

Working with





An essential new reservoir for the South East

June 2024



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Foreword



Nevil Muncaster, Engineering and Asset Director, Thames Water

Hello.

Over the past few months we've been working on designs for several key parts of the proposed new reservoir to the south west of Abingdon, as well as an interim master plan, and we're now at a point where we can share them and seek your views.

We've launched a public consultation and we'd really appreciate your feedback.

We know that the risk of severe droughts is increasing, which is why we're working with the government, our regulators and other water companies to develop new water storage and supply solutions.

The new reservoir would help to protect millions of people for the next century and beyond from the risk of drought. It would also provide a unique opportunity to deliver new habitats, walking trails and recreational spaces.

We want our proposals to reflect what matters to you, so please have your say.

Planning for water shortages

Our water resources are under threat

We know that climate change is increasing the risk of severe droughts in the UK, which are now expected to be much worse than those of 1976 and 2022.

Whilst winters are forecast to be warmer and wetter, summers are expected to be hotter and drier, and more frequent and intense weather extremes are predicted. Coupled with an increasing demand for water as our towns and cities grow, the future viability of our water supplies is fragile.

It's vital that we plan for future droughts now – learning to manage and use water more wisely and, critically, increasing our storage capacity and developing new sources of water.

A reliable water supply is usually taken for granted, but not having enough water could mean:

- Schools and businesses being closed
- Water restrictions or rationing, for example relying on standpipes in streets
- Having to abstract more water from rivers and streams, impacting habitats and wildlife
- Decreasing crop yields and higher food prices

Increasing our water storage capacity

We have plans in place to reduce water leakage from our network and customers' pipes, and the government has pledged policy measures to support water companies to encourage customers to use water wisely.



In Summer 2022, then the hottest on record and the driest since 1995, river and reservoir levels became exceptionally low, impacting wildlife, habitats and farmland in the Thames Valley and other areas, so that some farmers were unable to water crops.

But on their own, these initiatives are not enough. We must increase our water storage capacity and develop new sources of water.

Recognising the potential scale of the water shortage crisis, the government, our regulators and water companies are working together to plan new large-scale water storage and supply solutions.

The proposed new reservoir to the south west of Abingdon is one of these.

Fixing leaks in our network

We have an ongoing programme of work to repair pipes in our network, prioritising the most serious.

In 2022/23 we fixed a total of 66,896 leaks, compared with 61,671 in 2021/22, and over the next two years we're investing \pounds 200 million to replace water mains.

It would draw-in water from the River Thames during winters, storing it until it is needed – when the weather has turned dry or demand for water increases.

Our proposals would provide customers with a drought insurance policy for the next century and beyond.

Our Water Resources Management Plan 2024

Every five years, water companies publish Water Resources Management Plans, setting out how they intend to provide a secure water supply for their customers in the context of climate change and the need to protect and improve the environment.

We developed our last Water Resources Management Plan in collaboration with other water companies across the South East and published our latest draft in August 2023. It's being reviewed by the Secretary of State for Environment, Food and Rural Affairs.

The proposed new reservoir

The site for the proposed new reservoir is bounded by the A34, the Great Western Main Line railway (London to Bristol) to the south, the A338 to the west, and the River Ock to the north.

The site chosen:

- is close to the River Thames
- has reasonably flat land

- has the right geology and ground conditions for a reservoir
- is adjacent to a railway line and has major road links

Key facts



Volume 150_{Mm³}



271 MI/d equivalent to over 3 million baths

Could supply

It will come

into use by



Project update

We're part way through a process of preparing designs for the new reservoir, and are on track to submit an application for development consent to the Planning Inspectorate in 2026.

The application would seek the powers to build the new reservoir, so that construction could begin in 2029 with the reservoir operating in 2040.

We're engaging stakeholders and local communities as we go, to understand priorities and gather important information and feedback which will help to shape our proposals.

We've launched a public consultation on emerging design options and an interim master plan for the proposed new reservoir, and you can find out more about it, including how to respond, in the next chapter of this brochure.

We're planning to hold a further public consultation on a full set of proposals for the new reservoir in 2025.

Developing our designs and an interim master plan

Over the last few months we've been working on several key parts of the reservoir design, including:

- the connections needed to transfer water between the reservoir and the River Thames
- highway access to and around the reservoir site
- drawdown infrastructure for emptying the reservoir in emergencies

- the location of rail sidings that could be used to transfer materials to and from the reservoir site during construction; and,
- the position of associated operational infrastructure, like pumping stations and water treatment works, within the reservoir site.

We've also created an interim master plan – an overall spatial layout of the proposed reservoir and surroundings, including wetlands for capturing flood water and providing new habitats for diverse ecology, operational areas, such as for treating water or transferring it to and from the reservoir, amenity areas, public access, woodlands and paths.

You can find out more about our emerging design options and interim master plan in our consultation documents, which can be found via our website <u>thames-sro.co.uk/SESRO</u>.

Alternatively, you can email us at: info.SESRO@thameswater.co.uk or contact our Customer Helpline on 0800 316 9800.







Investigating the site's geology

There aren't many suitable sites in the South East for a large new reservoir, close enough to a major river and with suitable underlying geology. The site chosen for the proposed new reservoir is close to the River Thames, has reasonably flat land and, critically, the right sort of geology – an abundance of bedrock clays.

We've started carrying out ground investigation surveys on parts of the site, extracting soil and rock samples from boreholes (narrow shafts bored into the ground) and small trial pits, to gather detailed information about local ground conditions.

We've also received planning permission for an embankment trial, which we'll begin in Summer 2024 on land to the south of the Steventon – Hanney Road, to test exactly how the local clays behave when compacted. You can find out more about our programme of ground investigation by visiting our website at: **thames-sro.co.uk/SESRO**.

Environmental surveys

It's also important that we build a detailed understanding of the local environment, and how it changes through the seasons, so that we can predict the potential impacts of our proposals and adjust them as needed.

We've started carrying out surveys of the local ecology, habitats, watercourses, and many other environmental features, and will continue beyond 2024. We've made some interesting discoveries during recent archaeological surveys on the site of the proposed new reservoir, including Roman ditches, pits and pottery.





Cross-section illustrating the geology of the proposed reservoir site

Public consultation

We've been developing design options for parts of the proposed new reservoir, balancing their relative advantages and disadvantages, considering factors such as engineering and construction feasibility, safety, environmental impacts and costs.

We've also prepared an interim master plan for the reservoir site, which you can find out more about in the next chapter of this brochure.

We're holding a public consultation and we'd like your feedback.

Our consultation documents are available via our website, at: thames-sro.co.uk/SESRO.

You can request copies of this booklet or any of the public consultation documents by emailing us at <u>info.SESRO@thameswater.co.uk</u> or via our Customer Helpline on 0800 316 9800.

Community information events

We're holding a series of community information events in June and July, in the following locations:

 27 June:
 Sutton Courtenay

 29 June:
 East Hanney

 1 July:
 Abingdon

 5 July:
 Wantage

 9 July:
 Didcot

 15 July:
 Steventon

 18 July:
 Marcham

You can find out more about these and register to attend at: thames-sro.co.uk/events.

We're asking those who want to attend to register so that we can keep track of numbers and relay any changes to the event arrangements, but it is not essential and if you don't register you won't be turned away. You can respond to the public consultation in the following ways:









Future public consultation

We're planning to hold a further public consultation in 2025.

Before then, we'll publish a Statement of Community Consultation, explaining how we'll consult and work with local communities.





Alternative options for Water Treatment Works (for Southern Water)

Rail sidings and material handling area during

Steventon to East Hanney

road diversion

construction



Main access road



Connectivity to the River Thames (conveyance tunnel/ emergency discharge channel)



Design options for public consultation



Our interim master plan

We've created an interim master plan for the proposed new reservoir, setting out a potential overall spatial layout of the site.

Key features include:

Naturalised landscapes

Embankment earthworks with varied and gentle slopes, combined with proposals for woodland belts and copses, hedgerows, grasslands and pasture.

Watercourses and wetlands

Watercourse diversions, wetlands and replacement floodplain storage areas, to channel and store water, manage flooding and contribute to overall biodiversity gains.

Habitats for wildlife

Extensive habitat creation and enhancement, to significantly improve the habitats available for wildlife locally.

Access

Access to and around the site for local communities and visitors, including a network of paths with access for walkers / wheelers, cyclists and horse riders, and active travel provision along a realigned Steventon – Hanney Road.

Recreation and education

Nature trails, a visitor centre, cafés, a water sports centre, recreational lakes and an education centre.

Operational infrastructure

Space for the equipment that would be needed to operate the proposed new reservoir safely and efficiently: a pumping station, conveyance tunnel with emergency drawdown, water treatment works and a pipeline for transferring water to the Southern Water supply area.

Future proofing

We've left space in the interim master plan for potential future connections to and from the reservoir:

- space for connections to the Severn to Thames Transfer, if that project is developed
- space for another water treatment works and connections to the Swindon and Oxfordshire water supply area, to enable a larger transfer of water to this area if needed

These connections aren't part of the new reservoir project at the moment, but it makes sense for us to identify space for them because they may be needed in future.

We're holding a public consultation on emerging design options and our interim master plan, which you can out more about by visiting our website at:



<u>thames-sro.co.uk/SESRO</u>







Lasting benefits

Whilst the primary purpose of the new reservoir is to provide the vital water resources we need – safeguarding future water supplies – there is also a unique opportunity to provide wider, lasting benefits.

These benefits include creating new landscapes with improved wildlife habitats, providing spaces for leisure and recreation, and boosting the local economy.

We're ambitious in our vision for public value and want to create a lasting legacy for communities and the environment.

What we've heard

We've started asking local communities and stakeholders what activities and facilities they would like to see at the reservoir site. They've told us they'd like a wide range of activities, the most popular being access to green spaces, with places to enjoy nature including wildlife and bird watching, walking and running trails and café and restaurant facilities.

We've already included many of these features in our interim master plan for the reservoir site.

We've also had initial conversations with organisations with an interest in the environment, access and recreation, raising a long list of potential opportunities and issues for us to consider.

What next?

We'll widen the conversations we've been having and look to build partnerships with organisations that have the expertise, resources and networks to contribute to the effectiveness and sustainability of the legacy benefits.

This is a once-in-a-lifetime opportunity – we want to work together to design the new reservoir for future generations.

You can find out more about our work to deliver lasting benefits via our website, at **thames-sro.co.uk/SESRO**.

We're also

commissioning a report by a property company to evaluate the impact of reservoirs on property prices, and we'll publish it when it's completed.



The reservoir embankments and landscapes

10km of new embankments would create a watertight perimeter around the reservoir with outer slopes covered by grassland and pasture, new woodlands, paths and hedgerows.

The embankment structures

The main structure of the embankments (the 'structural fill') would be formed from bedrock clays that exist in abundance at the site – specifically Kimmeridge Clay and Gault Clay. These would be excavated from the centre of the site, which would become the reservoir basin (leaving enough in place to ensure that the bottom of the reservoir would be watertight), and moved to the perimeter, to form the reservoir embankments.

The overlying sands and gravels are ideal for creating landscaped spaces on and around the embankments (the 'landscape fill').

To protect against the erosive effects of waves, a layer of natural stone (large, angular blocks), known as rip-rap, would be placed around the inner-face of the reservoir.

Internal drainage systems within the embankments would transfer fallen rainwater to drains at the base of the embankments, extending around the perimeter of the site to channel water into new diverted watercourses.

Landscapes

The slopes of the new embankments – which would be between 15m and 25m high, from the level of the ground to the crest of the embankments – are being designed to varied gradients and with slackened slopes, to appear natural and blend with the existing landscape.

The embankments would be used to create extensive new areas of woodland, copses, pasture and grassland and native hedgerow, criss-crossed by new paths.

We're engaging with organisations including Natural England, the Environment Agency, Oxfordshire County Council and North Wessex Downs National Landscape to develop landscape and habitat designs.

Biodiversity net gain

Alongside the new reservoir, we're planning to introduce significant enhancements to local habitats and biodiversity, including over 90 hectares of new woodland, scrub, ditches, wet woodland and wet grassland.





Drawing showing a cross-section of the embankment at the western end of the proposed new reservoir.





Managing environmental impacts

We're working to develop our proposals so that they avoid, mitigate or reduce the worst environmental impacts while realising and enhancing the best environmental opportunities – such as spaces for new habitats and wetlands.

The Environmental Impact Assessment process

2024

Environmental Impact Assessment

We're producing an Environmental Impact Assessment (EIA), to record what the environment is like now, with a detailed assessment of how our proposals would change it, and proposals for how we'd deal with these changes, such as putting in place appropriate environmental mitigations.

Typically, an EIA considers a broad range of environmental factors including:

- Population and human health
- Biodiversity, including protected species and habitats
- Land, soil, water (including flooding), air and climate change
- Construction impacts, such as noise, vibration and dust
- Material assets, cultural heritage and the landscape
- The cumulative affects of overlapping environmental impacts

EIA Scoping Report

We'll submit an EIA Scoping Report to the Planning Inspectorate (PINS), setting out the scope and environmental assessment methods that we intend to use. PINS will consult with statutory bodies and provide a Scoping Opinion – the basis of our subsequent work.

Preliminary Environmental Information

Our preliminary environmental information will identify likely significant environmental impacts and how we might mitigate them.

2025

Environmental Statement

The outcome of the EIA will be published in an Environmental Statement, which will be submitted to PINS as part of our application for development consent.

2026







Managing flooding

We're aware of the existing flooding issues in and around the proposed location of the new reservoir, including:

- Fluvial flooding, caused by rivers and streams overtopping their banks
- Surface water flooding, caused by rainfall running over or ponding on the ground
- **Groundwater flooding**, caused by groundwater rising up to the surface

Left unmanaged, the proposed new reservoir could make the local flooding situation worse, so it's vital that we put in place measures to ensure that this does not happen.

Fluvial flooding

Several tributaries to the River Ock cross the site of the proposed new reservoir, converging with the Ock south of Marcham.

To avoid displacing the water that currently flows in these tributaries, we're proposing to divert them into new watercourses flowing around the perimeter of the new reservoir site towards the River Ock.

The flow of water through these channels would be regulated by meandering embankments and vegetation.

New floodplain storage areas would be created to replace existing floodplain areas currently present on the proposed reservoir site.

Surface water flooding

Rain falling on the reservoir embankments would be captured by drainage systems within the embankment structures. Our early modelling suggests that capturing, storing and channelling this potentially significant volume of water, in conjunction with the replacement flood storage areas that we're proposing, could reduce the risk of flooding elsewhere.

We'll continue to work closely with stakeholders, including the Environment Agency, local planning authorities, catchment groups and local communities, to explore local and wider flood resilience opportunities.

Groundwater flooding

The flood modelling and assessment work that we've carried out so far shows that the introduction of the reservoir has the potential to cause groundwater levels to rise in areas to the south and east of the site. To mitigate this, new surface water channels to the west and east of the reservoir site would be used to intercept this groundwater.

In addition, we're proposing to install a groundwater interceptor drain beneath the perimeter of the reservoir site.

You can find more information about our plans to manage flooding in our Flood Risk factsheet, via: thames-sro.co.uk/SESRO.







The construction phase

Building the proposed new reservoir would be a major undertaking, taking around ten years from starting works in 2029 to completion in 2039.

The nature of the construction activities taking place over this time would vary, with the main heavy earthworks taking around five years to complete.

We know that for local people this may raise many questions and concerns about the potential impacts of the works and how they'll be managed. Whilst we can't answer all of these yet, we'll be doing much more work on our construction plans in 2024 and beyond.

Indicative construction timeline

Year 1	Enabling works	Non-intrusive works, including ecology and archaeology, utility diversions.		
Year 2	Site mobilisation Site clearance, site compound construction. Waterway diversions, floodpl diversions, rail sidings and access roads constructed.			
Year 3	Main work startsWaterway diversions, floodplain diversions, rail sidings, access roads completed. Hanney Road realignment construction begins. River outfall and intake works, tunnel works, earthworks begin.			
Year 8	Main work completeReservoir embankments complete. Construction of public and recreation facilities begins.			
Year 9	Commissioning	Supporting infrastructure, for example pumping station, commissioned. Reservoir filling begins.		
Year 10	Filling and demobilisation	Reservoir filling continues. Main construction compound removed from site and land reinstated. Landscaping and public facilities completed.		
Year 11	Reservoir open and operational	Reservoir will be full. Facilities open to the public.		

Earthworks approach

During the most intensive construction phase, large quantities of material would be excavated from the site and repositioned to create the new reservoir embankments.

The site has been selected for several reasons, including the abundance of bedrock clays in the ground, which would be used to create watertight embankments around the perimeter.

The presence of these clays would mean that the major earthworks activities could be carried out within a closed site, without the need for significant volumes of excavated material to be brought in or removed from the site.

Site access

We're working closely with Network Rail on plans to transport the materials that aren't readily available on site by rail, to a new railhead branching from the stretch of the Great Western Main Line between Steventon and Grove. If agreed, this arrangement would further reduce the potential impact on the local road network.

There would also be road access to the construction site, with our primary route being via a new junction off the A415 Marcham Road. When construction is complete, this construction route would be converted into a permanent access to the reservoir for visitors.

Code of construction practice

Avoiding, reducing and mitigating potential disruption during the construction phases will be a major priority, with strict requirements written into future construction contracts.

The project will seek construction contractors used to delivering major infrastructure in rural environments.

A Code of Construction Practice (CoCP) would be developed and submitted alongside our application for development consent, setting out in detail the standards and controls that the contractors responsible for carrying out the works must adopt, to manage the potential environmental impacts of the works.







Ensuring the new reservoir is safe

In the UK, a combination of regulatory oversight, inspections, maintenance programmes and emergency readiness measures ensure that reservoirs are managed and operated safely.

The UK has an excellent reservoir safety record, with a long history of embankment dam construction and numerous significant dams still in operation which were constructed around 200 years ago.

The legal framework for reservoir safety

The proposed new reservoir would be designed, built and operated in accordance with the Reservoirs Act 1975, amended by the Flood and Water Management Act 2010.

Thames Water owns and operates 59 reservoirs which are all compliant with Act and has long established processes for surveillance, operation, monitoring and maintenance.

Designing the proposed new reservoir

All of the design work to date for the proposed new reservoir has been carried out under the supervision of an All Reservoir Panel engineer and follows international best practice. Some of the key design features include:

- A comprehensive monitoring and surveillance system which would be installed within the reservoir embankments
- Pipework with sufficient capacity to draw the reservoir down at a rate of 1m per day
- A comprehensive control system to prevent overfilling
- Wave erosion protection

Comparable reservoirs

The proposed height of the embankments for the proposed new reservoir is 15m-25m, comparable to several reservoirs currently managed by Thames Water, including the King George VI, Queen Mary, Queen Mother and Wraysbury reservoirs, all with dam heights of 12m-20m.

There are many examples of reservoirs in UK with taller embankments or dams, including Llyn Celyn in Snowdonia, Rutland Water and Kielder Water.

Emergency preparedness and dam break analysis

Reservoir owners and operators must have emergency response plans in place to deal with potential incidents, including those which could lead to a breach of the dam.

The probability of such a breach occurring at the proposed new reservoir is extremely low.

The dam break analysis and emergency response plans for the proposed new reservoir would be prepared ahead of the first filling of the reservoir, as stipulated by the Reservoirs Act. You can find out more about how we'll ensure the new reservoir is safe in our factsheet, available via: thames-sro.co.uk/SESRO







Moving water to and from the reservoir

The proposed new reservoir would supply water to local customers, as well as homes and businesses across London and the South East.

Customers in the Thames Valley

Water would be supplied via a new pipeline to support customers in both the 'Swindon and Oxfordshire' and 'Slough, Wycombe and Aylesbury' customer areas.

Customers in London

Water from the reservoir would be released into the River Thames to flow downstream to London for abstraction for Thames Water and Affinity Water customers.

Customers in Hampshire

Water from the reservoir would be treated and transferred via a new pipeline to customers in Hampshire.

Land within the reservoir site would be reserved for the construction of a water treatment works and supporting infrastructure, which would be subject to public consultation and planning approval.





Seeking the powers to build the new reservoir

Because the reservoir is classified a Nationally Significant Infrastructure Project, we're preparing an application for development consent, which we plan to submit to the Planning Inspectorate in 2026, seeking a range of planning, land and environmental approvals.

If the application is accepted, the Planning Inspectorate will consider it and hold an examination, before writing a report with its recommended decision. The final decision would be made by the Secretary of State for Environment, Food and Rural Affairs. If granted, the DCO would provide many of the necessary consents and powers to enable the project to proceed, including consent to build, operate and maintain the new reservoir, the ability to acquire temporary and permanent rights over land, and the right to undertake works that affect roads, streets and utilities.

Project timeline





Working with





Thames Water Clearwater Court Vastern Road Reading RG1 8DB