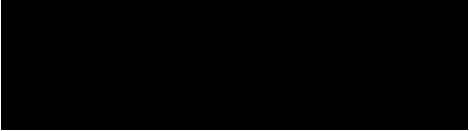


Large Scheme Gated Submission 1



Resilience

Date 1st October 2025
Version 02cg

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Glossary

Acronym	Full Term
AMP7	Asset Management Period 7
CNI	Critical National Infrastructure
DWI	Drinking Water Inspectorate
FEO	Final Enforcement Order
HazRev	Hazard Review
PR24	Price Review 2024
PIM	Programme Insights Manager
KR	Key Risk
HLPS	High Lift Pumping Station
RTW	Return to Works
DAF	Dissolved Air Flotation
GAC	Granular Activated Carbon
PAC	Powdered Activated Carbon
PFAS	Per- and Polyfluoroalkyl Substances
UV	Ultraviolet
SDP	Strategic Delivery Partner
BIM	Building Information Modelling
PCD	Price Control Deliverable
PCDW16a/d	Price Control Deliverable W16a/d
SWS	Southern Water Services
SSE	Scottish and Southern Electricity
RGF	Rapid Gravity Filter
ML/d	Megalitres per day

1 Executive Summary

1.1 Overview

This document has been produced to meet Ofwat Submission 1 for PR24 large schemes that are to follow the 'gated' process. [REDACTED] is one of seven Southern Water (SWS) schemes that Ofwat have identified which are required to follow this process.

[REDACTED] Investment during AMP7 addressed immediate water quality risks identified through our Hazard Review (HazRev) programme. Abstraction from the sensitive River Test chalk stream is becoming increasingly challenging in drought conditions due to planned licence reductions alongside expected increased variability of water quality throughout the year.

1.2 Regulatory Drivers and Strategic Engagement

This next phase of our investment strategy – known as [REDACTED] Resilience Scheme will focus on enhancing long-term asset resilience and delivering upgrades to meet evolving water quality demands. These investments are largely driven by Final Enforcement Orders¹ (FEOs) issued by the Drinking Water Inspectorate (DWI).

We have undertaken options definition and preferred solution development which has identified 96 outputs. Design maturity will improve during the development phase, with levels of uncertainty in scope, cost and programme estimates to be reduced between Submission 1 and Submission 2, meaning we will have increased confidence in these by the time of Submission 2. In addition, our understanding of risks and issues will mature between September 2025 and May 2026 which will further improve confidence in our estimates.

Risks are reflective of the lifecycle stage of the project, as the project moves through outline design and into full design the risk position will change.

Table 1 – Summary table

Category	[REDACTED] Resilience Scheme Details
WRZ	Hampshire
Population Impacted	[REDACTED]
Primary Assets	New DAF, GAC, UV and HLPS
Scope	• Additional raw water monitoring • Refurbished LLPS • Enhanced clarification processes (New DAF and refurbished clarifiers) • New GAC to replace existing PAC • New RTW facilities • Relocated UV • Replacement of existing chemical storage

¹ <https://www.dwi.gov.uk/water-companies/improvement-programmes/southern-water-improvement-programmes/srn-2022-00009-2/>

	• New HLPS
Delivery Partners	Strategic Delivery Partner (CMPD JV)
Estimated Development costs	£8.4m to Submission 2
Regulatory Drivers	DWI Final Enforcement Orders (FEOs)
Programme Timeline	2025–2031

Multiple options have been investigated throughout the treatment process at [REDACTED]. Details of the options considered and the outputs of the Risk and Value (R&V) process are given in Section 3 of this document. The key findings from the options appraisal work are:

- Abstraction: The abstraction Low Lift Pumping Station (LLPS) should be refurbished including replacement of the existing pumps with VSD pumps
- Clarification: Retain and refurbish clarifiers 1 to 4. Replace flat bottomed clarifiers (units 5 to 7) with new Dissolved Air Flotation (DAF) clarification process
- Taste and Odour: Replace Powdered Activated Carbon (PAC) process with Granular Activated Carbon (GAC) process
- High Lift Pumping: Replace existing High Lift Pumping Station (HLPS) with new
- Chemical Storage: New sodium hypochlorite dosing adjacent to point of application. New sodium bisulphate storage and dosing

The details of our preliminary findings and recommendations are outlined in this report. We seek approval and endorsement from Ofwat to continue our development phase of [REDACTED].

2 Background and Objectives

2.1 Introduction

This document provides a summary of investment needs at [REDACTED] and options to address these Needs. It discusses how these Needs and options have developed through time and how we have managed this process, engaged with stakeholders and developed costings as the scheme has progressed.

Abstraction from the sensitive River Test chalk stream is becoming increasingly challenging in drought conditions due to planned licence reductions alongside expected increased variability of water quality throughout the year. In order to provide environmental protection for the rivers Test and Itchen, particularly in periods of low flow, the Environment Agency amended four abstraction licences held by SWS for public water supply. These licences were the subject of a Public Inquiry in March 2018. [REDACTED]

2.2 Investment Need

Treatment at [REDACTED] presently comprises coagulation, powdered activated carbon addition, clarification, and filtration followed by chlorine disinfection and ultraviolet (UV) disinfection. The UV disinfection is currently a temporary installation situated downstream of the High Level Pumping Station (HLPS). The

works was constructed in three stages between 1965 and 1988, just before privatisation, to meet the then treatment standards that are not as high as those framed in the Water Supply (Water Quality) Regulations 2018. Nonetheless, generally compliance has been achieved, however investment is required to ensure reliable performance that exceeds the minimum regulatory requirements and also meets DWI requirements and customer expectations for water quality.

Key shortfalls in current performance are:

- Taste and odour failures on occasions at the works supply point and customers taps
- Discolouration events in the network attributable in part to the levels of iron residual leaving the site
- There has been a history of bacteriological compliance failures in treated water

Taste and Odour is caused by chemicals Geosmin and MIB, released by algae which are seasonally present in river Test at [REDACTED]. Data for Geosmin and the algal indicator Chlorophyll A presented in Figure 1 below and clearly shows the seasonal spikes in Geosmin.

Figure 1 - River Test - Indicators of T&O causing chemicals (Algal counts on left axis, chlorophyll and geosmin are ug/l on right axis)

The Geosmin is currently not adequately removed by the treatment process, as shown in Figure 2 below.

Figure 2 - Geosmin in Treated Water leaving [REDACTED] (ug/l right scale)

A primary cause of discolouration events in the network is the presence of iron which has entered the network from the water supply works. Figure 3 below shows the iron residual leaving [REDACTED] over the last three years. The step down in the last year is the result of a temporary measure to mitigate the impact of a poor-

performing filtration asset due to be removed as part of the planned investment, and further improvement will be achieved once the full scope of the AMP8 scope is delivered.

Figure 3 - Iron levels in water leaving

The coliform compliance history in final water is summarised below.

Table 2 – Coliform Compliance History at

Year	Number of coliform compliance breaches
2016	1
2017	1
2018	7
2019	4
2020	1
2021	0
2022	0
2023	0
2024	1

Temporary UV was installed in 2019 to mitigate the coliform failures, and the coliform compliance improved from that date. The temporary configuration does not provide full standby capability and needs to be replaced with a resilient installation with standby that is capable of treating the full range of flows.

The investment plan for the site includes provision of new Dissolved Air Flotation (DAF) clarification treatment to replace two of the three clarification treatment streams. The stream that is being retained is a reliable base-load process that is well suited to treating the turbid winter water challenge. The new DAF process will improve the algal removal achieved and reduce the turbidity challenge on the filtration stage. The DAF process also allows better optimisation of the coagulation chemistry enabling lower iron residuals to be achieved. The plan also includes the construction of new Granular Activated Carbon (GAC) treatment to remove taste and odour-causing compounds including Geosmin and 2-Methylisoborneol (MIB) and allows the decommissioning of the Powdered Activated Carbon (PAC) dosing upstream of the clarification stage. GAC is a more reliable treatment process than PAC, and also future proofs the site against emerging contaminants such as PFAS and micropollutants arising from personal care products. GAC is also able to remove low levels of iron residual from the upstream treatment processes. These improvements directly address the Wholesomeness drivers of taste and odour and discolouration.

The third process improvement is the construction of a permanent full duty-standby UV disinfection capability to replace the current temporary installation which was a short-term mitigation against bacteriological compliance failures.

The wastewater and sludge handling system is also being brought into line with best practice to maximise the volume of water that can be recovered from the treatment process with a corresponding reduction in the volume of water that needs to be abstracted from the River Test.

There is also a comprehensive programme of replacement of life-expired assets (pumping, power supply and distribution and control) that have caused customer-impacting interruptions to supply and expose the site to resilience risk, many of which are itemised in the Final Enforcement Order.

Additional intermediate pumping is included to re-lift the water through the new GAC and UV treatment stages, and the investment programme includes all the necessary ancillaries and run-to-waste facilities that enable resistant and reliable asset performance in the first instance with fail-over to standby systems, and rapid response and recovery in the event of unforeseen failure.

The next investment phase of our strategy will focus on enhancing long-term asset resilience and delivering upgrades to meet evolving water quality demands. These investments are aligned with the Final Enforcement Orders (FEOs) ² issued by the Drinking Water Inspectorate (DWI).

We have undertaken options definition and preferred solution development which has identified 96 outputs. Design maturity will improve during the development phase, with levels of uncertainty in scope, cost and programme estimates to be reduced between Submission 1 and Submission 2, meaning we will have increased confidence in these by the time of Submission 2. In addition, we expect that our understanding of risks and issues will mature between September 2025 and March 2026 which will further improve confidence in our estimates.

The need for this programme of investment at [REDACTED] has developed due to the issues and challenges outlined below:

- [REDACTED] treats surface water only. The first Notice on [REDACTED] was issued 2018 after two events and a DWI audit, the site has undergone significant resilience enhancements changes due to the issues identified on the site during events and compliance breaches. We have since received 87 FEOs from the DWI in February 2023 to resolve these issues.
- [REDACTED]
[REDACTED] The abstraction will reduce further in more severe droughts to 0 MI/d in a 1 in 20, 1 in 100 and 1 in 200-year drought. This will require [REDACTED] to be integrated into the Regional Water Supply Grid.
- [REDACTED] requires integration with the regional Hampshire water supply grid whilst also reducing our reliance on abstracting from the River Test, especially during periods of water stress, to protect the river's ecology in line with changes to our abstraction licence set by the Environment Agency (EA).

² <https://www.dwi.gov.uk/water-companies/improvement-programmes/southern-water-improvement-programmes/sm-2022-00009-2/>

2.3 Objectives

The scope of this Programme is the timely delivery of 96 outputs identified through detailed reviews of site risks and performance, alongside extensive engagement with the DWI.

9 of these are classed as FEO's - of which 18 FEO actions relate to reporting and monitoring. A further 5 actions are currently not classed as FEOs but are to receive equal priority by SWS due to their criticality to the future performance of the site. Failure to address these non-FEO's comes with a high risk of further enforcement notices being issued.

Addressing these long-term problems and the vulnerability of the sites throughout AMP8 within the context of their wider zones– remains our utmost priority.

Table 3 – Primary drivers

Scheme name	Reference	Driver	Date Requirement	Regulatory Notice
[REDACTED]	752228	FEO	Various	SRN_2022_00009_[REDACTED]_FEO v1
[REDACTED]	795023	FEO	Various	SRN_2022_00009_[REDACTED]_FEO v1

As part of our PR24 business plan we submitted a series of Enhancement Cases for consideration. Our assessment for [REDACTED] was included within 'SRN25 Supply Resilience Enhancement Programme, Enhancement Business Case – Special Cost Claim'³. This report was deemed a 'special cost claim' because it identified issues with four of our major WSW surface works and proposed that a single programme of strategic investment for each works to address needs would yield efficiencies rather than a series of smaller incremental projects.

The business case describes in detail how we assessed the needs at four of our WSWS surface works, including [REDACTED], and assessed strategies to address these needs.

2.4 PR24

Our PR24 Draft Determination Response (DDR) submission included the interventions to improve the resilience of water supplies from [REDACTED]. Our PR24 enhancement case and our DDR outlined that we have invested significantly more than our base allowance at our four largest treatment works ([REDACTED]). [REDACTED] This has been focused on resolving the immediate water quality risks identified through our HazRev programme.

The next phase, to be delivered in AMP8, is to resolve long-term asset resilience and provide enhancements to support future water quality needs. Since the DDR submission we have continued to work on these interventions and on alternative interventions to improve resilience and find efficiencies. The scale of the

³ SRN25 Supply Resilience Enhancement Programme, Enhancement Business Case – Special Cost Claim'
<https://www.southernwater.co.uk/media/2m5bxeka/srn-ddr-028-water-resources-supply-enhancement-cost-evidence-case.pdf>

resilience interventions being considered is being developed further and any changes will be reported in Submission 2.

3 Optioneering and Solution Design

3.1 Optioneering Activities post final Determination

We have reviewed and enhanced the PR24 preferred option analysis to identify potential options and refresh both the scope elements and associated costs to inform this document.

We have been informing Ofwat of the progression of the design as part of the quarterly reporting on projects, with our last briefing on [REDACTED] highlighting the following issues:

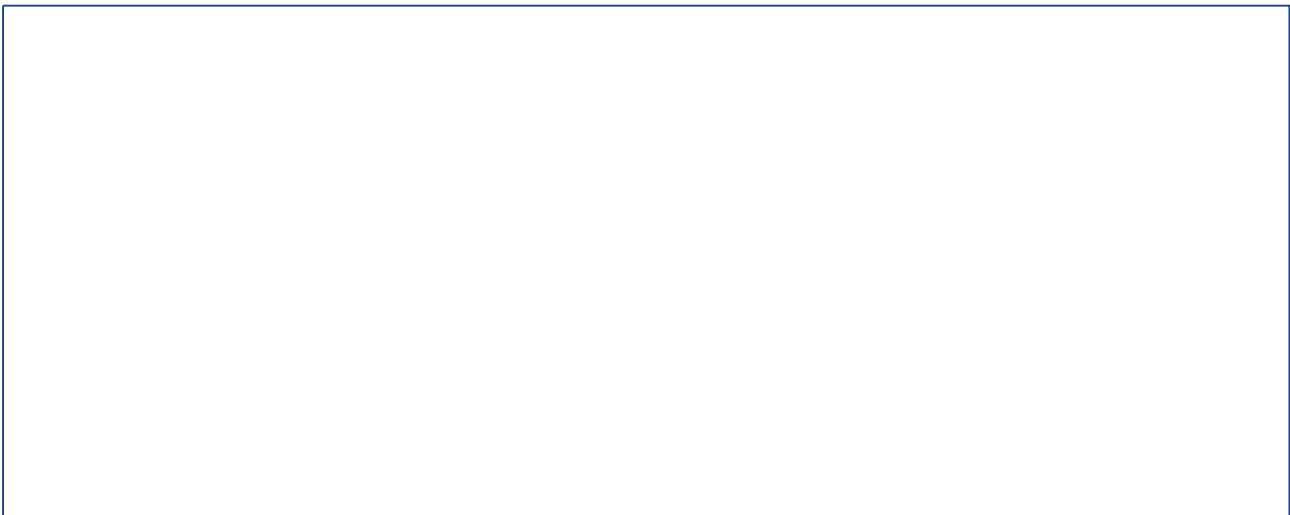
- Works are ongoing at the site to address the Drinking Water Inspectorate (DWI) Final Enforcement Order (FEO)'s.

[REDACTED]

Whilst acknowledging the need to progress [REDACTED] through the Ofwat gated process we also recognise the need to progress the project to maintain compliance and to achieve regulatory and enforcement dates and have carried out detailed briefings with our teams responsible for delivering capital investment projects with key information on the requirements, deliverable benefits and time, cost and quality expectations for a project.

Figure 4 illustrates the investment timeline for [REDACTED], including the work planned in AMP8. These work elements are discussed in greater detail in the following sections.

Figure 4 - Investment Timeline



3.1.1 Abstraction Works – Low Level Pumping Station refurbishment

The [REDACTED] abstraction works consist of:

- a) a river intake via eel screens, band screen and twin culverts
- b) a Low Lift Pumping Station (LLPS) and;

- c) the [REDACTED], which is utilised as side storage and to manage high turbidity in the river



The three main options investigated include:

- a) **Option 1** - refurbishment of the existing pumping station including retention and refurbishment of the aged pumps, plus new VSDs. This option has been **discounted** as it relies on aged asset which are unsupported, requires a bespoke solution during refurbishment, takes time to refurbish and results in loss of flow after refurbishment. This does not meet SWS long term resilience objectives.
- b) **Option 2** - refurbishment of the existing pumping station, including replacing the aged pumps with new more energy efficient VSD pumps. **This is the preferred option**, as this meets the long-term resilience objectives.
- c) **Option 3** - new build pumping station with new intake and LLPS. This would be purpose built to address all issues identified above. This option offers the highest risk reduction but has been **discounted** due to constructability issues, complex access requirement, and enabling, environmental and third party issues, which result in higher uncertainty of delivery to meet the FEO deadline. This option also has the potential for higher Capital spend beyond affordability.

Table 4 – Summary of R&V 3.1 long list of options considered for the LLPS

Table Summary of R&V 3.1 long list of options considered for the low lift pump

Options 1 and 2 include additional scope to resolve the silt build up, culvert access and egress issues. The proposed solution will be undertaken in two stages: a) Culvert access improvements, which include increasing the frequency of access and egress points and replacing all isolation penstocks, b) mitigations to prevent silt deposit at the river intake, options are still under development via external subject matter experts. Options 1-

3 include installation of raw water monitoring on [REDACTED] to include Ammonia, Dissolved Oxygen, Turbidity, pH, Conductivity, Temperature and Algae.

3.1.2 Clarification – Clarifiers 1-4 refurbishment and replacement of Clarifiers 5-7



- a) Start-up is directly into service and there are limited means of managing out of specification water from being passed onto the downstream RGFs. Stable operation requires formation of a sludge blanket during startups.
- b) Coagulation conditions on the existing clarification processes are sub-optimal. Ideally coagulant is dosed immediately upstream of a high shear-energy flash mixer, followed by controllable flocculation conditions. At [REDACTED] on streams II and III such controllable flocculation conditions are not available.
- c) The flocculation conditions within flat bottomed clarifiers are flow rate dependent which limits the operational flexibility and turn-down capability of the units. When operated at flows either side of the optimum, there is a risk of poorer solids removal and higher residual coagulant metal ion concentrations leading to potential downstream water quality problems within the distribution network.

Based on the above, SWS' internal R&V process determined that replacement of clarifiers 5-7 by a new clarification process offers the best solution, allowing for optimal coagulation and flocculation conditions immediately upstream of the solids separation stage. All flows from the new clarifiers will be diverted through existing RGFs 1-12, to combine with the flow from existing Clarifiers 1-4. The long list of clarification options considered is below. To select the most resilience clarification option for the site, four key clarification technologies were assessed against a combination of the various possible raw water sources (lake and/or river source).

The clarification processes considered included Dissolved Air Flotation (DAF), Flocculant Blanket Clarifiers (FBC), ActiCarb and Ceramic membranes. The ActiCarb and Ceramic membrane requires extensive trial and present a programme challenge to meeting the DWI FEO dates. Cost estimates for the ceramic membrane option were prohibitively high resulting in exclusion under the R&V process. FBCs will continue to present startup issues especially during low raw water turbidity, and high algae events in the lake. FBCs also have higher Opex due to chemical costs. We completed a trial that confirmed the suitability of DAF at [REDACTED]. Within SWS, DAF is utilised at Brede and Beauport WSWs, treating water from Powdermill and Darwell Reservoirs, the water quality is similar to [REDACTED], suggesting DAF would work well at [REDACTED].

Table 5 – Summary of R&V 3.1 long list of options for the clarification solution

Options		Scores	Commercial Consideration		Final Score	Level of Risk Reduction (High, Medium, Low)	Progress Option to Short-list?
		Total Score (on criteria)	CAPEX	OPEX	Overall Score (TOTEX)		
Option No.	Description						
1A	Option 1A - Abstract raw water from River and lake as currently done. Retain and refurbish all existing asset, including stage 3,	12	4	1	17	Low	No
3A(FBC)	Option 3A (FBC) - Abstract raw water from River and lake as currently done. Replace Stage 3 with new FBCs, Retain Clarifiers 1-4 and divert all flow through RGF 1-12. Retain and refurbish all other existing asset.	15	3	3	21	Medium	Yes
3A(DAF)	Option 3A(DAF) - Abstract raw water from River and lake as currently done. Replace Stage 3 with new DAF, Retain Clarifiers 1-4 and divert all flow through RGF 1-12. Retain and refurbish all other existing asset.	15	3	2	20	Medium	Yes
3A(Actiflo)	Option 3A(Actiflo) - Abstract raw water from River and lake as currently done. Replace RGF 13-14 and all existing clarifiers 1-7 with new Actiflo and divert all flow through RGF 1-12. Retain and refurbish all other existing asset.	14	3	2	19	Medium	No
4A(FBC)	Option 4A(FBC) - Abstract raw water from River and lake as currently done. Replace RGF 13-14 and all existing clarifiers 1-7 with new FBC and divert all flow through RGF 1-12. Retain and refurbish all other existing asset.	14	2	3	19	Medium	No
4A(DAF)	Option 4A(DAF) - Abstract raw water from River and lake as currently done. Replace RGF 13-14 and all existing clarifiers 1-7 with new DAF and divert all flow through RGF 1-12. Retain and refurbish all other existing asset.	16	2	2	20	High	Yes
4A(Actiflo)	Option 4A(Actiflo) - Abstract raw water from River and lake as currently done. Replace RGF 13-14 and all existing clarifiers 1-7 with new Actiflo and divert all flow through RGF 1-12. Retain and refurbish all other existing asset.	15	2	2	19	Medium	No
4B(DAF)	Option 4B - Direct 100% abstraction to Lake. Replace RGF 13-14 and all existing clarifiers 1-7 with new DAF and divert all flow through RGF 1-12. Retain and refurbish all other existing asset.	14	2	2	18	High	No
4B(Actiflo)	Option 4B - Direct 100% abstraction to Lake. Replace RGF 13-14 and all existing clarifiers 1-7 with new Actiflo and divert all flow through RGF 1-12. Retain and refurbish all other existing asset.	13	2	2	17	Medium	No

Replacement of all the existing clarifiers presented the highest Totex solution. The blended solution of retaining and refurbishing Clarifiers 1-4 and replacing Clarifiers 5-7 with DAF presented the solution with the highest Whole Life Benefit – i.e., greatest residual risk reduction against Whole Life Cost. A balanced view was taken with respect to Capex and Whole Life Benefit and the blended solution was selected to improve resilience and operational performance.

A new sludge management system is required to support the pre-disinfection system, including a new coagulant storage and dosing system.

3.1.3 Taste & Odour – New GAC Process

Powdered Activated Carbon (PAC) has been used historically at [REDACTED] for taste and odour removal. The [REDACTED] are also a source of algae, which presents some challenges to the reliance on PAC for efficient taste and odour (T&O) removal. Dose optimisation trials were conducted prior to AMP6 that established that the PAC doses required to effectively manage T&O-causing compounds were higher than the site was able to dose at the time. Improvements were implemented on the existing system to allow a higher dose to be applied, but this could not be utilised without directly impacting the clarified water turbidity coming off the FBCs and the application of lower doses than ideally required had to be continued.

The residual risk with continuous use of PAC is significant. These include Health and Safety risks to Operators working with the powdered material and the possibility of the PAC shielding pathogens within the downstream processes. Currently, the required PAC contact time is provided within existing clarifiers, albeit with a sub-optimal PAC dose. The choice of DAF as future clarification solution will require a large upstream tank to provide at least 1 hour's contact time if use of PAC were to continue. [REDACTED] is also prone to seasonal dissolved organics. Providing Granular Activated Carbon (GAC) treatment addresses the above risks and has additional benefits:

- a) GAC downstream of RGFs allows the adsorption of organic micropollutants to occur without competition from the raw water total organics load;
- b) By removing PAC from the clarification stage, it can be better optimised for turbidity removal and minimum coagulant metal ion residual;
- c) Clarifier sludge does not contain PAC, which has historically caused problems in the operation of the receiving wastewater treatment installations;
- d) The process is fixed-bed and does not rely on continuous operation of the PAC slurry make-up and dosing system;
- e) GAC provides an auditable control measure for T&O compounds, PFAS (if this becomes a problem), and pesticides;
- f) GAC provides polishing for low levels of metals (manganese and iron) with potential benefits both to UV operation and in the quality of water supplied into the distribution network.

It is on this basis that a strategic investment decision was made to include GAC and to ensure a resilient solution for taste and odour removal alongside removal of other parameter such as dissolved organics.

3.1.4 Disinfection – New RTW, relocated UV and new chemical storage and dosing

The existing works has no Run to Waste (RTW) facilities post main dose to prevent out of specification water from entering the chlorine contact tank. To address this deficiency this project is installing an automated, post main dose, RTW facility between the point of application of the final chlorine dose and the contact tank inlet. This will prevent out of spec water entering the contact tank and will ensure compliance with Regulation 26. The scope includes the provision of a 1MI storage tank and associated pumps and pipework to return the flows to the head of works or the [REDACTED]

[REDACTED]

[REDACTED]

3.1.5 High Lift Pumping Station

[REDACTED] Refurbishment works requires an extended duration of the pumps being out of operation, which risks interruptions to customers' supplies. [REDACTED]

[REDACTED]

3.1.6 Treated water storage

The existing potable water and industrial water storage reservoirs have a net storage volume of 4Ml/d and are aged but in good condition. There is a need to provide RTW on clarifier 1-4 outlets, the new DAF outlets and on the final water main, but this will require a new storage tank to be constructed. In addition, the construction and commissioning of DAF and GAC assets requires additional storage provision estimated to be 4Ml. The R&V process determine that the best value approach is to repurpose the existing aged reservoirs to receive the RTW flows, plus the DAF and GAC commissioning flows, with a new 3Ml treated water storage tank constructed adjacent to the new HLPS.

3.1.7 Power Resilience

Following a power resilience investigation, several issues have been identified at [REDACTED] that could affect the ability of the works to deliver water to customers. Some of these are related to equipment that has come to the end of its design life and is starting to show signs of becoming unreliable. Other issues are related to obsolete equipment that, although currently operating, has an increasing risk of failure due to its age – some assets are circa 50 years old. These assets include the standby generator, High Voltage (HV) switchgear, various transformers, HV cabling and Low Voltage (LV) switchgear.

[REDACTED] is serviced by Scottish and Southern Electricity (SSE) as the power Distribution Network Operator (DNO). [REDACTED]

The additional load from the new process is expected to increase the site load from 1.8MVA to about 3.2MVA. This requires additional power to be provided by the DNO. [REDACTED]

In view of the above, assets such as the transformers, generators and cables are planned to be upgraded to support the new site load and improve site resilience, this requirement is common to all options detailed in Table 7 below. The long list of options considered during R&V3.1 is detailed in this table. Option 2 was discounted as it does not include standby generation. [REDACTED]

[REDACTED] Option 1, 3 and 4 were progressed to costing.

Table 6 – Summary of R&V 3.1 long list of options considered for the power resilience scope

Options		Scores	Commercial Consideration		Final Score		Level of Risk Reduction (High, Medium, Low)	Progress Option to Short-list?
Option No.	Description	Total Score (on criteria)	CAPEX	OPEX	Overall Score (TOTEX)	Overall Score out of 64 (TOTEX + WLCarbon + Natural Capital + Social Capital)		
1	Single DNO Source + Fully rated duty/standby Generation + deliver common Scope in Table 1/2	19	4	3	26	41.3	High	Yes
2	Dual DNO Source + No standby Generation + deliver common Scope in Table 1/2	9	1	3	13	23.7	Low	No
3	Dual DNO Source + Fully rated duty/standby Generation + deliver common Scope in Table 1/2	15	1	3	19	29.7	High	Yes
4	Single DNO Source + Fully rated duty/standby Generation + Site UPS backed (Critical control, analysers) + Common Scope in Table 1/2	18	3	3	24	39.3	High	Yes

The CAPEX comparison of the shortlisted options is shown below. Benefit/cost for dual supply in Option 3 is considered low since both supplies would be from one DNO sub-station. Benefit/cost of site-wide Uninterruptible Power Supply (UPS) was low for Option 4, a separate FEO item dealing with automation of the site will reduce this risk. The two Ring Main Units (RMUs) and feed to Lakes Pumping Station would provide resilience for the ring main and reduced loads on the feeds.

Table 7 – R&V 3.2 CAPEX estimate for the power resilience scope

Capex only	Option 1 Single DNO supply (upgraded) – HV back up generator	Option 3 – Dual DNO Supply – HV Generator backup	Option 4 – Single DNO Supply (upgraded) – HV Generator backup & UPS
A) New HV cable to Lake PS			
B) 2 RMUs in existing site and feeds to Lake PS (assume existing HV cables can be retained)			

3.1.8 Final Process Configuration

The existing and proposed final site process configuration is shown in Figure 5. The replacement of the existing aged, fixed speed low lift abstraction pumps with new VSD models allows for continuous and resilient abstraction, with more energy efficient pumps as well as facilitating easier startup/shutdown, and flow ramp up or down in the event of water quality event. [REDACTED] is integral to the future of the site, especially under drought conditions. The lake provides buffering during high turbidity events in the river, a final destination to enable reclamation of the various RTW flows and overflows, further reduces the reliance on the River Test to discharge flows and avoids the need to build additional storage tanks, with additional benefits such as minimising the risk of river pollution and allowing water conservation.

The existing FBCs (Clarifiers 5-7) have less tolerance to higher turbidity in the river source, high algae concentration in the lake and PAC dosing upstream. Taking climate change impacts into consideration (more intense storms), the risk of higher turbidity in the river source is increasing, requiring significant reliance on the lake and a downstream clarification technology that can handle the risk of algae. The flocculation conditions within FBCs are flow-rate dependent, which limits the operational flexibility and turn-down capability of the units. When operated at flows either side of the optimum there is a risk of poorer solids removal and higher residual coagulant metal ion concentrations, leading to potential downstream water quality problems. The replacement DAF units can effectively treat raw water at elevated turbidity and algae concentrations.

The continuous use of PAC is no longer acceptable at the site. It presents Health and Safety risks to Operators, it introduces the possibility of shielding pathogens within the downstream processes, it is prone to blockages leading to interruptions in dosing and therefore does not ensure reliable and efficient removal of taste and odour (T&O) compounds generated by algae in the lake. GAC resolves these issues, with additional benefits

of allowing the clarification stage to be optimally utilised for turbidity removal, allowing the adsorption of organic micropollutants to occur without competition from the raw water total organics load, it is a fixed-bed process and does not rely on continuous operation of the PAC slurry make-up and dosing system. GAC also removes PFAS and pesticides (if these become a problem).

is prone to bacteriological failures post-disinfection, which was mitigated in the interim by the installation of a temporary UV units at the back end of the existing works. The installed UV has significant gaps in terms of redundancy, compliance with asset standard and is in the wrong location for a typical works, being downstream of the HLPS. The various overflows, RTW and commissioning flows would have required a larger volume of storage to be constructed to manage these volumes. The best value approach is to repurpose the existing aged treated water reservoirs to receive the overflows, RTW flows, and DAF and GAC commissioning flows, with a new 3ML treated water storage tank to be constructed adjacent to the new HLPS, which will replace the existing aged high lift pumps. This offers a significant risk reduction by removing any possible contribution of the aged reservoirs to bacteriological detections. UV irradiation is to be relocated to the appropriate position in the process.

Figure 5: Existing and proposed final site configuration post project completion

4 Solution Costs and Benefits

4.1 Introduction

This section provides updated costs for the current preferred option as well as providing details of the costing methodology that has been used to derive the costs. No best value appraisal has been undertaken to date; this activity will be undertaken prior to Submission 2.

The cost build-up is in-line with SWS' PR24 Methodology entitled "SRN15 Cost and Option Methodology"⁴. We have undertaken reviews on the scope items to ensure that relevant yardstick and sizing information is available and correctly presented. During this review, scope item costs were compared with the relevant cost curves and models and we have addressed any areas of mismatch and/or gaps.

The cost models and generated costs were validated and a sense check was applied to the outputs to address any further anomalies. Any further gaps were raised and checked, as well as addressed. The cost information was benchmarked with methodology provided in Annex B1.

Item	Cost
Blended Total Project Estimated Cost (Inc Corp OH for Price Review (PR) Only)	
Corporate OH (11.7% of blended total)	
Blended Total Project Estimated Cost (Exc Corp OH)	
Total Indirect Costs	
Contractor & Client Indirect Costs	
Sites Specifics and TtOR	
Net Direct Works Costs	

Table 8 : Solution Cost Estimates (Class 4)

4.2 Change Log - Post PR24

There have been no material changes to the scope, benefits, site location, route, programme or costs on this project since the PR24 Final Determination in December 2024 (based on Ofwat's PR24 criteria of change). Therefore, no change log is included in this submission.

⁴ Southern Water. SRM15 Cost and Option Methodology: Technical Annex (October, 2023). Available at: https://www.southernwater.co.uk/media/mjyp0of4/srn15-cost-and-option-methodology_redacted.pdf

4.3 Solution cost estimates

Solution cost estimates have been produced for the Ceramic membrane and DAF options. The costing methodology is consistent with the approach taken for PR24. The cost estimates are summarised below and reported, alongside the benchmarking.

4.4 Early CAPEX Estimate

The Stage 1 Strategic Delivery Partner (SDP) Contract has provided an **indicative** cost estimate for information purposes, which reflects a substantial increase (£265m) compared to the PR24 baseline. This variance underscores the need for a thorough validation of the SDP's underlying logic, particularly in relation to programme assumptions and procurement strategy.

Early during Submission 2 we will carry out a formal review of these indicative costs, complete our internal governance and update Ofwat through a revised Change Log as part of the Delivery Plan requirements.

To address this, Submission 2 will focus on key activities aimed at scrutinising areas where efficiencies may be realised. Central to this effort will be the development of a fully costed high-level design, offering a transparent and comprehensive representation of the proposed solution.

This design will be subject to rigorous benchmarking and assurance processes to test its feasibility, performance, and alignment with strategic objectives. These measures are intended to build confidence in the accuracy and reliability of the design and its associated costs, thereby supporting informed decision-making and mitigating delivery risk as the project advances.

Below sets out the areas of the scope and the cost increases.

Table 9 – Early Capex estimate (not confirmed)

5.1 Project delivery plan

Large Scheme Gated Process - [REDACTED]

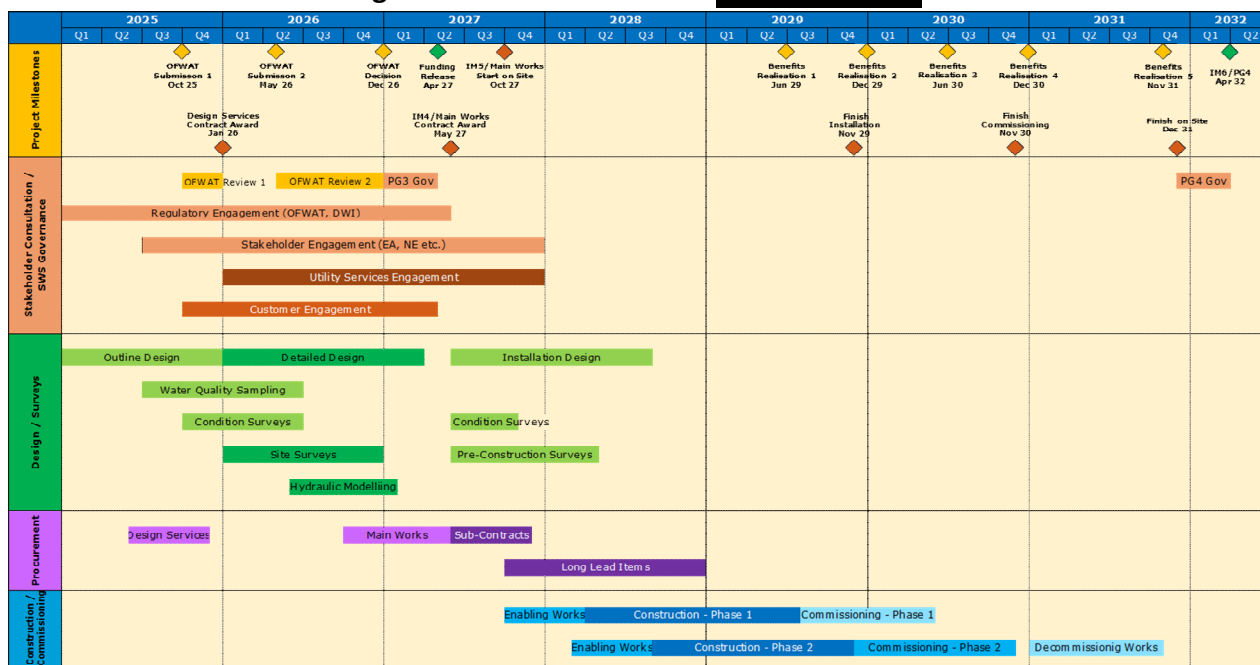


Figure 6 – Summary of Draft Delivery Plan

We have ensured that this submission is fully aligned with our DPW4 delivery plan table, including all key milestones and expenditure details. The relevant table is provided in the Annex C1. This replaces our August delivery plan submission as the most up to date baseline, there is likely to be limited change as part of our November 7th delivery plan update to the delivery plan. As part of Submission 2 there may be further changes to the delivery plan baseline.

Based on the proposed scope of works and programme constraints, our proposed target date for Submission 2 is May 2026. Should any significant risks emerge that affect our delivery plan, we may propose the Submission 2 target date be adjusted. We would discuss this approach in our quarterly engagement with Ofwat as required.

The activities completed by Submission 2 is highlighted in Figure 7 below:

Figure 7 - Activities to be completed by Submission 2

The key activities for Submission 2 are that the high-level design will be fully developed and costed, providing a clear and comprehensive overview of the proposed solution. This design will undergo rigorous benchmarking and assurance processes to validate its feasibility, performance, and alignment with project objectives. These measures will ensure a high degree of confidence in the design's accuracy, reliability, and cost-effectiveness, enabling informed decision-making and reducing risk as the project progresses.

The delivery plan has been developed through a structured process against the SWS scope, objectives, and success criteria. The SDP in partnership with SWS and key stakeholders have undertaken optioneering and feasibility assessments that have created a baseline on the project's complexity and risk profile.

The delivery plan itself includes detailed programming and scheduling, resource allocation, cost planning, risk management, quality assurance, health and safety compliance, and stakeholder communication strategies. Increasingly, digital tools such as Building Information Modelling (BIM) are integrated to enhance coordination and visibility. Assurance of these plans is achieved through internal peer reviews, formal governance gate reviews, and independent audits. Compliance with industry standards and regulations is verified, and risk and change control mechanisms are maintained throughout delivery. Performance is monitored using key metrics and regular reporting to ensure the project remains aligned with its objectives and expectations.

It is worth noting that by Submission 2, the SDP will have submitted a CTC 1, which is the first of three submission stages. At CTC 1, the SDP is required to submit the following:

- Design Proposals including sufficient Process Solution and Process Solution Parameters
- An initial programme for each project (schedule) in P6 showing the critical path activity

- Any revisions to the access date(s), key date(s) (where applicable) for each project and the completion date(s) and/or sectional completion dates
- Notional Design Deliverables Schedule(s)
- Notional Procurement Schedule(s) & the Framework procurement strategy
- Monetised risk register(s), unless agreed as an exceptional risk, for each project
- If available, subcontractor and/or supplier quotes for each package of work
- Where available/applicable, tender analysis of each subcontractor or supplier formal package(s), or assurance that S/C Framework and/or Bulk procurement arrangements prices have been assured in-line with SDP suppliers Framework rates
- Cost build sheets (including PRCs and backing sheets) for each project in accordance with SWS WBS where possible
- Copies of any reports and/or ECI outputs referenced and/or used in the Contractor's formation of the CTC(s), for each project, e.g. site/ground investigation reports, environmental reports

The Project team, CIT and wider internal stakeholders will review and assure the CTC submissions to ensure that the project is developing sustainably and inline with the project brief/design criteria.

5.2 Planning and consenting route

The Stage 1 scope of the Strategic Delivery Partner will inform the planning requirements and process route. This includes identifying necessary consents, environmental assessments, and stakeholder consultations. Progress will be reported quarterly to Ofwat, ensuring alignment with regulatory expectations and planning milestones.

5.3 Key risks and mitigation measures

Risk identification and evaluation activities are in line with SWS' risk management framework. This framework defines a process that all capital projects must follow for risk identification, evaluation, mitigation, and review, and is fully aligned with ISO31000 requirements. Following this process, the key risks to achieving the project objectives have been identified, scored, and mitigation actions defined.

Risks are identified, evaluated and managed using our Programme Insights Manager (PIM) system which provides real-time visibility and control across the delivery programme. Key delivery risks (and issues) are set out in Table 9 with planned mitigation measures.

Table 10 - Key Risks (and issues)

Risk Category (and ID)	Risk Description	Pre-mitigation Score	Mitigation Action	Residual Score
Power Availability Shortfall KR001				
Land / Reservoir / River condition KR002	Due to the unknown condition of the land/reservoir/river, there is a risk that assumptions surrounding the scope and breadth of enabling and construction works are incorrect. This could result in (a) additional/reduced costs and (b) delays/time saved.		Early surveys and modelling to be conducted before enabling or construction work is scheduled.	
Unclear or delayed scope / requirements KR003	Due to unclear/delayed scope and requirements data, there is a risk that design does not meet the required project output, resulting in failure to meet testing &		Regular assessment of design and outputs by Sponsor and Delivery teams at key milestones in project journey	

Risk Category (and ID)	Risk Description	Pre-mitigation Score	Mitigation Action	Residual Score
	commissioning /handover /Ops/regulatory dates.			
Poor Ground Conditions KR004	Due to the site location, there is a risk that of poor ground conditions which could result in construction delays and significant impacts to the schedule and costs		Early surveys and modelling to be conducted before enabling or construction work is scheduled.	
Availability of Specialist Resources KR005	Due to the nature of the work being carried out and the skills required to deliver the works, there is a risk that the specialist resource required will be unable to be sourced due to market demands, which may result in the project paying a premium.		Resource challenge is common across UK, has been escalated for awareness and support within SWS and key Regulators.	
Availability of Key materials KR006	Due to limits on the availability of key materials, there is a risk that competition pushes up prices and reduces availability. This could lead to (a) additional costs and/or (b) delays in delivering the project.		Working with procurement and supply chain to identify any early lead items and improve cost forecasts.	
DAF process performance issues KR007	Due to scoping issues with the DAF requiring pH correction by the chosen supplier and this not being within SWS scope. This element of the solution development cannot proceed		Jar testing is being completed to confirm if Ph correction will be required.	
Need to increase Sewer network capacity KR008	Sewer network capacity may need increasing in order to connect the surface water drainage from site		Hydraulic modelling being undertaken to assess this risk and create a detailed mitigation plan	
Storage Capacity KR009	Storage may reach capacity at peak construction times		Hydraulic modelling being undertaken to understand storage risks to create a detailed mitigation plan	

6 Customer Protection

6.1 Price Control Deliverables

As part of this scheme we recognise the importance of ensuring our customers are protected and so we have proposed a price control deliverable (PCD), this is in addition to our current PCDW16a on the water resilience and the upgrade of our water supply works.

This PCD follows the same conditions as set out in section 8.1.2 of [PR24-final-determinations-Price-control-deliverables-appendix-REDACTED.pdf](#)

Table 11 PCD Summary

Company	SRN
Enhancement area	Resilience
PCD No.	PCDW16d

Common requirements	See Section 8.1.2 of Price control deliverable appendix
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Additional company specific requirements

Description	Upgrade works at SRN water treatment works [REDACTED], Hastings and upgrade to Isle of Sheppey resilience
Output measurement and reporting	The company should report the % earned value (EV) delivered against the scope of works specified within each of the submission 2s. The company must annually report delivery progress of all interventions and must deliver all of these interventions by 31st March 2030 or non-delivery payments apply.
Assurance	Companies should provide assurance on the reported data as per the common requirements.
Conditions on scheme	No further conditions

Non-delivery PCD rate	Unit	Under-performance
[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]
Hastings	£m per 1% of earned value of project not delivered	0.35
Isle of Sheppey	£m per 1% of earned value of project not delivered	0.15

PCD outputs (cumulative)	Unit	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	2032-33	2033-34	2034-35
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
Hastings	%	0	0	0	0	0	0	100%	100%	100%	100%	100%	100%
Isle of Sheppey	%	0	0	0	0	0	0	100%	100%	100%	100%	100%	100%

7 Stakeholder and Customer Engagement

7.1 Overview

Southern Water has engaged proactively with key stakeholders throughout the development of the [REDACTED] Resilience Scheme. A stakeholder engagement plan has been created to guide activities up to Submission 2. Key Stakeholders include:

- Drinking Water Inspectorate (DWI): Engagement has been ongoing following notices and Final Enforcement Orders (FEOs). The scheme directly addresses DWI concerns around asset condition, treatment performance, and operational resilience.

- Environment Agency (EA): Coordination has focused on environmental constraints and planning considerations, particularly around raw water infrastructure and aqueduct refurbishment. Early-stage environmental impact assessments (EIAs) and planning reviews are underway.
- Ofwat: SWS continue to engage with Ofwat through quarterly meetings and reporting. The scheme has been introduced with the aims and objectives as well as key challenges with onsite visits planned to demonstrate the complexity of onsite activity.
- Local Authorities: Hampshire County Council.

7.2 Customer Engagement

Customer engagement has been extensive, and we have engaged with them as we developed our proposals for PR24 (refer to SRN25 Supply Resilience Enhancement Programme Sect 2.3) for full details.

In June 2023 we held five additional online sessions as our part of Water Futures 2030 engagement with customers across all counties in the Southern region to explore overall reactions to the planned four sites enhancement programme. This feedback told us that:

- Customers were largely supportive of the plans we have in place and understood the long-term risks of inaction
- Customers positively see benefits to both themselves, and to the local economy of the proposed investment programme, feeling that their previous views have been represented
- Customers understand the need for work to be prioritised and are happy to see that our current thinking matches their own
- References to sustainable solutions, use of technology and improving resilience for future generations increases confidence and support
- The current plan feels proactive and innovative and aligns with customers' desire for more modern and innovative methods of delivery

An overview of recently conducted relevant customer research has told us that the areas of focus are:

- Resilience – Customers recognise the need for and importance of urgent investment in basic infrastructure in the face of climate change
- Drinking water quality – Customers believe that safe drinking water is their number one priority as they need huge trust in the quality of water coming out their tap
- Carbon and Net Zero – Does not feel like a core priority for acceleration, though customers acknowledge wider importance of less carbon

Customer Priorities are therefore:

- Addressing ageing infrastructure, population growth, climate change
- Customers want long-term, sustainable solutions, not short-term fixes
- There's a strong preference for nature-based and partnership approaches, balanced with traditional infrastructure
- Customers expect affordable solutions that support future growth
- Local feedback highlights concern about overdevelopment, loss of green space, and infrastructure strain
- Mixed reactions to the scheme: some support a new WTW as sustainable, others worry about odour, noise, and prefer using existing infrastructure

7.3 Regulators and Partner Organisations

In developing our WRMP, we worked with a wide range of partners, including the DWI, Local Planning Authorities and organisations with responsibilities for protecting and enhancing the environment such as Natural England, Catchment Partnerships and River and Wildlife Trusts. We engaged with over 180 individuals from 75 organisations.

Ofwat - We met with Ofwat in September 2025 as part of the regular LSG Quarterly Review meetings. We introduced the team, provided an update on the scheme progress, issues, risks and timeline. Quarterly meetings will continue through Submission 1 and Submission 2.

A site visit is currently being arranged for November 2025 with Ofwat. This visit will provide an opportunity to demonstrate firsthand the intricacies of delivery and foster constructive dialogue around progress and regulatory expectations.

Drinking Water Inspectorate – The Company has been served with 9 FEOs^{5, 6}. SWS proposals have been developed to meet FEO's required steps, following a period of consultation with the DWI. We have the support of the DWI regarding our plans at [REDACTED]

We liaise with the Inspectorate on a regular basis. Throughout the year, we have quarterly meetings on our sites where they track our progress. Furthermore, we send them detailed reports every six months with updates and evidence of the ongoing work. We also have monthly meetings to discuss our overall progress and governance of our programme.

Environment Agency - SWS has provided a written update outlining the current status and forward strategy for the [REDACTED] scheme. As the project progresses, SWS recognises the critical importance of proactive engagement with key environmental stakeholders, particularly the Environment Agency (EA) and Natural England, due to anticipated changes in abstraction volumes and potential modifications to environmental discharge parameters.

To date, initial contact has been made with the EA, and key representatives have been identified to support collaborative forward planning. This early engagement is intended to ensure regulatory alignment and facilitate a smooth progression through future planning stages.

Natural England - SWS has also reached an agreement with Natural England to initiate formal engagement once the scheme's options have been sufficiently refined. This phased approach will allow for more targeted and meaningful discussions, ensuring that environmental considerations are fully integrated into the decision-making process.

As the project moves toward Submission 2, stakeholder engagement will intensify in parallel with the maturation of design options. The final solution will be underpinned by robust environmental assessments and

⁵ [Southern Water Improvement Programmes - Drinking Water Inspectorate](#)

⁶ [REDACTED]

regulatory input, ensuring that it is both technically viable and environmentally sustainable. This collaborative approach is expected to enhance confidence in the scheme's deliverability and compliance, while reducing risk and supporting informed investment decisions.

7.4 Stakeholder engagement plan

We have developed a Stakeholder engagement plan which is owned by both the Project Team and our Customer Engagement team to ensure effective, transparent, and inclusive engagement with stakeholders and customers throughout the lifecycle of the [REDACTED], supporting regulatory compliance, community trust, and successful delivery.

Table 12 - Stakeholder Identification

Stakeholder Group	Role/Interest	Engagement Priority
Drinking Water Inspectorate (DWI)	Regulatory oversight; FEOs issued	High
Environment Agency (EA)	Environmental compliance and planning	High
New Forest District Council	Local governance and planning	High
Local MPs and elected officials	Political advocacy and community representation	Medium
Community organisations & charities	Support for vulnerable groups	Medium
SWS customers	Service recipients and impacted residents	High

Engagement Objectives

- Address regulatory concerns and align with FEO timelines
- Build trust with customers following repeated service disruptions
- Ensure vulnerable customers (PSR) are prioritised in planning and delivery
- Incorporate local authority and community feedback into scheme design
- Communicate clearly and frequently about progress, risks, and benefits

Table 13 - Engagement Activities

Activity	Audience	Frequency	Purpose
Regulatory briefings and updates	DWI, EA	Quarterly or as required	Compliance and alignment
Local authority workshops	Councils, MPs	Bi-annually	Planning input and coordination
Incident debrief and planning sessions	Hampshire Resilience Forum, Emergency Services	Post-incident and annually	Emergency preparedness
Community forums and listening events	Residents, charities	Quarterly	Feedback and co-design
PSR customer outreach	Vulnerable customers	Monthly	Needs assessment and service assurance
Multi-channel communications (SMS, website, social media)	All customers	Ongoing	Updates, education, and transparency

Key engagement activities with these groups in the period to Submission 2 are:

- Regular contact with Ofwat and the Environment Agency to report solution progress and risk management
- Targeted meetings with the Local Planning Authority, Hampshire Downs National Landscape Unit, Natural England, Historic England to discuss initial development ideas and constraints, which can inform design development
- Contacting Statutory Undertakers to identify technical and programme constraints in the location of the solution and ways of working to mitigate constraints
- Providing updates to neighbouring local authorities and parish councils
- In addition, consulting environmental, community groups and residents through steps in the planning process, e.g. non-statutory consultation exercise

Customer engagement will continue through our established channels, including seeking feedback from our customer panel as the development of solution continues.

Stakeholder mapping has been undertaken which has confirmed the following key groups:

- Regulators: Ofwat, Environment Agency, Drinking Water Inspectorate, Natural England, Historic England
- Local Planning Authority: **Hampshire County Council**
- Local authorities and parish councils, Statutory Undertakers, Network Rail, National Highways, electricity, gas, telecoms and water providers
- Environmental, community and business groups

8 Assurance

8.1 Our approach to assurance

As described in our statement Data Assurance Summary, we take full responsibility for our performance information and seek to take a transparent approach to data assurance. We follow the 'three lines of defence' framework for our reporting governance and assurance activity. This framework helps to assure performance information by applying multiple levels of control.

Ultimately, all assurance activity has oversight from the Board and Audit Committee; the Board maintains oversight of material risks and issues and our timelines for improvement, while the Audit Committee monitors the assurance over the integrity of information reported by us in fulfilment of our regulatory, legal and environmental obligations as well as overseeing and challenging the effectiveness of our approach.

Our Risk, Audit and Assurance team ensures compliant reporting to our regulators by ensuring all our reporting is subject to internal review and appropriate external assurance.

We engaged [REDACTED] to undertake limited assurance (under ISAE (UK) 3000) over our Large Schemes Gated Submission 1, focusing on completeness, accuracy and validity of the data in the areas detailed by Ofwat in their Final Determination and subsequent guidance. [REDACTED] reports for each scheme are appended to this submission and describe their scope, approach and findings in greater detail.

8.2 Managing Risks and improvements

Through an extensive execution planning process, SWS has developed our PR24 Business Plan into AMP8 delivery and investment Plans. We continue to refine our plans for the AMP and are collaborating with our internal and supply chain stakeholders to improve maturity. During the development of our plans we are identifying, mitigating and managing deliverability risks.

We have established a Strategic Programme Operating Model, with each Strategic Programme Leadership Team responsible for mitigating and managing identified risks. This is an active and ongoing process and will be used to support future reporting submissions.

8.3 External Assurance findings ()

Annexes F1 and F2 contain the external assurance findings from our independent advisors (both technical and commercial). These findings have been reviewed by our Assurance teams, the respective MDs and our CFO as part of our signoff governance process.

All findings will be incorporated into our preparations for Submission 2 and reviewed as part of Submission 2 assurance.

9 Efficiency of Expenditure to Date

9.1 Costs to Submission 1 (1 April 2025 - 1 Oct 2025)

Please refer to the detailed breakdown provided in Annex G1, which outlines the cost and activities associated with Submission 1. This annex includes itemised expenditures, high level timelines, and relevant activity types for each cost component incurred during the initial submission phase. A summarised version of these costs is presented below for quick reference.

It is important to note that no costs have been incurred in relation to Submission 2 at this stage, as no early activities or preparatory expenses have been undertaken for that phase. All financial commitments to date are exclusively associated to Submission 1.

Table 14 - Submission 1 costs

Expenditure Summary	Submission 1 Costs (£)
SWS Indirect Costs	
Strategic Delivery Partner Stage 1 forecast	
Risk 10%	
SWS Overheads	
Total	
Total deflated to 22/23	

9.2 Forecast expenditure to Submission 2 (Oct to May 2026)

Please refer to the detailed forecast breakdown in Annex G1, with summaries below.

A summarised version of the Submission 2 forecast is presented below for quick reference. These projections are directly linked to the activities scheduled to be undertaken as part of the Submission 2 phase, and reflect anticipated operational, logistical, and strategic commitments necessary for its successful execution.

Table 15 - Forecast to Submission 2

Expenditure Summary	Submission 2 EAC (£)
SWS Indirect Costs	
Strategic Delivery Partner Stage 1 forecast	
Risk 10%	
SWS Overheads	
Total	
Total deflated to 22/23	

9.3 Comparison against the development allowance

The current financial forecast for SWS indicates a projected underspend relative to the allocated development allowance. This suggests that, based on current planning and expenditure trends, SWS is expected to operate within budget and may not require the full extent of the funds originally earmarked for development activities.

To ensure continued accuracy and responsiveness to changing conditions, the forecast will be reviewed and updated on a monthly basis. These updates will incorporate:

- Emerging risks that could influence cost trajectories
- Cost pressures arising from market fluctuations
- Resource constraints
- Scope adjustments
- Operational changes that may affect timelines or deliverables.

Forecast monitoring will help maintain transparency, support effective decision-making, and ensure that any deviations from the original forecast are identified.

Table 16 – Comparison of Development allowance (£M in 22/23 price base)

Development Funding Allowance	Submission 1 Costs	Submission 2 Forecast	Total EAC	Variance

10 Conclusions and Recommendations

10.1 Overview

is a key strategic site that is fundamental to maintaining a resilient supply of wholesome water for customers. The work completed on optioneering and option feasibility assessments, option definition and preferred solution development has provided evidence to justify developing the 96 output solutions. We have further validated the need for this investment, with strong stakeholder and customer support for water quality and resilience improvements to this site.

Whilst the proposed work will address the cause of the most substantial underlying risks at , key risks remain from increasing demand, abstraction and network power availability to the site.

The planned activities through to Submission 2 will ensure greater confidence in cost estimates and programme developed based on confirmed preferred solution and design. The options to date address the drivers and align with PR24 water quality and resilience objectives. Continued development will improve confidence in delivery and value for money.

10.2 Development Phase and Justification

The development phase has yielded mature option definitions and a preferred solution that collectively provide a robust foundation for advancing to Submission 2. These proposals address key vulnerabilities in the current system and reflect a proactive approach to future-proofing infrastructure.

Key outcomes from the development phase include:

- Evidence-based justification for progressing to the next submission stage
- Strong stakeholder and customer support for resilience improvements
- Alignment with PR24 strategic goals and regulatory expectations

Continued development will:

- Improve confidence in delivery outcomes
- Strengthen cost certainty and programme reliability

- Ensure resilience objectives are met in a sustainable and efficient manner

10.3 Risks and Considerations

Despite the progress made, several risks remain that could impact long-term delivery and performance. These risks are being actively monitored and will be incorporated into the next phase of planning and design refinement.

10.4 Recommendation

Our project plan in Section 5 confirms a full scheme completion (based on PR24 scope) is possible, provided currently identified risks and issues can be mitigated with continued key stakeholder support. Our activities to Submission 2 will confirm our preferred solution and updated forward plan for completion. Any significant changes will be notified to Ofwat.

We propose that sufficient evidence has been provided in this submission to enable the progression to Submission 2, where greater confidence in cost estimates, programme timelines, and delivery feasibility will be demonstrated.

11 Supporting Documentation

Annex B1: Cost Methodology

(See attached)

Annex C1: Delivery Plan DPW4

(see attached)

Annex F1: Technical Assurance Report

(See attached)

Annex F2: Commercial Assurance Report

(See attached)

Annex G1: [REDACTED] Cost Forecast to Submission 2

(See attached)