make provision for the new route of the Wilts and Berks Canal in relation to the reservoir proposal between the villages of Drayton, East Hanney and Steventon"*. This currently includes provision for a safeguarded route through the SESRO site for the canal. This is to primarily enable the future wider restoration and development of the canal to link it with the southern section beyond the Great Western Railway towards Grove and Wantage, or to an eastern section and connection to the River Thames, thereby enabling realisation of significant additional benefits (including ENG) beyond the SESRO boundary.	▪ Continued design development for canal route through SESRO site and integration with route options beyond site boundary. ▪ Continued development of the principles of partnership working with the WBCT	Potential for shared funding by WBCT for certain elements (e.g. GWR and A34 crossings)
Operational supply resilience and adaptability	Opportunity	The resources available in the reservoir would be expected to be recharged during higher flow (winter conditions) and then drawn down for use during drier (summer) periods. However, as the resource is available during all periods, it could also be used to buffer supplies to help manage operational issues during non-drought periods or to manage unplanned outage events. For example, in the event of freeze-thaw events during a winter low flow or cold period, which might cause short-term leakage increases particularly in London, SESRO resources could potentially be deployed to assist with this to provide operational flexibility and outage protection.	▪ Continue to develop SESRO as per gate three proposals ▪ Consider risk to summer drought supplies (and Deployable Output) should resources be deployed on an occasional basis during normal winter refill periods	Assumed 100% funding by SESRO partners

[23] see Supporting Document G: Stakeholder Engagement Strategy
[24] see Supporting Document C5: Biodiversity Net Gain
[25] https://engageenvironmentagency.uk.engagementhq.com/what-is-the-thames-valley-flood-scheme
[26] https://www.whitehorsedc.gov.uk/vale-of-white-horse-district-council/planning-and-development/local-plan-and-planning-policies/local-plan-2031/, noting this is expected to be superseded by Policy IN4 in the emerging Local Plan to 2041 (https://www.southandvale.gov.uk/app/uploads/2024/10/Joint-Local-Plan-2041-Publication-Version_October-2024.pdf)

Table 2.8 SESRO, alignment of potential benefits and opportunities in Table 2.7 with Ofwat's Public Value Principles

Ofwat Public Value Principle	Recreational Legacy	Habitat Creation	Social and Economic	Flood Defence Legacy	Wilts and Berks Canal	Operational flexibility
1. **Companies should seek to create further social and environmental value in the course of delivering their core services, beyond the minimum required to meet statutory obligations.**	✓	✓	✓	✓	✓	
Commentary	The SESRO DCO submission will meet statutory and legislative requirements. Current benefits discussions go well beyond this to meet the aspirations of the draft Design Principles and particularly in exploring the potential co-funded opportunities.					
2. **Social and environmental benefits should be measurable, lasting and important to customers and communities. Mechanisms used to guide activity and drive decision- making should support this.**	✓	✓	✓	✓	✓	
Commentary	The recreational, habitat creation and social and economic value benefits have been identified through a series of collaborative stakeholder workshops. The potential co-funded opportunities have been identified through recognition of feedback from local community and interest groups.					
3. **Companies should be open with information and insights on operational performance and impacts (both good and bad).**						✓
Commentary	SESRO community benefits and opportunities not currently directly aligned with operational performance. However, operational performance could be enhanced through flexible use of the assets and shared knowledge. Operational performance may be impacted through maintenance of any shared assets and may require further development as part of asset planning.					
4. **Delivery of social and environmental value outcomes should not come at greater cost to customers without customer support.**				✓		
Commentary	Possible additional benefits associated with reduced sewer flooding in Abingdon, aligned with customer supported outcomes and delivery incentives					
5. **Companies should consider where and how they can collaborate with others to optimise solutions and maximise benefits, seeking to align stakeholder interests where possible, and leveraging a fair share of third-party contributions where needed.**	✓	✓	✓	✓	✓	
Commentary	There are opportunities for collaboration across all benefit areas, which have been explored to gate three and will continue to be developed. These include with local sports clubs for optimisation of recreational benefits, local wildlife groups (e.g. BBOWT or the Ock catchment partnerships) for habitat creation and natural capital benefits, local education groups or economic partnerships, the Environment Agency, Lead Local Flood Authority and community flood groups and local canal trusts.					
6. **Companies should take account of their capability, performance and circumstances in considering the scope for delivering greater social and environmental value.**	✓	✓	✓			
Commentary	The SESRO partners have experience in developing the shared benefit elements, from experience across their operational sites elsewhere, such as Farmoor Reservoir, Walthamstow Wetlands or local education programmes. The potential co-funded opportunities may extend this capability, so the importance of close collaboration with potential partners will be critical.					

Infrastructure resilience to the risk of flooding and coastal erosion

Exposure of assets to flood risk

2.72 The current concept design for SESRO does include a number of assets which would need to be located in areas currently at risk of flooding, within Flood Zones 2 and 3. This includes the main reservoir site itself and the inlet / outlet structure.

2.73 Site selection for SESRO was undertaken as part of WRMP24 and a Flood Sequential Test report is included in the Thames Water WRMP24 supporting documents as an appendix[8]. The 150Mm^3 reservoir option passes the Sequential Test.

2.74 The reservoir is essential infrastructure and parts of the reservoir (and necessary associated infrastructure) would be located in flood zones, therefore an Exception Test (set out in planning policy) is also required. WRMP24 concludes that the project passes the exception test.

2.75 The options appraisal methodology discussed previously considers flood risk in the multicriteria assessment. The updated project design continues to meet the tests by mitigating all forms of flood risk within the SESRO site.

2.76 Design development and preparation for DCO submission will continue in gate four and an Environmental Impact Assessment will be developed including consideration of alternatives and formal flood risk assessment[27]. The Flood Sequential Test and Exception Test will be revisited and reported as appropriate in the DCO submission.

2.77 Further comments on the treatment of flood risk in option selection, as consulted upon in summer 2024, is provided in Supporting Document A1: Basis of Design.

Flood risk appraisal of design for gate three

2.78 There are flood risk issues that are relevant to the SESRO project. The assessment of each has developed since gate two and is summarised in Table 2.9 below. This work has used the latest UK Climate Projections (UKCP). Further work is planned in all areas, including formal flood risk assessment, as the project progresses towards Statutory Consultation and DCO submission during subsequent project stages.

Optimisation to deliver wider flood risk management benefits

2.79 As introduced in Table 2.7, at gate three we are currently exploring options with the EA, for the use of the SESRO access road to help prevent flooding in Abingdon as part of its Thames Valley Flood Scheme. This could help prevent extensive property flooding in Abingdon.

2.80 Beyond gate three, the SESRO partners and the EA will continue to discuss this opportunity, to better understand the issues and benefits. If agreed, further exploration of the cost and environmental implications and the associated integrated consenting strategy will be undertaken.

[27] See EIA Scoping Report (reference and link in Table 0.2 within Appendix)

Table 2.9 SESRO, summary of flood risk issues at gate three

Category	Overview of issues	Development work undertaken since gate two	Key findings at gate three	Further work planned
River flooding	The reservoir footprint would interrupt the route of existing watercourses and cover an area of existing floodplain, so there is a need to divert the watercourses around the perimeter of the reservoir embankments and replace the area of floodplain lost. Diversion of existing watercourses would be required to the east and west of the reservoir.	Fluvial flood risks have been assessed using an updated version of the EA's hydraulic model of the River Ock, as developed for gate two. Reflecting comments made by the EA at gate two, the model has been further updated, and re-issued to the EA for further comment: • **Validity checking of river channel cross-section data** using recently collected topographical data from site. This check has not yet been fully completed due to land access constraints across the whole SESRO site. However, some watercourses were surveyed and compared to cross-section data from 2007, showing only minor differences. • **Update to the floodplain topographical data** in the model using the latest LiDAR data, to ensure accuracy of out-of-bank flow paths. The comparison between the LiDAR data and 2024 ground based survey shows that the LiDAR has slightly higher bank levels, which will require correction. • **Review of the hydrology used in 2017 model** was undertaken as part of current study. The 2017 hydrology data was deemed appropriate and has been used in the latest iteration of the design of the Replacement Floodplain Storage (RFS).	• The area to the west of the reservoir provides sufficient space and flexibility to provide the necessary flood storage capacity. This would form the main area for RFS; however, some smaller areas are also identified to the north-east. • This RFS area will ensure that the existing fluvial flooding situation is not worsened by the development and flood risks to adjacent and downstream properties are not increased. • Within the main RFS area would be the diverted Cow Common Brook and Portobello Ditch, which would flow alongside a realigned East Hanney Ditch. To meet Water Framework Directive (WFD) and Biodiversity Net Gain (BNG) requirements, both watercourses would be improved as they are diverted (see Section 4 for further details). • The design of the RFS has been refined at gate three, to ensure that it enables compliance with environmental outcomes whilst delivering the required level of flood storage and attenuation. As noted at gate two, overall, there is a betterment to the flooding situation for downstream areas in Abingdon, largely driven by the reduced catchment area for the diverted watercourses, resulting in a decrease in flood extent downstream of A34 leading to a reduction in overall flood risk to Abingdon town.	Continued development, refinement and improvement of the fluvial flood model to ensure it is accurate for use in the Flood Risk Assessment that will accompany the future DCO submission. The proposed model, methodology and scenarios to be assessed will all be agreed with the EA in advance of the DCO submission.
Groundwater flooding	The proposed SESRO project has potential to increase groundwater flood risk in the areas surrounding the embankment. There is a particular concern, should risks be unmitigated, of increased groundwater flood risk in the immediate local area, which is already susceptible to surface water and groundwater flooding due to the relatively flat topography, poor surface water drainage and the local geology[28].	At gate two, a simple MODFLOW groundwater model was created to simulate groundwater flow within the superficial deposits. Following discussion with the EA this model has been revised to include the superficial deposits and the Lower Greensand aquifers. The groundwater model has been developed to assess the groundwater flood risk associated with the reservoir and to provide data to assist in the design of a groundwater drainage system. The original aim was for this updated model to be calibrated using data collected during 2023 or 2024. However, due to delays in the installation of boreholes for groundwater monitoring, owing to land access constraints, insufficient groundwater level and surface water flow data has prevented the full planned recalibration of the model at gate three. However, the groundwater model has been updated for gate three in a number of key ways: • Improvements to the conceptual model and representation of the superficial geology in the model based upon recent ground investigations, enabling creation of a new multi-layer model; • Improved understanding of shallow groundwater flows and interactions with the surface water drainage system;	• In response to the updated and refined modelling undertaken for gate three, an alternative approach to groundwater control has been included in the design. This assumes that the existing land drainage system will be removed/eliminated within the construction boundary and that a new drainage system will be required to maintain groundwater levels. The model was used to simulate this scenario and to identify potential areas of elevated groundwater level 'hotspots', should mitigation not be implemented. • The model has provided indicative (uncalibrated) volumes of shallow groundwater that needs to be removed by drains in two areas identified as vulnerable to elevated groundwater. This information has been used to estimate the spacings and lengths of new groundwater drainage required.	The model will be updated and recalibrated with groundwater and surface water monitoring data[29] Following this re-calibration, a review of the groundwater flooding risk assessment will be undertaken and the required groundwater flood risk mitigation and drainage solution refined and finalised.

[28] These areas are underlain by thin layers (around 2 to 5m thick) of superficial Alluvium and River Terrace Deposits which lie on top of low permeability Gault or Kimmeridge/Ampthill Clay Formations that prevent deeper groundwater drainage.
[29] it is estimated that sufficient data will be needed to represent seasonal behaviour of the system (ideally, 12 months, although less may be acceptable if a range of seasonal and water level conditions can be collected in a shorter period)

Category	Overview of issues	Development work undertaken since gate two	Key findings at gate three	Further work planned
		• Installation of some limited groundwater monitoring in recent boreholes across the SESRO site to provide more up-to-date calibration data for the model. As noted, this monitoring programme has not yet been completed, hence the model re-calibration is still incomplete at this preliminary stage; • Given these constraints, the model retains uncertainty. To address model uncertainty and its predictions, a basic sensitivity analysis of critical hydraulic properties and boundary conditions has been carried out.	• An indicative eastern and western quadrant 'herringbone' drainage system has been designed, in which drainage pipes/channels are oriented perpendicular to groundwater flow. This will allow for the maximum capture of groundwater and allow the water to be routed into the east and west watercourse diversions or other surface water channels. This is currently planned to replace the original concept of a single groundwater drain aligned and close to the waterway diversions, as the initial modelling indicates that this revised solution provides a more effective drainage solution.	
Reservoir Safety	Construction, operation, maintenance, and modification of large, raised reservoirs in England must be carried out in compliance with the Reservoirs Act 1975[30] (referred to below as "the Act").	• Between gate two and gate three, we provided information to stakeholders and local communities on the key steps that we will take to ensure the reservoir is safe at all times. Further information has been provided in a published factsheet, available through the SESRO document library: https://thames-wrmp.co.uk/projects/sesro/. • We have appointed the Construction Engineer, who will oversee the design and construction of SESRO, as required by the Reservoirs Act.	The design of SESRO is being undertaken to the highest standards and in accordance with the requirements of the Reservoirs Act.	Continued adherence to prevailing guidance and legislation to ensure safety of the final assets
Emergency drawdown	Guidance from the Environment Agency (EA) / Department of Rural Affairs (Defra)[31] advises that reservoirs should incorporate facilities to enable a sufficiently rapid drawdown in an emergency. For a large reservoir such as the SESRO, a maximum installed drawdown capacity of 1m depth per day is recommended.	As part of the options appraisal process we have explored alternative options for the emergency drawdown of SESRO. We have engaged with the Environment Agency with regard to the assessment of flood risk from the operation of the emergency drawdown arrangements.	Our preferred configuration at gate three is to design out the separate surface water canal and instead proceed with a tunnel only solution, linking SESRO to the River Thames. We believe this provides the best value solution for the scheme, with lowest consenting risk. We will continue engagement on this matter and particularly the interface with the Wilts and Berks Canal safeguarding plans within the SESRO site.	As part of any future Flood Risk Assessment, it will be necessary to simulate the flooding risk of operating the emergency drawdown in combination with a range of hydrological conditions in the River Thames. The combination of conditions is still to be agreed, but likely to follow those proposed in the Environment Agency's consultation response to PINS on the EIA Scoping Report.
Embankment breach flooding	Under the requirements of the Reservoirs Act 1975, all raised reservoirs must have a Flood Plan developed prior to the initial commissioning of the asset.	As noted in our published Environmental Impact Assessment Scoping Report[32], we were not proposing to undertake analysis or present information on the potential flood extent that could result from a breach of the embankments at SESRO ahead of our forthcoming DCO application. We consider that the risk of embankment breach is highly unlikely, for a variety of reasons as stated in our EIA Scoping Report, and any residual risk is adequately controlled and managed through other prevailing legislation, codes and standards.	However, the Scoping Opinion received from PINS[38] directed us to undertake further work on this matter as part of our EIA, stating "*In view of the Environment Agency's advice…the Inspectorate does not agree that this matter can be scoped out of further assessment at this stage. Accordingly, the ES should include an assessment of these matters or information demonstrating agreement with the relevant consultation bodies and the absence of an LSE.*"	We will continue to work closely with all Regulators and key consultees on all such matters as we develop the Preliminary Environmental Information Report (PEIR) and undertake the EIA, during subsequent project stages.

[30] as modified by the Water Act 2003 and Schedule 4 (Reservoirs) of the Flood and Water Management Act 2010
[31] Guide to drawdown capacity for reservoir safety and emergency planning, DEFRA Doc ref: SC130001, 017
[32] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/WA010005/WA010005-000010-WA010005%20-%20Scoping%20Report.pdf, Table 19-2

3. Drinking water quality

Drinking Water Assessment and Safety Plan

3.1 A Drinking Water Quality Risk Assessment (DWQRA) has been completed and is summarised below. A full detailed report is provided as Supporting Document B.

3.2 The DWQRA outlines the water quality risks and considerations for the construction and operation of SESRO, including both augmented flows back into the River Thames and direct transfers into interconnecting SROs (T2ST).

3.3 The DWQRA has been carried out in accordance with the ACWG guidance developed in the ACWG Water Quality Risk Framework Report[33], in the format of a Drinking Water Safety Plan (DWSP). A limiting hazard is defined as any parameter that is likely to drive the development of the SRO proposed. Risk scores were attributed to each limiting hazard at all stages between abstraction at the River Thames and raw water storage at the reservoir for each transfer option. These risk scores were captured in dedicated, ACWG-approved spreadsheet water quality risk assessment (WQRA) tools and reviewed in a collaborative strategic WQRA workshop. A complete list of the limiting hazards identified is specified in Supporting Document B. The outcomes of the workshops undertaken at gate two have been incorporated into the gate three DWQRA process, and increased monitoring data available and emerging hazard guidance from the DWI and ACWG have continued to inform and develop the DWQRAs. Results from the gate three water quality risk assessments continue to inform the engineering concept design of this option at this stage. No further specific concerns have been raised by DWI during the pre-gate three technical engagement.

3.4 The key outcomes are summarised below:

- Pathogen risk remains high as identified at gate two. Further water quality data including the presence E.coli, coliforms and somatic coliphages point out faecal and sewage contamination in the River Thames.
- Monitoring and modelling of the River Thames and SESRO reservoir indicate large populations of algae in the River Thames. Algal populations decrease as nutrient concentrations decrease in the reservoir due to biological activity. The presence of algae subsequently increases when abstraction resumes from the River Thames.
- Emerging hazards - Perfluorinatedalkyl substances (PFAS) risk remains high, current catchment data indicates Tier 2 classification according to DWI guidance.
- Emerging hazards - chromium risk currently low according to data from the monitoring programme to date.
- Customer acceptability risks due to changing source are low for SESRO, however integration with downstream SROs (particularly T2ST) need to consider impact of SESRO on their distribution networks.

3.5 Control measures identified in the DWQRA process include reservoir management controls (mixing, aeration, intake depths, intake inlet screens etc.). Water quality

[33] B19589BJ-DOC-001 Rev 06 ACWG WQ Risk Framework Report – Final (Strategic WQ Risk Framework FINAL Report) | 19/01/21 | ACWG

monitoring of the River Thames and SESRO will also greatly mitigate risks by informing when abstraction is suitable and notify of any potential pollution events.

3.6 The following future recommendations have been highlighted:

- Review distances between the Abingdon Sewage Treatment Works outfall (potential relocation) and SESRO's intake location from the River Thames.
- Understand operational controls on potential recreation activities at the reservoir to ensure appropriate mitigations are put in place.
- Continue and where applicable enhance, the water quality monitoring program to gather a broader set of quantitative data, particularly for emerging contaminants, to better inform risk likelihood scores and identify any seasonal patterns.
- Continue to monitor parameters for which regulatory enforcements may change or come into effect e.g. PFAS, chromium, endocrine disrupting compounds, NDMA.
- Integrate WQRA spreadsheets with downstream stages of the "source to tap" pathway for linked SROs and possible future connections into SESRO.
- Continue/plan customer engagement regarding acceptability of the scheme from a drinking water quality perspective.
- A thorough assessment of the potential impacts of INNS mussels on operation and maintenance of the systems.

Customer engagement

3.7 As noted in our submission at gate two, the project has benefitted from the outcomes of collaborative engagement with customers across 11 water companies[34]. This included focus on customer perceptions and reactions to changes to drinking water sources. The key outcomes of this study provided insight into customer sensitivity to source changes, indicating that most are not able to detect differences at the level that might be expected in a source change and that most household customers want initial notification only three to six months in advance of the change.

3.8 With regard to the use of the water that is stored within SESRO, this brings some key qualifications about change in source for customers:

- For TW's customers in London, the source of their water will remain unchanged. SESRO will store River Thames water, for later release into the river and subsequent re-abstraction in the lower reaches combined with treatment at existing Water Treatment Works (WTW), as current operations.
- For TW's customers in SWOX, the source of their water will also remain unchanged. SESRO will store River Thames water, as does Farmoor reservoir, transfer it back to Farmoor, store it and then treat it through an existing WTW.
- For TW's customers in SWA, the source of their water may change slightly, if the balance of resources shifts from groundwater sources towards use of the River Thames water. This would be subject to a separate project associated with changes to abstraction and treatment arrangements at Medmenham and do not form part of the SESRO project. This issue would be addressed through the DWSP, as part of that project.

[34] https://www.thameswater.co.uk/media-library/home/about-us/regulation/regional-water-resources/south-east-strategic-reservoir/gate-2-reports/D--SESRO-Stakeholder-and-Customer-Engagement.pdf

- For AFW and SWS customers, the source of their water may change with the implementation of transfer (T2AT / T2ST) SROs, if the balance of resources shifts from groundwater sources towards use of the River Thames water. Both would be subject to separate project consenting processes and do not currently form part of the SESRO project. This issue would be addressed through the DWSP, as part of those projects.

3.9 Therefore, in light of the conclusions of the previous customer research, the short timescales preferred for the communication of source changes to customers and the lack of sources changes resulting directly from the SESRO scheme, no further customer engagement on this specific topic has been undertaken for gate three.

3.10 This is in line with our gate two submission, where we confirmed that *"as SESRO moves on to Gate 3 there will be a switch from gathering wider customer insight into community consultation and engagement. There is no foreseen need for any specific customer research / insight to inform Gate 3 plans."* Therefore, our approach to gate three has followed the plan we outlined at gate two, as approved by RAPID.

4. Environmental

Water Framework Directive assessment

4.1 Technical Supporting Document C1 presents a project-specific Water Framework Directive (WFD) assessment for SESRO. A summary of this detailed assessment is provided below.

4.2 The format of the WFD assessment has been adapted to align with advice note(s) from the Planning Inspectorate[35] which details the expected format for WFD assessments for all Nationally Significant Infrastructure Projects. This has moved away from the ACWG methodology that has previously been used for earlier versions of the WFD assessment.

4.3 Under the guidance, a WFD compliance assessment comprises three key components:

- Stage 1, Screening assessment – to determine what activities associated with the Proposed Development require further consideration and what activities can be screened out at this stage of the process;
- Stage 2, Scoping assessment – to identify risks of the Proposed Development activities to receptors based on relevant water bodies and their water quality elements.
- Stage 3, Impact assessment – a detailed impact assessment of the water bodies and their quality elements that are considered to likely be affected by the Proposed Development. Any potential issue for non-compliance would be highlighted at this stage along with consideration of mitigation measures and enhancements that would contribute to WFD and RBMP objectives.

[35] Planning Inspectorate (PINS), 2017, Nationally Significant Infrastructure Projects: Advice on the Water Framework Directive. This document was updated in 2024: https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-advice-on-the-water-framework-directive

Stage 1, Screening Assessment

4.4 SESRO lies within the Thames River Basin District, which is covered by the Thames River Basin Management Plan (RBMP). The main site is within the Gloucestershire and the Vale Management Catchment and the Ock Operational Catchment. However, water bodies downstream on the River Thames also need to be considered, from the nearby Evenlode to Thame WFD water body as far as the tidal limit (Teddington Weir).

4.5 The footprint of the proposed scheme interacts with watercourses within six WFD surface water bodies in the River Ock Operational Catchment.

4.6 Ten surface water bodies are screened into the scoping assessment as part of the Stage 1 screening. Five water bodies are on the River Thames and five water bodies are tributaries within the River Ock catchment. There are 13 project activities (including construction and operational activities) which have been identified as having the potential to impact on these water bodies. The construction activities are sub divided with only one activity being Scoped in for further assessment. All operational Project activities are considered to have the potential to cause deterioration and/or prevention of future objectives. As a result, these all required further assessment in the Impact Assessment.

4.7 Two groundwater bodies are located within 2km of the site: Shrivenham Corallian (GB40602G60060) and Vale of White Horse Chalk (GB40601G601000). However, it has been determined that no Project activities have the potential to impact on the groundwater bodies. Therefore, impacts to WFD groundwater bodies are screened out of further assessment. There are no Groundwater Dependant Terrestrial Ecosystems (GWDTEs) within the Project footprint and groundwater modelling has shown those in close proximity to the proposed Project will be unaffected by the construction. Thus, GWDTEs have been screened out of further assessment.

Stage 2, Scoping Assessment

4.8 The Stage 2 Scoping assessment has determined that the Project does not have the potential to prevent the attainment of any of the Mitigation Measures associated with the Heavily Modified Water Bodies (HMWB) in the Zone of Influence (ZoI) i.e. the River Thames WFD water bodies downstream of the proposed intake/outfall structure. It was also determined that the Project will not prevent the achievement of any of the Programme of Measures (PoM) associated with the water bodies in this assessment which are outlined within the RBMP. Therefore, the assessment of these two elements have been scoped out of further consideration.

Stage 3, Impact Assessment

4.9 The Stage 3 Impact Assessment assesses how each of the water bodies that were scoped in during the Stage 2 Scoping Assessment would be impacted by SESRO. In particular, the project activities are reviewed to determine the potential impacts on the water quality, hydromorphology and aquatic ecology.

4.10 On the River Ock and the associated tributaries, the footprint of the reservoir and the ancillary infrastructure are likely to have the greatest impacts on the WFD water bodies compared with other Project activities. Mitigation is embedded into the scheme design

at gate three, via the diversions and improvements of various watercourses around the perimeter of the reservoir, as well as additional channel realignments. In addition, the reservoir has the potential to change flows and water quality in the surrounding water bodies with knock on impacts to the hydromorphology supporting element and aquatic ecology Quality Elements.

4.11 Detailed hydrodynamic modelling has been undertaken for the River Ock. Despite small reductions in river flow as a result of storage within the reservoir, at the three locations investigated within the River Ock and tributaries catchments, impacts on water quality were small. A notable risk to the biological Quality Elements on the River Ock and its tributaries relates to construction activities including the installation of crossings, the creation of watercourse diversions and the temporary loss of ditch habitats. With embedded mitigation in place, construction impacts are likely to be temporary with some short-term loss in habitat and species, but it will over time provide a greater habitat quality as a result of the mitigation design. As such, it is expected that there will be beneficial changes in biological Quality Elements once watercourse diversions are complete and these have been recolonised, with the potential to improve the overall ecological integrity of the associated watercourses in the mid to longer-term. The risk of non-compliance in view of the Ecological Flow Indicator (EFI) was also considered with the assessment indicating that the flows at the River Ock Assessment Point (located at the confluence with the River Thames) will remain compliant.

4.12 On the River Thames, the potential impacts are related to both the abstraction and augmentation from this water body and how it may affect downstream water bodies. There would also be a localised impact on the physical habitat (river bank and a small portion of the river bed) of the River Thames due to the presence of the intake/outfall structure.

4.13 The change in flow in the River Thames from abstraction and augmentation has the potential to impact water quality and the subsequent changes on hydromorphology and aquatic ecology. Detailed hydrodynamic modelling has been undertaken for the River Thames and builds on the gate two modelling work. Overall, the water quality modelling results show that immediately downstream of the SESRO augmentation there will be an improvement in water quality due to the augmentation of water from SESRO. The only slight decline predicted are transient small changes in BOD, Ammoniacal Nitrogen and Chlorophyll-a with no clear change to longer term water quality statistics. Therefore, it is not predicted that the WFD physico-chemical Quality Elements will change.

4.14 When considering abstraction activities, the available modelling suggests that there could be a slight reduction in flows above the 40th percentile (Q_{40}) with no discernible change in flows between Q_{40} and Q_{70}. Higher flows would remain within the range that is considered “normal” for the River Thames. Lower flows would remain protected from abstraction activities as a result of a Hands off Flow (HoF) at Sutton Courteney (HoF of Q_{50}). Furthermore, operational controls will be in place so that abstraction is limited to 1000 Ml/d and will increase in increments of no more than 300 Ml/d until a maximum of 1000 Ml/d is reached. As a result, the ecological and hydromorphological functions performed by higher flows remain.

4.15 The available modelling data suggest that, when operational, discharges from SESRO would augment lower flows. This means that the release from SESRO is offsetting some of the impacts of climate change in low flow conditions by augmenting flows in the Thames during summer and early autumn. As a result, the Thames surface water body (Evenlode to Thame) would remain compliant with the EFI (based on current Q_{95} and a future predicted Q_{95}). Furthermore, augmentation of low flows in view of climate change impacts would result in important ecological functions being maintained.

4.16 The overall assessment concludes that the proposed Project will not result in deterioration of any Quality Element of the water bodies screened in and will not prevent the future attainment of objectives. These findings are dependent on the successful implementation of the embedded mitigation outlined as part of the design and construction activities. Additional mitigation may be required should other impacts be identified. The residual uncertainties associated with this assessment at gate three, and the outline of the plan to resolve them, is included within Supporting Document C1.

4.17 It is also important to note that the reservoir itself would likely be considered a WFD Lake water body in the future. Nutrient reduction initiatives are currently proposed within the River Thames catchments upstream of the SESRO intake, including AMP8/AMP9 improvements at Sewage Treatment Works operated by Thames Water. These future reductions have been factored into the River Thames water quality predictions for the River Thames for the year 2040 when the reservoir would be operational. Model predictions currently suggest that this could improve the quality of water taken into SESRO so the water in the reservoir itself becomes indicative of 'good' status for total phosphorus. This future prediction however has some uncertainty and will need to be reviewed over time, as and when nutrient reductions initiatives are delivered and confirmed through water quality sampling.

Habitats Regulation Assessment

4.18 A Habitats Regulations Assessment (HRA) Stage 1 Screening Report for SESRO has been completed. The detailed reporting of this is found in Supporting Document C2, setting out the potential for Likely Significant Effects (LSE) from the project, during construction and operation, on National Network Sites. Reference is made to any potential LSE in relation to the Project, alone, and in combination with other projects.

4.19 SESRO is located within 10km of, and / or has potential hydrological or hydrogeological links, to four National Network sites, these are:

- Cothill Fen Special Area of Conservation (SAC),
- Hackpen Hill SAC,
- Little Wittenham SAC and
- Oxford Meadows SAC.

4.20 At this stage the assessment has concluded that no LSEs would occur alone or in-combination with other projects as a result of the impact pathways listed below.

- habitat degradation via pollution of ground water and changes in hydrogeology
- habitat degradation via pollution of surface water and changes in hydrology
- habitat degradation as a result of the introduction of invasive non-native species

- habitat degradation via air pollution (impact of atmospheric nitrogen deposition)

4.21 It should be noted that LSEs may conceivably be possible at Oxford Meadows SAC from nitrogen deposition[36] associated with emissions from traffic associated with SESRO as the A34 (the primary access route to SESRO) bisects this site, approximately 10km from SESRO. Further modelling of traffic generation and distribution associated with the construction and operation of SESRO, and consideration of the sensitivity of the SAC habitats to nitrogen deposition, may need to be undertaken to determine if this is a realistic pathway to LSEs at Oxford Meadows SAC and, therefore, the SAC may need to be screened into HRA Stage 1. Furthermore, Stage 2 Appropriate Assessment may also be required, subject to further information gathering and assessments. As more information and data becomes available this will be discussed with Natural England and a suitable approach to HRA on this SAC will be agreed.

4.22 There are no SACs designated for bats within 30km of SESRO.

Environmental Impact Assessment

4.23 An Environmental Impact Assessment (EIA) Scoping Report was produced and issued to the Planning Inspectorate (PINs) on 28 August 2024[37], to seek an EIA Scoping Opinion under Regulation 10 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended). Given the project scale it was assumed that an EIA would be required, therefore a request for a Screening Opinion from PINS wasn't made.

4.24 The Scoping Report provides an overview of the baseline environment, sets out the potential for likely significant effects from the Project and details the Applicant's intended approach to the EIA in terms of the scope, methodology and content of the Environmental Statement (ES) that will accompany the DCO application. The process of scoping determines which technical aspects have the potential to be significantly affected by the Project (scoped in) and which are not (scoped out).

4.25 A Scoping Opinion was received from PINS on 8 October 2024[38], on behalf of the Secretary of State for Food, the Environment and Rural Affairs. To provide this Opinion, the Inspectorate consulted in accord with EIA Regulation 10(6).

4.26 In the Scoping Opinion PINS has set out where it has / has not agreed to scope out certain aspects / matters based on the information provided as part of the Scoping Report and responses from Consultees. PINS has confirmed that the receipt of the Scoping Opinion should not prevent the Applicant from subsequently agreeing with the relevant consultation bodies to scope such aspects / matters out of the ES, where further evidence can be provided to justify this approach.

4.27 A summary of the key areas where the Scoping Opinion differs from the submitted Scoping Report are listed in Table 4.1 below. We will continue to work closely with all Regulators and key consultees on all such matters as we develop the Preliminary

[36] *note that the citation does not state nitrogen deposition as a vulnerability of qualifying species of the SAC*
[37] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/WA010005/WA010005-000010-WA010005%20-%20Scoping%20Report.pdf
[38] https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/WA010005/WA010005-000017-SESRO%20Scoping%20Opinion%202017%20EIA%20Regs%20FINAL.pdf

Environmental Information Report (PEIR) and undertake the EIA, during subsequent project stages.

Table 4.1 Key areas of PINS direction from SESRO EIA Scoping Opinion

Chapter / Discipline	Key areas of direction or change
Embankment breach	The ES should include an assessment of these matters or information demonstrating agreement with the relevant consultation bodies and the absence of a likely significant effect.
Traffic and transport – worst case scenario	The traffic and transport assessment should include a 'worst case scenario' option based on no railway siding option being available unless the proportion of the construction material arriving by rail could be confirmed.
EIA scoping boundary	Points of connections for utilities may extend beyond the scoping boundary, where this is the case, identify the changes in the boundary and their extent and determine if and how this alters the scope of the ES assessments.
Loss of solar energy apparatus	The ES should include an assessment of the loss of solar farm apparatus and identify any associated likely significant effects, if applicable
Air Quality	The ES should consider the potential impacts from changes to air quality in relation to potential increases in pollutants from traffic emissions on ecological receptors.

National Parks, The Broads and AONB (National Landscapes) Environmental Impact Assessment

4.28 In accordance with RAPID's guidance for gate three, an assessment of the likely effects on Areas of Outstanding Natural Beauty (AONB) or "National Landscapes" has been undertaken. An outline strategy is provided highlighting likely effects and showing how these effects will be addressed, having regard to the statutory purposes for the designations.

4.29 The North Wessex Downs National Landscape is located over 2km south of SESRO. As such, is may be indirectly impacted by the Project. The process to identify potential effects on the North Wessex Downs National Landscape and definition of potential mitigations would be implemented as part of a forthcoming DCO application (ahead of RAPID gate four). The detail of this assessment, strategy and associated timeline for implementation are provided in Supporting Document C4.

4.30 Relevant stakeholders have been consulted on the approach to the strategy, including suggestions for how SESRO could seek to further the purpose of the National Landscape designation in line with the duty on relevant authorities introduced by the Levelling-up and Regeneration Act (LURA) 2023. There are no firm precedents at the time of writing that demonstrate how a development has discharged the duty to seek to further the purpose of a designated landscape. However recent Defra guidance[39] on this matter will guide future work on this topic and the DCO submission. Stakeholder engagement on this matter will continue as the Project progresses.

[39] https://www.gov.uk/government/publications/the-protected-landscapes-duty

Other environmental considerations

4.31 The project has updated its assessment of Biodiversity Net Gain (BNG). BNG is an approach to development, and/or land management, that aims to leave the natural environment in a measurably better state than it was beforehand. The approach taken aims to support the net gain actions in the government's 25 year Environment Plan.

4.32 Developers must aim to deliver a minimum of 10% BNG with biodiversity value being measured in standardised biodiversity units. The Environment Act 2021 is expected to make it mandatory for nationally significant infrastructure projects (NSIPs) to achieve at least 10% biodiversity net gain, with secondary legislation expected to come into force in November 2025. At the time of writing there is currently no detail available regarding how BNG will apply to NSIPs through legislative requirements, guidance and any bespoke BNG metric(s). Therefore, in order to conduct the assessment for gate three, the established guidance and Statutory BNG Metric which currently applies to Town and Country Planning applications has been used.

4.33 Since gate two the BNG analysis has been updated to ensure it represents a robust estimate of BNG, reflective of the gate three Interim Master Plan:

- The biodiversity metric has been updated from version 4.0 (Natural England, 2023[40]) to the Statutory Metric (Defra, 2024a[41]).
- Habitat assessments were carried out for the Project where access allowed, although it should be noted that access to only circa 41% of the land within the Interim Master Plan boundary was available prior to drafting this report. Consequently, assumptions have been made regarding the classification and condition of habitats on site which have not been surveyed.

4.34 More detail on the BNG analysis is provided in Supporting Document C5. This highlights several key issues that need to be considered and resolved in the final DCO scheme design. Whilst the habitat classification and condition assessment field data collected for gate three provides a higher level of confidence in the calculations (than was achieved for previous iterations of the BNG assessment), until the entire site has been surveyed in the field, there will still be gaps in knowledge and assumptions will need to be made about the habitats present and their condition. Once a full baseline has been developed, the post-intervention scenario should be re-assessed to ensure:

- The Master Plan design is still able to achieve a minimum of 10% BNG for habitats, hedgerows and watercourses;
- Emerging requirements and guidance for NSIPs are considered, including those around trading rules to determine whether this applies to the Project. If so, review opportunities to provide more woodland, tree and ditch habitat.
- Further habitats and hedgerows to be retained and enhanced are considered;
- Impacts to irreplaceable habitats should be avoided, as a priority, or minimised where possible. Where avoidance is not possible, relevant stakeholders including Natural England and the Local Planning Authority should be consulted to agree

[40] Natural England, 2023. The Biodiversity Metric 4.0 User Guide JP039. [Online] Available at: https://publications.naturalengland.org.uk/publication/5850908674228224.
[41] Defra, 2024a. Statutory Biodiversity Metric Calculation Tool, S.I.: Defra

on a bespoke mitigation strategy for the loss of these irreplaceable habitats (e.g. ancient / veteran trees).

- The Master Plan is informed by, and aligns with, emerging Local Nature Recovery Strategies for Oxfordshire and the strategic significance for both the baseline and post-intervention scenario habitats are updated.
- Emerging requirements and guidance for NSIPs concerning additionality are considered.

4.35 The Project team will continue to engage with relevant stakeholders as further iterations of the Master Plan are developed and updates to the calculations are undertaken.

5. Carbon

5.1 A detailed appraisal of carbon emissions is provided in Supporting Document A2. This provides:

- an overview of the capital and operational carbon emissions,
- consideration of other direct emissions and removal opportunities,
- an assessment of the whole-life carbon emissions,
- a discussion of carbon mitigation analysis, highlighting current knowledge gaps,
- an overview of relevant ongoing work that is taking place, and
- consideration of further work, including the proposed carbon mitigation strategy.

5.2 The whole carbon assessment and mitigation approach for SESRO has followed industry guidance mainly PAS2080:2023 and the IEMA emissions reduction hierarchy to identify opportunities to mitigate carbon impacts of the scheme.

5.3 The emissions sources covered in the gate three whole life carbon assessment are outlined in Figure 5.1 below.

Figure 5.1 SESRO, whole life emissions sources quantified at gate three

	Capital emissions	Operational emissions	End of life emissions	Direct emissions/ removals
Inclusions	• New assets and activities in Gate 3 design • Diversions of existing assets • Removal of existing solar PV plants	• Operation of assets • Capital maintenance / replacement • Flow demands for T2ST, Farmoor • Hydroturbine power generation	• Decommissioning, removal and disposal of existing PV plants in the site vicinity	• Sequestration from landscaping works
Exclusions	• T2ST WTW assets	• Visitor transport emissions • Heating of water for end use • Renewable energy generation outside new hydro-turbines	• Removal, recycle, reuse, recovery or returning of new assets following the end of operating life of the scheme.	• Direct emissions sources from land use change

5.4 The outcomes of the whole life carbon analysis for gate three, aligned with design changes is summarised in Table 5.1

Table 5.1 SESRO, capital, operating and whole life carbon analysis for gate three

Category	Carbon Emissions (tCO2e)	Commentary
Capital carbon	495,700	24% increase of gate two, largely due to design changes, particularly with embankment earthworks and the sizing of major civil assets
Capital replacement carbon	219,600	Replacement of capital during 80 year appraisal
Operational carbon – power	2,660	Slightly higher than gate two due to more detailed appraisal of refill pumping power and lower energy recovery from river release hydroturbines, as direct use of water for SWS and TW has increased.
Operational carbon - non power	5,190	
Total whole life carbon (80 years)	**723,150**	Increase on gate two estimate

5.5 Work will continue in subsequent stages to refine the carbon baseline and target reductions within the design and through the supply chain.

6. Programme and planning

Project plan

6.1 The key milestones to enable the project to be commissioned by 2040, as required in the final WRMP and WRSE regional plans, are shown in Table 6.1 below.

6.2 The estimated earliest completion date, when water could be made available is during 2039/40. Work is ongoing to continue development of a quantified schedule risk assessment to better understand the probability and impact of delay to critical items on the schedule.

6.3 The project is currently running to schedule and is not significantly changed from that proposed at gate two. The gate three submission date has been deferred by a short period to account for a detailed assurance process, including full co-sponsor engagement and to align with timings of Board meetings across the Sponsor companies and with the first Annual Review of WRMP24 in summer 2025. This does not impact the future delivery programme.

6.4 Further details of the proposed schedule to deliver SESRO may be found in Supporting Document D: Project Management Plan, including information on projects risks, assumptions and dependencies and any existing data gaps. The detailed project schedule will be updated as the design progresses. The granularity of activity definition and dependency will continue to evolve to the DCO submission.

6.5 There are risks associated with the construction schedule presented at gate three resulting in a high likelihood of later completion date if unmitigated; whilst a costed risk assessment for potential schedule risk impacts is included in the QCRA, the schedule presented at gate three is exclusive of schedule time risk allowance. Measures will continue to be developed to seek mitigations to schedule risk which may require

advanced works to be undertaken and/or changes to the solution configuration to increase schedule confidence.

Table 6.1 SESRO, key milestones

Phase	Description	Date (indicative)
Gate 1	RAPID Gate 1 Submission (completed)	July 2021
Gate 2	RAPID Gate 2 Submission (completed)	November 2022
Gate 3	RAPID Gate 3 Submission	Summer 2025
Gate 4	PEIR Complete	Q4 2025
	SoCC Published	Q4 2025
	Statutory Consultation	Q4 2025
	SIPR specification completed	Q1 2026
	DCO Design Freeze (Control Point 2)	Q2 2026
	Book of Reference and Land Plans Complete	Q3 2026
	DCO Submission	Q4 2026
	RAPID Gate 4 Submission	Q1 2027
DCO Award	Secretary of State's award of DCO	Q1 2028
License Award	OFWAT approved.	Q2 2029
Delivery	Start on site	Q2 2029
	Scheme commissioned and operational	2039/40

Key risks and mitigation measures

6.6 Since gate two, with an increased understanding of the design and detail of the programme, risk management has become more mature. Risk is managed using a project level RAIDO (Risks, Assumptions, Issues, Dependencies and Opportunities) Log, which is focused on the quantification and mitigation of strategic risk across the project lifecycle covering development, delivery of early, main works and commissioning and asset operation.

6.7 The RAIDO Log enables the development of coherent and holistic mitigation strategies to address the primary consenting risks, which remain a priority at this stage in the project. This register forms the basis of the quarterly reporting to RAPID and the monthly risk review undertaken by the Project Board.

6.8 As part of the cost estimation process, the risk register has been analysed and quantified to include the financial implications of the critical cost and schedule risks. This analysis forms the basis of the monte-carlo simulation used to derive the cost risk element of the updated cost estimate discussed in Section 8. Further detail of this process may be found in Supporting Document A3: Cost and Risk Report.

6.9 To facilitate the updates to the QCRA, a more comprehensive approach to risk identification, assessment and management has been adopted at gate three with key areas of development including:

- **Risk Identification:** the quantity of risks identified in the QCRA has increased from gate two (c. 100) to be more than 270 at gate three.
- **Risk workshops** have been expanded to include input from more technical disciplines (up to 12) and an evaluation of risks to account for the uncertainty of key technical/ schedule/ pricing assumptions undertaken.
- **Risk Impact Assessment:** a higher proportion of risk impacts have been costed in detail with estimating input, including detailed impact estimates for critical delay items.

6.10 Supporting Document D: Project Management Plan provides a summary of the strategic RAIDO log, discussing the highest priority risks and what activity is being undertaken to mitigate the major cost and programme risks during subsequent phases of the project.

Proposed gate four activities and outcomes

6.11 The target submission date for gate four is February 2027. Details of the activities and costs proposed for gate four are provided in Supporting Document D with a summary aligned with RAPID WBS categories shown in Table 6.2 below.

Table 6.2 SESRO, proposed gate four activities

Category	Gate 4 activities
Programme & Project Management	Governance and oversight; project controls and management; assurance of critical deliverables; continued development of construction phase schedule;
Feasibility Assessment and Concept Design	Development of design to sufficient level for DCO submission, including Masterplan and design and access statement; scoping and initial development of digital twin; continued development of cost and risk estimates; continued development of Construction Methodology Report and 4D animations for DCO
Option benefits development and appraisal	Confirmation of benefits appraisal for DCO submission; continued development of legacy strategy for recreation, amenity and socio-economic benefit
Environmental Assessment	Development of PEIR; Development of Environmental Statement suitable to support DCO, based on the EIA Scoping Opinion; development of carbon and renewable energy proposals.
Data Collection, Sampling, and Trials	All environmental and ground surveys required to support DCO submission and subsequent design development for ITT; completion and interpretation of clay compaction trial
Procurement Strategy	Development of Ofwat Stage 3 submission; continued market engagement; early procurement of ECI and early works contractor(s); development and resourcing of a 'Shadow IP' team ahead of the IP procurement.
Planning Strategy	DCO submission in accordance with proposed consenting and planning strategy; implementation of proposed land acquisition and compensation strategy; development of all required Land Plans and Book of Reference
Stakeholder Engagement	Development of SOCC; development of consultation database and all associated studies and analysis; Statutory consultation and all associated activities; Technical engagement with regulators, statutory consultees and others; Development of all required engagement tools
Legal	Ongoing legal support and advice / review

6.12 The proposed costs for gate four activities are circa £292 million split over a two year period, with land acquisition accounting for approximately 32% of the spend.

Planning and land

Planning Strategy

6.13 The proposed storage volume of SESRO, consistent with the WRMP24, would exceed the threshold in the Planning Act 2008 (PA2008) which would require authorisation as a Nationally Significant Infrastructure Project (NSIP). The SESRO project team has therefore proceeded to register the SESRO project as a prospective NSIP and forthcoming DCO application with PINS and has commenced pre-application discussions. A PINS project page has been established and a request for an EIA Scoping Opinion was made on 28 August 2024 and a Scoping Opinion received on 8th October 2024.

6.14 Further to this a Section 35 application was made to Defra in Spring 2025 to confirm the project as an NSIP.

6.15 In developing the details of the preferred planning route and strategy further we have focused on several key areas since gate two. Further information on other detailed aspects of the planning strategy for SESRO may be found in Supporting Document E1. This includes details of the application schedule, information on pre-application activities, overview of governance and management arrangements, key planning risks and issues, consultation and engagement requirements and plans and a summary of other consents that are expected to be required.

- Working to **establish a core set of proposed Design Principles and refining the project vision** for SESRO. The vision and design principles are intended to fulfil the water resource requirements established by WRMP24, duties under the Water Industry Act 1991, the 'good design' and other policy expectations of the Water Resources NPS and the project sponsors' vision for community and environmental benefit that can be provided by SESRO.
- **Refinement and better definition of the associated development** that is necessary to deliver SESRO. This work has been informed by design development, option appraisals and early non-statutory consultation and engagement.
- Working to further define the **project boundary of SESRO with respect to how it interacts with other SRO and non-SRO projects**. This has enabled further consideration of what NSIP should be authorised through the SESRO DCO application and what other project elements should be included as associated development. It has also allowed consideration of where provision (such as space set aside or other design affordances) should be made for other projects and for construction sequencing. Overall, this has helped to refine where the SESRO DCO Order Limits are expected to be drawn in relation to other project boundaries.
- Further considering **other consents and licences required for SESRO** and the optimum route to acquire these, facilitated by a collaborative working approach to consents negotiation with prescribed bodies.
- Further building up the appropriate **processes, governance arrangements, capability and resources** to execute the planning and land strategy as the project has moved into the DCO application preparation stage.

- Further **developing and implementing the stakeholder engagement strategy**, including both engagement and non-statutory pre-application consultation required under the PA2008 and other applicable regulations.

NSIP works and project interactions

6.16 As noted earlier, the need for SESRO at 150 Mm^3 scale as identified in WRMP24 arises from its role in supplying water to the South East region, integrated with two regional transfer schemes (T2AT and T2ST), with resources shared across various companies and supply areas in accordance with the reported future pathway in WRMP24. The STT also remains part of the adaptive plan set out in WRMP24 as a potential future project.

6.17 Defining the interfaces between SESRO and these SRO and non-SRO projects is a key aspect of the planning strategy. The project sponsors are in active discussion to evaluate the project interfaces, sequencing, procurement and physical location of works and inform decisions on the planning strategy. A summary of the planning strategy associated with these interfaces is shown in Table 6.3 below.

Table 6.3 Planning strategy for key interfaces with other projects

Interface	Planning strategy
T2ST	It is anticipated that the T2ST SRO will comprise a water transfer pipeline, water treatment works (WTW) and other associated development. It is anticipated that either the pipeline will constitute an NSIP (post proposed reforms to the Planning Act 2008) or that the T2ST project will be directed under Section 35 of the Act to constitute a project of national significance, in either case therefore required to be consented by way of a DCO. Current T2ST proposals identify that the WTW and initial section(s) of T2ST pipeline(s) connected to a T2ST pumping station would be located within the SESRO site. TW and SWS are continuing to explore the consenting responsibilities for this infrastructure, within the SESRO DCO application and the proposed T2ST DCO application. The SESRO DCO application may therefore either incorporate or allow for consent boundary overlap for a water transfer project that requires development consent (i.e. some of this T2ST infrastructure within the SESRO site) in addition to the core SESRO reservoir NSIP and associated development, depending on the location and construction sequencing of these works.
T2AT	No additional physical works are required for the use of the River Thames to transfer water to Affinity Water for T2AT and so this will not form part of the SESRO DCO.
SWOX raw water transfer	The SWOX raw water transfer (or potential future treated water transfer) are non-SRO projects and are anticipated to be consented separately via TCPA1990 application(s) in due course. At this stage, no works are intended to be included in the SESRO DCO, but passive design allowance is being considered through measures such as pumping station design and space for a future water treatment works and pipeline construction when designing the SESRO landscaping and habitat proposals. In due course the drafting of the DCO will be considered to facilitate such physically overlapping future TCPA planning permission(s).
STT	No works for STT are intended to be included in the SESRO DCO, but passive design allowance is included to facilitate future connection, if required, through design of intake and outfall tunnel and pumping station and via landscape safeguarding for pipeline routes.

6.18 The above points have been taken into consideration for the initial project boundary, study areas and nature of potential environmental impact pathways discussed in the EIA Scoping Report. Further, more detailed discussion of this strategy and associated issues may be found in Supporting Document E: Planning and Land Strategy.

Land Acquisition Strategy

6.19 A land strategy has been developed to provide a framework through which the land and property requirements of the full project lifecycle are identified and delivered. This strategy ensures key considerations are built into scheme design and delivery. This will continue to evolve in accord with the scheme's development need.

6.20 The processes and activities for land acquisition and land access and undertakings are set out in Supporting Document E: Planning and Land Strategy. The land acquisition categories shown in Table 6.4 below will need to feature in the DCO submission or negotiations with landowners.

Table 6.4 Land acquisition categories required for SESRO

Land category	Description
Permanent land	The acquisition of the freehold and other relevant interests in land as well as riparian interests.
Permanent Land (subsoil only)	Where the transfer structure between the reservoir and the River Thames is a transfer tunnel i.e. a subsurface structure, then – where possible and where to do so in isolation from the surface land would not prejudice the delivery of the project – only the freehold of the tunnel plus a 'Protection Zone' will be acquired (excluding land at surface level).
Permanent Rights	The acquisition of permanent rights in land only for both Thames Water and/or third parties where necessary.
Restrictions in land	The acquisition of rights/restrictions in land to ensure the protection of the infrastructure e.g. a Protection Zone.
Temporary land	Land required to be temporarily occupied only, primarily to facilitate the construction of the project.
Temporary rights in land	Rights in land required temporarily, primarily to facilitate the construction of the project.

6.21 It is a requirement of the DCO process that promoters of projects should seek to acquire land by negotiation in the first instance instead of relying on the exercise of compulsory acquisition as its primary approach. In this instance, TW will follow standard DCO practice and seek to negotiate:

- Options to Purchase;
- Early acquisition of land or rights/restrictions by agreement;
- Occupation of land temporarily by agreement; and
- Temporary access over land by agreement.

6.22 TW will seek to engage with landowners to avoid the need to rely on powers of compulsory acquisition, however, the project's DCO application will nonetheless seek to include powers of compulsory acquisition to ensure that:

- it can still deliver the required land and rights for delivery of the project and its requirements if negotiations with landowners fails;
- land can be delivered in a timely manner to meet the project requirements and timeframes;
- the project is harmless from certain interests in land which might impede or restrict the safe, efficient and economic operation of the infrastructure;

6.23 Where TW does include powers of compulsory acquisition within its DCO application, it will need to make a case for these powers in line with the tests set out in Department of Communities and Local Government (DCLG) guidance and the 2008 Act. This case will be set out in the Statement of Reasons which is to be prepared for the DCO.

6.24 TW is committed to ensuring that it and its supply chain partners work collaboratively with those parties affected by the proposals and that they are treated fairly, their issues heard and responded to appropriately. Each engagement will be respectful and managed sensitively.

6.25 Land acquisition negotiations will continue throughout DCO application preparation with landowners and land interests affected identified in the Book of Reference, and any negotiations or attempts at negotiations will be documented in the Schedule of Negotiations and Powers Sought to be submitted with the relevant application.

6.26 A review of the high-risk, complex or strategic land uses and owners has been completed, and those landowners have been identified for early negotiation which commenced in August 2024. The other land related pre-application activities completed since gate two are summarised in the Table 6.5 below, all of which have contributed to the development of the land acquisition strategy at gate three.

Table 6.5 Summary of land acquisition and compensation activity since gate two

Category	Activity
Land referencing	• Updated HMLR titles obtained for land within the project limits (in accordance with Interim Master Plan) • First Draft of the Parcel Plans produced • Various management plans produced and agreed • First 'Landowner Letter' and list of recipients agreed (October 2024) and were issued late November 2024
Land acquisition	• Early acquisition negotiations with affected landowners commenced in August 2024 focussing on major landowners already engaged in negotiations for survey and investigation access • Engagement with landowners met at the recent non-statutory consultation events • Engagement with local power network DNO
Land access	• Extensive and ongoing engagement with all third party landowners and tenants, where access is required for environmental surveys or ground investigations • Formal agreement of access licences (and associated consideration payments) through mutual agreement or, where necessary, permission from Secretary of State for Defra for the serving of Notices to access land to carry out such works. • Continuation of survey access negotiations, with takeover of all activity by the newly appointed Technical Partner by end 2024.

6.27 The property Cost Estimate (PCE) has been updated for gate three to include various changes associated with the current scheme limits. The new PCE is incorporated into the overall scheme estimate.

6.28 The PCE will continue to be developed up to DCO submission, and will be inclusive any new land requirements.

7. Procurement and operation model

7.1 At gate three, the preferred procurement route for SESRO is via The Water Industry (Specified Infrastructure Projects) (English Undertakers) Regulations 2013, in accordance with the Stage 2 application submitted to Ofwat.

7.2 On behalf of the project sponsors, TW submitted a Stage 2 application to Ofwat on 15 October 2024, regarding the procurement, commercial and operational model for SESRO. It establishes the commercial, procurement and operational strategy which will guide the detailed development of SESRO towards procurement and delivery over the coming years and includes draft Heads of Terms between the parties.

7.3 To enable the sharing of resources between the multiple parties who would benefit from SESRO, initial prioritisation rules were also discussed in the Ofwat Stage 2 submission and will be developed further for gate four.

7.4 As agreed at checkpoint meetings with RAPID in November 2024, the contents of this Stage 2 document are not repeated here, being subject to a separate regulatory submission and acceptance process by Ofwat. We can confirm that there are no significant changes between the Ofwat Stage 2 submission and the RAPID gate three submission in respect of the preferred procurement route.

8. Solution costs and benefits

8.1 The updated design position at gate three has been analysed and a thorough update of the capital and operating costs of SESRO has been developed to reflect this utilising relevant All Company Working Group (ACWG) guidelines and HM Treasury Green Book guidance. This includes revisions to base capital cost, indirect costs, costed risk, optimism bias and operational cost, via review and refinement of the estimated bill of quantities and associated unit rates.

8.2 The final gate three cost position, following third party assurance, is £6.6bn. Further information can be found in Supporting Document A3: Cost and Risk Report. The templates requested by RAPID (Table 5a/5b, as per WRMP24, and the ACWG summary cost template) have been completed and accompany this submission.

8.3 In accordance with Government guidance, projects at an early stage of maturity should be stated as a range, the gate three range is advised as £5.5bn to £7.5bn.

Revised capex and opex costs

8.4 The revised cost estimates (and comparisons to gate two) are summarised in Table 8.1. The changes reflect the design development to gate three as discussed in section 2 of

this report. It should be noted that the gate two values have been adjusted to a 2022/23 cost base to allow for comparison with gate three.

8.5 The maximum utilisation operating cost and AIC is based upon a theoretical 'worst case' annual use, rather than a direct translation of the water resource model scenarios.

Table 8.1 Cost estimates (2022/23 cost base) and comparison to gate two Equivalent

Option Name	Units	Gate 3: 150 Mm³	Change gate 2 to gate 3
Option Benefit	MLD	271	
Base Capex	£m	4,294	
Costed Risk	£m	1,212	
Optimism Bias	£m	1,098	
Total Gate 3 Capex	£m	6,604	141% increase
Gate 3 Fixed Opex	£m/annum	4.18	
Gate 3 Variable Opex	£/ML	22.9	
Capex NPV	£m	5,193	197% increase
Maximum Utilisation (100%)			
Opex NPV	£m	103.4	18% increase
Total NPV	£m	5,297	187% increase
Gate 3 AIC	p/m³	268	131% increase

Key changes to cost estimate since gate two

8.6 The capex cost estimates at gate three are based upon a more granular concept design and a 'bottom-up' cost estimate of many of the main elements, compared to the approach used at gate two. This has resulted in cost increases - the most significant factors are summarised in Table 8.2. below. The five items listed are the highest cost items (accounting for approximately 84% of capex before costed risk and OB).

Table 8.2 Key drivers on capex increase between gate two and gate three

Description	% of increase tol capex (per element)
Reservoir Construction: The construction methodology and production rates have been reviewed in further detail leading to an increase in the cost estimate. There has been some increase in the earthworks volume due to the inclusion of a 'dig and replace' trench within the dam foundation (see supporting document A1).	114%
Enabling Works: Review of the length of haul roads required and update to their design. Review of the estimated rate for utility diversions, and separate cost for abandoning / removing existing utilities.	187%

Description	% of increase tol capex (per element)
Landscaping: The floating islands significantly increased in area. The following items have also been added to this part of the estimate: maintenance of habitats during construction, topsoil treatment, and noise bunds.	624%
Intake Pumping Station: The pumping station civil structure increased significantly in size and the design / construction methodology was significantly changed alongside a review of concrete and reinforcement requirements. A more detailed MEICA scope has been developed.	143%
Shafts / Tunnels: The diameter of the tunnels and shafts increased to facilitate changes to the proposed operation of the conveyance system**.**	80%

8.7 For gate three we have adjusted the approach to quantifying risk and the most significant risks were costed from a bottom-up approach, enabling a more granular QCRA to be undertaken. The costed risk at gate two was £386m (2022/23 price base); due to the changes in scope and the design solution along with the more granular bottom-up costed approach the costed risk at gate three is £1,212M. The most significant factors in this increase are outlined in Table 8.3 below.

Table 8.3 Key drivers on costed risk increase between gate two and gate three

Contributory Factor	Description
Capex and number of risks increased	Risk impacts are proportional to the base cost, as this has increased, the risk value has increased too. At gate two, the risk value was 23% of the total capex, this has increased to 29.1% at gate three. The number of risks identified in the QCRA has increased from 75 at gate two to 270 at gate three. These two factors have contributed to a risk value increase.
Estimating Uncertainty (EU) added to the risk value	EU has been included in the QCRA as part of the gate three development. The 13 EU items in the QCRA have an expected value of £174m, approximately 14% of the total risk value.
Time related costs added to the risk value	Time related risks have been identified during gate three and incorporated into the QCRA. The five time-related risks included in the QCRA have an expected value of £278m, approximately 23% of the total risk value.

8.8 Optimism Bias (OB) confidence ratings and methodologies were reviewed as part of gate three. Whilst several factors have been adjusted overall this produces a similar OB percentage at gate three of 26.80%, compared to 27.91% at gate two.

8.9 The annual fixed opex estimate for gate three is similar to that at gate two. Although the overall capex estimate has increased significantly the components that contribute to fixed operating costs have seen less movement.

8.10 There has been a significant increase in the variable opex predominantly driven by changes in expected water utilisation (increased pumping to the reservoir and other users, combined with a resulting reduction in flows available for generating power

using the hydropower turbines). However, the overall impact on the total opex NPV (including fixed and variable) is an increase from gate two to gate three.

8.11 We are collaborating with WRSE and other water companies to evaluate the impact of these cost estimate changes for SESRO and other schemes on the selection of options in the regional plan and consequently WRMPs. Our initial analysis indicates that SESRO continues to be one of the preferred options in WRMP24. However further work is required to validate this and we aim to complete this work and publish our findings in Autumn 2025.

Best value and solution benefits

8.12 The metrics that were used by the WRSE Best Value Planning process to differentiate between options in the regional water resources plan are shown in Table 8.4 below. These metrics were provided to WRSE in February 2023, aligned with the gate two design position and to inform the development of the revised draft regional plan and WRMP24. They have not been further updated since this issue. Methodologies for the production of these metrics have been consulted upon and published by WRSE as part of the development of the regional water resources plan.

8.13 These metrics have not been further scored or weighted beyond the modelling analysis undertaken by WRSE to derive the best value regional plan. The selection of SESRO 150 Mm^3 option in the preferred, reported pathway for the Final WRMP24 is documented in Section 2.

Table 8.4 WRSE best value metrics for SESRO options

Metric	150 Mm^3
SEA Benefit	50
SEA Disbenefit	-52
Natural Capital	1533830
Biodiversity Net Gain	1603.14
Customer Preference	1.26
Resilience: Reliability R1 – Uncertainty of option supply/demand benefit	3
Resilience: Reliability R3 – Risk of failure of planned service due to other physical hazards	4
Resilience: Reliability R5 – Catchment/raw water quality risks (incl. climate change)	2.71
Resilience: Reliability R7 – Risk of failure of planned service due to exceptional shocks	4
Resilience: Adaptability A3 – Operational complexity and flexibility	4
Resilience: Evolvability E1 – Scalability and modularity of proposed changes	1
Resilience: Evolvability E2 – Intervention lead times	1
Resilience: Evolvability E3 – Reliance on external bodies to deliver changes	1

source: Thames Water, Final WRMP24, Appendix X

8.14 Further appraisal of the socio-economic benefits of the preferred SESRO scheme have been undertaken for gate three, as additional to the standard best value metrics shown

above. These benefit values are not used in the formal water resource planning process, being at a more detailed level than required for that strategic planning process. This appraisal consists of three main elements:

- An update to the Natural Capital Assessment (NCA) for the gate three design
- An update to the wider socio-economic benefits for the gate three design
- A preliminary appraisal of the specific socio-economic benefits associated with the reconnection of the Wilts and Berks Canal through the SESRO site, and connection to the wider waterways network.

Natural Capital Assessment

8.15 The Natural Capital Assessment (NCA) involves the qualitative and quantitative assessment and monetisation of various ecosystem services to show the benefits (positive) or disbenefits (negative) of SESRO.

8.16 The aim of this assessment is to deliver a NCA, to meet the relevant requirements for gate three under the ACWG guidance, whilst continuing to align with the principles set out by the WRPG SG[42], ENCA[43] and the HM Treasury Green Book. Table 8.5 below provides a summary of the outcomes of the qualitative assessment.

Table 8.5 Qualitative assessment of natural capital outcomes at gate three

Ecosystem service	Score	Key
Climate regulation	↑↑	Potential substantial positive ecosystem service impact
Natural hazard regulation	↑	Potential moderate positive ecosystem service impact
Water purification	↑	Potential moderate positive ecosystem service impact
Water regulation	↑↑	Potential substantial positive ecosystem service impact
Air pollutant removal	↓	Potential moderate adverse ecosystem service impact
Food production	↓↓	Potential substantial adverse ecosystem service impact
Recreation	↑↑	Potential substantial positive ecosystem service impact

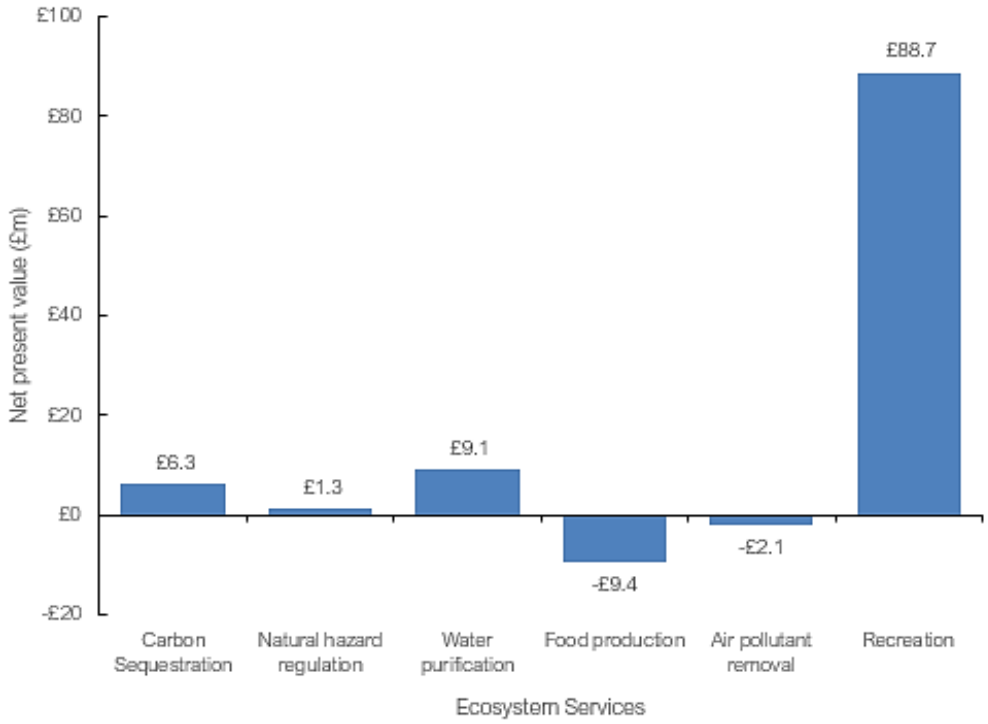
8.17 Each of the ecosystem services scoped into the gate three NCA has been quantified and, subsequently, monetised[44] to assess the change in value associated with the implementation of SESRO. All ecosystem service benefits have been calculated as a 'present value' over a 100-year appraisal period. This is in alignment with HM Treasury Green Book guidance on the period over which benefits should be calculated. Standard HM Treasury Green Book principles for valuation have been followed throughout the assessment process. A summary of the results of the quantitative assessment (for the central estimate of benefits) may be seen in Figure 8.1.

[42] Environment Agency (2022) Water resources planning guideline supplementary guidance – Environment and society in decision-making.

[43] ENCA represents supplementary guidance to the HM Treasury Green Book and sets out the principles, methodologies, tools and databases that can be deployed for undertaking natural capital assessments of policies, programmes and projects. Defra, 2024. Enabling a Natural Capital Approach: Guidance. Available at: https://www.gov.uk/guidance/enabling-a-natural-capital-approach-enca

[44] Valuation methods for each ecosystem service have been selected to align with relevant guidance. Broadly, the methods align with those set out in the WRPG SG; however, where appropriate and it has been deemed to improve the accuracy of the assessment, methods have been supplemented by recognised datasets such as those from ENCA, aligning with the ACWG guidance

Figure 8.1 NPV (£m) – 2024 Prices for each ecosystem service (central estimate)



8.18 SESRO is expected to result in an overall increase in most ecosystem service benefits, including climate regulation (carbon sequestration), natural hazard regulation, water purification and recreation ecosystem service provision.

8.19 Disbenefits are anticipated for food production and air pollutant removal services across all sensitivity scenarios.

8.20 The ecosystem service benefits associated with SESRO outweigh the disbenefits across all sensitivity scenarios. The total NPV over 100 years ranges from £60.42m – £119.31m.

8.21 The results broadly align with those from the gate two assessment, but there is an increase in benefit values for all categories resulting from updates to the Interim Master Plan design and associated input BNG data, the inclusion of hedgerow assets within the assessment and the updates to individual ecosystem service methodologies.

Wider socio-economic benefits appraisal

8.22 The wider benefits appraisal has been updated at gate three to reflect two key aspects: firstly, the updates to the Interim Master Plan since gate two and, secondly, the outcome of the legacy workshops and key user group engagement undertaken (see Section 9 below). A summary of the key benefits and changes since gate two is shown in Table 8.6. The quantification of these benefits could be further developed and refined as the scheme design, construction planning and operational arrangements are clarified for future DCO submission.

Table 8.6 Overview of socio-economic benefits and changes since gate two appraisal

Workstream	Key Benefits / Impacts	Key changes since gate two
Overview	Broad range of long-term benefits in Oxfordshire, providing opportunities to improve both physical and mental health, access to Science, Technology, Engineering, Arts and Mathematics (STEAM) learning opportunities, provide employment and grow the local economy.	Aligned, although more insight into legacy opportunities developed at gate three, following stakeholder workshops and engagement
Construction Employment	Significant quantity (multiple '000s) of full-time equivalent employment years are to be created by SESRO's construction.	Increase in expected construction phase employment opportunities estimated, following review of gate three design
Operational Employment	It is currently estimated that between 20 and 50 employment opportunities would be created due to SESRO's operation (both direct jobs and additional jobs through further economic activity).	Negligible change
Economic activity	The benefits of SESRO to the economy in the form of additional employment can also be expressed in terms of Gross Value Added (GVA). It is estimated that SESRO GVA contribution over the 10 year construction period would be significant.	Minor increase
Tourism	Tourism will play an important role within Oxfordshire's economy in the form of benefits realised by tourists by visiting SESRO and spending within the local area.	Additional benefit; not assessed at gate two
Health and wellbeing	The increased range of physical activities at SESRO will provide significant health benefits to local residents and visitors from further afield. More people would be expected to use SESRO than the existing site for physical activities.	Minor increase, due to updates to Interim Master Plan
Education	Education benefits are split between three categories: Benefit from education and interactive learning experiences, through school child visits to SESRO. Volunteering: SESRO will create opportunities for the community to engage with nature and each other. Apprentice / Upskilling: It is expected that a proportion of the jobs created by SESRO would be apprenticeships.	Increase due to addition of insight for apprenticeship and volunteering opportunities
Recreation, amenity and legacy	The NCA estimates recreation as a significant benefit. SESRO will be an asset providing green and blue space for people to enjoy nature, walking, cycling, bridleways for horse riding, play areas for children, water sports activities (sailing, swimming and angling) and bird watching. Regionally, SESRO will offer a unique combination of environment/nature, catering and activities. SESRO's proximity to settlements and a range of transport options means a significant number of users will be able to enjoy it into the future.	Minor increase, due to updates to Interim Master Plan and revision to estimated visitor numbers
Local community disbenefit	It is expected that SESRO will generate some disbenefits for local communities. Potential disbenefits include disturbance to a number of local businesses. Suitable mitigation packages will be developed for those affected. There is also a potential long term disbenefit of an increase to customer bills, which may affect Thames Water customers as part of securing future water supply.	No change

Preliminary assessment of Wilts and Berks Canal

8.23 As noted in Table 2.7, there are specific socio-economic benefits that could occur through the configuration of the safeguarding of the route of the Wilts and Berks Canal through and adjacent to the SESRO site. Engagement with the Wilts and Berks Canal Trust (WBCT) has been ongoing since gate one. Building on the options appraisal undertaken for gate three and to help inform decision making and final scheme design, a methodology to allow the benefits of enabling canal route safeguarding, and links to the wider waterways network, has been scoped at gate three. Two initial options were considered[45]:

- Safeguarding and supporting the delivery of the segment of the Wilts & Berks (W&B) canal route which runs wholly within the boundary of the SESRO DCO limits (i.e. within the main reservoir site, to the west of the A34).
- Developing a canal connection from the segment within the DCO limits to the River Thames.

8.24 While the first option is expected to bring benefits to the local population (by bringing access to nature closer to them), the second option (a full connection to the Thames) could unlock additional boating and pedestrian demand, due to the increased attractiveness of a complete canal, connected to the wider river network. This could increase the attractiveness of the area leading to further benefits.

8.25 The full benefits appraisal has not been completed, but initial estimates suggest that significant benefits may be available should the W&B canal be reinstated, particularly if connected to the River Thames. This is not currently part of the SESRO project but recognises a potential shared benefit that may be available from collaborative development of the DCO. Engagement will continue on this matter as the design is progressed towards DCO submission, so that the preferred configuration of this aspect of the scheme, both within the main site and also links to the wider River Thames, may be understood and considered.

9. Stakeholder and customer engagement

9.1 This section provides information on the engagement undertaken with local communities and stakeholders to inform the master plan design for SESRO to gate three. It includes an overview of the engagement activity, the main points of feedback from local communities and stakeholders and how they have been considered in the on-going programme of work and development of SESRO.

9.2 Our engagement activity through gate three built on previous engagement, taking account of issues and concerns raised by local communities and stakeholders, and was designed to give stakeholders the opportunity to comment at a formative stage, whilst engaging openly and transparently. Further details on these aspects of stakeholder

[45] Under all options it is assumed that the remainder of the W&B canal is developed and reopened to align with any development of the canal within, or to the north of, the site. This means that the assessment is not simply considering the benefits generated by those sections in isolation, but also includes the synergies that they develop for the wider canal restoration project.

engagement may be found in Supporting Document G: Customer and Stakeholder Engagement.

9.3 We developed our approach to engagement in line with RAPID's guidance for gate three[46] building the foundation of stakeholder and customer feedback received prior to, and activity completed through gate two, the representations made to RAPID on the gate two submission and direct feedback from RAPID and other regulators.

9.4 We recognise the importance of managing the 'journey' for all who will be directly affected by the construction and operation of SESRO. The approach is based on principles of clarity and transparency, inclusiveness, and responsiveness to people's views.

Stakeholder engagement

9.5 Stakeholder engagement and feedback has informed and continues to influence the SESRO design and legacy benefit goals, which is a key part of planning and the DCO application process. It lays the groundwork for fulfilling the further prescribed stages of statutory consultation during 2025 and to enable PINS to be assured, in due course, of the adequacy of consultation, which forms part of pre-acceptance checks for the DCO application.

9.6 The DCO process has a number of stages where those affected by a project can participate in consultation events, receive information and make representations. Through our stakeholder engagement strategy, we are providing a structured approach including additional non-statutory pre-application information and engagement events and providing information about the programme and next steps that people can anticipate. We undertook a non-statutory consultation in 2024, focused on our emerging options and Interim Master Plan, the feedback from which has been published through a Statement of Response in summer 2025. In addition,

- We have developed a multi-strand programme of engagement to ensure we engage with all parties who are interested in the project comprising engagement with local people; land and property owners; local organisations; parish, district and county councils; regulators and technical stakeholders.
- We are providing a regular stream of external public communications highlighting important steps in the SESRO programme and providing an update on a particular SESRO topic of interest, for example, on the WRMP approval, ground investigations, clay compaction trial, and archaeological surveys.
- We have shared information, for example, our initial masterplan and optioneering work, with technical stakeholders, providing regular updates on the programme of work and the studies underway and giving opportunity for comment and feedback.
- We have worked with regulators and stakeholders as part of Technical Liaison Groups to jointly define the scope of work and technical methods and to provide the outputs for technical assessments for review and challenge at an early stage of work.

[46] RAPID, January 2024, Strategic regional water resource solutions guidance for gate three

- We have engaged with stakeholder organisations, who have specialist technical knowledge or a specific interest, to share relevant information and provide opportunities to input to the work.

9.7 Across the stakeholder groups there is awareness of the scheme both locally and regionally. There are local concerns, particularly in relation to reservoir safety, flood risk and construction impacts. However, there is also support recognising the potential environmental, social and economic opportunities the reservoir could bring.

9.8 The foundation for our on-going customer and stakeholder engagement activity has been set reflecting both local concerns and wider community support for the legacy SESRO can provide.

Wider benefits and customer engagement

9.9 Wider benefits for SESRO, which are documented further in sections 2 and 8, are being developed in collaboration with local stakeholders and communities to ensure they are relevant and appropriate. We are forging partnerships with a range of organisations, such as conservation groups, educational institutions, and community groups and by leveraging their expertise, resources and networks we can enhance the effectiveness and sustainability of the lasting legacy benefits that SESRO can provide.

9.10 Engagement to date includes topic-based workshops with local stakeholder and community organisations; in depth discussions on topic specific issues; and community research with local communities and across the wider South East region. As part of the non-statutory public consultation, we led specific engagement on legacy opportunities, and the Interim Master Plan was an integral part of the consultation.

9.11 Specifically, in respect of customer engagement, we commissioned a survey (early 2024), with over 1,000 participants who are representative of local residents[47] and the wider South East of England[48], to understand their preferences on aspects of the design, and what additional activities and features they would value and use as part of the proposed reservoir. This survey has provided some helpful insight on awareness and knowledge of the project as well as preferences for opportunities at the site.

Stakeholder feedback

9.12 We have taken feedback on board in developing our designs and engaging with the community. Examples include:

- In response to comments from our Landscape technical Liaison Group, undertaking a project level landscape character assessment which has informed our project landscape led design principles and Interim Master Plan.
- Stakeholders have previously provided feedback that they would like a range of visuals and schematics to aid their understanding of the project, so we have produced scaled physical models alongside videos, animations and VR visuals in response, which formed a key part of our non-statutory consultation in 2024.

[47] Local residents were included based on a 20km radius from the project, based on date from the Open Geography Portal by the Office for National Statistics.
[48] Office for National Statistics 2021 Census data was used to ensure survey participants were representative of the South East of England

- Production of a series of factsheets on topics ranging from flood risk to the DCO process to support improving community understanding of technical issues and processes.

9.13 Further information on the themes of the feedback received, and our response to it, may be found in Supporting Document G: Customer and Stakeholder Engagement.

Next steps

9.14 As we progress the project towards a DCO submission in 2026 we will continue with our technical liaison meetings with stakeholders, one to one landowner engagement, community briefings and public information campaigns.

9.15 Ahead of the DCO submission, there will also be three key engagement and consultation stages; these being:

- a public information campaign in summer 2025, including our Statement of Response to the 2024 consultation,
- engagement with Local Planning Authorities prior to the planned publication of our Statement of Community Consultation in the Summer of 2025, and
- our Autumn / Winter 2025 statutory consultation.

9.16 In summary, we have in place a dedicated engagement team with an extensive, well-structured engagement programme. The programme operates at many levels - one to one conversations, talks, presentations through to consultation events; we are listening and responding to feedback. As set out in our community research, although the voices we hear loudest oppose the scheme, they do not represent the overall community. We continue to work with those in opposition to address concerns, but we will also ensure we develop a scheme which not only delivers water for customers and a range of wider opportunities.

10. Board statement and assurance

10.1 Board Assurance statements for this gate three submission are provided within the associated covering letter to this submission.

10.2 The assurance framework used for this submission is a risk-based approach and is based on the three lines of assurance model shown in Figure 10.1. This is similar to that applied to other submissions and is consistent with the assurance requirements laid out in Ofwat's Company Monitoring Framework and meets the assessment criteria defined by RAPID.

10.3 This approach provides an effective programme of assurance which considers areas that are known to be of prime importance to customers and regulators; or may have a significant financial value, alongside the likelihood or reporting issues. Areas of higher risk receive three lines of assurance while other areas, where the risk is lower, may be targeted with first and second lines only.

10.4 A risk assessment was completed against each product to identify the lines assurance required. Line 1 assurance was undertaken by our consultants whilst undertaking work, Thames Water and partners (where appropriate) technically assured reports as a 2nd

line review, and Arup Binnies joint venture were appointed as the external assurers (Line 3).

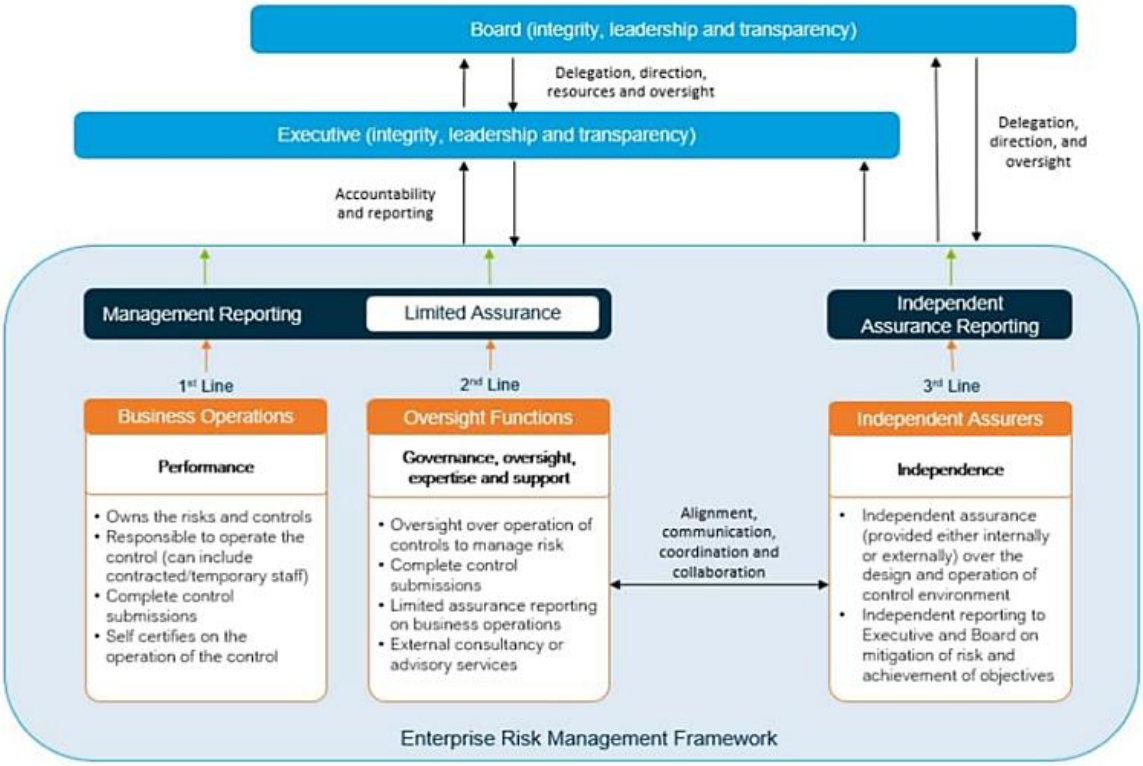


Figure 10.1 Gate three Assurance Framework

10.5 Thames Water confirms that this submission has been prepared in accordance with the RAPID gate three guidance and that it:

- supports the recommendations for solution progression made in the submission at gate three and the recommendations for which option within the solution should be progressed;
- is satisfied that a realistic and achievable programme for the solution is presented in the report, there are no insurmountable obstacles to the delivery of the solution in accordance with that programme and that progress and continuing development of the solution at gate three in accordance with that programme is commensurate with the solution being "construction ready" for 2025-2030 (subject to current uncertainties being addressed, including but not limited to: availability of development funding, progress on planning, appropriate and timely financing, supply chain availability and workforce capacity).
- is satisfied that significant risks to the delivery of the solution in accordance with the programme and within current cost projections, have been identified and that mitigations are being developed through routine risk management processes, recognising that not all risks are in the control of the solution.
- is satisfied that the progress on the work carried out for gate three is of sufficient scope, detail and quality to ensure that applications can be made for development consent orders, planning applications and other necessary statutory consents and permits at the right time, in accordance with the schedule set out in the gate

three report. The work carried out at gate three is commensurate with the solution being "construction-ready" for 2025-2030; and

- is satisfied that expenditure has been incurred only on activities that are appropriate for gate three and is efficient and cost effective.

10.6 The supporting Assurance Statements from Southern Water and Affinity Water co-sponsors are provided within the Supporting Documents.

11. Efficiency of expenditure

Gate three costs

11.1 The costs for the period between the gate two and gate three submissions are presented relative to Ofwat's Final Determination allowance. For accurate comparison with the Final Determination allowance, as requested by RAPID, actual costs are deflated back to a 2017/18 cost base[49].

11.2 Overall, the forecast spend to gate three represents a saving of £0.05m against Ofwat's Final Determination (FD)[50] allowance, allowing for the underspend at gates one and two (see Table 11.1). All required outputs for gate three have been delivered, along with the required activity to enable timely and efficient delivery of gate four and the DCO application.

*Table 11.1 Gate three forecast total cost for each partner company**

Company	Forecast Total Cost to RAPID Gate 3 (£M, 2017/18 prices)	Ofwat FD Allowance for Gate 3 (£M, 2017/18 prices)	Underspend on previous gates (£M, 2017/18 prices)	Saving (£M)
Thames Water	43.84	28.54	15.34	0.04
Affinity Water	21.60	14.06	7.55	0.01
TOTAL	**65.44**	**42.6**	**22.89**	**0.05**

**Southern Water will make contributions from Gate 4 onwards*

11.3 In accordance with the latest gate three guidance from RAPID, more detailed cost breakdowns are provided for any category where the costs exceed £500k. This breakdown may be found in Supporting Technical Document D: Project Management Plan.

11.4 The breakdown of costs to gate three is shown in Table 11.2 in accordance with the reporting template provided by RAPID. All costs are split 33% to AFW and 67% to TW (with SWS providing costs from gate 4 onwards). The spreadsheet version of the Efficiency of Spend template has been issued to RAPID as a separate file, as part of the gate three submission.

11.5 The activities undertaken to gate three are those agreed with RAPID, through our gate two submission and subsequent checkpoint meetings, as appropriate and necessary at this stage in the project development cycle. The primary addition to the gate 2 scope of

[49] using Thames Water's Internal Business Plan (IBP) deflationary factors, based upon the CPIH (November 2019 dataset) index

[50] PR19-final-determinations-Strategic-regional-water-resource-solutions-appendix.pdf (ofwat.gov.uk)

work has been the Clay Compaction Trial for which the indicative scope and costs of work were agreed with RAPID prior to the implementation of the contract.

Table 11.2 SESRO, summary of gate three cost breakdown (as per RAPID template)

Category	Expenditure*	% of Total	Description of Activity
Programme & Project Management	£11,290,376	15%	Programme Manager, Project controls and programming support, Assurance, Project Director and Executive governance, Sponsor governance across partner companies
Feasibility Assessment and Concept Design	£15,502,376	21%	Engineering design and all associated studies, supervision of ground investigations,
Option benefits development and appraisal	£264,373	1%	Water resources modelling, socio-economics benefits appraisal, terrestrial environmental analysis to inform the Interim Master Plan and development of initial recreational and access arrangements
Environmental Assessment	£7,976,358	10%	EA and NE costs, water quality modelling, reservoir physical and algal modelling, WFD and aquatic ecological assessments, EIA Scoping, HRA, BNG assessment, environmental permitting strategy
Data Collection, Sampling, and Trials	£11,592,519	20%	Environmental surveys (EIA baseline), ground investigations, clay compaction trial, supervision and safety management of all site works
Procurement Strategy	£4,021,147	8%	Strategic review of procurement routes, client governance, external advisory services and steering group on commercial matters, Stage 2 submission to Ofwat
Planning Strategy	£2,580,208	3%	OCC and VoWH DC costs, strategic planning review and DCO strategy, land access and acquisition advice and strategy, third party landowner survey access support
Stakeholder Engagement	£4,005,360	8%	Stakeholder lead, all consultation and engagement support and activity, including PR and external relations, legacy analysis and strategy
Legal	£1,916,204	3%	Legal advice on various issues and policies
Other	£6,290,866	11%	Overhead recovery on capital contracts
Total	**£65,439,788**	**100%**	
Gate 3 allowance	**£65,490,000**	-	*Including previous underspend*
Gate Underspend	**£50,212**	-	

** (£, 2017-2018 prices)*

Solution progression

11.6 We recommend that the 150 Mm^3 solution for SESRO be progressed through to DCO application and RAPID gate four submission. To support this recommendation, we confirm that:

- The solution is in the preferred (reported) pathway in the WRSE regional water resources plan, in the Final WRMP24 for Affinity Water and Thames Water and in the

revised draft WRMP24 for Southern Water, with construction required to start in the period 2025–2030.

- To be "construction ready" in the period 2025–2030, continued enhancement funding is required for investigations and development to progress towards a DCO application and subsequent examination, and to support all associated commercial, procurement and consenting activities.
- To progress, the solution needs the continued regulatory support and oversight provided by the Ofwat Stage process and RAPID Gated process.

12. Conclusions and recommendations

12.1 SESRO can provide a provide a reliable, sustainable and new supply of water to TW, SWS and AFW during critical times of drought and can be construction ready between 2025–2030.

12.2 Our engineering design at gate three has been developed with consideration of key risks and constructability as well as to taking account of public engagement feedback, including the public consultation in Spring 2024, as summarised in Section 2.

12.3 We continue to refine the design with consideration of additional information from investigations and surveys, feedback from key stakeholders (statutory bodies and regulators) and independent advice from the Reservoir Advisory Panel, Appointed Construction Engineer and the Design Council.

12.4 All capital costs have been benchmarked and care has been taken to ensure spend through gate three has been proportionate and efficient.

12.5 We have now implemented our planning and lands strategy and through gate three have received a S.35 Direction from the SoS and an EIA Scoping Opinion from the Planning Inspectorate. Our environmental investigations are continuing as planned and we have addressed the Priority Actions set at Gate 2.

12.6 We are now implementing our procurement strategy and are due to complete the initial Market Engagement exercise in summer 2025. Our current approach is to procure an ECI (Early Contractor Involvement) contractor upon submission of the DCO to support works during examination, begin construction preparatory work and update target price and schedule.

12.7 The Project Sponsors recommend that:

- the SESRO 150 Mm^3 solution should progress to RAPID gate four.
- risk management shall continue as outlined in the Project Management Plan, to ensure that the major consenting and design risks are addressed and mitigated as far as reasonably practicable by gate four.
- investigations continue to ensure that the significant construction phase risks are explored to minimise cost exposure.
- engagement and procurement of a main works contractor shall be undertaken within the gate 4 period, as set out in Stage 2 submission to Ofwat.

Appendix A: Supporting documentation

Summary of gate two actions and recommendations

Table 0.1 includes a summary of the progress made against any actions and recommendations given by RAPID at gate two and signposts where further detail can be found in the main report and/or appendix.

Table 0.1: Summary of progress against gate two actions and recommendations

Action / Recommendation	Progress at gate three	Signpost to further detail
A1: Confirm to RAPID that the solution aligns with Affinity Water's and Thames Water's Water Resource Management Plans (WRMP) and relevant Regional Plans at the next available regular checkpoint meeting after the publication of the WRMPs and Regional Plans	Final WRMP24 published for Affinity Water and Thames Water; Revised draft WRMP24 for Southern Water re-consulted on in 2024. SESRO 150 Mm3 option selected in all plans and in WRSE Regional Plan.	Main Report, Section 2
A2: Work with the Environment Agency to develop 100Mm3 option to the same level as 150Mm3 option, including environmental assessment, modelling and master planning, to understand the full environmental impact and benefits of the 100Mm3 option compared to the 150Mm3 option	100 Mm3 option NOT selected in revised draft and final WRMP24. Therefore, no further detailed appraisal work undertaken on 100 Mm3 option beyond work completed for options appraisal in WRMP24.	N/A
A3: Evidence should be provided to RAPID's satisfaction that 150Mm3 option does not provide wider drought and South East supply system resilience benefits sufficient to justify the larger scheme compared to the 100 Mm3 option.	SESRO 150 Mm3 option selected in all plans and in WRSE Regional Plan, as critical part of best value plan.	Main Report, Section 2
A4: clear and robust best value evidence to RAPID's satisfaction to be provided in line with WRMP recommendations to demonstrate 100Mm3 is preferred over 150Mm3 option. We would welcome confirmation that abstraction reductions at Farmoor and wider environmental destination scenarios for the southeast can still be supported with a smaller scheme being progressed.	SESRO 150 Mm3 option selected in all plans and in WRSE Regional Plan, as critical part of best value plan.	Main Report, Section 2
A5: More information to RAPID's satisfaction to be provided on wider key risks and mitigations around construction and procurement	Risk assessment update for gate three, included in cost estimate and discussed in supporting documents	Main Report, Section 6 Supporting Document D: Project Management Plan Supporting Document A3: Cost and Risk Report

Action / Recommendation	Progress at gate three	Signpost to further detail
A6: Review and update landscape and visual impact assessment (LVIA) methodology with Natural England	Extensive engagement with Natural England since gate two, including development of Landscape Character Assessment and LVIA appraisal methodology, via EIA Scoping Report	Main Report, Section 4 Supporting Document C3: EIA Scoping Report Supporting Document C4: Strategy for managing impacts on North Wessex Downs National Landscape
A7: Work with the Environment Agency flood risk team to refine and develop flood risk modelling.	Refinement of flood risk analysis, albeit constrained by lack of access to all required watercourses; Further model updates to be implemented as part of PEIR and subsequent consultation in 2025	Main Report, Section 2
R1: Update the solution design to reflect the preferred solution size	SESRO 150 Mm3 option selected in all plans and in WRSE Regional Plan, as critical part of best value plan. Design updated to reflect development of this preferred configuration	Main Report, Section 2
R2: Thames to Southern transfer water treatment works is currently located on the SESRO site but has not yet been incorporated into the solution design. It should be clarified which of the SESRO options could accommodate both the reservoir and the Thames to Southern water treatment works within the site space	SESRO 150 Mm3 option selected in all plans and in WRSE Regional Plan, as critical part of best value plan. The Interim Master Plan developed for the preferred configuration safeguards space for the T2ST WTW as part of the SESRO site.	Main Report, Section 2
R3: Remove utilisation uncertainty or assumptions where required by gate three.	Resource utilisation analysed and confirmed at gate three	Main Report, Section 2
R4: Local customer and stakeholder engagement to continue to gate three.	Extensive consultation and engagement undertaken between gate two and three	Main report, Section 9 Supporting Document G: Stakeholder Engagement Report
R5: Engagement with Historic England to be completed by gate three.	Historic England included in ongoing engagement on heritage issues and EIA Scoping. This engagement will not be completed until completion of DCO requirements, post consent.	Supporting Document C3: EIA Scoping Report
R6: Show directly how the benefits of the solution align with Ofwat's Public Value Principles.	Review and re-estimate of scheme socio-economic benefits	Main report, Table 2.8

Action / Recommendation	Progress at gate three	Signpost to further detail
R7: SESRO-STT-T2ST conjunctive use benefit of 19Ml/d plus any other in-combination deployable output impacts with other solutions including with T2AT should be accounted for within the regional modelling. Present water resources benefit under dry year critical periods in addition to dry year annual average under 1 in 500 drought resilience and climate change.	Conjunctive use benefits included in option data provided to WRSE for Regional Modelling and Plan	Not included in gate three submission, although confirmed by Section 2. For details, see Thames Water WRMP24 published tables and Section 11.
R8: Use environmental assessments to inform new masterplan development of the 100 Mm3 option to inform environmental risks and opportunities.	100 Mm3 option NOT selected in revised draft and final WRMP24. Therefore, no further detailed appraisal work undertaken on 100 Mm3 option beyond work completed for options appraisal in WRMP24.	N/A
R9: Provide a programme of work to clarify the review and mitigation of the reservoir's mixing and thermal stratification risks	Water quality risks modelled and assessed as part of gate three scheme design and confirmed through DWSP	Main report, Sections 2 and 3

Summary of gate three contents

This gate three submission consists of a main technical report and a range of technical supporting documents. The documents that make up the submission, along with a short synopsis, may be found in Table 0.2 below.

As requested by RAPID gate three guidance, Supporting Document I lists the criteria from the gate three guidance and signposts where in the main report and / or in which supporting document it is addressed.

Table 0.2 Summary of documents within gate three submission

Document	Synopsis of contents
Gate three Technical Report	Overview of all technical and commercial assessments completed, as required by RAPID gate three guidance
A1, Basis of Design	Summary of engineering design and delivery details associated with the scheme
A2, Carbon Report	Summary of the carbon footprint of the scheme, strategy to mitigate such emissions
A3, Cost Report	Summary of the costs of the scheme and associated options (capex, opex, costed risk and optimism bias).
B, Drinking Water Quality Risk Assessment	Outputs and discussion of the drinking water quality risk assessment and workshops completed for the scheme
C1, Water Framework Directive Assessment Report	Strategy, initial evidence and discussion on the assessment of the preferred scheme completed under the requirements of the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017
C2: Habitats Regulations Assessment (HRA)	Strategy and discussion on the assessment of the scheme completed under the requirements of the Conservation of Habitats and Species Regulations (2017) as amended (Habitats Regulations)
C3, Environmental Impact Assessment (EIA) Scoping Report	Link to published version of EIA Scoping Report, as issued to the Planning Inspectorate (PINS): Documents | South East Strategic Reservoir Option (SESRO) (planninginspectorate.gov.uk) *Note: not re-submitted as part of RAPID gate three*
C4: Strategy for managing impacts on North Wessex Downs National Landscape	Strategy and discussion on the strategy to assess and manage potential impacts on the North Wessex Downs National Landscape (formally Area of Outstanding Natural Beauty)
C5, Biodiversity Net Gain Report	Strategy, initial evidence and discussion on the assessment of the scheme options for biodiversity net gain, both aquatic and terrestrial, as required by the Environment Act 2021.
D, Project Management Plan	Breakdown of any major cost elements to gate three, overview of proposed scope and costs beyond gate three looking forwards towards submission of consent application(s), future programme overview, key risks and proposed mitigation strategy
E, Planning and Land Strategy	Overview of proposed consent strategy and recommended approach and overview of secondary consents required and of proposed land acquisition and compensation strategy and recommended approach.
F, Procurement and Operational Strategy	Stage 2 submission to Ofwat, not published *Note: not re-submitted as part of RAPID gate three*
G, Stakeholder Engagement Strategy	Overview of stakeholder engagement completed since gate two and representations received, overview of planned consultation to DCO submission and summary of strategy for legacy recreational and amenity use of SESRO
H, Board Statements	Assurance Statements and covering letter for all partner companies
I. Gate 3 Guidance Criteria and Signposting	Table signposting relevant main report sections / supporting documents against RAPID Gate 3 criteria