

Water Resources Management Plan 2024 Statement of Response Annex 6: Hampshire Water Transfer and Water Recycling Project (HWTWRP)

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**Southern
Water** 

Contents

Contents

Contents	2
1. Introduction	6
1.1 Overview	6
1.2 Changes between the Draft and Revised Draft WRMP24	7
1.2.1 Flow pathways	8
1.2.2 Draft WRMP24	9
1.2.3 Southern Water revised draft WRMP24	12
2. Havant Thicket Reservoir (Approved Scheme)	16
2.1 Havant Thicket Reservoir (Approved Scheme) background	16
2.1.1 Consultation themes	16
2.1.2 Influence on the WRMP24	16
2.1.3 Consultation response	16
2.2 Havant Thicket Reservoir (Approved Scheme) mitigation	17
2.2.1 Consultation themes	17
2.2.2 Influence on WRMP24	18
2.2.3 Consultation response	18
2.3 Havant Thicket Reservoir (Approved Scheme) planning application	20
2.3.1 Consultation themes	20
2.3.2 Influence on WRMP24	20
2.3.3 Consultation response	20
3. Hampshire Water Transfer and Water Recycling Project	22
3.1 The WRMP24 Supply Demand Balance challenge	22
3.1.1 Consultation themes	22
3.1.2 Influence on WRMP24	22
3.1.3 Consultation Response	22
3.2 Options appraisal process	24
3.2.1 Consultation themes	24

3.2.2 Influence on WRMP24.....	25
3.2.3 Consultation response	25
3.3 Option selection.....	27
3.3.1 Consultation themes	27
3.3.2 Influence on the WRMP24.....	29
3.3.3 Consultation response	29
3.4 Hampshire Water Transfer and Water Recycling Project option history and development	31
3.3.1 Consultation themes	31
3.4.2 Influence on WRMP24	31
3.4.3: Consultation response	31
3.5 Option treatment process	34
3.5.1 Consultation themes	34
3.5.1 Influence on WRMP24.....	34
3.5.3 Consultation response	34
3.6 Option costing	35
3.6.1 Consultation themes	35
3.6.2. Influence on the WRMP24.....	35
3.6.3 Consultation response	35
3.7 Global water recycling examples.....	36
3.7.1 Consultation themes	36
3.7.2 Influence on WRMP24.....	36
3.7.3 Consultation response	36
3.8 Wastewater releases.....	40
3.8.1 Consultation themes	40
3.8.2 Influence on WRMP24	40
3.8.3 Consultation response	40
3.9 Customer bills and share price	41
3.9.1 Consultation themes	41
3.9.2 Influence on WRMP24.....	42
3.9.3 Consultation response	42
3.10 Consultation process (for draft WRMP24).....	43
3.10.1 Consultation themes	43
3.10.2 Influence on WRMP24.....	43
3.10.3 Consultation response	43

3.11 Portsmouth Water commitment	44
3.11.1 Consultation themes	44
3.11.2 Influence on WRMP24	45
3.11.3 Consultation response	45
3.12 Portsmouth Water security of supply	46
3.12.1 Consultation themes	46
3.12.2 Influence on WRMP24	46
3.12.3 Consultation response	46
4. Option specific consultation feedback	47
4.1 Drinking water (safety, mitigation, acceptability and taste)	47
4.1.1 Consultation themes	47
4.1.1 Influence on WRMP24	48
4.1.3 Consultation response	48
4.2 Environmental assessment (construction)	50
4.2.1 Consultation themes	50
4.2.2 Influence on WRMP24	50
4.2.3 Consultation response	50
4.3 Environmental assessment (operation)	52
4.3.1 Consultation themes	52
4.3.2 Influence on WRMP24	53
4.3.3 Consultation response	53
4.4 Amenity and recreation	54
4.4.1 Consultation themes	54
4.4.2 Influence on WRMP24	54
4.4.3 Consultation response	54
4.5 Landscape and location of the scheme	55
4.5.1 Consultation themes	55
4.5.2 Influence on WRMP24	56
4.5.3 Consultation response	56
5. Public stakeholder engagement and consultation	56
5.1 Stakeholder engagement for WRMP24	56
5.1.1 Consultation themes	56
5.1.2 Influence on WRMP24	56
5.1.3 Consultation response	57

5.2 Future planned events, consultations and assessments 58

 5.2.1 Consultation themes 58

 5.2.2 Influence on WRMP24 59

 5.2.3 Consultation response 59

1. Introduction

Over a million homes and businesses depend on Southern Water and Portsmouth Water to supply their water. With an increasing population in the Southeast, climate change and tighter restrictions on how much water can be taken from the environment, we're looking to provide new sustainable sources of water that will be reliable into the future and help provide water in our region, especially during a drought.

This annex summarises the results of the public consultation on Southern Water and Portsmouth Waters' draft water resource management plans, specifically with regard to the Hampshire Water Transfer and Water Recycling Project (HWTWRP).

Southern Water received 591 responses to their consultation and Portsmouth Water received 273 responses relating specifically to the HWTWRP. The comments made or concerns raised by the respondents in respect together with our response to them, can be found in this document under each section.

As Southern Water are the beneficiary of the water arising from this this scheme, it is included as a primary option in their water resource management plan. As the owners of Havant Thicket Reservoir, a vital component of the scheme, Portsmouth Water acknowledge the scheme in their water resource management plan but derive no direct output benefits from it.

This latest dWRMP document is part of a long-running process of consultation on Southern Water's Water Resources Management Plan (WRMP) 2024. The first consultation on the proposed HWTWRP was held by Southern Water as a back-up option in the consultation on the West Southampton Desalination option, from 8 February until 16 April 2021. This was followed by a second public consultation, held from the 5 July to 16 August 2022, on the proposed HWTWRP. Consultation documents and feedback reports from these previous exercises are published on the Southern Water website: www.southernwater.co.uk/our-story/our-plans/water-for-life-hampshire/consultations.

This consultation on the two company Water Resource Management Plans ran for 14 weeks from the 14th November 2022 to the 20th February 2023

This annex refers to the following documents which can all be found on our website: [Water Resources Management Plan \(southernwater.co.uk\)](http://www.southernwater.co.uk/water-resources-management-plan)

- The Hampshire Water Transfer and Water Recycling Project (HWTWRP) - [hampshire-wtwp-2022-frequently-asked-questions.pdf \(southernwater.co.uk\)](http://www.southernwater.co.uk/hampshire-wtwp-2022-frequently-asked-questions.pdf)
- The Havant Thicket Reservoir (Approved Scheme) – <https://havant-thicket-reservoir.uk.engagementhq.com/>
- The 2022 draft WRMP24 – [Our Draft Water Resources Management Plan \(southernwater.co.uk\)](http://www.southernwater.co.uk/our-draft-water-resources-management-plan)

1.1 Overview

The *Hampshire Water Transfer and Water Recycling Project* (HWTWRP) is a major part of Southern Water's *Water for Life – Hampshire* programme. This proposed scheme will provide huge benefits for the county by securing vital water supplies for customers during a drought, while protecting the rare and sensitive chalk rivers – the River Test and the River Itchen – from which 'raw' water, required to supply homes and businesses is currently sourced.



The project is an innovative solution that combines water recycling technology with reservoir storage. It is being developed and delivered as a partnership project by Southern Water and Portsmouth Water. The companies are grateful to the feedback received during the draft Water Resource Management Plan 2024 (dWRMP24) consultation process and have carefully considered the points raised by individuals and stakeholder organisations to see if any changes to the plans are needed.

Understandably, the proposed changes to the way water is supplied to Southern Water and Portsmouth Water customers in Hampshire has prompted many questions and some concerns from customers of both water companies. This document is a response to these questions and concerns, but does not include information on every aspect of the plans. For further information about this project, please see our website:

<https://www.southernwater.co.uk/our-story/our-plans/water-for-life-hampshire>

This document sets out the responses by both water companies to the feedback received. These have been grouped in separate sections and by topic. The sections are numbered with references included in Portsmouth Water and Southern Water's respective Statement of Response documents.

The report is structured as follows:

1. Introduction -this covers the scope, purpose and structure of the document and the utilisation of the proposed HWTWRP option and how this has changed between the dWRMP24 and the revised dWRMP24.

2.The Havant Thicket Reservoir (Approved Scheme) - this describes the approved Havant Thicket Reservoir scheme which is under construction and has been granted planning permission. Consultation comments asked for further information on the scheme background, the mitigation plan for the scheme and the planning application process. Detailed replies to these consultation comments for further clarity can be found here.

3.Hampshire Water Transfer and Water Recycling Project - this responds to a wide range of consultation comments including the supply-demand challenge, the options appraisal and selection process, and a range of technical questions regarding the option.

4.Option Specific Consultation Feedback - this section provides technical responses and clarity to a range of consultation comments on drinking water standards, the environment, amenity and recreation and landscape and location of the scheme.

5.Public Stakeholder Engagement and Consultation: This section provides responses to consultation comments linked to the customer engagement to date, and future engagement planned as the option develops.

Each heading includes a clear statement on how the feedback in for the topic areas has influenced the development of the revised dWRMP24.

1.2 Changes between the Draft and Revised Draft WRMP24

This section gives details about the use of the approved Havant Thicket Reservoir and the proposed Hampshire Water Transfer and Water Recycling Project (proposed HWTWRP). This was as put forward in the original dWRMP24 (the 2022 view) and is now detailed in the updated revised dWRMP24 (the 2023 view).

Section 3.1 gives details of why this option has come about. It shows how the demand for water and the pressures on the local environment have led to this option being proposed.

1.2.1 Flow pathways

Figure 1 details the flow pathways associated with the approved Havant Thicket Reservoir scheme, the proposed Hampshire Water Transfer and Water Recycling Project (proposed HWTWRP) and another WRMP24 option associated with transferring water to the Sussex North Water Resource Zone (WRZ) in Southern Water's supply area.

At present, Portsmouth Water takes water from Source B Springs (element '5' in Figure 1) and sends this to Works A (Portsmouth Water) Water Supply Works (WSW) via a pipeline (element '8') to supply drinking water to Portsmouth Water customers (represented by element '9'). This process continues under the approved Havant Thicket Reservoir scheme and proposed HWTWRP.

Under the approved Havant Thicket Reservoir scheme, the only source of raw water for the approved Havant Thicket Reservoir is Source B Springs Source (element '5'), which is transferred to the reservoir via a pipeline (element '3'). During a drought, the raw water can then be taken from the reservoir and transferred to Works A (Portsmouth Water) WSW via a separate pipeline (elements '4' and '7'). This additional supply allows Portsmouth Water to send additional transfers of drinking water to Southern Water's Hampshire Southampton East WRZ.

Under the proposed HWTWRP, both the Source B Springs (element '5') and recycled water from Budds Farm wastewater treatment works (WTW) (via elements '1' and '2') can provide a raw water supply to the approved Havant Thicket Reservoir (via element '3'). The extra access to raw water then, in addition to the water provided by the reservoir itself, allows Portsmouth Water to also transfer raw water directly from Havant Thicket Reservoir to Southern Water's Otterbourne WSW (element '6') and then onto Southern Water customers in Hampshire.

In the long-term future there are also outline proposals for considering a third element being added to this scheme, should it be required. This additional element involves building a new pipeline to connect the Havant Thicket Reservoir to Southern Water's Pulborough WSW. This new pipeline would allow Portsmouth Water to transfer raw water directly to Southern Water's Sussex North WRZ for treatment and onward supply (element '10'), if necessary.

Schematic of System
Havant Thicket Reservoir

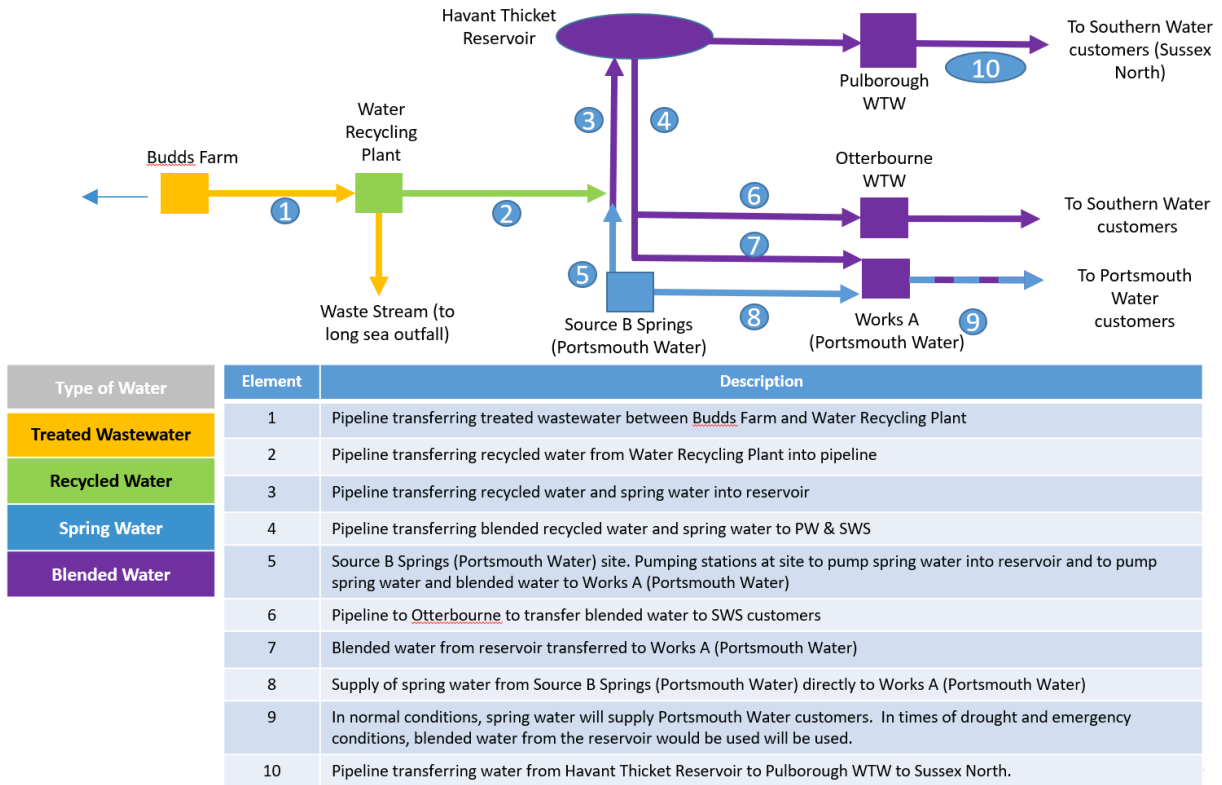


Figure 1: A schematic diagram showing the main elements of the Hampshire Water Transfer and Water Recycling Project.

1.2.2 Draft WRMP24

This section details the use of the approved Havant Thicket Reservoir and Hampshire Water Transfer and Water Recycling Project (proposed scheme) as proposed by the original dWRMP24 (the 2022 view). The section is split into Southern Water and Portsmouth Water supply zones.

In developing their WRMP24s, working with other water companies in the Southeast region, Portsmouth Water and Southern Water considered a wide range of possible supply-demand futures via nine ‘Situations’. The different situations considered included differing levels of climate change, population growth, and possible reductions in how much water we are licensed to take or abstract from the environment due to sustainability considerations. This form of ‘adaptive planning’, as the process is called, will help the companies monitor and shape their plans as time goes by. Further information on this adaptive planning approach is provided in the companies’ revised dWRMP24.

Need for water: a summary

All water companies in England and Wales are required under the Water Industry Act to prepare and maintain a Water Resources Management Plan (WRMP) every five years. Southern Water is currently working to address the immediate challenges for meeting the demand for water with the supply of raw water during drought conditions in Hampshire. This review is necessary due to the licence changes affecting the amount of raw water that can be abstracted from the River Test and the River Itchen, and future changes



expected, as set out in its WRMP24 submission. Southern Water's WRMP 2019 (WRMP19) was prepared to meet supplies in a 1-in-200 year drought with an overall supply-demand deficit for Hampshire – the difference between how much water is needed and how much is available - of around 192 MI/d¹ during periods of peak demand.

Southern Water is continuing to investigate the impacts of its abstractions in Hampshire. These investigations are likely to lead to further reductions in abstraction licences, as requirements to meet environmental flow targets under the Water Framework Directive and Habitats Directive are better understood. Southern Water has already agreed to licence reductions at its Andover source from 2027 and a cessation of abstraction from their Alresford source in the Candover Catchment is expected from 2030. Southern Water's revised dWRMP24 estimates that total further reduction in available supplies from existing resources during a drought could range from 33MI/d to 78MI/d by 2050.

Hampshire Water Transfer Water Recycling Project

Southern Water's dWRMP24 included the ongoing development of HWTWRP. The scheme has two separate component parts; a pipeline to transfer up to 90MI/d from Havant Thicket Reservoir to Otterbourne WSW (sized to account for future needs and mitigate against known risks), and a water recycling plant that could provide up to 60MI/d. Smaller capacity variants of the WRP (15MI/d, 30MI/d and 45MI/d) were also considered.

Option utilisation

Work done as part of dWRMP24 showed that Southern Water would require up to 85 MI/d from the proposed HWTWR; a bulk import of water from Havant Thicket Reservoir to transfer to Otterbourne WSW and relies on a 60 MI/d water recycling plant to supply the Havant Thicket Reservoir to make that scale of transfer available (Table 1).

Drought intensity	Results of flows modelled over all "Situations" for the Transfer	Results of flows modelled over all "Situations" for the Water Recycling Plant
Normal Year Annual Average	15 MI/d to <30 MI/d	12 MI/d to <30 MI/d
1:100 Dry Year Annual Average	61.59 MI/d to 78.17 MI/d	12 MI/d to 52.56 MI/d
1:500 Dry Year Annual Average and 1:500 in Dry Year Critical Period scenarios	22.5 MI/d to 85.4 MI/d	12 MI/d to 60 MI/d

Table 1: Option utilisation

¹ MI/d = Million or mega litres per day

The higher end of the ranges typically occur in the future with the increase demand on the network due to increases in population, sustainability challenges or climate change.

The lower end of the range under the 1:500 Dry Year Annual Average and 1:500 Dry Year Critical Period conditions is because a River Test Drought Permit/Order option under 1:500-year drought conditions is still available to use prior to 2040.

Portsmouth Water dWRMP24

Need for water: a summary

Portsmouth Water's dWRMP24 estimated that population growth could create a need for between 9MI/d and 31MI/d of extra water by 2075, with climate change leading to a further need for between 4MI/d and 10MI/d more water by 2075. Furthermore, to protect the rare chalk streams and rivers in the area, Portsmouth Water's dWRMP24 estimated that the company could lose between 33MI/d and 107MI/d from its existing supplies by the 2050s, which would also need to be replaced by an alternative source.

Havant Thicket Reservoir (Approved Scheme)

Portsmouth Water's dWRMP24 included the ongoing development of the Havant Thicket Reservoir and its first use in 2031-32, to support increased bulk supplies to Southern Water in the event of a drought. This was accompanied by a scheme to improve network connectivity to help unlock additional benefits from the approved Havant Thicket Reservoir scheme, by allowing Portsmouth Water to move water more flexibly within its supply area.

Options linked to water recycling

Portsmouth Water's dWRMP24 showed that for the majority of future supply-demand scenarios considered, Portsmouth Water did not require any additional water from the Havant Thicket Reservoir, apart from the volume needed to supply Southern Water.

However, with the additional proposal to provide high volumes of untreated raw water to Southern Water further into the planning period, an additional source of water to rainfall and spring water is required to fill the Havant Thicket Reservoir. The proposed HWTWRP provides this additional water. Under the core preferred plan, Portsmouth Water does not require additional water from Havant Thicket Reservoir for itself above and beyond that envisaged by the Approved Scheme. The extra water is to support the bulk supply of raw water to Southern Water.

Because the extra supply of raw water is required in Southern Water's dWRMP24 from 2030-31 (in the 2022 view), if the revised option were to be built, the water taken from the reservoir by Portsmouth Water to satisfy this need would be blended reservoir water (i.e. with contributions from rainfall, recycled water and spring water).

The majority of the Portsmouth Water dWRMP24 adaptive planning situations (seven out of nine) reflect the same situation described above, indicating that it is a likely scenario.

In future supply-demand scenarios based on higher population growth, greater than currently indicated in Local Authority plans, the investment model suggested that Portsmouth Water did require building up to 20MI/d of additional treatment works capacity at Works A (Portsmouth Water) WSW to supply its own customers. In these scenarios this additional volume could be provided by the proposed HWTWRP. This would allow Portsmouth Water to take a larger amount of water from Havant Thicket reservoir starting in

2048-49. This supply would need to be supported by recycled water from Budds Farm and this is the reason why Portsmouth Water highlighted recycled water in the 'adapting to change' section of its consultation document, rather than as a core component. Furthermore, the use of this source of water to Portsmouth Water in these high growth scenarios would only be possible if a new water transfer from Thames Water to Southern Water is built prior to that need which would be an alternative supply of water to Southern Water customers in Hampshire.

Option utilisation (normal / typical year versus a drought scenario)

Portsmouth Water's dWRMP24 (2022 view) included up to 25MI/d of blended water from Havant Thicket Reservoir under a range of conditions from 'normal year' (what you might expect to happen in a typical year) through to extreme drought (a 1-in-500 year event) in order to supply a transfer of water to Southern water for their western zones.

Further work since the development of the dWRMP24 has confirmed that water will only be taken from the reservoir under emergency scenarios such as drought. This makes sure the reservoir is full at the start of a drought. Therefore, under a normal year, Portsmouth Water customers would continue to receive spring water as they do now.

1.2.3 Southern Water revised draft WRMP24

Need for Water: a summary.

Since the publication of dWRMP24, there has been a revision to the planned delivery date of the proposed HWTWRP. This has also meant Southern Water delaying the implementation of some abstraction licence reductions, particularly within the River Itchen Catchment, to reduce future reliance on drought permits and orders. However, the overall magnitude of potential abstraction licence reductions across the period of the plan remains the same as those outlined in the dWRMP24, with a reduction of supplies in Hampshire during drought of up to 78MI/d by 2050.

Hampshire Water Transfer Water Recycling Project

Southern Water's revised dWRMP24 (2023 view) retains the proposed HWTWRP but with two changes:

The capacity variants of the water recycling plant have been revised to 20MI/d, 40MI/d and 60MI/d from 15MI/d, 30MI/d, 45MI/d and 60MI/d.

The delivery date has been revised to 2035-36 from 2030-31.

Ongoing development of the Hampshire Water Transfer Water Recycling Project (HWTWRP) in its two parts: Part 1 includes the Water Recycling Plant and transfer to Havant Thicket Reservoir, Part 2 being the transfer from Havant Thicket Reservoir to Otterbourne WSW.

The timing revision now signals the first use of the infrastructure as being 2035-36.

Option utilisation (normal / typical year versus a drought scenario)

Work done as part of rdWRMP24 showed that Southern Water would require up to 69 MI/d of untreated raw water from the proposed HWTWR; a bulk import of water from Havant Thicket Reservoir to transfer to Otterbourne WSW. This relies on a 60 MI/d water recycling plant to supply the Havant Thicket Reservoir (Table 2).

Drought intensity	Results of flows modelled over all “Situations” for the Transfer	Results of flows modelled over all “Situations” for the Water Recycling Plant
Normal Year Annual Average	20 MI/d to 45 MI/d	27 MI/d to 60 MI/d
1:100 Dry Year Annual Average	61 MI/d to 63 MI/d	20 MI/d to 56 MI/d
1:500 Dry Year Annual Average and 1:500 in Dry Year Critical Period scenarios	35 MI/d to 69 MI/d	20 MI/d to 60 MI/d

Table 2: Option utilisation (normal / typical year versus a drought scenario)

The higher end of the ranges typically occur in the future with the increase demand on the network due to increases in population, sustainability challenges or climate change. We note that further material changes may emerge in relation to timing and need for HWTWR as a result of ongoing modelling work, and if this is the case, we will ensure these changes are fully and appropriately consulted on.

Portsmouth Water revised dWRMP24

Need for water: a summary

Since the dWRMP24 (2022 view), all water companies that form part of the Water Resources South East (WRSE) group, have continued to refine key components of their WRMPs. For Portsmouth Water this includes further understanding of its 2050 environmental destination i.e. the scale of the sustainability reductions that might be required by 2050 to protect rare chalk streams and rivers in the area. The environmental destination has been updated to better reflect the outcome of one of its investigations on the River Itchen. Overall, this work has concluded that more water needs to be left in the environment than originally planned. To compensate for this, the revised dWRMP24 (2023 view) now has a greater need for new water than previously.

Havant Thicket Approved Scheme

Portsmouth Water’s revised dWRMP24 continues to include the approved Havant Thicket Reservoir. However, it is now estimated to provide benefit from 2031-32 instead of 2029-30. The delay is the result of an opportunity to future proof the pipeline tunnel in the approved scheme. The pipelines put inside the single tunnel would only initially be used by Portsmouth Water to fill the reservoir with spring water and take water out again. They would not be used for recycled water unless, and until, the HWTWRP has received the official go ahead to proceed and has been constructed.

The Portsmouth Water revised dWRMP24 (2023 view) also continues to include the Source O Booster Upgrade option to help unlock additional supplies from the Approved Scheme, although it is not required until 2039-40 (instead of 2029-30 in the dWRMP24 (2022 view)). This is because the option no longer includes a benefit (MI/d) in a normal year scenario (a typical year) i.e. it would only be used to increase supplies in a drought.

Options linked to water recycling

Further work completed by Portsmouth Water since dWRMP24 has shown that Portsmouth Water would need more water from the Havant Thicket Reservoir than was originally envisaged under the Approved Scheme. In Portsmouth Water's rdWRMP24 adaptive planning 'Situation 4²', the plan suggests that from 2046-47 Portsmouth Water requires additional water from Havant Thicket Reservoir for its own use, above and beyond that envisaged by the Approved Scheme. The proposed HWTWRP can provide this extra water for Portsmouth Water customers. To support this extra demand the plan suggests the reservoir could need additional recycled water to be put in the reservoir, meaning the water taken would be blended reservoir water (i.e. with contributions from rainfall, recycled water and spring water).

The plan suggests the scale of this need would require up to 20 MI/d of additional treatment works capacity at Works A (Portsmouth Water) WTW from the mid to late 2040s and a new 10 MI/d WTW at the location of service Reservoir C (Portsmouth Water) from the early 2050s. These options are predicated on the prior construction of the proposed HWTWRP scheme for Southern Water.

Three out of nine Portsmouth Water rdWRMP24 adaptive planning situations broadly reflect the situation described above. These are associated with a 'high' environmental destination i.e. scenarios where there are larger reductions to Portsmouth Water licensed abstractions to protect flows in Chalk rivers. In the remaining six situations, there is no need to build additional treatment capacity or take additional blended reservoir water.

Option utilisation (normal / typical year versus a drought scenario)

Since the development of the dWRMP24 (2022 view), Portsmouth Water has confirmed that the design assumption for the approved scheme is such that water will only be taken from the reservoir under emergency scenarios such as a developing drought. This protects the drought resilience benefit offered by the reservoir (i.e. it makes sure the reservoir is full at the start of a drought). This design assumption is included within the Portsmouth Water rdWRMP24, although later in the plan there is a small dependency on recycled water in a normal / typical year beyond 2050 (up to 10 MI/d). This implies a more regular abstraction from the reservoir. Portsmouth Water will seek to remove this dependency in the next water resources management plan (WRMP29) via the consideration of new options, although the need for recycled water in a drought is expected to remain.

Portsmouth Water customers and recycled water

The use case for the reservoir, with or without the recycled water element, is that it will only be used to provide resilience to public water supplies in a drought scenario. Therefore, under normal circumstances, the way water is supplied to Portsmouth Water customers will not change and reservoir water (whether blended with recycled water or not) will not be used.

During a drought, water in the reservoir will be used to guarantee that public water supply is maintained. At present, this is likely to be an infrequent event. However, the risk will be reassessed every five years within future WRMP's. Every subsequent WRMP will assess the impact of climate change, growth, environmental

² Situation 4 is one of nine situations (or scenarios) that we have looked at to comply with the guidance. We describe these situations in more detail within our revised draft WRMP. Situation 4 is the preferred situation that we use to populate our WRMP24 planning tables

challenges on this assumption and the conclusions shared and consulted on with Regulators and Customers – as is happening with this plan.

If the use of the reservoir is triggered by a developing drought scenario and the HWTWRP has been given approval and been constructed, then the Portsmouth Water customers who might receive blended water in the event of a drought in the 2030s and 2040s would likely include customers in Havant and Portsmouth, although other customers around the periphery could be provided with this water if needed. Works A (Portsmouth Water) WSW currently supplies water to around 30% of Portsmouth Water’s customers and this percentage would increase if new treatment work’s capacity were developed.

As with water from rivers or reservoirs, recycled water can only be used as drinking water after further treatment. All water leaving treatment and entering the public water supply, no matter its source, must meet the very strict legal standards for drinking water, quality set out by the Drinking Water Inspectorate. The standards are set out in UK legislation under guidance from the World Health Organisation. This includes the key areas of bacteriological and viral quality.

2. Havant Thicket Reservoir (Approved Scheme)

This section describes the approved Havant Thicket Reservoir scheme which is under construction and has been granted planning permission. Consultation comments asked for further information on the scheme background, the mitigation plan for the scheme and the planning application process. Detailed replies to these consultation comments for further clarity can be found in this section. This scheme is separate to the HWTWRP.

2.1 Havant Thicket Reservoir (Approved Scheme) background

2.1.1 Consultation themes

This section relates to the approved Havant Thicket Reservoir scheme which formed part of WRMP19 for Portsmouth Water and Southern Water. During the consultation, respondents asked for further information about the reservoir, including:

- Can Havant Thicket Reservoir be used to prevent abstraction from chalk streams in the summer months?
- What are the excess flows from Source B Spring Source (Portsmouth Water) on a daily basis and how do the flows change throughout the year?
- The objective of the approved Havant Thicket Reservoir in terms of funding and resulting abstraction reductions.
- Confirmation of the completion date of the reservoir and if any delays would jeopardise the plan.

The following section provides further information on the approved Havant Thicket Reservoir scheme and responses to the consultation themes.

2.1.2 Influence on the WRMP24

The consultation comments in relation to the approved Havant Thicket Reservoir scheme have not resulted in a change in the plan.

2.1.3 Consultation response

Havant Thicket Reservoir is an environmentally-led project. Its purpose is to protect two of Hampshire's globally rare chalk rivers – the River Test and the River Itchen. Southern Water, which supplies water to customers across a large part of Hampshire, has been instructed by the Environment Agency to protect these rivers by reducing the amount of water it takes from them during a drought. This means the company needs to find new sustainable sources of water to maintain supplies to its customers in Hampshire to make up for the loss of supplies from the rivers.

Portsmouth Water is in a position to help with this major challenge because of the large number of natural springs in the Havant area which currently provide ca. 30% of the company's total water supply. In the winter and other periods of high groundwater levels, there is more water coming from the springs than Portsmouth Water needs for its own customers, and this surplus water flows straight out to sea. Depending on the time of year, and level of rainfall, these excess flows from Source B Spring Source (Portsmouth Water) can be up to 80 million litres a day (Ml/d). This excess water can be stored in the Havant Thicket Reservoir and subsequently used to supply to Southern Water in the event of a drought.

This will enable Portsmouth Water to share water from its network with Southern Water and makes water supplies much more resilient across the whole region.

Portsmouth Water received formal planning permission for the Havant Thicket Reservoir scheme in October 2021, and work has now started on site. Once complete, the reservoir will hold up to 8.7 billion litres of water and will be able to supply 21Ml/d of treated drinking water via Works A (Portsmouth Water).

The two main contracts for the construction of this facility have been awarded; one for the reservoir itself and another for the pipeline to take water from the springs to the reservoir. Future Water is building the reservoir itself, and Ward and Burke will be constructing the pipeline necessary which will take water from the Source B Spring Source (Portsmouth Water) through Havant to fill the reservoir and subsequently draw the water back out when needed.

The approved Havant Thicket Reservoir scheme and subsequent transfer of treated water to Southern Water was included in the WRMP19 strategy as a mitigation to both offset supply-demand deficits introduced by abstraction licence changes in 2019 and to allow Southern Water to reduce reliance on drought permits and orders, specifically on the River Itchen and Candover. It would also allow Southern Water to accommodate future sustainability reductions which are expected to come in for River Itchen and River Test abstraction licences. The reservoir is funded by Southern Water, please see: [A New Reservoir in the South East | Portsmouth Water.](#)

The Havant Thicket Reservoir was originally designed to provide benefit from 2029-30 but is now forecast to provide benefit from 2031-32. The reforecast delivery date is the result of an opportunity to future proof the pipeline tunnel included within the approved scheme to accommodate the HWTWRP. The pipelines put inside the single tunnel would only initially be used by us to fill the reservoir with spring water and take water out again. They would not be used for recycled water unless, and until, the HWTWRP has received the official go ahead to proceed and has been constructed. This revised timeline has no impact on Portsmouth Water's WRMP24 as the reservoir is designed to support Southern Water.

Southern Water will undertake a further consultation, including the Havant Thicket Reservoir revised schedule, in the second quarter of 2024. The delay will be addressed in their revised draft WRMP. As part of their revised draft WRMP submission Southern Water will be setting out a mitigation strategy to offset potential for increased reliance on drought permits and orders as a result of the new timeline.

2.2 Havant Thicket Reservoir (Approved Scheme) mitigation

2.2.1 Consultation themes

A number of the consultation comments related to the environmental mitigation of the Havant Thicket Reservoir and respondents requested additional information or considerations. These included:

- General concern regarding the proposed HWTWRP and its potential impacts on the environmental objectives of the Havant Thicket Reservoir as a 'first and foremost environmentally-led project'.
- Suggestion that due to the perceived risk of environmental damage from the approved Havant Thicket Reservoir, the proposed HWTWRP should be reconsidered. This relates to wildlife and local amenity predominately. The respondent questioned if alternative solutions to the approved Havant Thicket Reservoir could be found.
- Recommendations by Historic England to help mitigate identified harm and highlight opportunities for enhancement to the historic environment.

- Concern that the approved Havant Thicket Reservoir would not achieve Biodiversity Net Gain (BNG) due to the loss of irreplaceable ancient woodland (which makes BNG not possible).
- Further clarity on how to balance – or mitigate -the loss of ancient trees and woodland.
- Concern about the indirect loss of woodland needed to establish and maintain the site and the need to minimise or avoid the risk.
- Concern that the importance of full canopy ancient woodland does not seem to be recognised and the package of mitigation includes management of existing woodlands already owned by water utilities which have been neglected for decades.
- The need for full mitigation of greenhouse gas emissions from construction and operation.
- The need for additional measures to address the dip in carbon capture between the felling of mature trees in 2023 and the maturing of new saplings, covering a 10 to 20-year period.

2.2.2 Influence on WRMP24

The consultation comments in relation to the mitigation measures for the approved Havant Thicket Reservoir scheme have not resulted in a change in the plan as the Approved Scheme reservoir was part of WRMP19 and planning permission has already been granted. Further clarity on this is in the following section. Portsmouth Water is continuing to work with local interest groups and the Local Authorities regarding the commitments made in its planning approval for the approved Havant Thicket Reservoir scheme.

2.2.3 Consultation response

Havant Thicket Reservoir is an environmentally-led project. Its purpose is to provide a new, sustainable source of water which will allow Southern Water to reduce abstraction from sensitive chalk streams – the River Test and the River Itchen – in Hampshire. During the original planning application, Portsmouth Water committed to ensuring the scheme would provide additional community and environmental benefits. This position has not changed. Portsmouth Water will not give its support to the proposed HWTWRP if there is any doubt over either the safety of this water, or if the HWTWRP might impact on the environment and leisure commitments it has made.

In usual circumstances, planning permission would not be granted to remove ancient woodland, such as the area known as 'The Avenue', on the site. That is why in the approval of the scheme, Portsmouth Water is required to undertake significant environmental mitigation and compensation works.

Portsmouth Water recognises that the canopy of woodland on site cannot be replaced by planting new trees. That is why it has developed a much wider programme of environmental works which includes carrying out extensive improvements to established woodland locally, for example in Southleigh Forest and Havant Thicket. It is also entering into an agreement with a local landowner to rewild 80 hectares of agricultural land to woodland, wood pasture and grassland and launching a capital grants scheme to enable community-led local environmental projects. As part of this work, it has relocated more than 200 adolescent trees from site and is reusing ancient woodland soil to support these new areas of planting. Taken overall, these projects will deliver a significant environmental net gain for the area. In addition, many of the felled Oak trees will be used in the construction of the visitor centre.

Portsmouth Water was granted planning permission for Havant Thicket Reservoir, and the required removal of The Avenue, because of the exceptional need to protect world-renowned habitats, the River Test and the River Itchen, in Hampshire by providing a new sustainable source of water. Chalk rivers are some of the rarest habitats in the world and Southern Water has entered into a long-term agreement with the Environment Agency to significantly reduce abstraction of water from these rivers.

Many years of research went into preparing the planning applications for a new reservoir, including the consideration of more than 70 alternative sites before selecting the current site. It was the most suitable because of its underlying geology and the fact it is close to a sustainable source of water (rare springs which currently flow out to sea during winter).

Other investigated sites were located too far from a sustainable water source, were not large enough to supply the water required, or were home to larger areas of woodland. Portsmouth Water also looked closely at options for a smaller reservoir, however, it could not provide the amount of water needed.

Portsmouth Water's environmental plans involve both onsite and offsite commitments that include planting and improving more than 200 hectares of woodland and wood pasture and creating a new wetland on the northern shore of the reservoir to support local bird species.

Trees will sequester carbon at different rates. Young, fast-growing trees will capture carbon dioxide at a quicker rate than mature trees. Portsmouth Water has committed to planting and improving more than 200 hectares of woodland and wood pasture in mitigation for the removal of 12.5 hectares of woodland on site. More than 6,000 trees have already been planted, in addition to projects to translocate more than 250 young trees from within the reservoir footprint and working with volunteers to replant young saplings and grow 200 oaks from seed.

As part of the company's environmental mitigation strategy agreed with the Environment Agency, 5.5km of watercourse restoration is planned onsite and in local offsite locations.

Portsmouth Water is carrying out environmental work in Havant Thicket woodland which includes introducing a wider variety of broadleaf woodland and improving the ponds and ephemeral streams there. As part of its off-site mitigation work, it is carrying out significant improvements to local woodland, Southleigh Forest. Southleigh Forest is situated in an area that appears to be a local stronghold for the Bechstein's bat and as such its restoration would be extremely beneficial for this species, as well as other bat species.

The company has been monitoring the reservoir site and surrounding areas since 2005 and has a detailed awareness of the wildlife present and how to relocate species in the safest possible ways. All this work is strictly regulated and is being carried out under licences from Natural England.

Significant measures are being taken to ensure wildlife is not harmed and that animals are not present during construction works. Portsmouth Water's ecologists have translocated aquatic plants (macrophytes) and macroinvertebrates such as larvae from the site to appropriate nearby watercourses. Specialist ecologists also inspected trees prior to removal to make sure no protected wildlife was present.

Prior to any work starting, ecologists created new habitats for bats, dormice, reptiles and other wildlife to move into. This included installing around 200 bat boxes and around 300 dormice boxes in nearby woodland. With the help of volunteers, Portsmouth Water has already planted over 6,000 trees on the site and has relocated saplings from The Avenue to be replanted nearby. In addition, volunteers have worked hard to relocate bluebells and have planted an 'acorn nursery' to grow oaks from the acorns found on site. We discuss bio-diversity net gain in our main Statement of Response.

Carbon emissions were one of the factors that WRSE considered when evaluating alternative schemes to secure future water supplies for the South East. The reservoir has a lower energy consumption than other options. The shape of the site is such that an embankment will only be needed around 60% of the reservoir perimeter and all clay needed to build the watertight embankment is available on site and will not need to be imported. Other sites did not offer these major advantages. It is considered achievable for the reservoir operation to become carbon neutral by 2031/32, meeting the requirements set by the planning policy.

Historic England made a number of recommendations as part of the planning approval process for Havant Thicket Reservoir. A detailed level of recording has been undertaken to preserve the historic significance of The Avenue. A Level 3 recording of the features being lost was proposed, following Historic England's

guidance *Understanding the Archaeology of Landscapes: A Guide to Good Recording* (2017). The purpose of the historic landscape and built heritage recording was to produce an archive to preserve by record the significant features in order to retain their significance and relationship with the development of the Leigh Park Grade II* Registered Park and Garden and the Sir George Staunton Conservation Area. Landscaping will also be undertaken, to integrate the reservoir into its surroundings.

2.3 Havant Thicket Reservoir (Approved Scheme) planning application

2.3.1 Consultation themes

Several of the consultation comments related directly to the planning application process for the approved Havant Thicket Reservoir scheme. In summary there was some concern that the proposed HWTWRP was 'smuggled in' and was intentionally not included in the original planning application. The following provides a summary of the main themes raised by respondents:

- Concern that the proposed HWTWRP was added by stealth (and is considered as unethical) as it was not part of the approved Havant Thicket Reservoir scheme planning application. Some respondents said they felt they were lied to and manipulated into supporting the original planning application and not provided with sufficient information on the proposed HWTWRP at the time.
- If the proposed HWTWRP had been included with the original planning permission, it would have led to objections which may have altered the planning approval. Several respondents questioned if this was planned as Portsmouth Water and Southern Water knew the proposed HWTWRP would be unpopular and there is a lack of trust in Southern Water.
- The proposed HWTWRP does not comply with the terms of planning permission granted to Portsmouth Water.
- Planning permission and local support was given based on the reservoir being filled with spring water, not treated wastewater. Respondents questioned why the plan of diverting winter spring water was changing.
- Concern that the original plans were framed as a leisure and wildlife facility for residents.
- The original plans for the reservoir should be upheld and not changed to suit Southern Water.

2.3.2 Influence on WRMP24

The consultation comments in relation to the approved Havant Thicket Reservoir planning application has not resulted in a change in revised dWRMP24 or the proposed HWTWRP but further clarity is provided below.

2.3.3 Consultation response

At the time Portsmouth Water submitted the original planning application for Havant Thicket Reservoir, desalination produced at a new site on the West Southampton coast was Southern Water's preferred option under its Water for Life – Hampshire programme. During the planning application process, Portsmouth Water and Southern Water had discussed alternative options as a back-up to desalination, including recycled water, but at this point they were simply options.

Information was shared about water recycling during Portsmouth Water's original planning process for the Havant Thicket Reservoir. During the Planning Committees' meetings, members raised questions about the scheme and it was highlighted that any changes to the current application would require separate planning

approval, as is still the case. There is a written record of this in the [minutes](#) (see pages 4, 10 and 32 within the linked file) and information about the scheme was also shared with Havant Borough Council's Planning Committee for consideration in this [public document](#) (see page 3). This was also publicised ahead of both Planning Committees through Southern Water's [consultation](#) on its desalination plans which ran from 8th February until 16 April 2021. Portsmouth Water was open and upfront about these proposals, answering questions with the information available at the time.

The planning permission for the approved Havant Thicket Reservoir is different to any required for the proposed HWTWRP. Please refer to Section 5.2 for the requirements of the proposed HWTWRP.

If the proposed HWTWRP were to go ahead, spring water would continue to be stored in the reservoir in line with the original approved plans for the scheme.

Havant Thicket Reservoir is an environmentally-led project. Its purpose is to provide a new, sustainable source of water which will allow Southern Water to reduce abstraction from sensitive chalk streams – the River Test and the River Itchen – in Hampshire. The planning application was for the construction of a reservoir for raw water storage which would provide additional community and environmental benefits. See planning documents: <https://havant.moderngov.co.uk/documents/s37806/Report.pdf>

Initial investigations suggest that recycled water would be cleaner than the spring water entering the reservoir and there is no reason for it to impact the planned facilities at Havant Thicket Reservoir. Please refer to Section 4 for further details on the scheme.

Please refer to Section 3.11 for Portsmouth Water's commitment to the scheme.

3. Hampshire Water Transfer and Water Recycling Project

3.1 The WRMP24 Supply Demand Balance challenge

3.1.1 Consultation themes

A range of consultation comments questioned the need for the proposed HWTWRP. The following key points were raised by respondents:

- Why is there a need to develop the proposed HWTWRP considering the high amounts of rainfall we get in the UK?
- Assumption that with the development of the approved Havant Thicket Reservoir, the companies would be self-sufficient for water and that this would be enough to reduce pressures on the River Itchen.
- Is the requirement for the proposed HWTWRP a result of previous lack of investment in infrastructure?
- Why is water recycling needed when the winter spring water is enough to keep the reservoir topped up?
- Acknowledgement of the benefits of using recycled water in drought-stricken countries for agricultural and other uses (not drinking water) but concern that Hampshire does not count as one of these areas.
- Suggestion for the need for an independent oversight of the companies' assessment of need for the scheme.

3.1.2 Influence on WRMP24

The consultation comments have not resulted in a change to the revised dWRMP24 but further clarity is provided below.

3.1.3 Consultation Response

Section 1.2 details the expected utilisation of the option and how this has changed between the draft and revised draft WRMP24. This following section details the supply demand balance, which resulted in the need for the option.

Southern Water

The proposed HWTWRP is a major component of Southern Water's Water for Life – Hampshire programme.

The Water for Life – Hampshire programme is driven by reductions in the amount of water Southern Water can take from the River Test and the River Itchen. In 2018, the Environment Agency revised Southern Water's abstraction licences in Hampshire in order to protect these sensitive chalk streams. This significantly reduced the amount of water the company can take from the River Test and River Itchen.

South East England is classed as water-stressed by the Environment Agency. The pressure on water resources is amplified by the impacts of climate change, population growth, an increasing expectation that more water is left in the environment, and the requirement that water companies plan for more severe 1-in-500-year droughts by 2040.

Southern Water supports this reduction as it will help protect the wildlife that lives in and around these rivers during a drought. However, the 2018 licence reduction means the loss of a significant proportion of the water available for public supply during drought (up to 200MI/d, see table). In the future it is likely that both Southern Water and Portsmouth Water will need to make further reductions to their abstractions in Hampshire to meet ever-tightening environmental targets.

It is clear therefore that in order to provide resilient supplies for the future, Southern Water will need to effectively find a similar amount of water to its current supplies through a combination of water efficiency, leakage reductions and new sources. Southern Water's revised dWRMP24 estimates that up to an additional 90MI/d of water will need to be found by 2050. The majority of this additional water will be needed to replace existing abstractions from the environment as set out in the following table:

Reductions in Public Water Supply (Deployable Output) during a 1 in 200 drought (MI/d)				
Date				
2018 Licence Changes and other confirmed reductions	-105	-61	-3	-169MI/d
WRMP19 forecast for 2024-2027	0*	-26	-26	-52MI/d
Updated WRMP24 Forecast Long Term (2024-2050) Future Licence Changes to meet Long Term Environmental Destination	0*	Up to -32	Up to -58	Up to -90

*The 2018 licence changes mean that there is already no water available from the River Test during drought except under a drought permit or order

While Southern Water works to deliver those solutions in the near term, it is reliant on drought permits and drought orders to maintain supplies. However, these are not sustainable in the long term and have potentially adverse impacts on the River Test and the River Itchen. The proposed HWTWRP will allow Southern Water to reduce that reliance and therefore reduce impacts on these sensitive and protected chalk streams.

This document is focused on Southern Water's supply in the Hampshire area. There are additional supply-demand balance needs in the wider region which link to the Havant Thicket Approved Scheme and the proposed HWTWRP as described below.

- Southern Water's dWRMP24 identified the need for a bulk import from Havant Thicket Reservoir to Pulborough WSW in its Sussex North WRZ under some supply-demand scenarios. The approved Havant Thicket Reservoir is needed in conjunction with the proposed HWTWRP for this transfer to Sussex North WRZ. In addition, Southern Water also needs a transfer from Thames Water to Hampshire to offset the loss of supply to the Hampshire area from the Havant Thicket Reservoir.

- Portsmouth Water's dWRMP24 identified a significant supply-demand deficit, largely resulting from the need to meet sustainability reductions in its current abstraction licences. Portsmouth Water has updated its supply and demand forecasts for revised dWRMP24. The outcome of this indicates a greater supply-demand deficit largely due to higher sustainable abstraction reductions (as detailed in Section 1.2).

Southern Water and Portsmouth Water will continue to work and engage with the Environment Agency and Ofwat regarding the development of the proposed HWTWRP. The evidence for the need for the scheme was set out in the company's dWRMP24 which was shared with regulators and stakeholders including Ofwat, the Environment Agency and Natural England. It will also be included in Southern Water's revised dWRMP24.

3.2 Options appraisal process

3.2.1 Consultation themes

The consultation feedback had multiple comments regarding options appraisal and the potential of alternative options to the proposed HWTWRP. The key comments from respondents are as follows:

- The need for evidence that a robust range of alternative options (supply and demand) have been considered in terms of feasibility, costs and environmental assessments. Overall concern that a lack of alternatives may favour the proposed HWTWRP.
- A range of consultation comments questioned if alternative options have been considered, which include:
 - Options to collect and store rainfall, high river flows and run-off in reservoirs and aquifers. In particular during wetter winters linked to climate change (to reduce flooding). This also included options to separate rainfall from sewerage.
 - Permanent hosepipe bans (temporary use bans) to reduce customers' water demand.
 - Greater reductions in leakage, which could also occur sooner, and questioned if Southern Water could increase the rate of mains replacement to reduce leakage and bursts.
 - Greater demand reductions for both households and non-households through initiatives such as grey water recycling in homes and gardens, water butts and building standards by 2040 rather than 2050.
 - Use of treated wastewater for alternative uses (such as industry, golf courses, firefighting), rather than drinking water.
 - Further consideration of options which work with nature and bring wider benefits.
 - Further consideration of options that were previously rejected, such as water transfers to neighbouring water companies.
- Concerns around a lack of transparency over the options appraisal process which resulted in the proposed HWTWRP being selected, and recommendation for the process to be completely undertaken again. Respondents highlighted that the scoping of options in the options appraisal is not visible.
- Concern that some 'greener solutions' considered through the options appraisal have now been deferred to 2029. It was suggested that deferring these solutions may influence the available options.

Option selection is covered in Section 3.3.

3.2.2 Influence on WRMP24

The consultation feedback on options appraisal process has not resulted in any changes to the proposed HWTWRP in the revised dWRMP24, but additional clarity is provided below.

3.2.3 Consultation response

Southern Water's WRMP19 included a desalination plant on the West Southampton Coast along with demand management and other supply schemes in Hampshire at Fawley was identified as part of the options appraisal process supporting the development of our Water Resources Management Plan 2019. This scheme was included in Southern Water's final WRMP19 as the preferred option for resolving the supply-demand balance in Hampshire. Also making up the supply-demand balance were pressing commitments in relation to consumption, leakage, catchment management and other new infrastructure schemes.

Desalination on the West Southampton Coast was considered viable as the technology has been used elsewhere in the UK, most notably in the Thames estuary.

Southern Water was asked by regulators to consider the feasibility and deliverability of a number of alternative options to desalination at Fawley.

In 2020 and 2021, Southern Water carried out detailed assessments to determine if the desalination scheme was the right solution to develop further in preference to other alternatives.

The outcomes of these assessments were provided to regulators as part of the Regulators' Alliance for the Progression of Infrastructure Development (RAPID) gated process as well as being made publicly available. RAPID is made up of three regulators of the UK water sector Ofwat, the Environment Agency and the Drinking Water Inspectorate, with Natural England acting as conservation adviser. The consultation documentation included a thorough evaluation of the various options against a number of planning, environmental, socio-economic and cost criteria, as well as legal and policy obligations and wider strategic objectives. The options appraisal process tested the benefits and impacts of the various options against one another, and determine which option was overall the most preferable option.

The work confirmed the likelihood of adverse impacts of the desalination option on the marine environment and on the New Forest National Park during construction and operation phases. Based on the multiple criteria used in the assessments, the West Southampton Coast desalination option emerged as the least preferable option. The likely impacts of the desalination plant and its associated pipelines meant that the proposal was not considered to be deliverable in this location at this time, particularly in view of the other alternatives.

Based on the assessments of all potential options against a standard set of criteria, the proposed HWTWRP was considered to be the most appropriate long-term solution. The inclusion of a water recycling component to the approved Havant Thicket Reservoir scheme provided greater resilience to both Southern Water and Portsmouth Water against further reductions in abstractions from the environment in the future. At the same time, the options appraisal process confirmed a combined option involving both water transfer and water recycling solutions - the Hampshire Water Transfer and Water Recycling Project i.e. the proposed HWTWRP - as the most preferable option. This option performed well across the range of criteria considered and the addition of water recycling provided important adaptability to address a larger proportion of the water supply deficit than the water transfer option could achieve on its own.

A similar combined solution, utilising a new lake for water storage rather than the approved Havant Thicket Reservoir, and involving a larger water recycling plant (75Ml/d), emerged as the second most preferable solution. This option provides a 'back-up' option in case the proposed HWTWRP cannot be delivered. However, this option is not currently being progressed through the consenting process. The key

differentiators between the back up option and the Hampshire Water Transfer and Water Recycling Project (or proposed HWTWRP) were that the proposed HWTWRP presented significantly better value for customers than the back-up option, and a shorter delivery schedule, as well as being better able to meet long-term regional supply requirements.

The full Options Appraisal Process is set out in detail in RAPID Gate 2, Annex 5 and available here: www.southernwater.co.uk/our-story/our-plans/water-for-life-hampshire/technical-documents

In addition to progressing with the proposed HWTWRP, Southern Water has included a number of measures in its revised dWRMP24. These include:

- a. Reducing Per Capita Consumption (PCC) under dry year conditions to 110 litres per head per day (l/h/d) by 2045. This is 5 years earlier than the 2050 target year set by the regulators.
- b. Reducing non-household consumption by 9% by 2037-38.
- c. Reducing leakage by 50% by 2050.

Southern Water is now in the process of developing its WRMP24. All water resource options which are included in a WRMP are selected through a formal plan development process, which is overseen by Defra, the Environment Agency, Natural England and Ofwat (the economic regulator for the water industry) with close scrutiny by the Consumer Council for Water, the consumer watchdog for the water industry, and which the public is consulted on as part of a statutory process. Southern Water is also working closely with the regional group, Water Resources South East (WRSE), and other water companies in our region to ensure the regional need for water supply can be met.

The Hampshire Water Transfer and Water Recycling Project is a major component of Southern Water's Water for Life – Hampshire programme. Due to the size of the water deficit in Hampshire, other measures under the programme are also required, including:

- Funding the new Havant Thicket Reservoir, which is being built by Portsmouth Water.
- Funding the Thames to Southern Transfer (T2ST) scheme
- Reducing leakage (by 15% by 2025, 40% by 2040 and 50% by 2050 from a 2017-18 baseline).
- Helping customers reduce their water use to 100 litres a day.
- Working with landowners to ensure that they don't impact the water quality of the rivers for wildlife or supply.

The full Options Appraisal Process is set out in detail in the Regulators' Alliance for Progressing Infrastructure Development (RAPID) Gate 2, Annex 5 and available here: www.southernwater.co.uk/our-story/our-plans/water-for-life-hampshire/technical-documents

Southern Water's dWRMP24 (2022 view) produced three leakage scenarios which achieved a range of leakage reductions in line or exceeding the National Infrastructure Commission's targets of halving leakage by 2050. The most ambitious leakage scenario was selected for the preparation of the dWRMP24.

Southern Water's target level of service for Temporary Use Bans is 1 in 10 years, and the implementation of these have been supported by customers since 2010. The 2018 licence changes to our River Test and River Itchen abstractions and the actions we have agreed with the Environment Agency as part of our Section 20

Agreement³ mean that, based on our assessment of flows in the River Test we are likely to need to implement more frequent Temporary Use Bans in practice, than our target. This is likely to remain the case while we are reliant on Drought Permits and Orders for the River Test and River Itchen to maintain supplies and a long-term solution for Hampshire's water supplies is delivered.

In order to achieve these targets, Southern Water plans to replace all its existing household meters with 'smart' meters that can collect and transmit data in near real-time, by the end of 2029-30. This would provide the company with a platform to promote water efficiency in conjunction with other initiatives at an earliest possible date. Southern Water implemented the bulk of its Universal Metering Programme over one five-year planning cycle (2010-15). As part of the programme, the company installed over 500,000 new meters to increase its domestic meter penetration to over 87%. The replacement of all existing domestic meter stock by 2029-30 is therefore a realistic and achievable target.

Similarly, the majority of non-household meters (including industry, golf courses etc) will be replaced by smart meters by 2029–30 with full replacement by 2034–35. As part of our strategy to achieve 9% reduction in non-household demand by 2037–38. The use of treated wastewater is considered for non-household use, however, the higher salinity and risk of inappropriate use limits the locations this can be implemented.

Southern Water is also revising its mains replacement programme as it is important to replace infrastructure at an appropriate rate to meet the future service standards. This is likely to include a mixture of mains replacement of both trunk main and non-trunk main pipes. Given that 80% of leaks are identified and repaired on service pipes, the plan is to target infrastructure replacement on Southern Water's service pipe assets.

3.3 Option selection

3.3.1 Consultation themes

The consultation feedback raised a number of points regarding the selection of the proposed HWTWRP and why it was selected over other options. Points made by respondents include:

- The scheme requires considerable infrastructure to be built, use of chemicals and a high amount of energy and cost. Why was the proposed HWTWRP selected over other options which require less infrastructure, cost and/or energy, and are considered 'greener' as well as reducing the impact on reservoirs? These options should be considered first.
- Why was the proposed HWTWRP selected in comparison to further demand reductions options and other supply schemes, such as storage of rainfall and winter river flows.
- The proposed HWTWRP is not 'best value' and does not show consideration for customer preferences or the environment in decision making.

³ This Section 20 Agreement is an operating agreement between Southern Water and the Environment Agency from March 2018 which includes a sequence of actions for Southern Water to take in drought conditions, and a commitment to delivery of a new long term strategic resource.

- Options that are less carbon intensive should be selected before schemes that are carbon intensive. The selection of the option indicates carbon was not a factor in option selection and does not support reaching net zero by 2030.
- The public have had little information about alternatives to the proposed HWTWRP. It has been presented as the only reasonable option. Water recycling should be a last resort.
- A decision about this should be delayed until after 2030, when smaller alternative schemes have been fully investigated and if appropriate, implemented.
- Respondents do not support pushing one option and the company should look at a number of options (a diverse approach) and deliver in parallel as a backup if one option was to fail.
- Other options were dismissed because they could not be delivered by 2027, yet this option cannot be delivered in that time frame either, even if everything goes smoothly and according to plan. Southern Water should take a step back now that desalination has been rejected and fully consider all alternative options to the proposed HWTWRP.
- Concern that pursuing desalination on the West Southampton Coast has resulted in a lack of alternatives and now no other option can be considered.
- Suggestions that transfers from other water companies should be considered.
- Concerns around trying to develop one solution that meets the demand in a 1-in-500 year extreme drought event which will burden customers with heavy costs for many years when alternative and better solutions could be provided.
- The proposed HWTWRP should be rejected.

In addition to comments about the rationale behind the proposed HWTWRP, respondents suggested alternatives to the option. These include:

- Use of Peel Common WTW instead of Budds Farm WTW for water recycling
- Discharge of recycled water to the Lower Itchen and confined aquifers instead of Havant Thicket Reservoir
- Managed Aquifer Recharge
- Winter Storage Reservoirs
- Upgrade Otterbourne treatment capacity by 2031
- Upgrade River Test treatment capacity by 2031
- Move Otterbourne abstraction closer to tidal limit
- Relocation of Portsmouth Water source A abstraction to tidal limit
- Use of Testwood Lakes in conjunction with local treatment works
- New Lower Greensand abstraction in North Hampshire, near Kingsclere

- Rowlands Castle reservoir
- Pumped storage at Southleigh Forest.

3.3.2 Influence on the WRMP24

The consultation feedback has not resulted in a change in the revised dWRMP24, but further clarity is provided below.

3.3.3 Consultation response

There is a formal "best endeavours" obligation on Southern Water through the Section 20 Agreement with the Environmental Agency to deliver a solution that reduces reliance on drought permits by 2027, or early as practicable.

This best endeavours obligations requires Southern Water to deliver a long term water resource solution for Hampshire. Which means any decisions on options can't be delayed.

Both Southern Water and Portsmouth Water followed a consistent options appraisal process that is integrated across the WRSE regional group and neighbouring water companies' WRMPs and wider programme requirements for environmental, resilience and water quality assessments. An initial screening identified over 1100 options at a regional level which were available for selection by the regional best value investment modelling. Where options were rejected, the reason for rejection was included in a Rejection Register. A total of 639 feasible options have been excluded from the regional investment modelling for several reasons, including adverse environmental assessments (including in relation to water quality and drinking water quality) or uncertainty/deliverability issues. Whilst these options remain technically feasible, in many cases these options, in the early stage of development, gave rise to significant uncertainties and require further development to confirm option feasibility. These options have been excluded as part of the programme appraisal process with WRSE's programme management board (PMB) and through water company discussions with regulators. Some of the options, however, have been available to use in investment model sensitivity runs, to help with wider discussions

Transfers from other companies are considered and are a key part of the regional planning. These are all near term. A WRMP19 solution for a new transfer from Wessex Water was ruled out on Environmental Grounds, due to impacts to the River Avon. In addition, Southern Water planned in our Water Resource Management Plan 19 (WRMP19) additional transfer from Portsmouth Water for a further 9MI/d. However, this was also formally ruled out due to the yield from their new Groundwater source.

In determining a long term water resource solution for Hampshire there are few alternative solutions that can provide both the required level of resilience to 1 in 500 drought and which remove reliance on drought permits and orders as soon as possible.

Working with other water companies in the South East through WRSE, Southern Water has developed both a Least Cost Plan and also a Best Value Plan to help select the optimum solutions for meeting the supply-demand balance challenge. The Best Value Plan considers additional drivers to cost; such as carbon values, environmental impacts and resilience metrics. These plans are then consulted on to gather stakeholder and customer feedback before they are approved by DEFRA and then finalised.

The back-up option would require a bigger water recycling plant (75MI/d), an additional approximately 20km of pipeline and development of a new environmental buffer lake of ca. 600 million litres (MI) rather than an enhanced use of the planned 8,700MI Havant Thicket Reservoir and therefore has a higher cost and higher carbon impact. It also would not deliver the benefit of operating the proposed HWTWRP with the larger of Havant Thicket Reservoir, which could provide up to 90MI/d in a drought with a smaller water recycling plant.

To summarise, the key reasons for selecting the proposed HWTWRP over the back-up option are as follows:

- The lower cost relative to the back-up option – not requiring the development and construction of a separate environmental buffer lake to the planned Havant Thicket Reservoir.
- Quicker delivery – not requiring a separate environmental buffer lake to the planned Havant Thicket Reservoir. This reduces reliance on the prolonged use of interim measures.
- Higher drought flow (90MI/d) and greater resilience afforded as a result of the larger capacity of Havant Thick Reservoir.

Managed Aquifer Recharge (MAR) Schemes, or Aquifer Storage and Recovery schemes (ASR) require a specific combination of geologic and hydrogeologic conditions and require extensive testing over multiple years to establish their viability. The Environment Agency and Natural England have expressed concerns over the MAR option in Hampshire that is currently included in Southern Water's dWRMP24 and will be withholding their support for the scheme unless it has been demonstrated that the scheme is viable and will not have any negative environmental impact. Southern Water has provided further details on the potential for other ASR schemes in Annex 8 of its Statement of Response.

Options involving discharges to the Lower Itchen were screened out due to the highly sensitive nature of this Chalk Stream with both quantitative and qualitative impacts on the designated sites that could not be mitigated. In particular, future licence constraints are likely to include Natural England's Common Standard Monitoring Guidance (CSMG) Flow Targets which would set very tight constraints on both abstraction and discharges even under normal conditions, not just during droughts and would render such a discharge regime impracticable.

Use of Peel Common WTW would not provide the volume of water required as its capacity is only about a third of the Budds Farm WTW and would have similar environmental and delivery risks. Other WTWs would involve construction of pipelines potentially across the River Test and River Itchen Site of Special Scientific Interest (SSSI) and the Itchen Special Area of Conservation (SAC). Typically, these other WTWs are smaller and so multiple pipelines from several WTWs would be required to achieve the same benefit if used as the source of the water. In addition, these works already provide either direct or indirect discharge (via groundwater) to the River Test and River Itchen, for example to the Portsmouth Water Lower Itchen Abstraction providing de-facto reuse and flow support. Removal of that volume might necessitate further abstraction licence reductions and/or more frequent use of drought permits and drought orders.

Options like Winter Storage Reservoirs, or offline storage, are considered within Southern Water's dWRMP24. For example, the River Adur Offline Storage Reservoir in Sussex. New reservoirs take a significant amount of time to develop, and the ones proposed in the South East do not provide the required volumes. Existing lakes already developed e.g. Testwood Lakes, are also considered but again are typically too small to provide benefits associated with the proposed HWTWRP; however, they may form a part in future resource systems.

Options to upgrade treatment capacity at Otterbourne WSW or River Test WSW form part of a resource mitigation package and individually do not significantly increase water production. However, gains can be made in resilience and efficiency.

Moving abstraction closer to tidal limits can have benefits in terms of minimising abstraction on the upstream reaches. However, on the River Itchen, Portsmouth Water Source A is already close to the tidal limit and relocating Otterbourne WSW to the same location would not significantly increase the useable abstraction and still might be subject to future licence reductions. The construction of the connecting pipe, abstraction intake and pumping station, to Otterbourne for treatment would also cause additional environmental impact.

The changes to Southern Water's Lower Greensand abstraction in North Hampshire, near Kingsclere and the Pulborough Winter Transfer in Sussex, both provide support to the wider supply network. However, neither are of a capacity to replace, nor provide the 1-in-200 year drought resilience of the proposed HWTWRP.

3.4 Hampshire Water Transfer and Water Recycling Project option history and development

3.3.1 Consultation themes

A number of consultation comments received, requested additional information or clarity on option history and development. The key themes in consultee comments include:

- Inconsistencies in the option detail provided by Portsmouth Water, Southern Water, WRSE and the RAPID Gate 2 submissions and the need for consistency in describing the option.
- The size of the water recycling plant element of the scheme was initially 15MI/d within the RAPID submission but increased to 60MI/d in dWRMP24. The increase in capacity increases delivery risks which need to be considered within the WRSE modelling.
- Confirmation of the new infrastructure is needed for the project, in particular the infrastructure (number, length and location of pipelines) needed to allow recycled water to Portsmouth Water customers.
- Getting clarity on the schematics for the proposed HWTWRP and flow pathways in comparison to the approved Havant Thicket Reservoir schemes, including any sweetening flows (a reduced water flow that is required to prevent the water stagnating and to keep the treatment plant operational) which may influence the discharge volumes into the reservoir.

3.4.2 Influence on WRMP24

The consultation comments about the option history and development have not resulted in any changes to WRMP24 or the proposed HWTWRP, but further clarity is provided below.

3.4.3: Consultation response

All new major water resource projects in England are being overseen, and their investigation and development funded, by RAPID through a 'gated' process. The aim of the gated process is to identify optimal regional and inter-regional solutions with construction proposed to begin in the 2025-30 period. Based on its assessment of these projects, RAPID will make recommendations to Ofwat for continued funding of the projects. The approved Havant Thicket Reservoir and the proposed HWTWRP are being assessed as part of this process.

We state which three regulators make up RAPID in section 3.2.3. RAPID is overseeing projects for several water companies through a 'gated' process and making recommendations to Ofwat about whether proposed projects should continue to receive funding.

The aim of this gated process is to identify optimal regional and inter-regional solutions, with construction proposed to begin in 2025-2030.

Due to the urgent need for Southern Water to deliver schemes in Hampshire to offset the loss of supplies from the River Test and River Itchen, it is on an accelerated timeline for the gated process. Its gates, or assessment points, are therefore earlier than for the rest of the water industry. This has meant that on

occasions, the decision points have been out of step with the WRMP24 development timelines. Southern Water, Portsmouth Water and WRSE are working to keep consistency between these processes, while accepting that due to various pressures on the timelines for development, the project for RAPID submission and the regional strategy may at times not align.

The process Southern Water has followed for selecting the proposed HWTWRP is covered in section 3.2.3. Further work carried out since dWRMP24 has led to a revision in the capacity variants of the water recycling plant in the proposed HWTWRP. Initially, four variants were considered: 15MI/d, 30MI/d, 45MI/d and 60MI/d. Following a review of the water needs under various supply-demand scenarios, these have now been revised to 20MI/d, 40MI/d and 60MI/d. The maximum water recycling plant capacity is still capped at 60MI/d but the minimum size has increased to 20MI/d.

In 2020 and 2021, as part of the RAPID gated process, Southern Water carried out an extensive options appraisal process to confirm whether its desalination proposal (set out in our WRMP19) was the right solution to develop further in the context of the other options available.

Southern Water's options appraisal process included a thorough evaluation of the various options against a number of planning, environmental, socio-economic and cost criteria, as well as legal and policy obligations and wider strategic objectives. The options appraisal helped better understand the benefits and impacts of the various options.

For the desalination proposal, it confirmed some of the concerns raised from the public consultation that the proposal would likely have adverse impacts on the marine environment and on the New Forest National Park, both from its construction and operation. Out of all of the options considered, desalination at Fawley emerged from the options appraisal process as the least preferable option. The likely impacts of the plant and its associated pipelines meant that the proposal was not considered to be deliverable in this location, particularly in light of the better alternatives that were available.

At the same time, the options appraisal process confirmed a combined option involving both water transfer and water recycling solutions - the *Hampshire Water Transfer and Water Recycling Project* (previously known as Option B.4) - as the most preferable option. A schematic of the proposed HWTWRP is shown in figure 1. This option performed well across the range of criteria considered and the addition of water recycling provided important adaptability to address a larger proportion of the water supply deficit than the water transfer option could achieve on its own.

The WRSE investment modelling including potential modular yields for the water recycling plant up from 15MI/d to 60MI/d. This would allow the scheme to adapt to meet future increased need for water, for example under higher environmental ambition scenarios or if more challenging climate change impacts and population growth were to materialise. In the draft WRMP24 a 15MI/d plant was initially selected from 2031 increasing to a 60MI/d plant from 2042. This would allow more water to be left in the environment in Hampshire and enable transfer of water to Portsmouth Water and Sussex North from the 2040s.

Figure 2 shows a schematic diagram of the proposed HWTWRP including transfer of recycled water from the water recycling plant at Budds Farm WTW to Havant Thicket Reservoir and then onward to Otterbourne WSW.



Figure 2: A schematic showing the main components of the proposed HWTWRP.

A similar combined solution, previously known as Option B.5, utilising a new lake for water storage rather than the Havant Thicket Reservoir, and involving a larger water recycling plant, emerged as the second most preferable solution. This option provided a ‘back-up’ option in case our preferred solution could not be delivered. However, this option is not currently being progressed through the consent process.

Consultation comments questioned what additional infrastructure is needed from Portsmouth Water’s perspective. Regarding additional infrastructure for the proposed HWTWRP, no additional assets or infrastructure would be needed for Portsmouth Water customers, if this option was progressed. However, there is an opportunity to implement some additional infrastructure as part of developing Havant Thicket Reservoir that would provide the capacity and flexibility to accommodate recycled water in the future. This would include the installation of a second pipeline between Source B Spring Source (Portsmouth Water) and the reservoir along the same route as the existing spring water pipeline, before branching off at the reservoir site to pass through the embankment. The length of this second pipeline would be approximately 3km. Early construction of this infrastructure, if progressed, would reduce the cost and impact of carrying out this work at a later date on customers.

3.5 Option treatment process

3.5.1 Consultation themes

A number of respondents commented on the treatment process for the proposed HWTWRP. The key points raised by respondents were as follows:

- Reverse Osmosis (RO) for water treatment is not a suitable method in the UK (environmental effects captured in Section 4.2).
- Concerns about the technology which would be employed and adequacy of the treatment method.
- Confirmation of the chemicals needed for the treatment process.
- Concerns that the reservoir will be full of effluent.
- Concern as to whether Southern Water has taken into account the large cost of sewer catchment management needed for this option to operate safely in terms of discharges into the sewer.
- Concern that the discharge consents and monitoring may not be stringent enough and would be expensive. It was questioned whether local industries have been consulted about the impacts on updating and introducing consents.

The following section provides further detail on the treatment process that is currently proposed.

3.5.1 Influence on WRMP24

The consultation comments about option treatment processes have not resulted in any changes to WRMP24 or the proposed HWTWRP, but further clarity is provided below.

3.5.3 Consultation response

Reverse Osmosis is a proven technology. The use of the Reverse Osmosis membrane not only helps with removal of total dissolved solids, but it is also a very good and proven barrier for the removal of high molecular weight compounds, such as pharmaceuticals and other emerging compounds of concern. Microfiltration (MF) has been included in the integrated membrane treatment process to help with removal of turbidity from the treated wastewater and MF is a good barrier against protozoa, bacteria and some viruses as well. MF helps extend the life of the Reverse Osmosis membranes which are costly to replace.

The Ultraviolet Advanced Oxidation Process (UV-AOP) will be used for compounds with low molecular weights that cannot be fully removed by the Reverse Osmosis process. Granular Activated Carbon will be used by the water recycling plant to ensure any residual disinfection by-products are also removed. The Reverse Osmosis process produces a highly purified water where hardness and alkalinity have been almost completely removed from the water, along with a broad range of micronutrients. The water will then be remineralised, a process in which minerals like calcium and magnesium are reintroduced to the water, and the alkalinity adjusted to improve the quality in line with guidance from the World Health Organisation. The water will then be blended with the water taken from the Source B Spring Source (Portsmouth Water) within the reservoir.

The treated wastewater from Budds Farm WTW is of a very good quality from a low nutrient and low total suspended solids standpoint, as a result of the high levels of treatment it receives.

No untreated sewerage will enter the reservoir. It is hydraulically impossible for untreated sewerage to enter the reservoir as there is no physical connection for this to happen.

Due to the site being low lying, the propensity to have saline intrusion into the wastewater collection system is high. This gives rise to a risk of higher total dissolved solids concentration (e.g. chloride), that cannot be removed without further treatment. The water recycling plant would use global best practice with a multi-barrier approach and monitoring to ensure that the water quality meets the required standards before being transferred to the reservoir.

The plant will also monitor the quality of the treated effluent from Budds Farm WTW and will shut down if this moves outside of the treatable parameters. The recycled water will also have a lower nitrate level than the spring waters due to the treatment at Budds Farm WTW.

Southern Water has been sampling and monitoring the sewer network together with the impacts on the final effluent from Budds Farm WTW. This information is being fed into the design and risk assessment. As discussed above, the proposed water recycling process is a 'Full Advanced Process' that, together with the proposed inlet monitoring, provides a robust multi-stage process treatment to produce high quality water, with strong monitoring to protect both customers and the environment.

3.6 Option costing

3.6.1 Consultation themes

A range of consultation comments were received in relation to the cost of the option. The key points raised by respondents were as follows:

- The current costs of the scheme are considered too high (and do not provide value for money) and work needs to be done to reduce the costs before the scheme is considered further.
- The costs of the scheme are high for a scheme which would only be used periodically.
- The Ofwat determination document made it clear that this effluent recycling solution was considered to be a very expensive option, especially as a drought resilience asset. The solution is only really considered cost effective if the capacity is increased from 15MI/day to 60MI/day.

3.6.2. Influence on the WRMP24

The consultation comments about option costing have not resulted in any changes to WRMP24 or the proposed HWTWRP, but further clarity is provided below.

3.6.3 Consultation response

The costing for the constrained options is covered in Section 6.3.1 and the carbon costs in Section 10.2 of Southern Water's rdWRMP.

The cost of the proposed HWTWRP was tested at RAPID Gate 1 (September 2021) and Gate 2 (December 2021). The assessment is detailed in Gate 2, Annex 5 here: www.southernwater.co.uk/our-story/our-plans/water-for-life-hampshire/technical-documents.

The proposed HWTWRP was compared with other options including variations of the initially proposed desalination project and a separate water recycling scheme that would involve taking some treated wastewater from Peel Common WTW to supplement the flows from Budds Farm WTW.

The cost of delivering a desalination project was approximately 65% higher, when reviewed for the RAPID Gate 1 submission, than the proposed HWTWRP. As demonstrated through the options appraisal process, the proposed HWTWRP provides good value for money, especially when the resilience and environmental protections it brings are considered. It was also noted that desalination has a high operational running cost relative to water recycling, especially in relation to power consumption.

A variation of the water recycling proposal that involved taking some treated wastewater from both Peel Common and Budds Farm WTWs was 25% higher in whole life cost, when compared to the HWTWRP, due to the additional pipeline from Peel Common WTW and the need for an Environmental Buffer.

An option to only take additional flows from Havant Thicket Reservoir was 42% lower than the proposed HWTWRP; however, this solution was not developed further as without supplementation of recycled water, the reservoir alone would not be able to provide the quantity of water needed during a drought.

All estimates for RAPID Gate 2 submissions were costed from first principles for civil engineering elements using UK market rates current at the time and outputs commensurate with UK contractor delivery norms. Elements of this were assessed with relevant delivery partners. The process elements, including the water recycling plant, were costed using Southern Water's own cost data with gap-filling from alternative UK water sector data as required.

At RAPID Gate 2, all costs were independently assured prior to being included within the overall project report.

As mentioned earlier, the revised dWRMP24 is considering a range of water recycling plant capacities through the best value options appraisal process. This will balance the supply need, costs and environmental impacts of different treatment plant sizes and the scheduling of those options alongside the wider WRMP24 strategies.

For a legally compliant plan, we are required to maintain supplies under drought year conditions. Without this scheme we cannot maintain supplies during droughts without resorting to drought permits and orders.

3.7 Global water recycling examples

3.7.1 Consultation themes

Consultation feedback pointed to limited examples of using recycled water as drinking water from other countries. This section includes more examples of where the technology has been used globally, in addition to addressing the direct consultation themes raised by respondents of:

- Concerns that mixing spring and recycled water is an untried process and the project might not be successful. Concerns relate to the use of a technology that would be the first of its kind in the UK.

3.7.2 Influence on WRMP24

The consultation comments about global water recycling options have not resulted in any changes to WRMP24 or the proposed HWTWRP, but further clarity is provided below.

3.7.3 Consultation response

Water recycling is a safe, established method of water treatment that is used elsewhere around the world (Figure 3). In [California](#), USA, for example, water recycling has been used for more than 40 years.

Figure 3: Examples of water reuse scheme from around the world



¹ Secondary treatment usually based on activated sludge and in most examples includes nutrient reduction.

² DWTP = drinking-water treatment plant.

³ UOSA = Upper Occoquan Service Authority.

In Orange County Water District of California, Reverse Osmosis is part of the treatment process used to purify treated wastewater into recycled water that is then put into the groundwater sources to blend with all other water supplies (including rainfall and snowmelt). It is then re-abstracted and recycled again and again.

Southern Water's proposals are similar, although rather than putting recycled water into groundwater, the recycled water would blend with other water supplies (including rainwater and spring water) in the Havant Thicket Reservoir before being pumped to the Otterbourne WSW for further treatment to meet strict UK drinking water standards.

The Full Advanced Treatment process Southern Water is proposing to use is a globally proven multi-barrier treatment process. It is used by countries including the USA, Singapore and Australia, which have similar water quality and environmental standards to the UK, to produce a high quality recycled water.

Further information on the global use of water recycling can be found here: www.southernwater.co.uk/water-recycling

There are a number of global projects where recycled water is blended with groundwater (spring sources or the aquifer) and with reservoir (surface) water. The potable reuse guidance document by World Health Organisation⁴ references all these projects. Some of these have been operational since the 1960s.

To address the concerns expressed, Southern Water and Portsmouth Water have appointed experts in reservoir design and water quality modelling to develop a raw water blending model to show the impact of blending spring water, that will be abstracted to fill Havant Thicket Reservoir, with recycled water of better quality. The reservoir will be a unique and dynamic body of water in its own right; the quality of which will be influenced not only by the sources of water flowing into it, but also external factors such as rainwater, wildlife and vegetation. Groundwater when still in the ground is protected from wildlife and vegetation and is therefore not impacted by high organics from the bird population around or nutrients from various sources. Examples of projects listed in the World Health Organisation document are shown in Table 1 below:

⁴WHO, 2017. [Potable reuse \(who.int\)](http://who.int)

Table 3: Examples of use of recycled water for potable supplies from around the world (WHO, 2017)

Scheme	Type	Environmental buffer (IPR only)	Start date	Treatment process (after secondary wastewater treatment)
Montebello Forebay, Los Angeles County, California, USA	IPR	Groundwater	1962	Media filtration, SAT, Cl ₂
Old Goreangab plant, Windhoek, Namibia	DPR	—	1969–2002 (replaced)	Algae flotation, chemical clarification, media filtration, GAC, Cl ₂
New Goreangab plant, Windhoek, Namibia	DPR	—	2002	O ₃ , DAF, rapid sand filtration, O ₃ , BAC, GAC, UF, Cl ₂
Water Factory 21, Orange County, California, USA (replaced, see below)	IPR	Groundwater	1976–2004 (replaced)	Lime clarification, media filtration, GAC, Cl ₂ RO added 1977, AOP (UV/H ₂ O ₂) added 2001
Groundwater Replenishment System, Orange County, California, USA	IPR	Groundwater	2008	Cl ₂ , MF, RO, AOP (UV/H ₂ O ₂)
Upper Occoquan Service Authority, Fairfax County, Virginia, USA	IPR	Surface water	1978	Lime clarification, media filtration, GAC, Cl ₂ , chloramination
Hueco Bolson recharge project, El Paso Water Utilities, Texas, USA	IPR	Groundwater	1985	PAC, lime clarification, media filtration, O ₃ , GAC, O ₃ , Cl ₂
Clayton County Water Authority, Georgia, USA	IPR	Surface water	1985	Land application, UV, Cl ₂
West Basin water recycling plant, California, USA	IPR	Groundwater	1995	MF, RO, AOP (UV/H ₂ O ₂), NH ₂ Cl
Langford Recycling Scheme, Chelmsford, UK	IPR	Surface water	1997	UV
Gwinnett County, Georgia, USA	IPR	Surface water	1999	Chemical phosphorus removal, UF, O ₃ , GAC
Scottsdale Water Campus, Arizona, USA	IPR	Groundwater	1999	Media filtration, MF, RO, Cl ₂
Torreele, Wulpen, Belgium	IPR	Groundwater	2002	UF, RO, UV
NEWater, Singapore	IPR	Surface water	2003	UF, RO, UV
Los Alimitos, Water Replenishment District of Southern California, USA	IPR	Groundwater	2005	MF, RO, UV
Chino Basin groundwater recharge project, Inland Empire Utility Agency, California, USA	IPR	Groundwater	2007	Media filtration, SAT, Cl ₂
Arapahoe County/Cottonwood, Colorado, USA	IPR	Groundwater	2009	Media filtration, RO, AOP (UV/H ₂ O ₂), Cl ₂
George, South Africa	IPR	Surface water	2009/2010	UF, Cl ₂
Prairie Waters Project, Aurora, Colorado, USA	IPR	Groundwater	2010	Riverbank filtration, AOP (UV/H ₂ O ₂), BAC, GAC, Cl ₂
Beaufort West, South Africa	DPR	—	2010	Media filtration, UF, RO, AOP (UV/H ₂ O ₂), Cl ₂
Permian Basin, Colorado River Municipal Water District, Texas, USA	IPR	Surface water	2012	UF, RO, AOP, Cl ₂
Dominguez Gap Barrier, Los Angeles, California, USA	IPR	Groundwater	2012	MF, RO
Big Spring, Texas, USA	DPR	—	2013	MF, RO, AOP (UV/H ₂ O ₂), blending, media filtration, Cl ₂
Beenyup groundwater replenishment scheme, Perth, Australia	IPR	Groundwater	2016	UF, RO, UV
Cloudcroft, New Mexico, USA	DPR	—	Being developed	MBR (enhanced secondary treatment), Cl ₂ , RO, AOP (UV/H ₂ O ₂), blending, UF, UV, GAC, Cl ₂

The proposed HWTWRP will use the same technology or multi-barrier treatment process that countries such as the US, Singapore and Australia have been utilising for some time. Water recycling occurs every day though the natural water cycle, and our rivers are made up of run-off from rainwater and groundwater, agricultural run-off and treated wastewater from wastewater treatment plants, with water companies

abstracting and treating this water for consumption. The process proposed will augment the natural water cycle, providing purified water from a source that is normally discharged to the sea.

Technology selected in the water recycling process is also part of the Gateway Desalination plant operated by Thames Water. Running a water recycling pilot plant at Peel Common WTW and later at Budds Farm WTW has also allowed Southern Water to better understand the technology.

Northumbrian Water developed a similar scheme where recycled water (from a non- Reverse Osmosis based technology) was introduced in Hanningfield Reservoir, via the River Chelmer, for further treatment at the Langford WSW. The Langford Water Recycling scheme has been operational, on and off, since 1997.

3.8 Wastewater releases

3.8.1 Consultation themes

A number of consultation replies made reference to wastewater releases which have impacted customer confidence in the option that were not related to the proposed HWTWRP. Some respondents mistakenly assumed that wastewater services in the area were provided by Portsmouth Water. This section provides further clarity on the difference between the option and wastewater releases and addresses the following consultation themes raised by respondents:

- Southern Water has a very bad track record on wastewater and regulatory compliance for rivers, harbours and bathing waters. Its performance must be improved before this option can be considered. There should be investment in sewerage treatment capacity to avoid this occurring in the future. This has created anger and mistrust towards Southern Water.
- Can Portsmouth Water trust Southern Water to treat the water to the correct standard and will not take short cuts?
- The project should be delayed due to a lack of public trust in Southern Water.
- A view that Southern Water is happy to pay the fines rather than take responsibility.
- A suggestion that Southern Water should be sanctioned by refusing to allow the transfer of water until the company improves wastewater performance.

These comments link to Section 4.1 drinking water safety and should be viewed in conjunction with this section.

3.8.2 Influence on WRMP24

The consultation comments about wastewater discharges have not resulted in any changes to WRMP24 or the proposed HWTWRP, but further clarity is provided below.

3.8.3 Consultation response

Portsmouth Water only provides drinking water. Wastewater services in the area are provided by Southern Water. A map of the operational areas is presented below in figure 4.

Figure 4: Southern Water operational areas



Southern Water recognises its environmental performance has fallen short of expectations. The company has set out a Turnaround Plan to address this. You can read it here: [6579_ofwat_company_turnaround_plan.pdf \(southernwater.co.uk\)](https://www.southernwater.co.uk/6579_ofwat_company_turnaround_plan.pdf).

One of the main issues Southern Water is focusing on is stormwater releases and reducing the use of combined sewer overflows (CSOs). Southern Water's [Clean Rivers and Seas Task Force](#) is working hard to demonstrate how a range of alternative, nature-based and innovative solutions can make a difference. Recently, Southern Water [announced](#) that it will be investing up to a further £35 million between now and spring 2025 to scale up and accelerate its [Pathfinder work](#). [Pathfinder](#) projects were set up with the aim of learning how we could identify, target, design and deploy sustainable solutions that have a significant impact on the use of storm overflows.

It is important to understand that the proposed HWTWRP is fundamentally different, and separate, to the current system of stormwater releases which are designed to protect homes from flooding.

Stormwater is wastewater that has been heavily diluted by rain and is sometimes released to the environment to reduce the risk of flooding to homes and businesses. Recycled water is purified water that has gone through a series of advanced treatment techniques. It is this purified, recycled water that would be released into Havant Thicket Reservoir as part of the proposed HWTWRP.

Respondents' comments raised questions about Portsmouth Water's trust in the scheme. Please refer to Section 3.11.

3.9 Customer bills and share price

3.9.1 Consultation themes

The consultation feedback included a number of comments in relation to customer bills (the impact of the scheme) and the company share price (as a motive for the scheme). The points from respondents included the following themes:

- The scheme will require significant infrastructure and ongoing costs which will have a significant impact on customer bills. Some customers may be unable to afford bill increases.

- Further clarity on the funding arrangements of the scheme and bill impacts for customers of both companies.
- Concern that the costs of the scheme will spiral and be passed onto customers.
- Issue raised that if the scheme would run 365 days a year when it is only needed during periods of drought (and therefore a significant bill increases).
- Concern that this scheme is being driven by profit and share price rather than interests of the customers and the environment.
- Question as to whether Southern Water preferred this option over smaller, cheaper and more environmentally friendly options for profit.
- Concern that in return for storing recycled water, Southern Water will fund the approved Havant Thicket Reservoir for the benefit of Portsmouth Water shareholders.
- More information is need on investments against dividends paid to shareholders as there is concern the scheme is about profit.
- Concern about Macquarie Asset Management having a stake in Southern Water.

3.9.2 Influence on WRMP24

The consultation comments about bill and share price have not resulted in any changes to WRMP24 or the proposed HWTWRP, but further clarity is provided below.

3.9.3 Consultation response

The proposed HWTWRP is being developed to protect the River Test and the River Itchen chalk streams and ensure sustainable supplies of water for customers during a drought.

New sources of water need to be developed alongside demand management options such as reducing leakage and consumption by household and non-household customers, because of the size of the shortfall and the loss of available supplies from the rivers and groundwater sources during a drought.

Without new sources of water, Southern Water will have to continue to rely on drought permits and drought orders to take more water than its abstraction licences allow from the River Test and the River Itchen rivers – potentially damaging these sensitive habitats.

Southern Water is working closely with Portsmouth Water to develop a plan that increases the water available in the approved Havant Thicket Reservoir during a drought. But this is just one of the many measures planned to provide resilient water supplies. In addition to reducing leakage and demand for water, these include working with farmers and landowners to reduce the impact of fertilisers and other nutrients on watercourses that can rule out abstraction.

The proposed HWTWRP will operate year-round to supplement water levels in the Havant Thicket Reservoir and provide a base level of supply to Southern Water's supply zone in Hampshire. This will ensure the pipelines and equipment are kept clean and maintained, so they are available to supply the full amount of water when needed and reduces the abstraction impact on the River Itchen. The operation will be at the minimum level required for this purpose. This is standard practice for water recycling plants as it reduces the risk of degradation and other issues if the equipment is switched off and only operated when required and ensures supply resilience for other operational issues (e.g. loss of ground water or river abstractions due to pollution incidents).

The overall cost to customers depends on the final cost of the solution. Like all water industry costs, funding for operational improvements and maintenance on the water supply side of the business is averaged across water supply customers' bills across Southern Water's region.

As part of the proposed HWTWRP selection process a key element was the operating costs, which include pumping. The construction and operational costs are lower when compared to desalination (See section 3.6.3), however, they are higher than the current system operational costs. The proposed HWTWRP costs will be spread over many years to reflect the continued resilience benefits of the project.

Portsmouth Water customers are not paying for the Havant Thicket Reservoir or other component parts of the proposed HWTWRP, either through their drinking water bills to Portsmouth Water or their wastewater bills to Southern Water. There may however be indirect costs from Portsmouth Water to Southern Water via the provision of future bulk water supplies. The proposed HWTWRP would also allow an increased abstraction from Havant Thicket Reservoir which may result in the need for future upgrades of Portsmouth Water's water treatment works. These potential investments are beyond the 2025-2030 investment period and would be reconsidered for WRMP29, alongside potential other supply and demand options. Southern Water's dividend policy aims to ensure a fair balance of reward between customers and investors, and Southern Water shareholders strongly support the investment needed to improve company performance. Southern Water has not paid external dividends since 2017.

Funds managed by Macquarie Asset Management injected £1.1 billion to recapitalise the Southern Water group in September 2021. This financed additional investment in infrastructure, and reduced group debt. As operational performance improves, distributions will be kept below a 4% yield in each year to March 2025.

3.10 Consultation process (for draft WRMP24)

3.10.1 Consultation themes

The consultation received comments about the consultation process followed for dWRMP24. The key themes raised by respondents include:

- Seeking confirmation as to who is checking if the legal obligations linked to the consultation have been followed.
- Concern that Southern Water may have been underhand about the proposal and the consultation.
- Concern that the advertisement of the proposed HWTWRP has not been adequate and therefore questioning the validity of the consultation if respondents are not aware.
- Concern that there has not been enough consultation on the proposed HWTWRP.
- The information provided for the consultation is impenetrable to the public and stakeholders.

3.10.2 Influence on WRMP24

The consultation comments about bill and share price have not resulted in any changes to WRMP24 or the proposed HWTWRP, but further clarity is provided below.

3.10.3 Consultation response

Southern Water first consulted on the proposed HWTWRP as a back-up option in the consultation on the West Southampton Desalination option from 8 February until 16 April 2021.

It consulted on elements of the desalination scheme (pipeline routes and inlet/outfall locations) and introduced the concept of backup alternatives, including water transfers and water recycling.

The purpose of the consultation was to consult on the proposed desalination plant on West Southampton Coast as the strategic solution for the programme and on alternative water transfer and water recycling options should the desalination option prove undeliverable, at this location and at this time.

Due to COVID-19 restrictions at the time, the consultation was digital-led, using the online Virtual Engage platform alongside social media, press advertisements, media interviews, briefings and webinars.

Southern Water received 180 responses and 3,224 people accessed the virtual engagement space. Feedback from the consultation showed a clear preference for the alternatives.

In December 2021 at RAPID Gate 2, Southern Water confirmed, following the conclusion of the options appraisal process, that the new selected option was the proposed HWTWRP.

A second public consultation was then held from the 5 July to 16 August 2022, on the proposed HWTWRP.

Due to the lifting of many COVID-19 restrictions, this consultation included six in-person consultation events held in village halls and shopping centres, alongside online engagement including webinars and a virtual exhibition room. Copies of the consultation documents were hosted in nine deposit locations along with Freepost feedback forms.

Southern Water received 571 responses, met 878 people in person at community events and 9,169 people accessed the consultation website.

Consultation documents and feedback reports were written in simple language and are published on Southern Water website: www.southernwater.co.uk/our-story/our-plans/water-for-life-hampshire/consultations

The next public consultation will be held in 2024.

This section should be read alongside Section 5.1 (which provides further details about draft WRMP24 consultation) and Section 5.2 which details future planned events and consultations.

3.11 Portsmouth Water commitment

3.11.1 Consultation themes

Representations from Portsmouth Water dWRMP24 consultation provided the following key themes in relation to Portsmouth Water commitment to the scheme.

- The potential impact on Portsmouth Water's reputation with customers.
- Concern that the scheme has been imposed upon Portsmouth Water by Southern Water.
- Would Portsmouth Water reconsider support of the option based on widespread customer opposition to drinking recycled water?
- The need for assurance that the benefits of the scheme for customers, local residents and the environment are maintained if the water recycling plans go ahead.
- The reason(s) that the water recycling option is not more predominant in Portsmouth Water's dWRMP24.

Section 3.11 and 3.12 should be read in conjunction due to their linkages.

3.11.2 Influence on WRMP24

The consultation comments have not resulted in a change to the rdWRMP24 but additional clarity is provided below. The regional plan by WRSE will also be updated to include additional information on the proposed HWTWRP and future planned engagement with customers.

3.11.3 Consultation response

In 2018, following a detailed study completed by the water industry, the National Infrastructure Commission produced a 'state of the nation' report about national water infrastructure called, 'Preparing for a Drier Future' ([Preparing for a drier future \(nic.org.uk\)](https://www.nic.org.uk)). The report observed that England faced a potential shortfall of four billion litres of water a day in meeting demand in the 2050s and that this resulted in a dramatic change in government policy. For the preceding 30 years, regulators had prioritised demand-side reductions (aimed at reducing leaks and water consumption by customers). The report made it clear that this policy would need to change to avoid future water shortages. Leakage and demand reduction need to continue, but in addition there is need for a '*national transfer network in England and new infrastructure, such as reservoirs and water re-use systems.*'

Havant Thicket Reservoir will be the first in a series of new reservoirs, pipelines, and transfer facilities to be built following this change. Water resources planning is no longer a local water company issue and the whole industry will increasingly trade larger and larger volumes of water across boundaries between water companies. Existing rivers and canals will be utilised as part of the solution to move water from where it is available to where it is not. The Southeast, as a water stressed area, is a critical location for several major schemes which include the construction of new reservoirs, major pipelines, desalination plants and water recycling plants. More recently, the national ambition to restore our natural environment means that licensed abstractions from rivers and boreholes will also reduce, putting additional pressure on supply for most water companies.

Southern Water currently supplies most of its customers in South Hampshire with water sourced from the River Test and the River Itchen. As a result of the sensitivity of these chalk rivers, Southern Water has agreed with the Environment Agency to reduce its abstraction from these rivers during periods of drought and find new, sustainable ways of providing its customers with drinking water. The Havant Thicket Reservoir, along with demand and leak reduction, will go some way towards reducing abstraction from these rivers, but additional sources of water are needed if Southern Water is to meet its targets to protect these chalk stream habitats.

Once the reservoir is built and the surplus water from Source B Spring Source (Portsmouth Water) is put to good use, the only **additional** sustainable sources of water available in the Southeast are seawater and treated wastewater.

Southern Water put forward water recycling as its preferred option in late 2021. Under this scheme, more water would be available in Havant Thicket Reservoir and Southern Water would be able to transfer water directly to its Otterbourne WSW. This would provide a new source of water, enabling Southern Water to meet its targets for minimising abstraction from the River Test and River Itchen during times of drought.

Portsmouth Water has committed initial support for the proposed HWTWRP; however, Portsmouth Water will not continue to give its support to the scheme if it has any doubt over the safety of this water, or the impact it might have on the environment and leisure facilities at Havant Thicket Reservoir. It will also consider the views of its customers and local stakeholders in support of the option and with representations for planning permission. Portsmouth Water will also commission a third-party independent review of the option as part of its due diligence assessments.

Southern Water is currently carrying out detailed studies and investigations as it explores this scheme further. Portsmouth Water is keeping an open mind as it awaits the outcome of these, and is encouraging its

customers to do the same. Water is an expensive commodity to move around and historically water companies have tried to use water available locally as far as possible. But the water resources position in the UK is being challenged by climate change and the growth in population and the water companies have to look further and further afield to satisfy their customers' needs, at the same time taking care of the natural environment. This is especially true in the water stressed Southeast, the driest part of the UK with 50% of the national average rainfall levels.

Portsmouth Water understands that some customers have concerns about drinking recycled water. As the operator of the reservoir with total control of the water entering and exiting it, it would have to be fully satisfied with the safety of the proposals and subsequent operation before it would allow it to be used as a source of drinking water. Portsmouth Water will be speaking directly to its customers about recycled water, giving them the facts, and offering them opportunities to ask questions. Please refer to Section 5.

Portsmouth Water's revised dWRMP24 will include greater reference to the option and the linkages to the plan.

3.12 Portsmouth Water security of supply

3.12.1 Consultation themes

The consultation feedback included a range of comments linked to the impact of proposed HWTWRP on Portsmouth Water's security of supply and its customers. The comments by respondents can be summarised as follows:

- There is a lack of clarity regarding which Portsmouth Water customers would have recycled water (and why), the proportion of the time they would receive this water for and any changes in this position over time.
- Concern that customers would no longer be able to drink the spring water which they enjoy greatly.
- Concern that Portsmouth Water will no longer have control over the reservoir and would have more frequent hosepipe bans.

Section 3.11 and 3.12 should be read in conjunction due to their linkages.

3.12.2 Influence on WRMP24

The consultation comments have not resulted in a change to the revised dWRMP24 but further clarity is provided below.

3.12.3 Consultation response

Section 1.2.3 details the use of the proposed HWTWRP, including how the scheme influences Portsmouth Water customers drinking water in terms of drinking water supply.

Southern Water currently supplies most of its customers in South Hampshire with water sourced from the River Test and the River Itchen. These are two globally rare chalk streams which provide vital habitats for a wide range of wildlife. As a result of the sensitivity of these rivers, Southern Water has agreed with the Environment Agency to reduce its abstraction during periods of drought and find new, sustainable ways of providing its customers with drinking water. The primary purpose of the Havant Thicket Reservoir is to help reduce abstraction from these rivers.

Under the current, approved plans for Havant Thicket Reservoir, during drought or emergency conditions, water from the reservoir will be piped to Portsmouth Water's water treatment works, at Works A, to be treated to drinking water standards and used to supply some of its customers in Hampshire. This would free

up water to the west of Portsmouth Water supply area which would be shared with Southern Water, without impacting Portsmouth Water's security of supply. The sharing of the water resources with Southern Water from the Havant Thicket Reservoir was one of the original planning objectives of the scheme ([Havant Thicket Reservoir project \(engagementhq.com\)](https://www.engagementhq.com))

Havant Thicket Reservoir itself would be fully controlled by Portsmouth Water. This includes controlling the water that enters and leaves the reservoir. The proposed HWTWRP will not change Portsmouth Water's levels of service or the frequency of temporary use bans (such as hosepipe bans).

4. Option specific consultation feedback

4.1 Drinking water (safety, mitigation, acceptability and taste)

4.1.1 Consultation themes

Respondents expressed concern regarding the impact of the proposed HWTWRP on drinking water quality. The key themes of comments included:

- Concerns about the impact of the scheme on the purity of the spring water:
 - Idea that it goes against Portsmouth Water plans to continue supplying high-quality, reliable drinking water.
 - Psychological issues of knowing your water has been mixed with recycled water may result in customers resorting to bottled water.
 - The impact on the taste of water, in comparison to the spring water customers are accustomed to.
- Concern that the recycled water may result in potential ill-health effects:
 - Respondents would like assurance the water will be safe to drink.
 - The amount of evidence to show that there will be no ill-health concerns in the future (i.e. 20, 50, 80 years from now) and the party responsible for any future ill-health effects.
 - Further information is needed about the treatment process to remove pollutants such as bacteria, viruses, fungi, heavy metals, sodium content, endocrine disruptors, pharmaceutical products and by-products, microplastics, industrial pollutants, herbicides, pesticides, recreational drugs and radioactive materials.
 - Concern that not all of the micropollutants in the effluent may be monitored (i.e. emerging substances), which may cause ill-health in the future (i.e. cancer). How would these be monitored?
- Issue raised that Southern Water's reputation is linked to wastewater discharges and impacts customers' confidence in drinking recycled water. There is a concern that short cuts will be made which will result in contamination of the drinking water (linked to Section 3.8).

- Respondents raised a number of possible causes for failure and requested additional information on how testing and safety measures would be put in place (and asked if there would be public access to this data). The potential points of failure include:
 - The project design is flawed and/or is poorly executed.
 - The equipment is not regularly maintained.
 - The testing does not cover all contaminants.
 - The effluent is not tested prior to release to the reservoir.
 - The source material (i.e. raw effluent) entering Budds Farm WTW changes and the processing is no longer adequate to remove all pollutants.
 - The measures that would need to be taken in case the reservoir was affected by a pollution event e.g. would it result in drawing the reservoir down to clear out pollutants?

4.1.1 Influence on WRMP24

The consultation comments about environmental assessments linked to the construction of the scheme have not resulted in any changes to WRMP24 or the proposed HWTWRP, but further clarity is provided below. This includes further information on future planned assessments.

4.1.3 Consultation response

Water recycling is a safe, established method of water treatment that is already used elsewhere around the world. In the USA, companies have been recycling wastewater to create a drinking water source for more than 40 years. Water recycling plants use advanced treatment techniques to convert treated wastewater into highly purified source water. Special membranes are used to remove salts and a range of other impurities. The process includes Reverse Osmosis, where water is forced through tiny membranes 50,000 times smaller than the width of a human hair, to remove dissolved salts and impurities. This process also removes some essential minerals such as calcium and magnesium that have to be added back in to achieve the water quality and a similar taste to the current chalk waters.

Any water sent into public supply would be required to meet the strict standards set out by the Drinking Water Inspectorate.

As with any water treatment process, a suite of water quality indicator parameters, and other operational parameters, will be measured continuously for each stage of the advanced treatment process. This will ensure there is no risk of water leaving the water recycling plant that does not meet the high standards required. The suite of analysis will be reviewed in light of new and emerging substances.

An automated control system will monitor these parameters against a strict performance specification, initiating an automatic shutdown procedure if required. Operators would then diagnose and rectify the underlying fault, purge off-specification water from the system, and return the system to normal operation. Monitoring will be conducted for the combined output of a process, but also on individual units within a process. Only water that meets the required quality would be passed forward into the reservoir.

Chemicals used in the water recycling process, such as acids and alkalis used in pH correction and anti-scalant, are regulated and approved by the Drinking Water Inspectorate (under what is known as Regulation 31 approval) as suitable to be used in applications where consumers may be in direct contact with this water.

Any other chemicals that will be used in the membrane cleaning process, such as citric acid (a food grade chemical) and sodium hypochlorite (a disinfectant used in drinking water disinfection processes) are also

Regulation 31 approved. Hydrogen peroxide is an Environment Agency-approved chemical to control pollution events in rivers. It is therefore suitable to be in contact with the environment and as hydrogen peroxide degrades rapidly, it is also safe for use in the treatment of drinking water supplies.

Lime and carbon dioxide are used for remineralisation of drinking water treatment in some parts of the UK, including at the Thames Water desalination plant in London.

Recycled water is highly treated, purified water with lower levels of the nutrients known for causing algal blooms, than the spring water feeding into the reservoir. For example, initial modelling indicates that the average concentration of nitrates in the recycled water put into the reservoir would be significantly lower than the levels found in the spring water; 0.1mg/l (milligrams per litre) in recycled water, compared to 30mg/l in Havant spring water and 34mg/l in the water from Source B Springs. A permit for the release of recycled water into the reservoir will be granted and monitored by the Environment Agency.

Water recycling schemes of this type have been in operation internationally for decades, with the earliest examples dating back to the 1960s. In 2017, California had at least 8 large scale indirect water recycling plants in operation, with a further seven in development. The longest standing example of water recycling systems is the Goreangab Water Reclamation Plant in Windhoek, Namibia. The first iteration of this system was commissioned in 1969; in 2002 this was replaced with a new larger facility. Unlike the Southern Water proposal, this is a direct water recycling system, where the recycled water is transferred directly to the water supply works instead of discharging to the environment. No adverse health effects have been attributed to the introduction of this recycled water source to the drinking water supply for Windhoek. Southern Water has conducted an advanced statistical analysis to quantify the public health risk associated with the proposed water recycling system; this covers both acute health impacts associated with pathogen exposure, and chronic health impacts associated with chemical exposure (e.g. carcinogens). The findings of this analysis show extremely low health risk posed by the recycled water (benchmarked against WHO standards), even in simulated extreme treatment failure scenarios.

Southern Water has undertaken a pilot trial using the proposed treatment process at Budds Farm WTW. As part of this trial, an extensive sampling campaign was undertaken to measure concentrations of a large suite of pollutants, encompassing all the categories identified above, for the crude sewage, WTW final effluent, and at each stage of the water recycling treatment process. The proposed full advanced treatment process is an internationally proven and robust multi-barrier treatment process capable of removing a broad spectrum of contaminants to produce a high purity recycled water. Southern Water's pilot sampling data has successfully demonstrated the robustness of the process for its specific system. The sampling data from the pilot plant was used as an input to the quantitative risk assessment process which was mentioned in the response to the previous question.

The proposed full advanced treatment process uses Reverse Osmosis in tandem with UV-AOP⁵. In doing so, the high rates of removal achieved by the Reverse Osmosis process alone are further augmented by the high rate of removal achieved by the UV-AOP process to produce high purity recycled water. The concerns around the 'cumulative effect on people' relate to the chronic health risk associated with a water supply. Southern Water has completed a quantitative risk assessment for the chronic health risk and found that the risk very low, even in unrealistic extreme failure scenarios, and is of a higher quality than the baseline set by the World Health Organisation.

⁵ Ultraviolet Advanced Oxidation Process

As detailed in Section 3.11, Portsmouth Water understands that some customers have concerns about drinking recycled water. Portsmouth Water, as the operator of the reservoir with total control of the water entering and exiting it, would have to be fully satisfied in the safety with the proposals and subsequent operation before it would allow it to be used as a source of high-quality drinking water.

Portsmouth Water and Southern Water will be speaking directly to their customers about recycled water, giving them the facts, and offering them opportunities to ask questions. Please refer to Section 5.2.

4.2 Environmental assessment (construction)

4.2.1 Consultation themes

Respondents expressed concern regarding the environmental effects of the construction of the proposed HWTWRP. The key themes include:

- The environmental and social impact of the scheme's construction.
 - Social disruption due to the digging up of roads and upheaval of ground.
 - Potential effects on ancient woodlands and street trees.
 - The levels of carbon emissions.
 - The construction would disturb a landfill site which may result in landfill gas and leachate being released to the environment.
 - The construction of a pipeline which would have a massive adverse impact on the local community.
 - Overall concern that the pipeline would impact biodiversity.
- The potential to mitigate the impact of the pipelines by combining the pipeline into the same route and tunnel as the reservoir pipeline.
- The use of tunnels rather than open cut excavation for pipeline to reduce the impact on the local environment.
- The impact of tunnelling through the chalk aquifer on the drinking water source at Havant and Source B Springs and management of this risks.

4.2.2 Influence on WRMP24

The consultation comments about environmental assessments linked to the construction of the scheme have not resulted in any changes to WRMP24 or the proposed HWTWRP, but further clarity is provided below. This includes further information on future planned assessments.

4.2.3 Consultation response

A range of studies and investigations are ongoing as part of the consenting process for the proposed HWTWRP. A Preliminary Environmental Information Report and Habitats Regulations Assessment is being prepared, which will form part of Southern Water's next stage of public consultation in 2024.

These documents will report the preliminary findings on any likely significant impacts remaining, post scheme development, of the project based on the information available at the time and is designed to inform respondents' responses to the next consultation.

Southern Water will mitigate as many of these potential impacts as possible through ongoing careful design of the proposals, from routing the pipeline to avoid local communities and environmentally sensitive sites, to tunnelling beneath urban areas to minimise disruption to local roads and traffic e.g. in Havant. Construction of the above and below-ground infrastructure will be planned and undertaken with the utmost care to minimise disruption to people and the environment.

The majority of the underground pipeline would be installed using a conventional open cut excavation, which involves digging a trench, laying the pipe in the trench, and then backfilling the trench with soil before reinstating the land.

Some sections of the pipeline route pass through critical crossings that will not be generally suited to open cut excavation. These include roads, railways, waterways and sensitive environmental areas. In these areas, trenchless methods will be used to tunnel or drill underneath the ground to install the pipe without disturbing the surface.

As part of the scheme development process, and following the environmental assessments, the first step for the mitigation of impacts of environmental features such as ancient woodland and chalk aquifers is avoidance. Where this is not possible, due to their proximity to the sites that the pipelines would connect, Southern Water will look to mitigate any impact by using sensitive construction techniques.

Some 'future proofing' may be carried out during the main reservoir's construction. This would make it easier, safer and more efficient to install some elements of additional infrastructure associated with the proposed HWTWRP. For example, the installation of an additional pipeline to combine, in the future (if and when the proposed HWTWRP receives the appropriate approvals and consents), the flow from both Source B Spring Source (Portsmouth Water) with those of water from the recycling plant into one larger pipe in Portsmouth Water's proposed new tunnel. This would be between Source B Spring Source (Portsmouth Water) and the new reservoir, and it could avoid the need for Southern Water to construct an additional pipeline at a later date. These works in no way pre-empt the consultation and consenting process for the proposed HWTWRP and would not enable Southern Water to use this short section of pipeline until the point at which consent is granted for the proposed HWTWRP.

More details on proposed construction techniques and mitigations can be found here: [hampshire-wtwp-2022-consultation-brochure.pdf \(southernwater.co.uk\)](https://www.southernwater.co.uk/hampshire-wtwp-2022-consultation-brochure.pdf).

As part of the Development Consent Order (DCO)⁶ process, technical specialists undertaking the Preliminary Environmental Information Report and Environmental Statement downstream will inform the scheme development. Initially areas for avoidance will be highlighted, followed by understanding of the mitigation that may be required for areas where avoidance is not practicable. Following this, further regulatory impact assessments will be undertaken to inform the ultimate specific mitigation needs to be for those impacts.

Water recycling does use a lot of power in the treatment process but far less than desalination. Water recycling is also more effective than desalination. A typical desalination plant produces 40 litres of purified

⁶ Southern Water is pursuing the scheme via a Development Consent Order. Further information can be found in Section 5.2.

water for every 100 litres of seawater fed into it. A water recycling plant produces about 80 litres and, because the source water is much less saline than seawater, it uses one-tenth of the power to do so.

The proposed HWTWRP is needed to address the environmental impact of abstraction from chalk streams. Southern Water has a significant shortfall in available water in Hampshire after decades of relying on abstraction from the environment. New technology is needed to make up for this shortfall as Southern Water looks to meet its future need.

Careful consideration of energy requirements and carbon emissions during the design and planning stages of the proposed HWTWRP will help manage and reduce emissions during construction and operation.

A carbon strategy and plan has been developed to inform the design of the lowest carbon solutions and ensure the project aligns with the water industry commitment of net zero by 2030. The plan uses best practice methodologies to model and identify areas of high embedded and operational carbon, and then reviews possible alternative options. For more about carbon see sections 2.2.3 and 4.3.3

The pipeline alignment is designed to travel through the ground layers above the Chalk which allows the water to flow to Source B Spring Source (Portsmouth Water). As such, no changes or effects to the spring flows or quality are anticipated.

4.3 Environmental assessment (operation)

4.3.1 Consultation themes

Respondents raised questions regarding the environmental effects resulting from the operation of the proposed HWTWRP. These key themes included:

- The water industry has committed to net zero operational carbon by 2030. The proposed HWTWRP requires enormous energy and therefore will create a large carbon footprint and energy needs. Consultees want confirmation about the energy and carbon emissions of running the scheme.
- The scheme jeopardises the environmental and biodiversity benefits of the Havant Thicket Approved Reservoir. These include:
 - Impacts to the reservoir wetland due to algal blooms and dead spots where the recycled and spring water do not mix.
 - Environmental effects if untreated sewerage was to enter the reservoir.
 - Changes to the environmental effects when the proportion of effluent to spring water changes over the year.
 - Influence on reservoir levels and whether there would be a reduced fluctuation of reservoir levels which would have a detrimental effect on biodiversity.
 - Concern that the BNG of the Havant Thicket Reservoir cannot be delivered due to the use of recycled water.
 - The impact of any salts in the recycled water on reservoir water quality.
- Concerns that the downstream effects (as on designated sites such as Langstone Harbour and Hayling Island) have not been assessed, in particular due to nitrates. Confirmation of the brine discharge location and the potential environmental effects is needed.

- A number of consultees indicated that they would switch to drinking bottled water if the proposed HWTWRP goes ahead and raised concerns as to whether the environmental effect of this has been considered in terms of plastic waste and carbon implications.
- Concerns as to whether consideration has been given to the practicalities of repairing a burst pipe carrying recycled effluent pumped under pressure in the relevant residential areas.

4.3.2 Influence on WRMP24

The consultation comments about environmental assessments linked to the operation of the scheme have not resulted in any changes to WRMP24 or the proposed HWTWRP, but further clarity is provided below. This includes further information on future planned assessments.

4.3.3 Consultation response

Southern Water and Portsmouth Water are working together to ensure that environmental commitments made in respect of the approved Havant Thicket Reservoir, particularly around the biodiversity benefits of the wetland, will be maintained. A range of environmental surveys, studies and ground investigations are ongoing as part of the consenting process for the proposed HWTWRP. These include a comprehensive assessment of the construction and operational impacts of the project.

Southern Water will prepare a Preliminary Environmental Information Report and Habitats Regulations Assessment which will form part of its next stage of public consultation in 2024. These documents will report the preliminary findings on any likely significant impacts remaining post scheme development, of the project. Southern Water will share its progress on these assessments at its next consultation in the form of 'preliminary environmental information'. This information will outline the company's initial understanding of the proposed HWTWRP's impacts and provide details of the proposals to avoid or minimise them. The scope of these studies will include the areas of concern identified in the consultation such as the effects of reservoir level fluctuations, general effects on the wetland and reservoir dead spots.

Southern Water will continue to undertake environmental investigations. The main Environmental Impact Assessment will be documented in an Environmental Statement that will be submitted as part of the DCO application.

With regard to integration of the project with the approved plans for the Havant Thicket Reservoir, Southern Water and Portsmouth Water are working together to ensure there will be no detriment to planning and environmental commitments made in respect of the reservoir, particularly around the wetland. This includes the commitment to achieving Biodiversity Net Gain (BNG) as agreed with the approved Havant Thicket Reservoir scheme. BNG is an approach to development that aims to leave the natural environment in a better state than it was before development. This means that the development must not only prevent or mitigate the loss of biodiversity, but it must also create or enhance new habitats. It is also worth noting here that the proposed HWTWRP would be required by law to ensure that the habitat for wildlife is in a better state than it was before scheme (in other words, to provide BNG).

The salinity (which is predominantly made up of chloride and sodium concentration) within the treated wastewater would be removed before it is transferred from the water recycling plant to Havant Thicket Reservoir. The salinity is removed by RO, which increases the starting concentration in the reject waste stream. The treated wastewater from Budds Farm WTW has a salinity level of around 2.5 grams per litre (g/l), and would increase to around 11g/l in the rejected waste stream, which is released to sea. Seawater has a salinity of around 33g/l, higher than the increase in the reject waste stream to 11g/l.

There are no anticipated adverse impacts of the project on Langstone Harbour. The rejected brine water from the water recycling plant would be released, along with the treated wastewater, from Budds Farm WTW via the existing Long Sea Outfall 5.7km out into the Solent. This outfall was installed in 1992 to protect local bathing water quality and the harbour by releasing treated wastewater out into the deep-water channel. Southern Water will undertake marine surveys this year, which, combined with dispersal modelling, will

inform the Environmental Impact Assessment report (EIA). The scheme would be subject to Habitats Regulation Assessment (HRA) during the assessment stage.

Any water put into public supply would be required to meet the strict standards set out by the Drinking Water Inspectorate. Ongoing public engagement will help ensure the cleanliness and wholesomeness of the water provided is known and understood by customers and the general public. The support of local authorities and other key stakeholders and partner organisations in sharing and signposting engagement material will also help achieve this.

Following treatment at the water recycling plant, the recycled water is required to meet drinking water standards and hence any repair to burst pipes would be no different to current practice for a water mains repair. It is important to note that the proposed HWTWRP is fundamentally different, and separate, to the current wastewater system and stormwater releases which are designed to protect homes from flooding. See Section 3.8 of this document for more information.

Carbon assessments were completed during the development of the scheme and used as a comparison between the various options e.g. desalination, indirect water recycling and the proposed HWTWRP. A carbon plan is being developed to inform the design of the proposed HWTWRP and to ensure the project minimises the impact and helps Southern Water to meet the water industry commitment of net zero by 2030. The carbon strategy will inform carbon modelling and identify areas of high operational carbon, which will be avoided wherever possible. Please refer to Section 4.2 for further information on operational carbon emissions.

4.4 Amenity and recreation

4.4.1 Consultation themes

Respondents expressed concern that the HWTWRP could impede the amenity and recreation objectives of the Havant Thicket Reservoir. The key themes include:

- Respondents highlighted that the reservoir was a space for community, recreation, leisure and well-being (including supporting those with mental health issues), but the proposed HWTWRP would have adverse effects on this.
- Respondents raised concerns that the proposed HWTWRP would change the types of leisure activities which can take place, compared to what was set out in the original planning application for the Approved Havant Thicket Reservoir.
- The Approved Havant Thicket Reservoir scheme included the prospect of water sports which has now been rescinded and further information was requested as to why that is the case.

4.4.2 Influence on WRMP24

The consultation comments about amenity and recreation of the scheme have not resulted in any changes to WRMP24 or the proposed HWTWRP, but further clarity is provided below.

4.4.3 Consultation response

As well as providing drinking water and creating new habitats for wildlife, Havant Thicket Reservoir will become a new leisure and community focus area for Havant. There will be footpaths for walking, cycling and horse riding, facilities for bird watching as well as picnic and play areas. A visitor centre will be built on the site with a café, toilets and space for education and community activities.

Footpath links between the site, Staunton Country Park and Havant Thicket and the wider area will be kept in place to ensure connectivity is retained during construction. Portsmouth Water is also making

contributions to Hampshire County Council to enhance local bridleways, including cycle and pedestrian connections in Staunton Country Park, and sustainable access to the site from the B2149 and Whichers Gate. Portsmouth Water is continuing to work closely with the local community, including local schools, to shape the recreational opportunities available.

Initial investigations suggest that recycled water would be cleaner than the spring water entering the reservoir and there is no reason for it to impact the planned leisure facilities on site. Portsmouth Water would only support these plans if satisfied that there would be no detrimental impact on the recreational plans that have been approved through existing planning permissions.

In respect to water sports, the level of recreation at the reservoir has been agreed with Portsmouth Water's Havant Thicket Stakeholder forum (which is made up of local community groups, councillors, schools and environmental organisations) after many years of discussions, surveys with local communities and learning from other reservoir sites and public parks. It is important to note that while different activities were put forward as suggestions, Portsmouth Water did not promise, or commit to providing, specific water sports.

Portsmouth Water has carefully considered a range of potential leisure activities at the reservoir site, including sailing and canoeing. As part of this process, Planning Solutions Ltd, who are experts in developing and managing water-based visitor attractions, were asked to review the visitor experience offer at the reservoir.

All three scenarios scoped by Planning Solutions (Low, Medium and High activity levels) were tested extensively with our Havant Thicket Reservoir stakeholder forum. The overwhelming feedback received, both from written surveys and discussions with the local community, has been not to offer large-scale public water sports, including canoeing, at the reservoir. The forum members selected the 'Medium' level plan, with the proviso of providing scope for future expansion. This was because it would be a much busier place if there was a more intense water sport offer, attract more people and put greater strain on the environment, facilities and local communities.

Currently a draft Recreation Strategy for the reservoir has been circulated to the stakeholder forum members. Their input will help to finalise the exact recreational provision Portsmouth Water will offer at the reservoir when it is full and operational in 2031/32. This will include footpaths for walking, as well as routes for cycling and horse riding, facilities for bird watching, picnic and play areas and car parking. There will also be a visitor centre with a café, toilets and space for community and education activities.

4.5 Landscape and location of the scheme

4.5.1 Consultation themes

The consultation comments raised a number of points in relation to the landscape effects of the scheme and the location of the scheme. The key themes raised by respondents include:

- The water recycling plant should be located to minimise the need for major pipeline routes.
- Respondents questioned if alternative locations had been considered.
- The location of the water recycling plant is on a former landfill site which could result in environmental risks (covered via Section 4.2) and could also result in impacts on the local area in terms of smells and gases released to the local environment.
- Due to the historic landfill the site may be subject to ground movements which could impact the operation of the site.

- Respondents questioned the visual impact of the water recycling plant which would be difficult to screen and as a result, be an eyesore on the landscape.

4.5.2 Influence on WRMP24

The consultation comments about the landscape and location of the scheme have not resulted in any changes to WRMP24 or the proposed HWTWRP, but further clarity is provided below.

4.5.3 Consultation response

Southern Water undertook a robust site selection process to identify the best location for the new water recycling plant. It first looked for sites within a radius of 500 metres of Budds Farm WTW as keeping the water recycling plant close to the source of water will help reduce energy consumption due to shorter pipeline lengths.

Given that available land within 500 metres of Budds Farm is severely limited, this search area was expanded to 1,500 metres. Southern Water identified sites within this search area that would minimise impacts on residential areas, community facilities and key infrastructure.

The preferred location for the water recycling plant is referred to in Southern Water plans as 'Site 72'. It is an industrial site, near Budds Farm WTW. Following a robust process, we carefully assessed a number of options. We then selected this site from the feasible options as a result of its suitability and proximity to the source of water to be recycled.

Ground investigations undertaken to date at Site 72 have not identified any issues that would either preclude development or operation of the site, or could not be managed via industry-standard construction practices, such as those associated with ground movements or the release of gases.

The water recycling plant would be carefully designed and screened to minimise its visual and environmental impact during construction and operation, and be sympathetic to the location.

5. Public stakeholder engagement and consultation

5.1 Stakeholder engagement for WRMP24

5.1.1 Consultation themes

A number of the consultation comments expressed concern over the consultation of WRMP24 and consider the consultation inadequate. The key points made by respondents were as follows:

- Consultation has been inadequate and not well advertised.
- Why were the consultations not published on customer bills to allow customers who have no or limited online access to be aware.
- Concern that previously published information (such as the RAPID Gate 2 reports) were redacted.

5.1.2 Influence on WRMP24

The consultation comments about stakeholder engagement have not resulted in any changes to WRMP24 or the proposed HWTWRP, but further clarity is provided below.

5.1.3 Consultation response

Southern Water's customer engagement in relation to the development of its WRMP24 has far exceeded the statutory requirements, and our consultation in relation to WRMP24 meets or exceeds statutory requirements. Southern Water conducted a consultation which was accessible to customers through its website.

To prepare WRMP24, Southern Water has been engaging with the regulators since the publication of WRMP19. It has also engaged with customers and stakeholders on water resources for some time, particularly through WRSE. Southern Water has participated in webinars, public meetings and meetings with councils and other stakeholders.

Southern Water received comments on the options, and the assessments of benefits and impacts, particularly from the Environment Agency and Natural England. Southern Water's dWRMP24 incorporated a number of these comments.

Through Water Resources South East (WRSE), Southern Water held discussions with other regional groups on the potential to transfer water from other parts of the country to the South East. These discussions looked at technical methods, regional policies and the additional value that the Regional Plans, and thereby company WRMPs, deliver through the development of a best value framework. Southern Water has actively supported these activities and contributed to a series of workshops and webinars with stakeholders to invite their input on various aspects of the company's plan. All the slides from the webinars, together with a recording of the presentation and discussion, were published online.

In June 2022, Southern Water submitted an early draft WRMP24 to Defra as required by the WRMP Direction 2022 which enabled it to take on board some early feedback which helped in the development of its dWRMP24.

Southern Water's dWRMP24 was published for consultation between November 2022 and February 2023. The aim of the public consultation was to reach as many customers as possible, and to engage with a representative audience across the supply area. In order to achieve this, it produced a comprehensive set of documents for public consultation on the dWRMP24 including:

- A technical report and appendices that described different components of the plan in detail along with the methods and data used for each component.
- A consultation document that summarised the company's proposed strategy for ensuring that it can maintain a continuous, reliable supply of water to its customers in all but the most extreme drought conditions.
- An online questionnaire accompanying the consultation document with 21 key questions on different aspects of the proposed strategy. A prepaid envelope addressed to Defra was provided with the questionnaire.
- A four-page A5 information leaflet on the plan.
- Strategic Environmental Assessment and Habitats Regulation Assessment of the plan.
- Water Resources Planning tables, including the data used to develop the plan.

A number of these documents were made available on the Southern Water website. Hard copies of dWRMP24 were made available at the company's regional offices for people to come and view them;

including some detailed information that could not be provided through the website due to the data that would be required to support it. Electronic copies of particular documentation were directly sent to respondents upon request.

During the consultation period there were 983 views and 340 visitors recorded on the WRMP landing page of the 'Have Your Say' website and a further 5,784 views and 1,721 visits to the WRMP section on the main Southern Water website.

The consultation was promoted to customers through news releases issued to the regional media, advertising in regional newspapers and local authority publications and interviews with regional television and radio. This was supported by social media such as Facebook and Twitter.

Southern Water held meetings with the Environment Agency, Natural England, Ofwat, Defra and the Consumer Council for Water. Throughout the process, the company liaised regularly with the Southern Water Customer Challenge Group.

The consultation included workshops, briefings and one-to-one meetings with interested parties including local councils, environmental bodies, elected members, economic forums and consumer groups.

As part of its ongoing insight work, Southern Water has robustly gone out and spoken to a range of customers and specifically targeted certain audiences to make sure their voices were heard including vulnerable, future and business customers (both informed and uninformed). It also undertook a quantitative survey with over 100 customers which was a complete replication of the consultation but with customers who may not have had a chance to have their voice heard. The company made sure it reached out to the local communities where these schemes are being proposed to hear more local feedback on the challenges and feedback they had.

A full outline of Southern Water's engagement activities, both pre-consultation and during the consultation can be found in its main Statement of Response.

The 2022 public consultation (<https://www.southernwater.co.uk/our-story/our-plans/water-for-life-hampshire/consultations>) focused on the site and pipeline routing and potential opportunities and impacts of the construction of the water recycling plant and associated pipelines. It did not specifically state where the recycled water would be used for drinking water supplies.

Some information was redacted in the RAPID Gate 2 reports to ensure compliance with the Security and Emergency Measures Direction (SEMD) 2022, which is a ministerial direction that sets outcomes water companies must meet in the interest of national security and for the purpose of mitigating the effects of any civil emergency. Primarily the redactions related to sensitive information regarding the operation of existing water treatment works and/or the supply and distribution network. The information that was redacted for RAPID Gate 2 was mostly the costing information, as Southern Water is about to tender the delivery it was deemed inappropriate to publish these, along with the site names. Southern Water redacted for commercial confidentiality and SEMD, as per RAPID guidelines. However, the majority of the information is not redacted in the reports on the company's website.

Original (unredacted) copies of the RAPID Gate 2 documentation were made available to RAPID at the time., which includes its constituent regulators (Ofwat, the Drinking Water Inspectorate and the Environment Agency).

5.2 Future planned events, consultations and assessments

5.2.1 Consultation themes



The consultation responses received raised concern about the scheme not undergoing thorough assessment and missing information about the next stages of assessment and consultation. The following key points were raised by respondents:

- Suggestion that the option and public consultation should be delayed until further assessments are completed in relation to drinking water, the environment and alternative options.
- Concern the scheme would be determined by the DCO route, rather than local planning permission and bypass the local authority for consenting the scheme.
- Confirmation was sought on timescales for delivery, including opportunities for public and stakeholder influence, and input into the scheme.
- Confirmation of the communication plan going forward for customers and stakeholders.
- Confirmation of the impact on landowners (in particular those along the pipeline route)

5.2.2 Influence on WRMP24

The consultation comments about future planned events, consultations and assessments have not resulted in any changes to WRMP24 or the proposed HWTWRP, but further clarity is provided below.

5.2.3 Consultation response

This following section firstly provides an update to the expected delivery scheme in comparison to the dWRMP24 and then provides a response to the consultation comments.

Update on delivery dates

Proposed delivery data change to the Hampshire Water Transfer and Water Recycling Project

As the scope of the proposed HWTWRP has matured, testing of the delivery schedule has been conducted, including a Quantitative Schedule Risk Analysis (QSRA) which has enabled a greater understanding of the project's risks. This analysis has concluded that a 2030 delivery date is not achievable given the level of risk now understood in key areas of the programme. The analysis has indicated greater confidence in delivering the proposed HWTWRP by 2035. This assessment is based on some key assumptions (i.e. that the preferred water recycling plant location can be secured and customers have greater acceptance of recycled water). There are a small number of significant factors influencing this assessment, which in combination result in the extension of forecast delivery timescales. These are:

- Size requirements for the water recycling plant – because of the impact of further supply-demand investment modelling and an updated forecast of future environmental destination needs
- Development Consent Order – the potential risks relating to submission, decision, or legal challenge
- Direct Procurement for Customers – the potential risks to complete an agreement
- Interface and consenting risks due to combination of the Havant Thicket Reservoir project and the proposed HWTWRP.

Southern Water now forecasts that the proposed HWTWRP will be available to provide benefit from April 2035 rather than April 2030 as in the dWRMP24.

The proposed scheme delivery date is already of regulatory and public interest. This is because the scheme occurs later than the original West Southampton Coast desalination scheme proposed in Southern Water's WRMP19 for 2027-28. There are concerns that the later delivery date could have negative impacts on protected chalk stream habitats in Hampshire.

Southern Water will be consulting on this change in likely delivery date for the proposed HWTWRP, and the proposed measures to meet the supply-demand balance in the interim while also protecting the environment, as part of a further round of consultation on WRMP24.

Consultation response

Southern Water is seeking consent for the proposed HWTWRP through the DCO process due to its scope, size and status as a Nationally Significant Infrastructure Project. The project spans six local planning authorities and Southern Water is working with them collectively to discuss and develop the plans.

The broad timeline for the proposed HWTWRP is:

- 2019: WRMP19 published
- 2021: First public consultation on preferred strategy (desalination) with water recycling as a back-up option
- 2022: Public consultation (pipeline route options)
- 2024: Public consultation (pipeline route and water recycling infrastructure)
- 2024: Anticipated consent application submission
- 2026: Consent application decision
- 2035: Final date by which the proposed HWTWRP is expected to be operational.

In May 2022 Defra confirmed that the proposed HWTWRP is of national significance, and that in order to achieve consent Southern Water will need to apply for a DCO from the Secretary of State. DCO applications are submitted for large-scale infrastructure developments, known as Nationally Significant Infrastructure Projects. DCO applications are made to the Planning Inspectorate who will consider the application and make a recommendation to the relevant Secretary of State (in the case for the Department for Environment, Food and Rural Affairs) who decides whether to approve or reject the application.

There is a considerably more onerous requirement on the applicant for consultation and engagement under the DCO consenting regime compared with the town and country planning route for consenting a scheme. The DCO process is built around significant consultation and engagement and resolving as many issues as possible before the application is submitted, ensuring local communities and other interested parties have opportunities to shape the proposals as they are developed. Applicants must demonstrate how they have met strict requirements relating to consultation and engagement when they submit a DCO application.

Southern Water's next public consultation on the project will provide preliminary environmental information on the likely effects of the project on the environment.

Information on alternative options to the project were provided within both Southern Water's February 2021 and Summer 2022 public consultations, available here: [Consultations \(southernwater.co.uk\)](https://www.southernwater.co.uk/consultations).

Public awareness and engagement will be ongoing as the plans progress with a series of school and community talks planned, alongside briefings, drop-in sessions and updates on websites and social media.

Once the final pipeline route has been confirmed, Southern Water will contact landowners who are directly affected by the proposed works and seek to understand the impact of the works on them. The aim will be to mitigate that impact as far as possible, without compromising on the ability to deliver the scheme. Compensation will be assessed with reference to a statutory framework. The principle is that people should be left neither better nor worse off financially as a result of the works. The impact of the works and the level of compensation will vary from landowner to landowner and will be discussed on a case-by-case basis.

As detailed in Section 3.11, Portsmouth Water and Southern Water understand that some customers have concerns about drinking recycled water. Portsmouth Water, as the operator of the reservoir with total control of the water entering and exiting it, would have to be fully satisfied in the safety of the proposals and subsequent operation before it would allow it to be used as a source of drinking water. Portsmouth Water and Southern water will be speaking directly to their customers about recycled water, giving them the facts, and offering them opportunities to ask questions. This programme of activities would run alongside the Southern Water future engagement work.

ENDS