Gate 2 Submission: Supporting Technical Report
Water Recycling

6 December 2021

from
Southern Water

Contents

Please refer to Gate 2 Submission Navigation and Glossary (Appendix 1 within Submission Summary) for the glossary of terms, definitions and abbreviations for this document.

Executive Summary

This Concept Design Report describes the stage of work completed to analyse the feasibility and viability of Water Recycling Options, in response to Southern Water's (SW) Water Resource Management Plan 2019 (WRMP19) and Section 20 (s20) agreement obligations, to deliver the Strategic Resource Option (SRO) by 2027, through the Regulatory Alliance for Progressing Infrastructure Development (RAPID) Gated process. The SRO is part of the wider Water for Life Hampshire (WfLH) programme, which across a series of projects aims to reduce Southern Water's reliance on river abstraction and increase the resilience of supply sources during droughts.

The purpose of the CDR is to outline the detailed analysis that has been undertaken related to the Water Recycling options considered at Gate 2. The analysis completed covers multiple technical areas, including design, site selection, network infrastructure, environmental, planning and consenting, risk management, customer and stakeholder engagement, procurement, schedule and cost modelling. The information presented in this document is the underpinning basis and evidence that informs the overall recommendations and decisions presented in other Gate 2 submission documents. For clarity, this CDR does not include any overall recommendations and conclusions, please refer to the Concept Design Report – Water Recycling document and Submission Summary as part of this Gate 2 Submission for details on recommendations and conclusions.

Since Gate 1, SW has progressed analysis into the feasibility and viability of the Water Recycling Options carried forward from Southern Water's Gate 1 submission. Water Recycling was identified as the alternative to the Base Case in WRMP19. At Gate 1, a total of five water recycling-based options were considered. One of these five options was discontinued as part of the Gate 1 final determination. Of the remaining four water recycling-based options, two are considered within this document. A summary of the water recycling-based options considered within this document is included in the table below.

Option no.	Option Name	Technical Analysis location
B.2	61 Ml/d Recycled water sent to Upper Itchen / Environmental Buffer (EB) - treated at Otterbourne Water Supply Works (WSW)	Technical detailed included in this document
B.3	61Ml/d Recycled water sent direct to Otterbourne WSW	Discontinued prior to Gate 2 – Not included in this document
B.4	75Ml/d direct water transfer from Havant Thicket Reservoir, supplemented by 15Ml/d water recycling plant	Technical detailed included in Annex 3, Havant Thicket Technical
B.5	75 Ml/d Recycled water sent to Upper Itchen / EB – treated at Otterbourne WSW	Technical detailed included in this document

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Key Findings

- Internationally, Water Recycling is understood and utilised. However, the limited UK market for Water Recycling systems may present challenges for this solution from several perspectives.
- Site selection work confirmed the pipelines considered would require a pumping station and Break Pressure Tank's (BPTs) to be sited along the route. The siting of these features is partly dependent on the topographical studies of the land and associated hydraulic modelling which will be produced in the next phase of project development. This means that an area of search for this infrastructure will need to be established within the recommended pipeline corridors, and for further work to be undertaken to identify a preferred site.
- Regarding the Pipeline options, outcomes for both Options B.2 and B.5 site selection process recommends Pipeline 1 and Pipeline 2 to connect to Otterbourne WSW and Parcel WRP 72 (with Parcel WRP71 retained as a backup). Option B.5 would also require Pipeline connection between PC WTW and the WRP.

- Stage 4 of the site selection process concluded that there remained a number of consenting risks that needed to be considered further in Stage 5, including:
  - There remain risks associated with HRA and watercourse crossings that require further design and assessment
  - There needs to be further consideration of how to manage potential impacts on the South Downs National Park
  - The routeing of the pipeline corridors needs to be reviewed to avoid direct and indirect effects on ancient woodland
- Both Water Recycling Options are expected to cause adverse environmental impacts, such as biodiversity, flora and fauna, and air and climate impacts, although opportunities to offset these impacts exist
- Stakeholders and customers have a negative perception of water recycling and creates a high-risk that will need to be managed as part of development as a viable back-up Option.
- The preferred consenting strategy reaffirms SW's initial view at Gate 1 that a DCO is the preferred route for the Water Recycling Options. Access into the DCO consenting regime would not be automatic, i.e. the project does not currently meet the thresholds for being defined as a NSIP. Projects can however be directed into the DCO regime through a s35 direction by the Secretary of State – SW's consideration of the factors to support such a direction suggest that a comprehensive case can be made.
- We have used best practice and benchmarking to optimise delivery schedules. Notwithstanding both Water Recycling Options are expected to be completed and operational in Q4 2030.
  The estimated Capital Expenditure (CAPEX) for the two Water Recycling Options is £480m for Option B.2, and £562m for B.5, estimated 108-year OPEX and 108-year Net Present Values for the two water recycling-based options is £618m for Option B.2 and £703m for Option B.5.

1. Background and objectives

This report details key technical information that underpins the analysis completed to assess the feasibility and viability of water recycling-based Options. This information substantiates recommendations and decision made via the Options Appraisal Process (OAP), detailed in the Submission Summary and Detailed Feasibility & Conceptual Design Report (CDR).

This document is a ‘level 3’ document, which focuses on the detailed technical information specifically related to Regulatory Alliance for Progressing Infrastructure Development’s (RAPID) Gate 2 information requests. Key technical information included in this document is highlighted in the level 2 document of the Gate 2 submission hierarchy, illustrated in Figure 1.

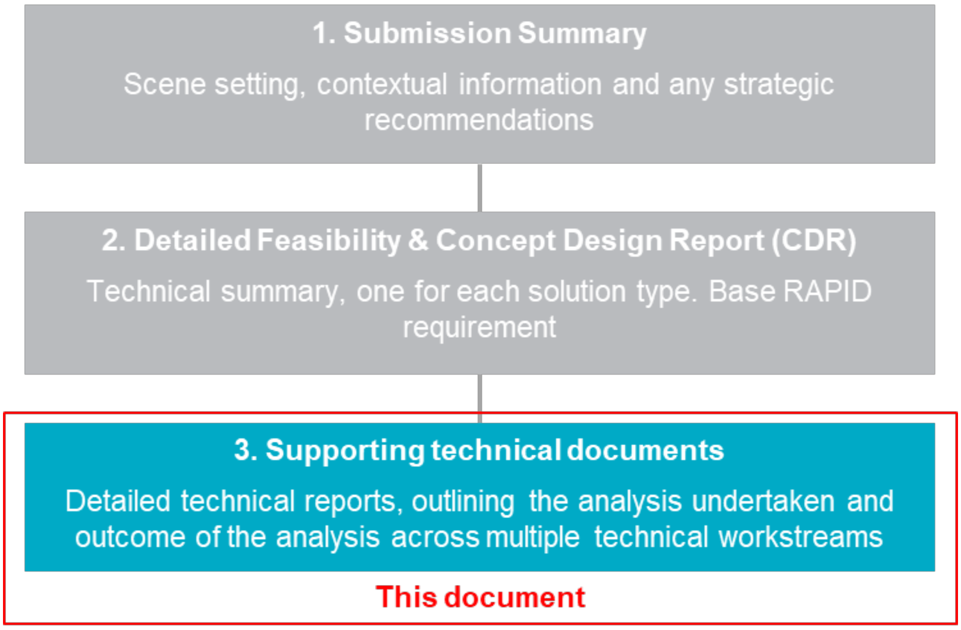


Figure 1 - Accelerated Gate 2 submission document structure

Throughout this Level 3 Water Recycling report two Options, Options B.2.and B.5, have been considered and technical information for each of the Options have been detailed. The Options included within this report are detailed in Table 1**.**

Table 1 - Water Recycling-based Options

Option no.	Option Name
B.2	61 Ml/d Recycled water sent to Upper Itchen / Environmental Buffer (EB) - treated at Otterbourne Water Supply Works (WSW)
B.5	75 Ml/d Recycled water sent to Upper Itchen / EB – treated at Otterbourne WSW

Key objectives of this Water Recycling Report are:

1. Detail technical information that underpins the assessment of Options B.2 and B.5
2. Provide technical detail that is specifically aligned to RAPID information requests of the Gate 2 submission
3. Provide technical detail that is specifically aligned to recommendations made by RAPID as part of the Gate 1 submission final determination
4. Provide substantive detailed information that supports the Level 2 Water Recycling Detailed Design & CDR

Document Structure

This report includes specific sections covering ten separate technical areas, all of which are specifically focused to the water recycling-based Options considered at Gate 2. Specific sections include:

1. Engineering Design
2. Network Infrastructure
3. Site Selection
4. Environmental
5. Planning and Consenting
6. Risk Management
7. Stakeholder and Customer
8. Schedule
9. Cost Modelling
10. Commercial and Procurement

In each of these areas, content is specifically aligned to the RAPID information requirements for the Gate 2 submission.

2. Conceptual Design

2.1. Overview of solution

The section below will present the conceptual design for the Options B.2 and B.5. Since the only difference between the two options, other than the Deployable Output (DO) from the WRP, is that Option B.5 will have a supply into the WRP from PC WTW, the sections relevant to the conceptual civil, mechanical and electrical design and water conveyance system will be common to both Option B.2 (Strategic alternative 61 Ml/d Water Recycling to EBL) and (Strategic alternative 75 Ml/d Water Recycling) and B.5.

A number of Strategic Resource Options (SRO) to meet the potential supply-demand deficit that would arise in a drought event have been investigated by Southern Water Services (SW) including desalination, water recycling and the use of Havant Thicket Reservoir (HTR) that will be built and operated by Portsmouth Water (PW) whilst SW will own and operate the majority of the interconnecting infrastructure between the reservoir and SW's Otterbourne WSW.

This report focuses on SW's proposed indirect water recycling approach that includes using a source of final effluent (FE) for advanced treatment at a new Water Recycling Plant (WRP), transfer of the recycled water to a new Environmental Buffer Lake (EBL) followed by re-abstraction for treatment at a WSW. The two Options described in SW's Gate 1 report are summarised below:

- **Option B.2:** This considers a transfer of FE from Budds Farm (BF) WTW to a new 61 Ml/d capacity WRP with recycled water transferred to a new, 75 ML capacity, lined EBL, for re-abstraction and treatment at Otterbourne WSW.
- **Option B.5:** This Option consists of a transfer of the combined supply of FE from Peel Common (PC) WTW and Budds Farm WTW to enable the WRP to treat up to a capacity of 75 Ml/d. Recycled water will be transferred to a new, 75 ML capacity, lined EBL for re-abstraction and treatment at Otterbourne WSW.

Figure 2 below illustrates a schematic of the transfer route for the two Options.

Figure 2 - Schematic diagram of the transfer routes for Option B.2 and B.5

Table 2 below is a summary of the Gate 3 activities that SW intends to carry out on Option B.5 and an update on SW's plan for Gate 2 specified in the Gate 1 report has also been included. Note that a number of consultation meetings with the Drinking Water Inspectorate (DWI), the Environment Agency (EA) and Natural England (NE) have taken place since the start of Gate 2 and SW has provided updates and a draft of the Water Safety Plans (WSP) for review to the DWI. The final WSPs are available for submission.

Table 2 - Summary of Gate 2 activities from Gate 1 and next steps to Gate 3

No.	Next steps to Gate 2 listed in Gate 1 report	Update	Next steps into Gate 3
1	Operate the pilot plant and extract online monitoring data as well as sampled data.	The pilot plant has been operating for the past 9 months and online data as well as grab samples are being considered in the analysis.	Continue to run pilot and carry out routing process performance sampling.
2	Generate more accurate power and chemical costs to include in a cost estimating exercise.	This data is not scalable from the pilot plant; however, mass balances and Reverse Osmosis (RO) projections from Hydranautics RO software were used to estimate chemical costs and unit sizes. The plant hydraulics are not confirmed therefore the pumping requirements for a full-scale design cannot be derived from the pilot. Therefore, Operational Expenditure (OPEX) estimates from pumping will be developed during detailed design.	Continue to generate more data and refine mass balance to use a larger sample set.

No.	Next steps to Gate 2 listed in Gate 1 report	Update	Next steps into Gate 3
3	Use pilot recycled water to carry out blending tests with natural water sources. This will help inform new treatment processes at Otterbourne WSW.	A desktop study was completed to assess how blending along the distribution network impacted downstream water quality.	Loop test will be carried out to confirm impact of remineralised water on the network.
4	Analyse sample catchment data in context of the existing source control programme. That identifies potential sources of chemicals that may be hazardous and discharged into wastewater collection systems by consented trade dischargers. An 'enhanced source control' programme will be considered.	The characterisation of source water and the 'enhanced source control' programme are discussed in Section 2.1.1. WSPs using a source to tap approach has also been completed and signed off by the SW's water quality and water risk team for issue to the DWI. Note a draft version of the WSPs was submitted on the 13/04/2021.	Samples of the receiving water at Budds Farm WTW's Long Sea Outfall (LSO) will be taken to establish baseline for environmental monitoring. This will be defined by the Environmental Enabling team. Update WSPs with new data collected.
5	Use the data from points 1 to 4 above to refine the process unit sizing and waste stream flow and concentrations.	RO projection was used in the mass balances to determine process unit sizing, waste stream flows and concentrations.	This will be further developed using a larger sample set collected in Gate 2. Moreover, hydrogen peroxide quenching with hypochlorite has started to establish potential for DBP formation. The result will dictate if peroxide quenching will be carried or not.
6	Work with RAPID (the EA and NE specifically) to revise discharge permit.	An analysis of the waste stream has been carried out and a position statement will be drafted to demonstrate compliance with yearly Total Nitrogen (TN) load at the Budds Farm LSO.	A mass balance on the expected TN load per year shows SW will not breach its yearly TN load per the existing permit. More sampling data on the MFR and ROC will be taken to demonstrate the actual values reflect the mass balance data. Any additional parameters on salinity will be discussed with the EA.
7	Work with a larger customer group to further test acceptance of water recycling as a suitable Option to augment water supply especially during times of drought.	Following Consumer Council for Water (CCW) best practice [1] and SW's Customer Participation Strategy, focus has been on high quality and meaningful engagement with the objective to ensure SW has the insight needed for any one of the potential SROs to succeed. For Gate 2 SW engaged with over 240 informed customers through deliberative approaches and over 1,950 in quantitative surveys. This built on the insight from Gate 1 with over 250 informed customers, 2,300 households and 350 Businesses through joint work	Customer and stakeholder engagement work will include site visits at the pilot plant.

No.	Next steps to Gate 2 listed in Gate 1 report	Update	Next steps into Gate 3
		with Water Resources South East (WRSE) and the thousands of interviews from Water Resource Management Plan 2019 (WRMP19) (>5,000) and 2019 Price Review (PR19) (>42,000). [1] https://www.ccwater.org.uk/research/engaging-water-customers-for-better-consumer-and-business-outcomes/	
8	Carry out brine discharge mixing studies to assess waste brine is not detrimental to receiving water.	This study has been completed and the Cormix modelling results show an insignificant change in salinity (TDS) and TN load from the waste stream generated by the WRP.	Modelling work will be updated using sampling data.
9	Find suitable discharge locations, to return non-brine waste streams from the microfiltration backwashing process. Work with agencies to find a suitable discharge Option for the blended brine and site waste. Data to support this approach will be derived from the pilot trial.	The combined waste stream has been assessed in the Cormix modelling and from the data waste stream segregation may not be required.	No changes identified.
10	Start coordination activities with SW's wastewater treatment staff to plan activities that will impact BF Wastewater Treatment Works (WTW) and PC WTW.	Engagement with SW's wastewater team has been ongoing and the challenges at BF and PC have been included in the concept design of the WRP, for example, a larger break tank to account for potential process setbacks at the WTWs.	Investigation into resilience of the donor WTWs will be carried out to ensure the quality and quantity of flow from these donor sites are not compromised. For example, ensuring the aeration systems at the WTWs are working appropriately with standby blowers and generators etc. Process improvement to further reduce the TN levels at those donor sites will be investigated.
11	Investigate capabilities of local laboratories to reduce risks with shipping samples overseas for analysis.	This activity has been completed. [redacted] are now fully capable of carrying out tests locally, however further work to obtain accreditation of some tests is still in progress.	[redacted] is moving forward with obtaining accreditation of some of the parameters that are required to monitor the performance of the WRP for example, some of the Disinfection By-products (DBPs) and Pharmaceuticals and Personal Care Products (PPCPs).
12	If Coronavirus pandemic restrictions continue into 2020, sampling and pilot trialling will be hindered. SW will investigate validity of using bench test data and globally available data to produce WSPs. However, laboratory data on some Contaminants of Emerging Concerns (CECs) will be challenging.	Since the Gate 1 submission, 5 sampling catchment campaigns have been completed. The pilot trialling has also been progressing.	Additional sampling will be carried out in Gate 3 to include seasonal changes and pilot data on a regular basis. As mentioned above, the catchment and pilot sampling data will be used to refine SW's WSPs for submission to the DWI.

2.1.1. Option B.2: Strategic alternative 61 Ml/d Water Recycling to EBL and Option B.5 Strategic alternative 75 Ml/d Water Recycling

Option B.5: In Option B.5, SW is proposing to increase resilience through combining final effluent from BF and PC WTWs to be treated at a new WRP with a recycled water production capacity of 75Ml/d. Recycled water will be transferred to a new lined EBL. The plant has been designed to operate at a minimum flow of 15 Ml/d to ensure that the process equipment is kept operational in readiness to increase the flow to 75Ml/d when required during a drought. During minimum flow, 15Ml/d of recycled water transferred into the EBL will be blend with river Itchen water and transferred to Otterbourne WSW for treatment. The new EBL will become the new regulation 15 surface water abstraction point at Otterbourne WSW.

In a drought scenario and depending on the 'Hands Off Flow' (HoF) conditions, SW may not be allowed to blend recycled water with the river Itchen's flow, in which case 75Ml/d of recycled water will be the source water for further treatment at the WSW. This recycled water would still have 24 hours of retention time in the EBL and will blend with the residual river Itchen flow in the lake. SW has carried out extensive wastewater and river catchment sampling to understand the risks with using FE from a predominantly domestic catchment by carrying out a pilot trial at PC WTW for a year. This section details the water recycling technology that will be included in the full-scale designs.

2.1.2. Background on Water Recycling Technology

Wastewater effluent generated from sewage treatment is commonly discharged into rivers or the sea. When discharged in rivers, wastewater effluent becomes part of the source water for drinking purposes. This is commonly known as unplanned recycling or *de facto* recycling. Recycling water through the use of technology to produce purified water that serves as raw water for drinking purposes is known as planned water recycling. Water recycling using treatment technology can be simply described as an acceleration and an improvement on the bio-chemical attenuation process that rivers and lakes currently achieve. The scheme proposed is an indirect recycling process. While direct water recycling involves transferring recycled water directly into a water treatment plant's inlet or to customers via the network, indirect water recycling involves 'breaking the chain' between the WRP and the WSW through the use of an environmental buffer such as a raw water lake, reservoir, pond, or even a river as a receiving water body prior to re-abstraction for drinking water treatment. An environmental buffer provides some potential benefits, namely:

- Provide time to respond to potential treatment failures or upsets
- Allow an additional opportunity for attenuation of microbial and chemical contaminants
- Enhance public perception

The need for an environmental buffer and its importance to public health largely depends on the influent water quality and the buffer's specific design characteristics. SW has carried out quantitative risk assessments of the blend with river water with recycled water that were used to refine the Water Safety Plan (WSP) submitted at Gate 2.

2.1.3. Overview of Water Recycling in the UK

Water recycling for various applications is not new on an international level, and the UK has two examples. Essex and Suffolk Water (ESW) were the first water company to have successfully installed and operated a WRP for drinking purposes, in the UK. A drought in the early 90s provided a compelling case for ESW to consider water recycling. The original plan consisted of treating a portion of the final effluent (FE) from Chelmsford Wastewater Treatment Plant (owned and operated by Anglian Water Services) and transferring the purified recycled flow to Hanningfield raw water reservoir for further treatment at Langford Water Treatment Plant. However, owing to public perception and pressure through the media ESW was forced to adopt a different approach and transfer recycled water into the river Chelmer prior to re-abstraction for drinking water treatment. Thames Water included, in their WRMP 15, the Deephams water recycling option and considered a 25 to 60 Ml/d facility to augment the River Lee. Thames Water have also designed, built, and operated a 44 Ml/d water recycling facility at Old Ford to produce recycled water for toilet flushing and irrigation of green areas, during the Olympics in 2012.

Currently, in the UK there are no specific regulatory framework in place regarding water recycling. The Drinking Water Inspectorate (DWI) uses the water safety plan (WSP) approach to ensure a source to tap risk assessment is in place with adequate monitoring so the plan can be adapted if the risk changes at any point in the future. The Environment Agency (EA) and Natural England (NE) have jurisdiction over discharges into receiving waters and this is key in an indirect water recycling approach that involves returning recycled water into rivers and existing lakes. Coordination with appropriate regulatory agencies will be key to the acceptance of this scheme and producing wholesome quality water.

2.1.4. Technology selection and proposed PFD

Various treatment methods and their efficacy were assessed for Water Reuse in AMP6 Phase 1 Report (November 2018). BF and PC WTWs are situated near the coast and are impacted by saline intrusion, therefore a Reverse Osmosis (RO) based treatment system will be necessary to remove the Total Dissolved Solids (TDS, or salt, component from the FE. The globally proven approach is to use Microfiltration/Ultrafiltration (MF/UF) and RO membranes, followed by ultraviolet advanced oxidation process (UV-AOP) using hydrogen peroxide as the oxidant. SW has proposed to adopt a similar process, which is depicted in the Process Block Diagram (**Error! Reference source not found.Error! Reference source not found.**) and process flow diagram (Figure 6**Error! Reference source not found.**).

The Process Block Diagram in Figure 3 shows the proposed full-scale design (Option B.5) with the new abstraction flows from BF and PC WTWs into a new break tank at the WRP followed by a multi-barrier treatment process and discharge into an EBL at Otterbourne WSW, Option B.2 does not require a feed from PC WTW. The rejected waste stream, produced from the MF and RO system, will be returned to the existing long sea outfall (LSO) at Budds Farm WTW.

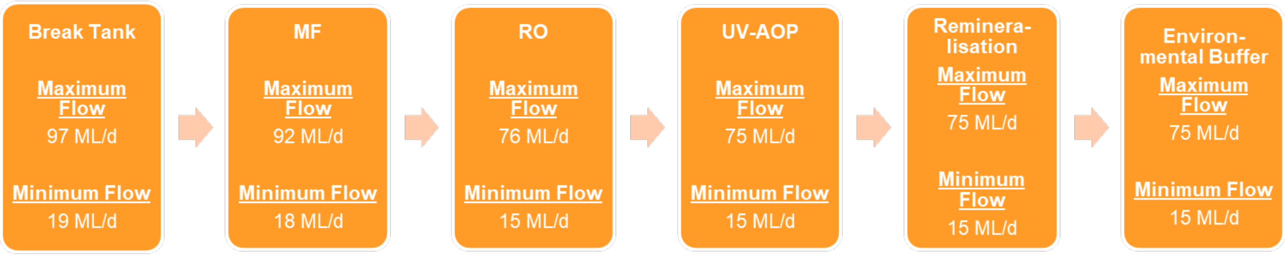


Figure 3 - Process Block Diagram of flows through the WRP

2.2. Engineering Technical Design

2.2.1. Source Water Characterisation

2.2.1.1. Catchment and Pilot Sampling

In Gate 1, the need to undertake a sampling programme to assess the impact from wastewater effluent discharge (both quality and quantity) on the river basins in Hampshire was discussed. Water quality data generated from this study sets a baseline for water recycling, for SW to understand the treatment practices and monitoring necessary to avoid deterioration in future. In addition, data from the pilot trial water recycling plant were collected, to assess its efficacy in removing a range of contaminants from the WTW FE.

The objective of the catchment study is to use sampling to:

- Establish presence of de facto recycling occurring in the rivers Itchen and Test in Hampshire and set a 'baseline' for comparison with recycled water produced from the pilot trial at Peel Common WTW, as discussed in the Gate 1 report
- Prepare a risk based WSP from source to tap, starting with the risk in the wastewater catchment that could impact the performance of the proposed WRP and the water quality transferred to the EBL

Since Gate 1, four additional sampling events have taken place, illustrated in Figure 4 below, and key catchment data, site specific water quality and pilot trial data, has been gathered to meet the Gate 2 objectives. This meets the level of confidence required to build up data for a Water Safety Plan (WSP), as following consultation with the DWI, SW understands the onus of a larger dataset demonstrating statistical representativeness as well as measuring the seasonal variation. This is critical to ensure that a comprehensive review of water quality risks is administered to inform WSPs. Due to the pandemic, SW was unable to collect samples during the summer of 2020, however, from the schematic below, sampling event number 6 will meet this objective for Gate 3.

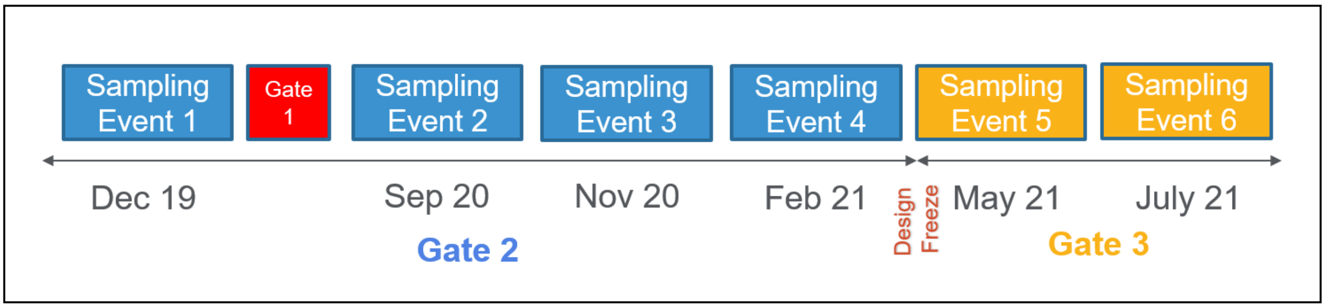


Figure 4: Diagram showing the catchment and pilot sampling events from December 2019 to July 2021, and the relevant gate stage where sampling results will be included in design aligned to each RAPID gate

Samples were taken at the frequencies depicted in Figure 4, the samples in December 2019 did not include duplicates or river water control samples however, the September 2020 onwards included duplicates and control samples.

Sampling events from September 2020 sampling events and onwards, was enhanced by undertaking more sampling, to include the following measures:

- Sample duplicates of the Budds Farm final effluent sample point and the Otterbourne finished water sample point. These duplicates were collected at the same time using the same sampling device by the same sampler and stored and shipped in the same way.
- Field blanks for PPCP analysis – one on a wastewater sampling trip and one on a clean water sampling trip. Field blanks consist of Liquid Chromatography with tandem mass spectrometry

(LCMS) water provided by [redacted] which is taken to the sampling sites and used to fill the sample bottles for analysis using the same method as is used to fill the other samples.

- River water control samples (sample point 0A and 0B)

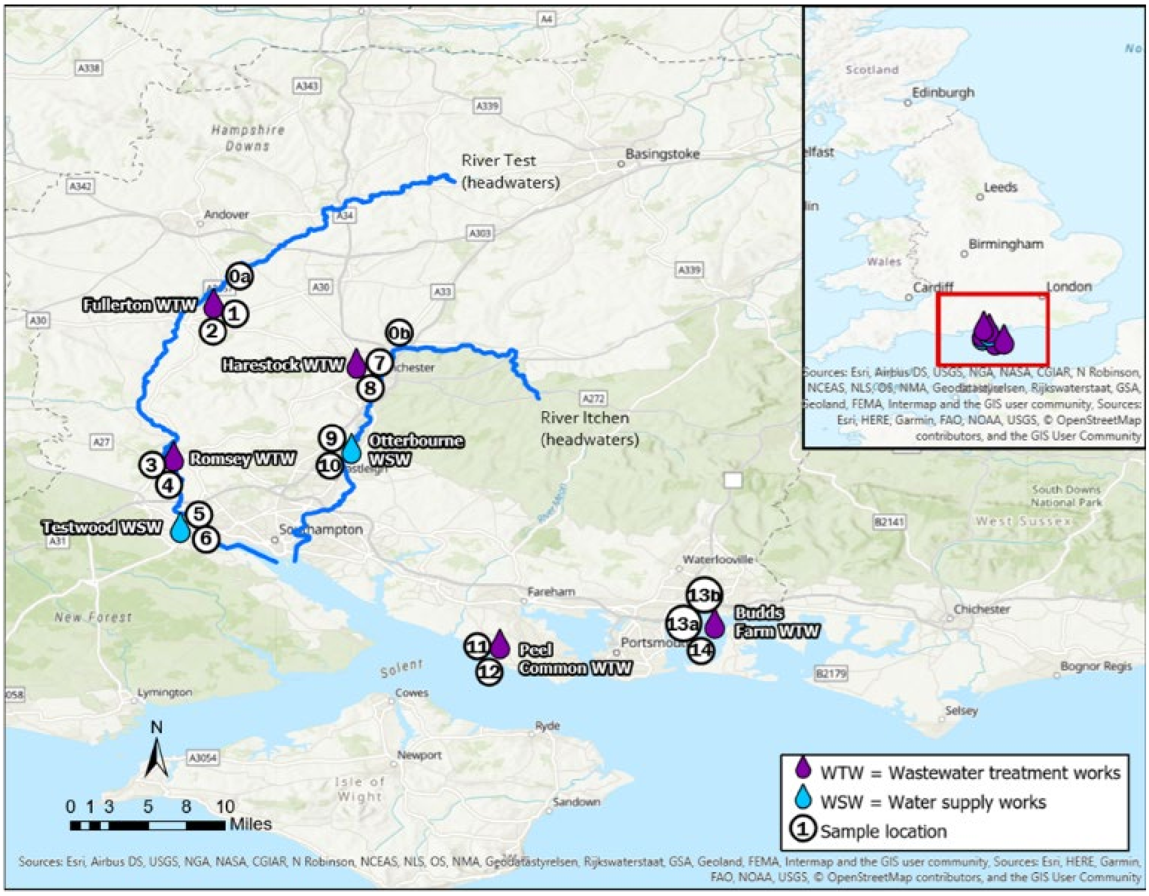
Stakeholder feedback was incorporated from November 2020 sampling event onwards the sample points at the recycling pilot plant at Peel Common were included in the catchment sampling event. From the February 2021 sampling event onwards, composite samples were included in the pilot plant catchment sampling event. The May 2021 sampling event included duplicate samples on all spot samples for those analysis conducted at [redacted] laboratories. Additional routine sampling was also carried out three times a week.

2.2.1.2. Catchment Sampling Locations

The wastewater and river catchment sampling locations are illustrated in Figure 5 and the locations are detailed in Table 3. While upstream wastewater discharges contribute to water supplies in the Test and Itchen River basins, downstream WSW that use these as sources do not characterise their process as a water recycling scheme. Considering that the existing water supply works are providing wholesome water that meets all regulatory criteria under the current conditions, in consideration of planned water recycling, it is important to consider this *de facto* recycling practice, whether intentional or not. In conjunction with data from the parallel pilot and bench studies, scientific literature, other globally relevant water recycling experiences, the cumulative analytical elements of this and other ongoing efforts will inform the basis and structure of data reports to be submitted to RAPID. This information will be critical in support of developing a water quality-based risk framework for facilitating communications with those agencies.

The objective of the catchment study is to:

- Provide a baseline understanding of characteristic water quality in and the environmental fate and transport of potential contaminants in the Rivers Test and Itchen
- Document the source water quality for pilot (PC WTW) and full-scale water recycling (PC and Budds Farm WTW) using advanced treatment



Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community, Sources: Esri, HERE, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Figure 5: Map of catchment study locations

Table 3: Catchment study locations

#	Sampling location	#	Sampling location
0a	River Test control	8	Harestock WTW treated effluent
0b	River Itchen control	9	Otterbourne WSW raw influent
1	Fullerton WTW crude influent	10	Otterbourne WSW drinking water
2	Fullerton WTW treated effluent	11	Peel Common WTW crude influent
3	Romsey WTW crude influent	12	Peel Common WTW treated effluent
4	Romsey WTW treated effluent	13a	Budds Farm WTW Havant crude influent
5	Testwood WSW raw influent	13b	Budds Farm WTW Eastney crude influent
6	Testwood WSW drinking water	14	Budds Farm WTW treated effluent
7	Harestock WTW crude influent		

2.2.1.3. Source control programme

To develop an enhanced source control programme, post Gate 2 catchment sampling data and WSPs will be used to identify significant risks. The source of these risks, to Budds Farm and Peel Common WTWs, is based on trade effluent permits. Other imports to the WTW, which could be controlled are Sludge Treatment Centre imports of cake and sludge, as recycle streams from sludge treatment may introduce refractory dissolved organic nitrogen along with elevated ammonia and NDMA precursors. Sizing of water recycling processes should be such that they can mitigate the impact of recycle streams from sludge centrate. For example, if elevated NDMA precursors are introduced via recycle streams, the UV system may need to be sized to provide a higher dose to reduce NDMA to acceptable levels. The risks of non-compliant FE being discharged into the Solent are negative impacts on the environment, however, in the context its use as a feed for water recycling, this final effluent could pose public health risks in addition to environmental risks if not controlled at source. Ongoing sampling would occur at source to reduce risk. The process for undertaking this sampling will be detailed at later stages of design process (post Gate 2).

2.2.1.4. [redacted] Sampling Data Validation

As part of the quality assurance/quality control (QA/QC) procedures, all samples collected in the field were kept on ice during transport to the analytical laboratories and refrigerated until analysis. All sample containers were provided by the [redacted]. Chemical sample containers were the appropriate type with preservative already added to the bottle, if necessary. Sterilised containers for microbiological samples were supplied by [redacted]. In addition, during microbiological sample collection, sample taps were wiped with ethanol and sample lines were flushed for about one minute before sampling.

While sampling, maximum precaution was taken in order to avoid any contamination. No eating, drinking or smoking nearby sample collection activities were respected. Nitrile gloves were used and changed at every sampling location. The sampling sequence started with collection of the cleanest samples first, followed by the dirtiest samples last to minimise the potential for sample cross contamination.

To provide the highest quality data for the project, implementation of quality control measures during sampling and analyses are critical. The following special samples are required elements for providing quality control and have been accounted for in the sampling plans:

1. **Field Blank**. Collect a field blank during each sampling event. A field blank is a high-quality water (specifically LC/GC/MS water) sample that is prepared by the analytical laboratory before sampling and is carried to the sampling site and exposed to atmosphere while sampling. One field blank would be analysed per sample event.
2. **Trip Blank**. A travel blank is a high-quality water (specifically LC/GC/MS water) sample that is prepared by the analytical laboratory before sampling and is carried to the sampling site but remains unopened during sampling. One travel blank would be analysed per sample event.
3. **Field Duplicate**. Collect a duplicate sample in the field at one randomized location per sample event. The duplicate should be collected in the same sampler, processed at the same time and stored and shipped in the same way as the rest of the samples. One field duplicate should be collected for each 10 – 20 samples collected.

[redacted] Environmental have designed their Quality Management System to meet the requirements of BS EN ISO/IEC 17025. The majority of the tests being undertaken for the project by [redacted] are done so at the Coventry and Hawarden Laboratories where most of their tests are accredited for a wide range of matrix as specified in the documentation provided by UKAS. For some of the tests there are no UK accredited laboratories however the methods are fully documented and carried out by competent and trained staff who operate under the same management system requirements. A range of quality assurance methods are employed at [redacted] such as:

- Analytical Quality Control samples (matrix matched spiked reference samples) run with each batch of samples
- Process blanks (matrix matched) included in each batch
- Instrument blanks run to check contamination within the instrument
- Independent check standard, included with every instrumental run of samples (using a different standard source to that used for calibration)
- Ongoing checks on competence of analysts - monitored using the proficiency testing (PT) samples described below and comparing Analysts results to those expected by the PT provider

- Proficiency testing, undertaken where available for every accredited component. All PT scheme results are audited, and investigations and root-cause analysis are carried out and recorded where unsatisfactory z scores are reported.
- Internal Audit Schedule, four yearly internal audits on each quality management section

2.2.2. WRP Design & Operation

As discussed in Gate 1, the WRP will be built to house a multi-barrier treatment process plant comprising membranes (MF and RO) and disinfection using UV-AOP prior to remineralisation and transfer to an environmental buffer lake. The WRP will receive a near constant flow of approximately 97 Ml/d to produce 75 Ml/d under maximum flow conditions. The plant was also designed to provide the capability of ramping down and operating at a minimum flow of 15 Ml/d production. MF backwash waste will be blended with RO concentrate and discharged to either the Solent or Budds Farm WTW. Neutralised MF and RO clean in place (CIP) wastes will be blended with MF backwash and RO concentrate waste or will be returned to the LSO at Budds Farm WTW.

Table 3: Process losses from the WRP at maximum and minimum flows (Options B.2 and B.5)

	Option B.2	Option B.5	
Process	**Typical flow (Ml/d)**	**Typical flow (Ml/d)**	**Minimum flow (Ml/d) for both options**
MF feed	78	97	19
MF filtrate	74	92	18
RO feed	74	92	18
RO concentrate	13	17	3
Design RO permeate	61	76[a]	15
UV-AOP	61	75	15
Remineralisation	61	75	15
Total production	61	75	15

2.2.2.1. Feed Water Quality

The WRP will receive treated wastewater effluent from Budds Farm WTW. Due to space constraints at Budds Farm WTW, a pilot trial at PC WTW was installed. Further evidence to support the equivalence of qualitative characteristic and variability of the FE from both sites was raised in Annex 2, Strategy B: Water Recycling, DWI feedback report.

As outlined above, additional sampling campaigns have been completed since Gate 1 and the results are detailed in Table 3. There is a significantly greater amount of data for PC compared to BF. This is due to the regular samples taken at the pilot plant. More frequent samples will be taken at BF and Bedhampton Springs in Gate 3 to capture the suite of determinants listed below.

Table 3 - Final effluent concentration from Peel Common and Budds Farm WTW to demonstrate the similarities in effluent quality

Parameter	Unit	Peel Common Final Effluent		Budds Farm Final Effluent	
		Avg	**Number of samples**	**Avg**	**Number of samples**
Alkalinity, total	mg/L as CaCO3	248.33	229	240.14	7

Parameter	Unit	Peel Common Final Effluent		Budds Farm Final Effluent	
Ammonia	mg/L as N	2.25	251	0.19	7
Biochemical oxygen demand	mg/L	6.65	220	2.72	7
Barium	ug/L	15.48	132	22.91	7
Calcium	ug/L	103265.91	132	129428.57	7
Chemical oxygen demand	mg/L	38.65	254	49.30	6
Chloride	mg/L	229.16	164	1013.00	7
Dissolved organic carbon	mg/L	9.63	274	8.16	7
Dissolved oxygen	mg/L	7.92	66	11.57	3
E. coli	#/100mL	14990.83	84	7857.14	7
Enterococci	#/100mL	6399.22	91	3714.29	7
F+ coliphage	pfu/100mL	6.73	106	2.14	7
Iron	ug/L	104.37	13	88.54	7
Lead	ug/L	0.22	9	0.99	7
Manganese	ug/L	40.87	132	25.37	7
Mercury	ug/L	ND	9	ND	7
Nickel	ug/L	2.71	9	2.94	7
Nitrate	mg/L as N	2.52	250	6.00	7
Nitrite	mg/L as N	0.27	251	0.03	7
Phosphorus, total	mg/L as P	3.14	281	2.49	7
Silica	mg/L	11.20	1	13.80	1
Sulphate	mg/L	63.68	164	179.71	7
Total Kjeldahl nitrogen (TKN)	mg/L as N	2.70	243	2.68	7
Total nitrogen	mg/L as N	3.93	32	7.28	7
Total organic carbon	mg/L	9.88	274	8.42	7
Total dissolved solids	mg/L	740.07	227	2278.57	7
Total suspended solids	mg/L	11.91	254	8.23	7
Turbidity	NTU	4.02	252	2.49	7
Atrazine	ng/L	ND	8	ND	6
Isoproturon	ng/L	ND	8	ND	6
Metolachlor	ng/L	1.50	8	ND	9

Parameter	Unit	Peel Common Final Effluent		Budds Farm Final Effluent	
Estradiol	ng/L	ND	8	ND	9
Estriol	ng/L	ND	8	ND	9
Caffeine	ng/L	12.75	8	110.67	9
Acetaminophen	ng/L	8.88	8	42.78	9
Ibuprofen	ng/L	ND	8	ND	9
Progesterone	ng/L	ND	8	ND	9
Bisphenol A	ng/L	34.25	8	23.22	9
4-nonylphenol (semi-quantitative/qualitative)	ng/L	741.25	8	691.11	9
Sucralose	ng/L	68750.00	8	68666.67	9

SW acknowledges some differences in the data for parameters such as chloride, lead, nitrates, TN and ammonia. These differences can be attributed to, in the case of chloride, greater saline intrusion in the Budds Farm WTW catchment compared to PC WTWs catchment, in the case of nutrient data (ammonia, nitrates and TN) the disparities may be associated with the number of sampling data collected for PC WTW compared to Budds Farm WTW, however it should be noted that the TN concentration in both BF FE and PC FE are below the discharge permit into the LSO and the pilot at PC has been designed to treat TN up to the permit concentration (TN permit at Budds Farm WTW 9.7 mg/l and PC WTW 9.0 mg/l). For parameters generally defined to as contaminants of emerging concern (such as sucralose, bisphenol A, ibuprofen and estriol), the FE quality for PC and BF are comparable when a similar sample size is considered (e.g. eight samples taken at PC compared to nine taken at BF for bisphenol A).

These similarities for a range of parameters are critical in ensuring that water quality produced by the WRP is reliably informed by the pilot testing programme and that it is appropriate for compliance with drinking water safety requirements. The pilot testing programme included a suit of regulated compounds as well as a suite of unregulated compounds in each of the following classes:

- 8No. disinfection by-products (DBPs);
- 15No. Consumer products and cleaning products;
- 54No. pharmaceutical and medical compounds;
- 7No. sterols and hormones;
- 20 pesticides, herbicides and fungicides;
- 3No. Flame retardants;
- 62No. volatile organic compounds; and
- 16No. Metals.

2.2.2.2. Pilot plant objectives

The pilot plant at Peel Common WTW comprises full-advanced treatment (FAT) process that includes MF, RO and UV-AOP (hydrogen peroxide), as this treatment process is globally validated for water reuse. The pilot plant consistently delivers a permeate flow of 2.6 m3/h with an overall recovery of 82%. The objectives of the pilot study to develop data critical to a comprehensive evaluation of this planned water recycling scenario include:

- Validation of the performance and water quality produced by the selected full advanced treatment (FAT) process, which has been used globally for decades, to support regulatory coordination;
- Use pilot water quality data to develop water safety plans for water recycling;
- Provide an opportunity for SW to become familiar with technologies that have not previously been applied; and

- Serve as an educational platform to support stakeholder engagement.

Data from the pilot is not scalable; therefore, a mass balance calculation, including process unit sizing, have been developed using historical data from Budds Farm WTW and sampling events described in section 2.3.1. RO permeate quality and chemical usage data was derived using projection data from the Hydranautics RO software. The full-scale plant hydraulics are not confirmed therefore the pumping requirements to generate OPEX estimates will be developed during detailed design.

2.2.2.3. Proposed Treatment Process

Figure 6 illustrates**Error! Reference source not found.** the overall PFD of the water recycling scheme. A brief summary of the process units included in the multi-barrier FAT process is as follows:

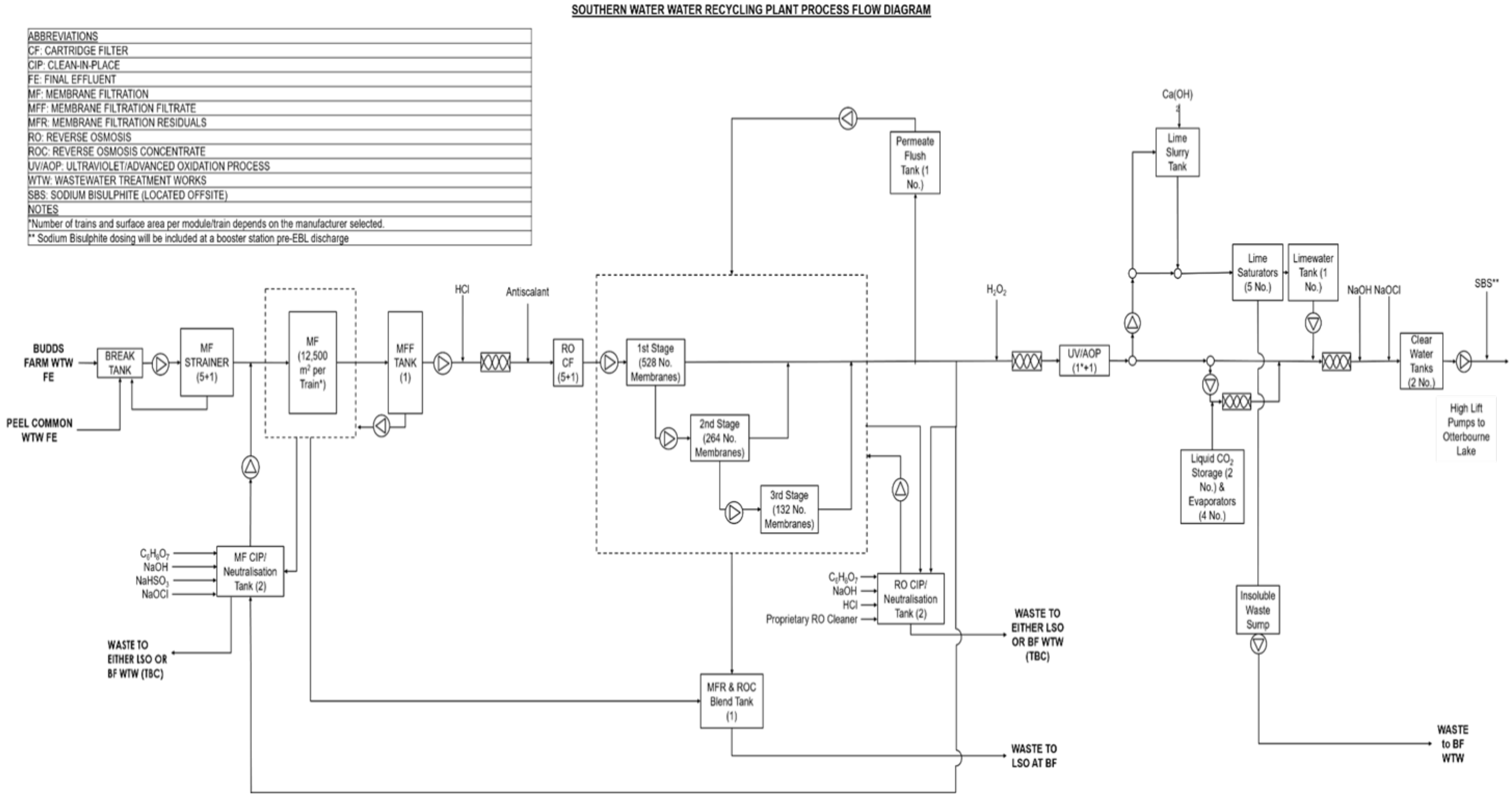
1. A break tank will mitigate diurnal flow variations from BF and PC WTW and will be designed with a 2-hour retention time
2. MF feed pumps take suction from the buffer tank to the MF plant. The MF system provides necessary pre-treatment upstream of RO by reducing the turbidity to <0.1NTU. MF trains include racks with membrane modules that provide filtration as well as a backwash and chemical CIP system to mitigate fouling. The proposed flux rate for the design of the MF is at 62l/m^2/hr (lmh). MF control system will automatically initiate a pressure decay test on each MF train to monitor membrane integrity on a daily basis. MF filtrate tank is used to provide suction for RO transfer pumps.
3. RO removes metals, inorganics, dissolved organic compounds, pathogens, contaminants of emerging concern and minerals from water. Cartridge filters also help protect the RO membranes. The RO train is designed to operate at an assumed 82% recovery. To prevent fouling of the RO membranes, acid and anti-scalant are dosed. Using a sequential chemical cleaning process where each stage of the RO train is cleaned individually, the RO CIP utilises different cleaning agents depending upon the type of foulant.
4. Typically, full scale UV-AOP systems in water recycling applications inject hydrogen peroxide or sodium hypochlorite upstream of the UV reactors as oxidants. UV-AOP is used for removal of pesticides, taste and odour and oxidisable constituents that are poorly removed by RO, small low molecular weight organics and non-polar compounds and disinfection credits.
5. The remineralisation process employs a side-stream limewater process for the reintroduction of calcium hardness to the RO permeate, carbon dioxide as a source of inorganic carbon to restore alkalinity and sodium hydroxide to raise the treated water pH. Remineralisation to ensure chemical stability for transfers within pipelines.
    - The process will consist of lime slurry tanks, lime saturators, a lime water tank and a carbon dioxide dosing system
    - Routine checks with adjustment of the pH set-point are used to actively monitor / control Langelier saturation index (LSI) & calcium carbonate precipitation potential (CCPP) to account for variations in temperature, RO feed TDS, and membrane age
6. Sodium Bisulphite will be dosed into the recycled water upstream of the EBL to ensure residual chlorine levels are maintained below 0.1 mg/l
7. RO concentrate (ROC) will discharge to the MF reject (MFR)/ROC blend tank, where it will be blended with MFR waste. The wet well was sized to accommodate both flows for up to 15 minutes at peak flow.

Process design assumptions were used to prepare a mass balance calculation for the WRP. The assumptions made include RO recovery rate based on Hydranautics RO projection data, process losses and literature data where appropriate. As SW is running a 0.1Ml/d pilot using the FAT process, the assumptions were compared from the projected data used in the mass balance for the full design. These are detailed in Table 4 below.

Table 4 - Assumptions in the development of mass balance

Parameter	Extent of Removal %	Process	Median pilot removal observed
Recovery rate	95	MF	Circa 95%

Parameter	Extent of Removal %	Process	Median pilot removal observed
Bacteria	99.99	MF	4.4 log based on total coliform reduction
Total suspended solids	100	MF	100%
BOD/COD	70	MF	82% / 34%. The COD is a lot lower than expected, more investigation will be carried out at Gate 3 but COD is mostly removed in RO
Dissolved oxygen	0	MF	20%
Ammonia, nitrate, nitrite and TKN	0	MF	Respective removal in the MF are: 7%, 1%, -14%, and 11%
Total organic carbon	0	MF	31%
Recovery from process	82	RO	Currently piloting in 82% recovery (previously tested up to 85% and as low as 75%)
Permeate loss	1	RO	Based on full-scale designs of similar facilities
Bacteria	99	RO	2 log based on TOC reduction across RO
DO/TOC	95	RO	1% / 99%
BOD/COD	95	RO	100% / 99%
Arsenic and selenium	90	RO	100%
Nitrite	87	RO	92%
Ammonia	96	RO	89% [basis of removal on RO projections is more valid than pilot value]
Antiscalant	100	RO	100% (per Avista projections)
TKN	66	RO	97%
Organic nitrogen	60	RO	No data



ABBREVIATIONS
CF: CARTRIDGE FILTER
CIP: CLEAN-IN-PLACE
FE: FINAL EFFLUENT
MF: MEMBRANE FILTRATION
MFF: MEMBRANE FILTRATION FILTRATE
MFR: MEMBRANE FILTRATION RESIDUALS
RO: REVERSE OSMOSIS
ROC: REVERSE OSMOSIS CONCENTRATE
UV/AOP: ULTRAVIOLET/ADVANCED OXIDATION PROCESS
WTW: WASTEWATER TREATMENT WORKS
SBS: SODIUM BISULPHITE (LOCATED OFFSITE)
NOTES
*Number of trains and surface area per module/train depends on the manufacturer selected.
** Sodium Bisulphite dosing will be included at a booster station pre-EBL discharge

Figure 6 - Process Flow Diagram (PFD) of WRP

2.2.3. Redundancy and Operational Strategy

Redundancy requirements are established by the function of the facility and criticality of continuous full capacity operations. To reliably produce 15 to 75 Ml/d the design includes fully redundant trains for all processes. Typically, all Microfiltration (MF) racks would operate in parallel and cycle through backwash, integrity test, and chemical cleaning modes. If one rack goes offline for an extended period of time (i.e., for mechanical repairs), the remaining 7 racks would increase in flux rate to meet production goals. In typical RO system design, continuous operation is recommended to avoid RO membrane fouling, so only one redundant unit is proposed. To produce 15 Ml/d, fewer trains need to be in service, and more redundant trains are available.

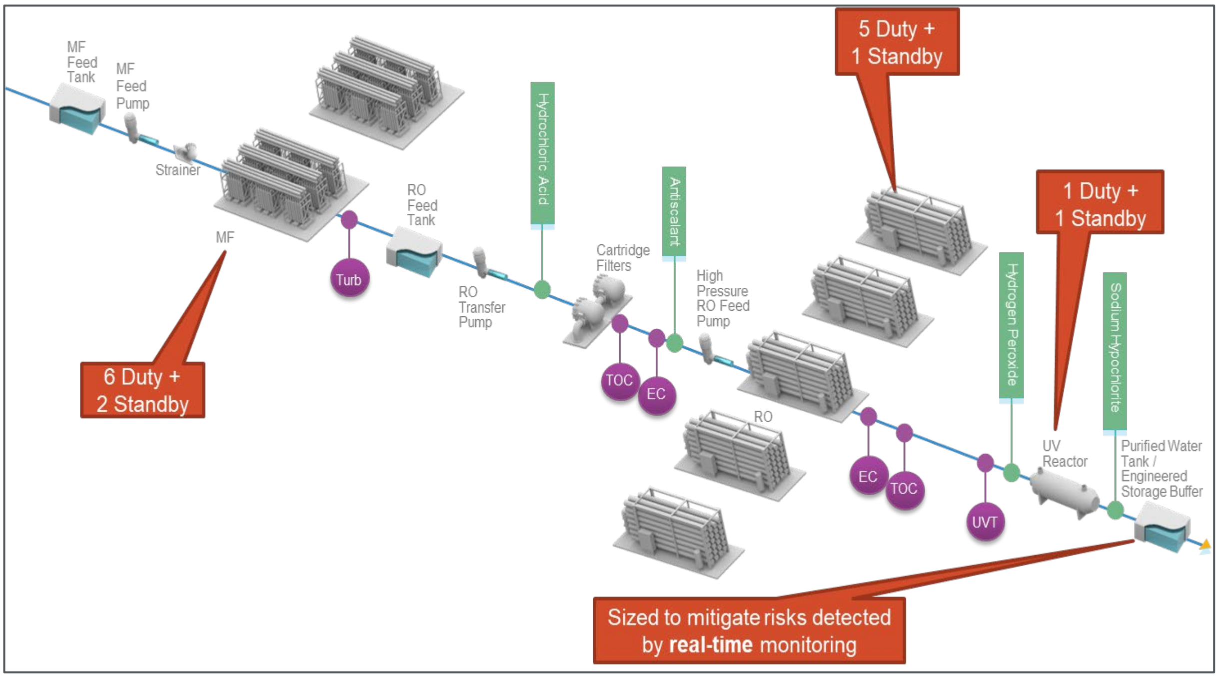


Figure 7 - Site layout with proposed instrumentation and monitoring

2.2.3.1. Overall Flow Control

Figure 7 above illustrates the plant layout complete with the proposed configurations of the instrumentation and monitoring control systems which will be used on-site.

Flow control of the WRP will be governed by the RO permeate flow setpoint which in turn will determine the control of flow from the high lift pumps to the EBL discharge point and will cascade backwards to the MF feed pumps.

A high-level overview of the control system designed is detailed below:

- Chemical dosing systems will operate with duty / standby configuration with respect to the metering pumps and there will be appropriate cycling of the operational pumps. The metering pumps will dose based on a set point concentration; flow paced based on the upstream flow with a trim from an upstream monitoring analyser (expect for antiscalant which will be flow paced based on the RO feed flow);
- High lift pumps will operate in a duty / assist / standby configuration with appropriate cycling of the duty and standby pumps based on run time. Pressure alarms at the discharge manifold of the pumps will shut down the high lift pumps and level alarms and sensors will determine the number of operational pumps as well as the operation of the RO train;

- Within the remineralisation process, the duty lime slurry metering pump will dose lime at a setpoint concentration, flow paced based on the Ultraviolet (UV) effluent flow with trim from a recycled water pH analyser. Low-low level in the lime slurry storage tank will shut down the lime slurry metering pumps;
- The Ultraviolet with Advanced Oxidation Process (UV-AOP) system will include two reactors in a duty / standby configuration with appropriate cycling of the duty and standby reactor based on run time. The control system for the UV-AOP system will be governed by the control philosophy of the vendor however will ensure that log removal setpoints for virus, N-nitrosodimethylamine (NDMA) and a selected number of chemical constituents are set. Shutdown of the UV reactors will occur if the reactor becomes unhealthy due to chamber temperature or low water level, feed flow rate exceeding the validated range or if the UV transmittance (UVT) drops below the validated range. If no UV reactor is available, RO permeate will be diverted to the MFR / ROC blend tank;
- The RO system will include five duty trains and one standby train, to avoid offline membrane fouling, the WRP control system will track RO runtime and cycle the trains such that none are offline for more than a setpoint operator interval;
    - High pressure (defined by an acceptable level of membrane fouling or by maximum design feed pressure) and low flow alarms will shut-down the RO system
    - Differential pressure across the cartridge filter will generate alarms
    - Combined and free chlorine residual will be measured upstream of the RO system to protect the membrane
    - Feed temperature and discharge pressures will be monitored
- The MF net production setpoint will be determined by the RO production setpoint. Pressure decay tests on each MF train will monitor the membrane integrity daily. MF backwashes will be initiated automatically if a train exceeds its run time, transmembrane pressure or filtrate volume produced;
- The break tank which buffers flow from Budds Farm WTW and PC WTW will operate in a duty / duty configuration with a periodic drain to prevent the build-up of microbial matter as well as monitoring level to ensure the tanks are within the operating band; and
- Strainer System will prevent larger solids and other debris from entering the MF system. High differential pressure across each strainer triggers an automatic backwash.

2.2.3.2. WRP Shutdown

Shutdown of the WRP will be performed by an automatically initiated sequence once the RO train flowrate setpoint is zero.

UV-AOP shutdown sequence will be as per the manufacturers process control narrative for a drain and rinse of the reactors.

Shutdown of the RO system will:

- Ensure that the control system will prevent upstream processes from shutting down until the RO system has completed its flushing sequence; and
- Potentially divert permeate water to the MFR / ROC blend tank until the system is fully shutdown.

MF shutdown sequence:

- Following completion of all RO system flush sequences, the control system will adjust the permeate flow rate set point for each RO train to zero; and
- The control system shall place all MF trains offline.

Ancillary system such as the chemical dosing lines will have an appropriate shutdown sequence.

In the event of a non-routine operation whereby the membranes have to be taken out of operation a membrane preservation operation will be undertaken whereby the membrane modules will be filled will a 1% NaHSO3 solution. To bring the membranes back into operation the membranes will be drained, and full flushing and Cleaning in Place (CIP) cycle will be initiated.

2.2.3.3. WRP Start-up

To ensure a safe start up sequence checks will be made such that all MF and RO trains are offline as well as the UV reactors being off.

The start-up sequence for the rest of the site follows:

1. Microfiltration
   - Water quality from the break tank is adequate;
   - MF system will run until the MF filtrate tank reaches a minimum level for a MF backwash;
   - MF filtrate turbidity is confirmed to be 0.15 NTU or less; and
   - Confirm Log-removal Values (LRV) of all operating trains (via pressure decay tests) are sufficient to meet the Critical Control Point (CCP) setpoint.
2. Reverse Osmosis
   - A selection of trains is brought online to reflect the number of trains required for the production setpoint;
   - RO trains are placed in a start-up stabilisation mode; and
   - RO permeate Total Organic Carbon (TOC) is confirmed to be 0.5 mg/l or less. Other parameters in the CCP verification will include Electrical Conductivity (EC).
3. UV-AOP
   - Gooseneck downstream of UV system is confirmed to be full;
   - Once RO permeate is flowing to the MFR / ROC blend tank the UV reactors shall be brought online; and
   - Confirmation the UV PLC is achieving its setpoint contaminant log reduction and oxidant dose, the influent UVT analysers are greater than 95% and hydrogen peroxide systems are on.
4. Ancillary system such as the chemical dosing lines will have an appropriate start-up sequence in conjunction with RO and UV-AOP systems
5. Final start-up sequence
   - Clear water tanks are at the high level setpoint; and
   - WRP is confirmed to be meeting its total pathogen log removal required as per the subsequent section.

2.2.4. Waste Streams

2.2.4.1. Waste Characterisation and Disposal Pathways

As illustrated in the Figure 8 below and shown on the Process Flow Diagram (PFD) in Figure 6, the WRP includes several liquid waste streams that require disposal. To help meet existing discharge requirements, MF reject will be blended with RO concentrate and pumped to the LSO at Budds Farm WTW. Other waste that includes chemicals, such as MF Maintenance Clean (MF MC), CIP or RO CIP waste, requires neutralisation prior to disposal. The design includes neutralisation either within the MF or the RO CIP tanks. Although unlikely, there is potential for large flows such as process tank overflows and off-specification water to be returned to the WRP MF feed tank.

The WRP will also produce the following waste flows:

- Following quenching of any residual chlorine with sodium bisulphite, the RO system brine will be blended with MF backwash waste and discharged to the Solent;
- Minor waste flows such as compressor cooling water, sample drains, and trench / slab drains will be discharged to the sanitary sewer; and
- Chemical sumps will be truck tankered off site in case of chemical spill.

2.2.4.2. Waste Discharge Impact Assessment

SW currently has a final effluent discharge permit from PC and Budds Farm WTWs via LSOs, illustrated in Figure 8, that include a TN limit of 9.0 mg/l and 9.7 mg/l respectively.

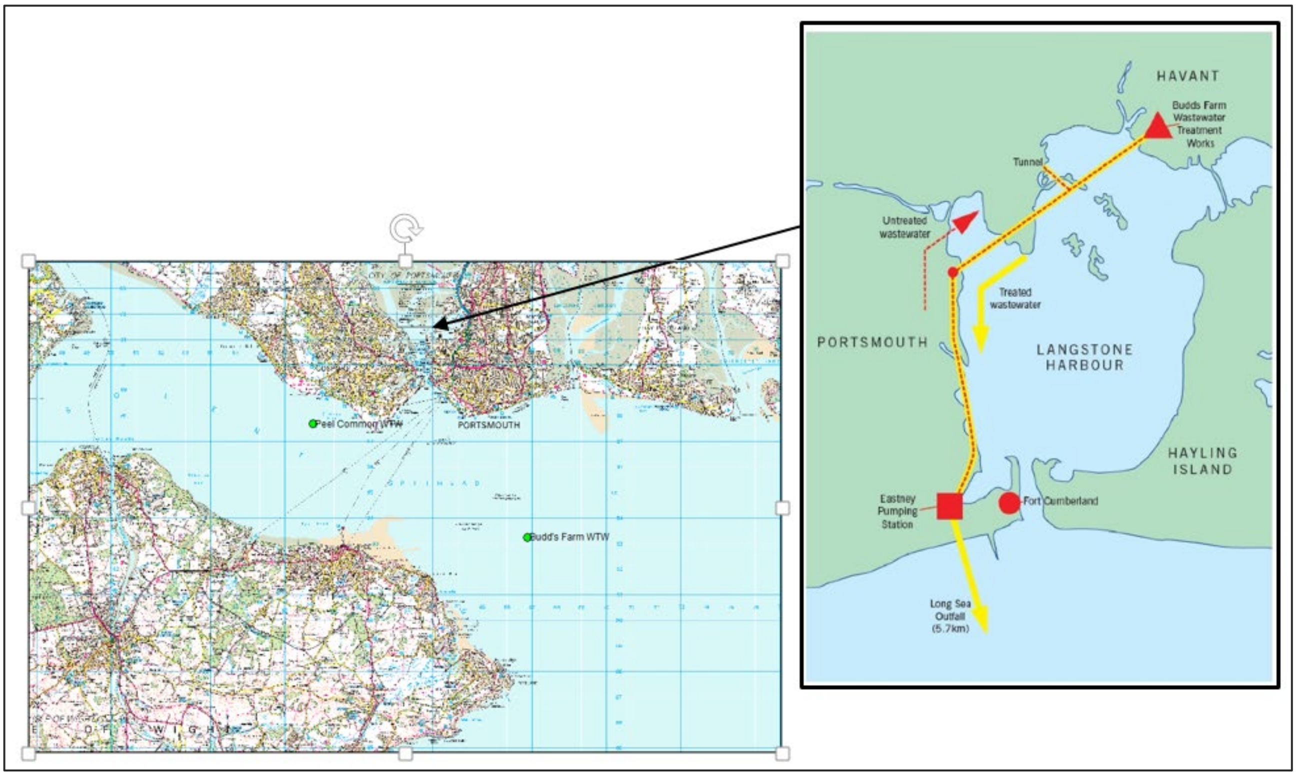


Figure 8 - LSO from Budds Farm to the Solent

For context, the schematic in Figure 9 below illustrates the current discharge arrangement at Budds Farm WTW.

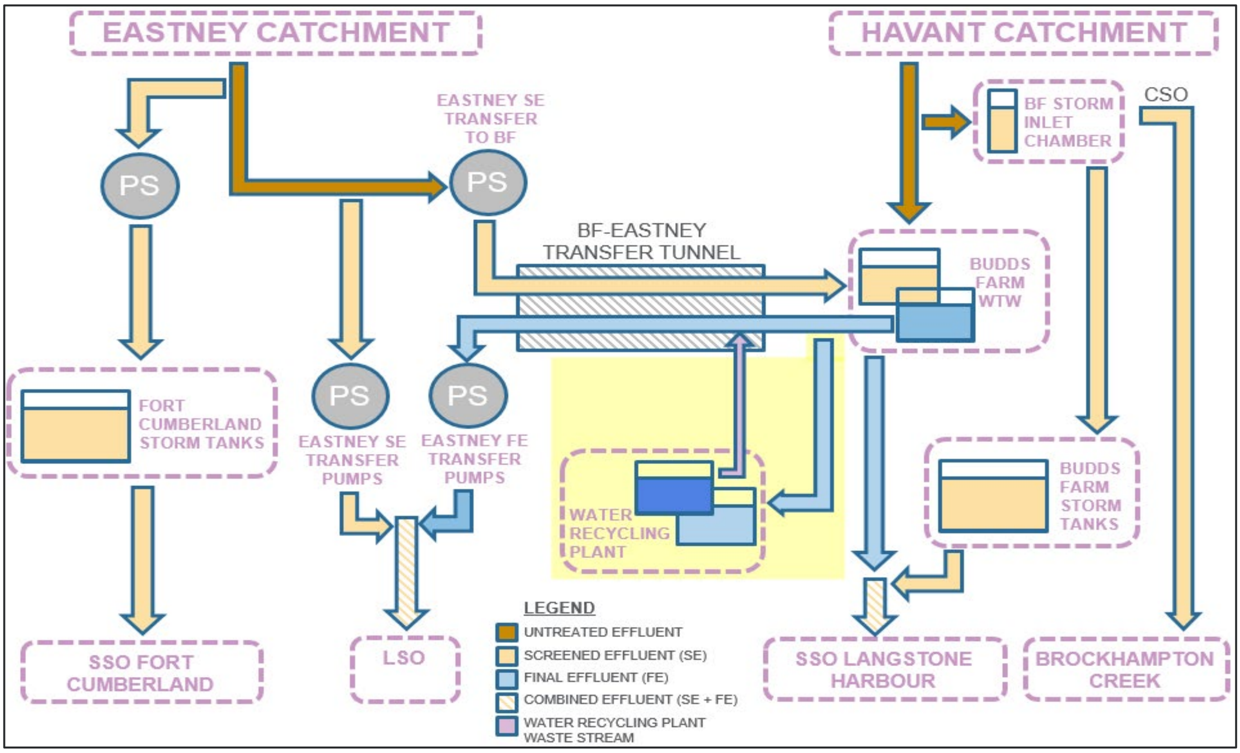


Figure 9 - Proposed Budds Farm WTW Catchment Discharges and Overflows including Water Recycling

The FE from Budds Farm WTW will be abstracted from the WTW outlet channel (prior to discharge into the BF-Eastney transfer tunnel) and transferred offsite for further treatment at the WRP. All waste discharges from the WRP will be transferred back to the BF-Eastney system and will be discharged downstream of the Budds Farm WTW FE outlet channel and directly into the BF-Eastney transfer tunnel. From this location, hydraulically, FE is unable to backflow to the Langstone Harbour Short Sea Outfall (SSO). Figure 9 illustrates how water recycling feed and waste returns integrate into the system (highlighted in yellow).

The key qualitative parameters within the waste stream returned to BF-Eastney transfer tunnel are salinity and then TN, Total Dissolved Solids (TDS). The data presented in Table 5 is based on the mass balance for the flow scenarios of operation of the WRP and was used in CORMIX modelling exercise to evaluate any potential changes (negative or positive) to the discharge point into the Solent. Table 5 below details the existing flow and load to the Solent in comparison to the flow and load to the Solent whilst the WRP is in operation at 75 Ml/d and 15 Ml/d.

Table 5 - Table to summaries the total nitrogen and dissolved solids load to the Solent compared to the existing loads from Budds Farm WTW and Peel Common WTW

	Existing							Future						
Discharge	Flow (Ml/d)	Flow (m3/s)	TN Load (kg/d)	TN Conc (mg/l)	TDS Load (kg/d)	TDS Conc (mg/l)	Salinity (psu)	Flow (Ml/d)	Flow (m3/s)	TN Load (kg/d)	TN Conc (mg/l)	TDS Load (kg/d)	TDS Conc (mg/l)	Salinity (psu)
Scenario -75 Ml/d														
Budds Farm WTW	92.6	1.07	898.22	9.7	253724	2740	2.74	28.12	0.33	272.74	9.7	77043	2740	2.74
Peel Common WTW	58.1	0.67	522.9	9	54614	940	0.94	15.03	0.17	135.3	9	14131	940	0.94
ROC + MFR								22	0.25	916	41.64	182457	8293	8.3
ROC + MFR + Budds Farm								50.12	0.58	1188.74	23.72	259500	5178	5.18
Total to Solent (from PC and BF FE and WRP reject)	150.7	1.74	1421.12	9.43	308338	2046.04		65.15	0.75	1324.04	20.32	273631	4200.02	N/A
Scenario -15 Ml/d														
Budds Farm WTW	92.6	1.07	898.22	9.7	253724	2740	2.74	67.12	0.78	651	9.66	183903	2740	2.74
Peel Common WTW	58.1	0.67	522.9	9	54614	940	0.94	54.03	0.63	486	9	50791	940	0.94
ROC + MFR								4.5	0.05	250	56	38369	11928	11.9
ROC + MFR + Budds Farm								71.62	0.83	901	12.58	222299	3317	3.32
Total to Solent (from PC and BF FE and WRP reject)	150.7	1.74	1421.12	9.43	308338	2046.04		125.65	1.45	1387	11.04	273090	2173.42	N/A

It can be seen with the introduction of the WRP there is a reduction in the TN load to the Solent as well as with the TDS.

Similarly, for TN, current and future discharge concentrations were assessed when the WRP is at maximum flow. Figure 10 and Figure 11 below illustrate that:

- Overall excess TN concentrations in the area is reduced by around 7% for the 75 Ml/d scenario and 2% for the 15 Ml/d scenario. As the drought scenario of 75 Ml/d will not operate for a prolonged period of time, there will not be a significant change to the TN geographical concentration. However, the distribution of the excess nitrogen is changed in the future scenarios when compared to the existing scenario;
- Over most of the model area concentrations change very little between the existing and future scenario; and
- In both future scenarios, concentrations in the Portsmouth, Langstone and Chichester Harbours are reduced as a result of the reduction in overall nitrogen load to the Solent.

Concentrations in a small area just around the Budds Farm WTW Eastney LSO are increased slightly in the 75 ML/D scenario. However, this is a high energy area and discharges are rapidly dispersed out of the Solent.

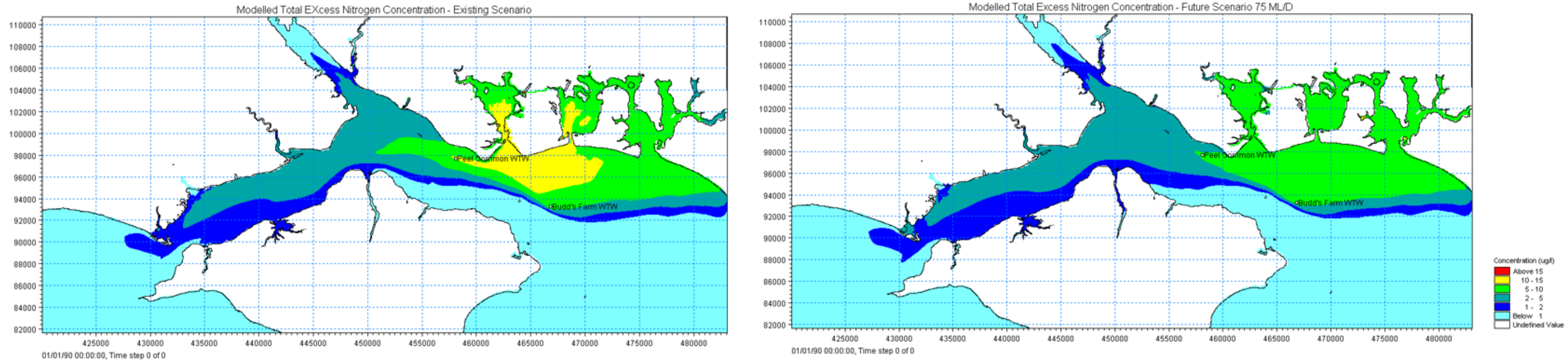


Figure 10: Modelled Mean Excess TN Concentration – Existing and Future Scenario 75 Ml/d

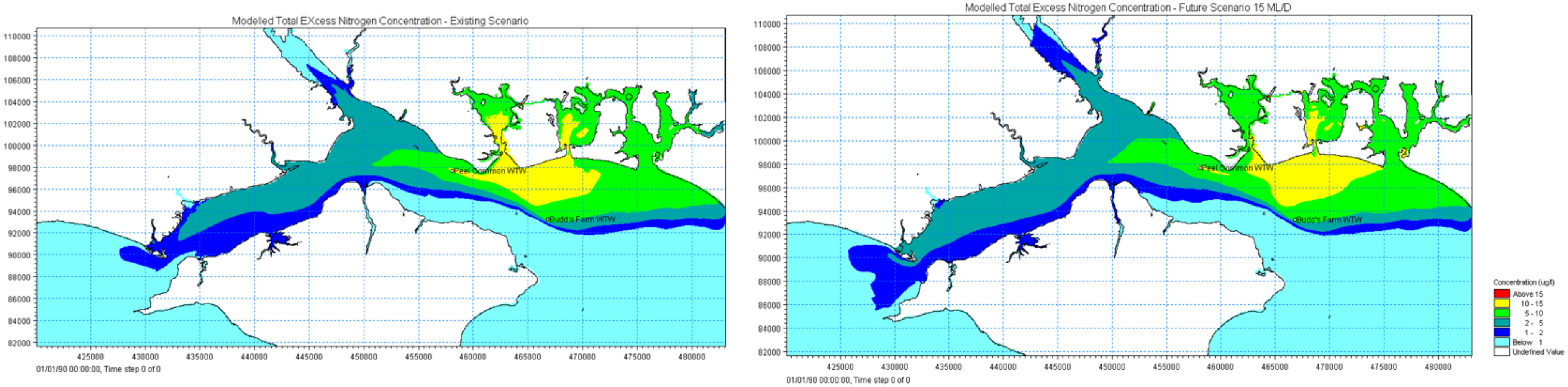


Figure 11: Modelled Mean Excess TN Concentration – Existing and Future Scenario 15 Ml/d

Figure 12 and Figure 13 illustrate how the increase in salinity of the waste stream compares to the existing operation as well as when the WRP is operating at 75 Ml/d during drought conditions and at 15 Ml/d during normal operation. The models identified:

- The modelled existing maximum salinity deficit close to the outfalls was found to be:
  - Budd’s Farm WTW (Eastney) LSO - 0.28 psu.
  - Peel Common WTW LSO - 0.24 psu.

- The modelled future maximum salinity deficit close to the outfalls was found to be:
  - Budd’s Farm WTW (Eastney) LSO 75 ML/D - 0.13 psu.
  - Budd’s Farm WTW (Eastney) LSO 15 ML/D - 0.20 psu.
  - Peel Common WTW LSO 75 ML/D - 0.06 psu.
  - Peel Common WTW LSO 15 ML/D - 0.10 psu.
- The modelling results indicate that changes to salinity concentrations in the Solent will only be very marginal in relation to the existing scenario

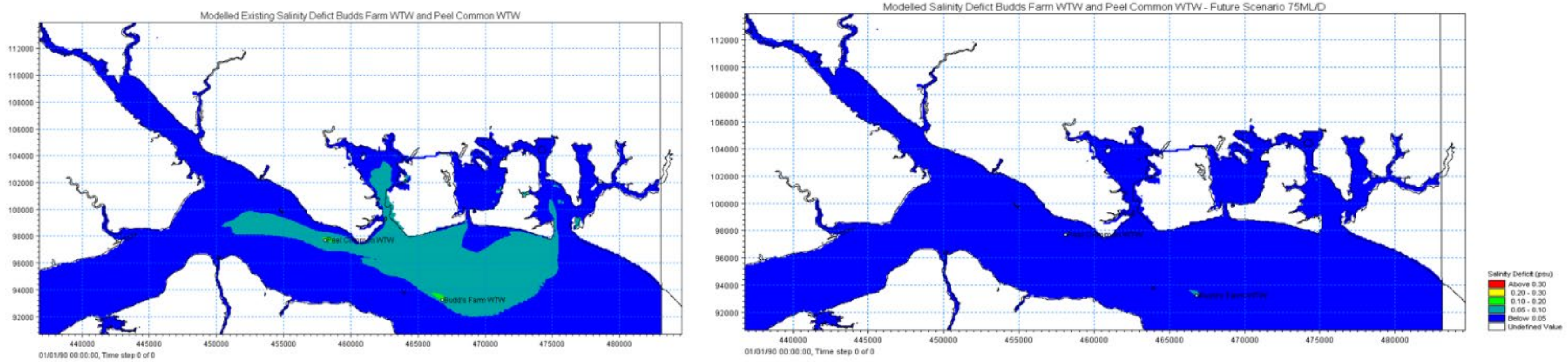


Figure 12: Modelled Maximum Salinity Deficit – Existing and Future Scenario 75 Ml/d

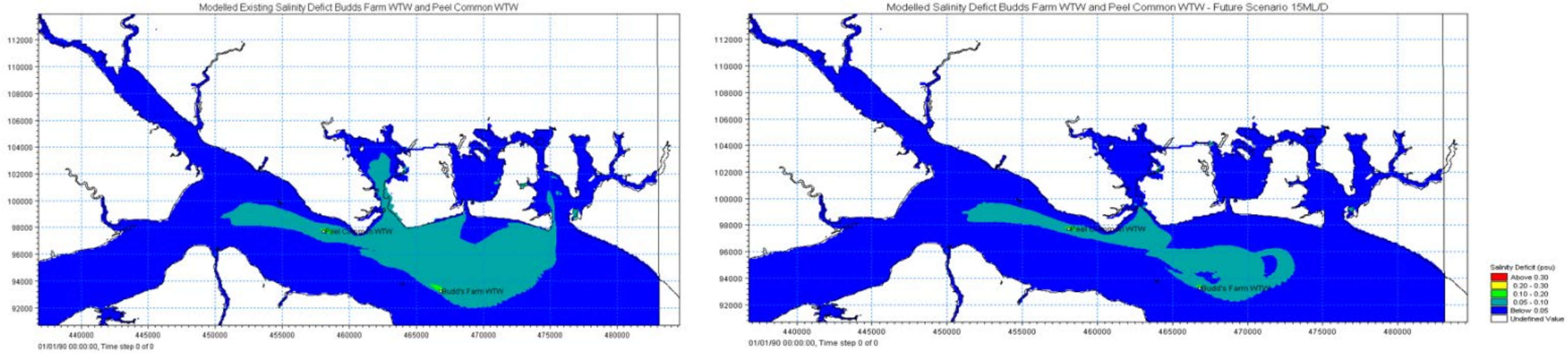


Figure 13 - Modelled Maximum Salinity Deficit – Existing and Future Scenario 15 Ml/d

2.2.5. Control of Process Performance

The following describes regulatory compliance calculations and WRP control system screens required for WRP. Note that the requirements of this section ultimately must comply with DWI or World Health Organization (WHO) guidelines on water reuse and therefore are subject to refinement until approval by the Regulators.

2.2.5.1. Pathogenic Microorganism Control

- The WRP control system will display the virus, Giardia, and Cryptosporidium LRV, where applicable, from each of the process units and the overall WRP treatment process on a common control screen. For continuously monitored inputs, the control system will update the information on the control screen every 15 minutes with the lowest value over that period; and
- The control system shall use the value calculated by the following LRV Total equation based on the Membrane Integrity Test (MIT) values for any MF train in PRODUCTION mode for any given time within the past 24 hours.

LRV calculation: $\mathrm{LRV_{Total}} = \log_{10}\left(\frac{1}{\left(\frac{1}{10^{\mathrm{LRV1}}}*\frac{1}{\mathrm{n\ duty\ units}}\right)+\left(\frac{1}{10^{\mathrm{LRV2}}}*\frac{1}{\mathrm{n\ duty\ units}}\right)\ldots+\left(\frac{1}{10^{\mathrm{LRV\ n^{th}duty\ unit}}}*\frac{1}{\mathrm{n\ duty\ units}}\right)}\right)$

- The control system shall report the same value for all measured columns of the RO row using a tiered approach, as follows:
  - Tier 1: Continuous calculated TOC Reduction of overall RO system
  - Tier 2: Continuous calculated conductivity (EC) reduction of each RO train. Use if no value for TOC reduction is available.
  - LRV calculation for the RO system, using the equation above
- The control system shall total the values in the MF, RO, and UV-AOP for each of the Measured Virus, Protozoa, and Bacteria columns and display the results graphically or otherwise.

2.2.5.2. Off-Specification Strategy

As detailed in the section above, control of WRP will employ a CCP approach to manage off-spec water and maintain achievement of pathogen LRVs. If an individual process or monitor fails, the facility will have provisions to divert off-spec water and prevent flow to the Otterbourne Lake.

Diversion points include:

- Membrane filtration feed tank. Should the MF Feed not meet feed water quality requirements for the membrane filtration system, the membrane filtration feed pumps can be shut off and the feed can be diverted through the tank overflow, or via a sump pump placed into the tank and sent to the Solent;
- RO feed tank. Off-spec MF Filtrate that may have entered the tertiary pipeline can be diverted at the overflow of the RO feed tank. The overflow will be sent to the ROC tank for discharge to the Solent;
- RO permeate. Based on continuous indirect integrity testing via conductivity and TOC, a CCP diversion point will be located on the RO permeate header between the RO systems and hydrogen peroxide feed point. The off-spec water will be sent to the MFR / ROC blend tank for discharge to the Solent; and
- Recycled water storage tank. Based on monitoring of log removal by the UV Control Centre (UVCC) (calculated with input from flow rate, UVT, lamp intensity, and oxidant dosing), a CCP diversion point will be located on the UV-AOP effluent header from the recycled water storage tank. The off-spec water will be sent to the ROC wet well for discharge to the Solent.

2.2.6. Water Recycling Non-Infrastructure

2.2.6.1. Site Location

Due to ABE obligations of programme timescales, two locations for the WRP have been investigated as part of this submission, informed by the site selection process. Land parcels illustrated as WRP_72 and WRP_71 in Figure 14 below are situated in the Langstone Harbour area of Havant, in close proximity to Budds Farm WTW. Both land parcels comfortably meet the spatial requirements of the WRP. Further details of the site selection process can be found in the Section 2.4 Site and Route Selection.

[redacted]

[redacted]

Land Parcel WRP_72 and Land Parcel WRP_71

[redacted]

A shaft is proposed to be located in the South East corner of the site and will be used to launch twin DN1400 pipe-jacks to receive incoming flows from BF, and to discharge waste flows to the Eastney LSO. Incoming flows from BF and PC will discharge into above ground buffer tanks, and these will feed the main process train, which is predominantly located inside a building. Flows will be conveyed from South to North, with clear water tanks providing holding volume before being pumped to Otterbourne. Liquid chemical storage is located on the West face of the building, ensuring segregation of incompatible chemicals and appropriate delivery bunding. CO2 and lime are stored in the North East corner of the site to suit the process flow.

The above has been discussed at site layout configuration workshops, with representatives from the design team and operations to ensure all needs are met. Permanent admin facilities will be provided on site to act as meeting space and temporary remote working.

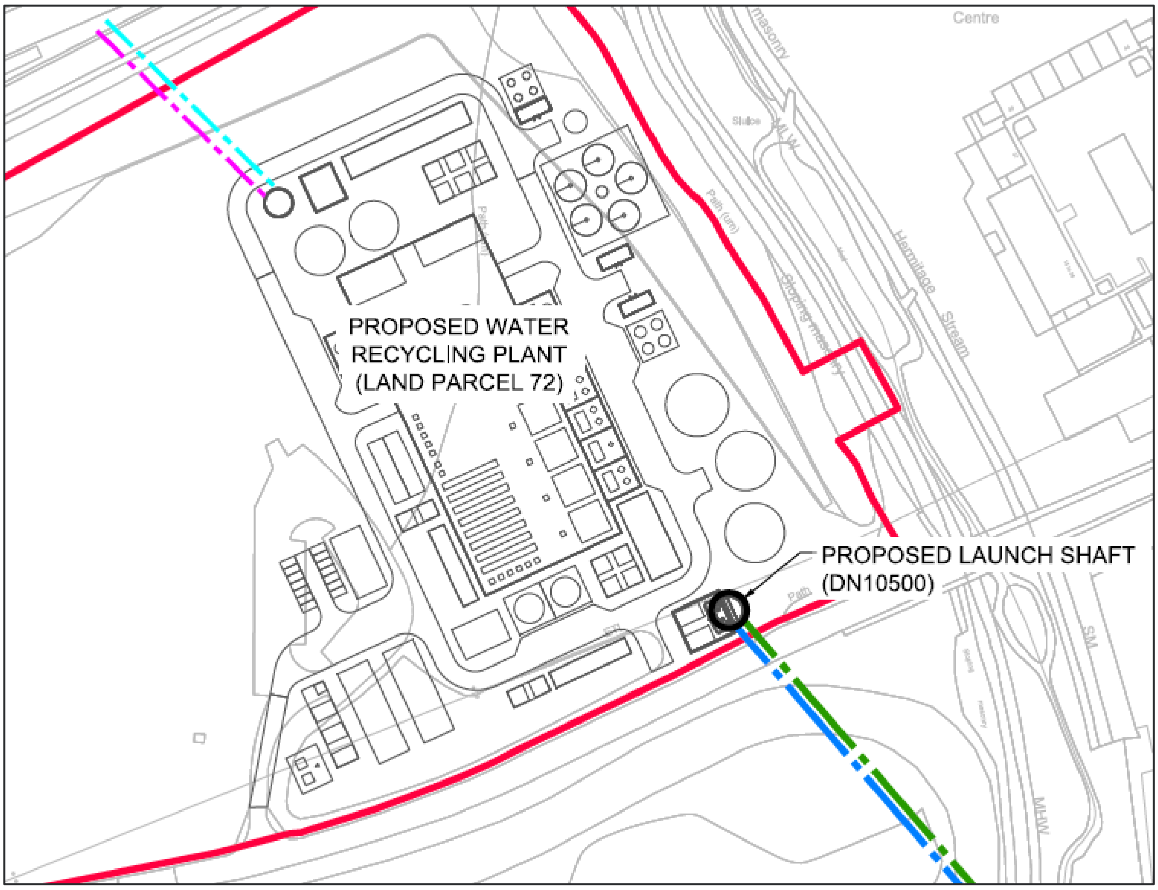


Figure 15 - WRP_72 site layout

Land Parcel WRP_71

The same principles as discussed above have been applied to land parcel WRP_71 which is adjacent to WRP_72 with similar access from the A27.

2.2.6.2. Approach to Earthworks, Roads, Drainage

Land Parcel WRP_72

The geotechnical desk study identified that the site was formerly used for domestic landfill. From aerial images, it would appear this was capped in the early 1990's. At this time no details of the extents and capping / lining of the landfill have been sought from the current landowner. Considering the likelihood of contaminated material, the design considers raising ground profiles with imported material to create areas suitable to construct the proposed buildings and process units. A retaining wall will therefore be required for large areas of the site. The site is outside of Flood Zone 1, and it is anticipated that surface water drainage will be attenuated utilising below ground storage or above ground basin, designed where appropriate to Sustainable Urban Drainage Systems (SUDS) principles. Chemical delivery areas and bunds will be interlocked during delivery to ensure the risk of chemicals spills is minimised. All CCP diversions or overflows will be returned to Budds Farm WTW via the connection pipe, for treatment, prior to any discharge via the LSO.

Land Parcel WRP_71

Land parcel WRP_71 is located to the East of Land Parcel WRP_72. The site is already developed and comprises existing / active warehousing and office units, it has been assumed that the same development as explained for Land Parcel 71 will be required to accommodate a WRP on this site.

2.2.6.3. Building Structures & Foundations

Several large holding tanks are required (inlet buffer volume, MF / RO waste, final clear water tanks), and the design currently assumes that these tanks will be above ground, glass fused to steel construction or pre-cast concrete tanks. Reinforced concrete base slabs will be founded on Continuous Flight Auger (CFA) piles. Particular requirements for the piling on WRP_72 will be to ensure that the integrity of the landfill is not affected.

The on-site buildings (inlet / outlet pumping stations, main process building, admin building) are expected to be steel portal framed construction with steel cladding. The building will be equipped with overhead lifting facilities, with suitable laydown areas for maintenance and removal of equipment.

2.2.6.4. Security & SEMD

It is assumed that the following will be provided, but will be confirmed at the next design stage:

- Site security fence, as per the SW standard detail, and security-controlled access gates; and
- Security doors and alarm system on all buildings.

[redacted]

2.2.6.5. MEICA and Power

Power supply to the WRP will be obtained from Farlington Primary Substation (PS). The power supply will consist of dual Distribution Network Operator (DNO) supply at 11 kV at 10 MVA and switchgear, for Option B.5. It is expected that power requirements will be approximately 25% less for Option B.2 at 7.5 MVA when compared to Option B.5.

Power Supply to the different process areas of the WRP will be obtained from the SW High Voltage (HV) Switchboard provided in two identical halves. The HV Switchboards will each have 7 no. Vacuum Circuit Breakers (VCB). Each half of the Switchboards will have its own building / kiosk. The distance between the switchboards should be a minimum of 3 m apart to provide a fire break. [redacted]

The Programmable Logic Controller (PLC) and Human Machine Interface (HMI) will be connected through Managed Ethernet Switches and routers for providing network security for connection to external communications network for in cooperation into WRP Supervisory Control and Data Acquisition (SCADA) system. Pumping stations, Break Pressure Tank (BPT) and WRP SCADA will be integrated together. All integrated SCADA at WRP will be connected back to Otterbourne WSW.

The site will consist of road lighting, external task lighting and internal lighting within kiosk and buildings which will all be Light Emitting Diode (LED) to provide the best Whole Life Cost (WLC). Illuminance levels shall be in accordance with standards. The external road and access lighting is photocell controlled with SCADA override. All other lighting will be manually switched.

2.2.6.6. WRP Constructability

In broad constructability terms, both Land Parcel 72 and Land Parcel 71 present the opportunity to employ both traditional building methods as well as offsite modular approaches. The area is typified by light industrial units, commercial and office space using steel framed construction and various cladding systems to suit the desired appearance. A similar approach to the buildings for the plant have been assumed with smaller mechanical and electrical equipment being housed in kiosks in the location where it is required.

Land Parcel 72 increases in complexity due to the land, in part, containing a former domestic landfill site. This presents the following risks:

- Excavation to profile the site and to install shallow foundations may interfere with the landfill capping layers;
- Unknown landfill material – The site is anticipated to contain domestic land fill material however it is unclear at this stage if the material would be classed as contaminated and therefore require more costly disposal with potentially fewer sites accepting more highly contaminated waste;
- Landfill leachate – Managing surface water on the site will need to take due consideration of interactions with landfill materials and potential impacts on groundwater and the adjacent Hermitage Stream; and
- Landfill Gas – It is unclear how gas is managed on the currently undeveloped site. SW's proposals will need to ensure that a landfill gas management plan is developed and implemented.

The following broad mitigations have been included at this stage:

- Cost estimates assume the site will be raised rather than lowered using imported fill to limit impacts on the landfill capping layers;
- Surface water will be collected and managed in either detention basins or below ground storage tanks. At this stage it is assumed these will be outside the footprint of the landfill; and
- Piled foundations which breach the landfill capping and lining are assumed to be cast insitu. This method will ensure a seal is formed between the pile and capping / lining to prevent leachate.

As stated above Land Parcel 71 has been developed for warehousing and office use and demolition of the existing structures will be necessary prior to construction.

Both Land Parcel 72 and 71 present challenges to transferring FE, treated raw water and combined waste streams being returned to the LSO waste due to the constrained access to the location on the BF site where take off and return "cut ins" can be made as well as the environmental sensitives of the adjacent Langston Harbour. As a result, the concept design and costing assume trenchless connections to both sites, broadly summarised as follows:

- Land Parcel 72 & 71 – twin 1.4 m ID jacked gravity pipes with associated launch and reception shafts

Further details can be found within the concept design drawings, available on request.

2.2.7. Water Recycling Pipeline Transfer Design

2.2.7.1. Indicative routes

There are two transfer pipelines presented in the following section:

1. For the transfer of treated and conditioned water from the WRP to Otterbourne Lake to augment the raw water supply to Otterbourne WSW: this route is the same for both Option B.2 and B.5
2. For Option B.5 only, the transfer from PC WTW to the WRP to allow for the increase to 75 Ml/d

At this stage all routes discussed are indicative corridors and are dependent on future route development. See Site Selection Chapter regarding the methodology followed.

In order to provide costs for the Multi Criteria Decision Analysis (MCDA) process, a single route has been selected, the risks and opportunities for all routes have also been captured, see Section 2.7 (Risk). As noted above, the WRP to Otterbourne pipeline route and size is the same for both B.2 and B.5 (as illustrated by Figure 16 and Figure 17, although they have different pipe velocities.

[redacted]

[redacted]

[redacted]

2.2.7.2. Transfer Pipeline Infrastructure (Key elements)

System Design & Hydraulics

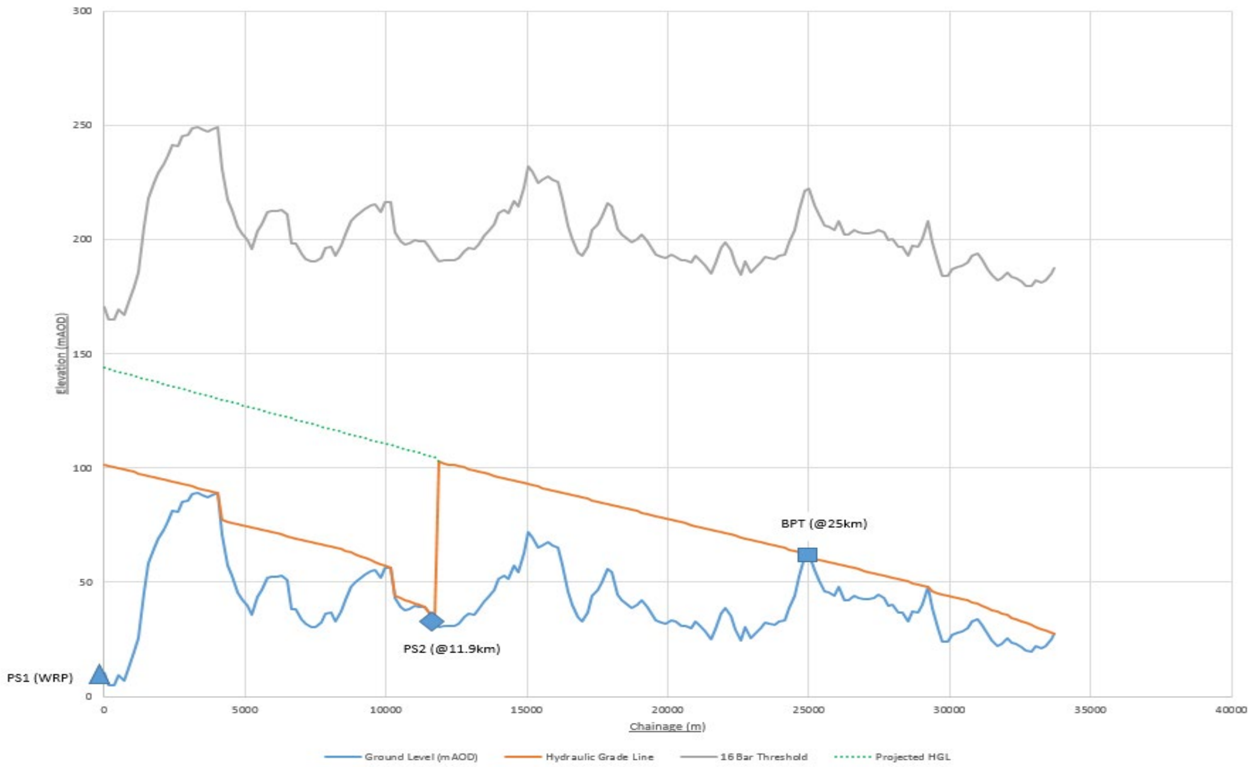


Figure 18 - Hydraulic Profile from the WRP to the new EBL at Otterbourne WSW

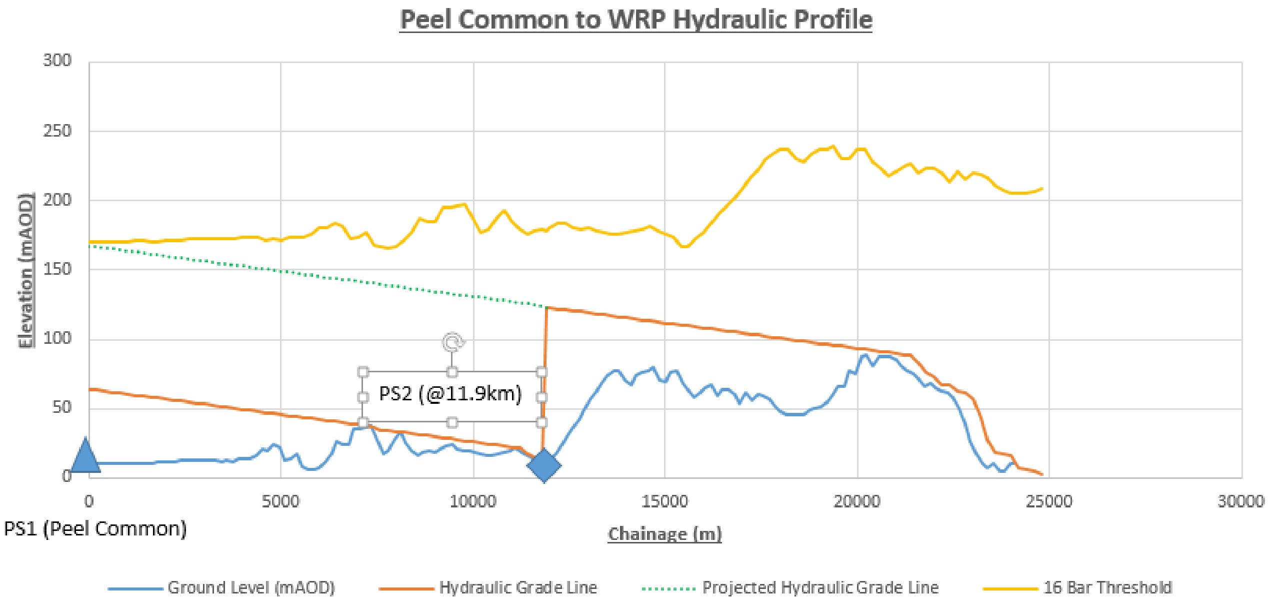


Figure 19 - Hydraulic profile from PC WTW to the WRP

Due to the significant distance and / or large amount of static head to overcome, dual stage pumping stations have been provided between WRP and the EBL at Otterbourne WSW and PC WTW to WRP. This is to ensure a single PS will not need to generate over 16 bar pressure (as this is a standard pressure rating for pipework / valves fittings etc.) The pumping stations shall operate in series along the pumping route that will split the head to be generated across the two pumping stations.

WLC analysis of efficacy of dual pumping stages vs single pumping stage and pipe diameter will be undertaken during design development. Single stage pumping / smaller diameter pipelines may result in the requirement for higher rated (PN26) pipes / fittings and operating costs but could provide a lower WLC due to the infrequency of pumping at peak flow rates during drought periods. It may also be possible to install pumps without the need for water storage compartments.

A BPT has been provided on the pipeline route from the High-Lift Pumping Station (HLPS) at the WRP site to Otterbourne WSW to mitigate potential surge issues. However, due to the topography and distances of pumping, it is likely that surge vessels will be necessary at both pumping stations to maintain transient pressures within acceptable limits.

Pumping Station Design

A HLPS will be located within the WRP footprint and for Option B.5 at PC WTW. Second stage pumping station requirements and locations will be determined following hydraulic modelling and land evaluations on the preferred pipeline route.

A typical PS will include the following items:

- High-lift pumps;
- Fully isolatable dual water storage compartments;
- Pump house;
- Motor Control Centre (MCC) kiosk to house electrical system;
- Surge vessel system;
- Power supply consisting of: Generator (including emergency / standby power generation), Low Voltage switchboard with mains and generator incomers, motor starters, feeders and Instrumentation Control and Automation (ICA) section;
- Step-up and step-down transformers;
- Control instrumentation;
- Telemetry outstation;
- Heating, Ventilation and Air Conditioning (HVAC) system for heating / cooling;
- Site welfare facilities;
- Access road; and
- Security gate and perimeter fencing.

The estimated footprint required is around 6200 m^2.

2nd Stage Pumping Station - WRP – Otterbourne WSW Environmental Buffer Lake

A second stage PS has been provided for the concept design, it is likely a similar footprint and arrangement to the HLPS as illustrated in Figure 18.

For the concept design location (baseline route), the power supply to the 2nd stage PS is estimated as a single DNO supply at 11 kV at 1200 kVA [redacted]

A Programmable Logic Controller (PLC) will provide control and monitoring of the pumps plus supervisory function of all plant in the PS, with a Uninterruptable Power Supply (UPS) providing power back-up of 1 hour.

The PLC and HMI will be connected through Managed Ethernet Switches and routers for providing network security for connection to external communications network for cooperation into WRP SCADA system. Pumping stations, BPT and WRP SCADA will be integrated together. All integrated SCADA at WRP will be connected back to Otterbourne WSW.

2nd Stage Pumping Station - Peel Common WTW – WRP (Option B.5 only)

A second stage PS has been provided for the concept design, it is likely a similar footprint and arrangement to the HLPS as illustrated in Figure 19.

For the concept design location (baseline route), the power supply to the 2nd stage PS is estimated as a single DNO supply at 11 kV at 1100 kVA [redacted] The site would also have the similar PLC and SCADA arrangement as above.

Break Pressure Tank (BPT) - WRP to Otterbourne WSW (EB)

The BPT concept design provides two fully isolatable water storage compartments. The tanks will be surrounded by embankment screening supported by a retaining wall, provide permanent access for future inspection and maintenance of the tank walls.

A de-chlorination kiosk with chemical delivery bund and access road has also been provided as a safeguard to mitigate an overdose of hypochlorite to the raw water being transferred from the WRP to Otterbourne EBL. This infrastructure has been included following conversations with the EA and NE and SW proposed to adopt a residual free chlorine of less than 0.1 mg/l in the flow entering the EBL. This data is in alignment with other open water lagoons that are permitted by the EA for example, the lagoon at Weirwood WSW that discharges into the Medway. Appropriate monitoring with feedforward and feedback control will be installed to ensure the chlorine level is maintained at below 0.1 mg/l. SW is also considering the removal of the chlorination system at the WRP, however, this will be confirmed at Gate 3.

The estimated footprint required is 4350 m2. For the concept design location (baseline route), a 3 phase DNO will be required and is estimated at 415V 100A supply to provide power to the site and control functions. The site will require a PLC, telemetry outstation arrangement and an UPS system.

Ancillary Equipment

The standard transfer system includes isolation valves, flow meters, sampling, washouts etc. and has been included in the concept design to facilitate maintenance and monitoring of the transfer asset and water quality.

Security & SEMD

It is assumed that the following will be provided, but will be confirmed at the next design stage:

- Site security fence as per the SW standard detail c/w vibration sensors;
- Security cameras;
- Loss Prevention Certification Board (LPCB) SR3 covers or higher;
- Security doors to all buildings; and
- Alarm system on all buildings.

The alarms and cameras will be monitored offsite [redacted] There will be multiple alarm systems within the multiple building around the water recycling site.

2.2.7.3. Pipeline Infrastructure Construction

Open Cut Construction

The proposed pipeline will be installed using standard construction methods conventionally used for a cross-country pipeline. At this stage it is assumed that open cut excavation will be used for the majority of the route. The depth of the trench will vary dependent on the ground conditions but will be a minimum of 0.9 m in open fields to prevent frost damage or overloading from vehicle movements.

A max working corridor of 25 m between perimeter fences will be required for the pipeline installation. This will allow sufficient room for open excavation, storage of excavated material, construction plant transit and handling of pipework. The working corridor will be reduced where construction allows and in order to minimise impact, for example when crossing hedgerows and ditches.

Trenchless Construction

No-dig techniques will be employed at critical crossings of main rivers; motorways; railways; at locations where this will reduce the impact on environmentally sensitive areas or where construction is otherwise restricted. The construction methodology selected will be dependent on pipe diameter, length of trenchless crossing and ground conditions.

Tunnelling

Segmental tunnelling will be utilised under the following conditions:

1. Specific locations where the length of drive exceeds the maximum capability or
2. Where other methodologies are not suitable and
3. Where there is an opportunity to house two pipelines within a tunnel

Pumping Stations & Break Pressure Tank

Hard and soft earthworks solutions will be employed to resolve any topographical variations, ensuring that the site can be terraced into flat areas suitable to accommodate kiosks and buildings. If the sites contain contaminated land, site remediation and / or removal of contaminated material for offsite for disposal will be undertaken. Overlying deposits are assumed to be suitable for supporting smaller site structures, larger assets could be founded on bedrock deposits using bored or CFA piling.

2.2.8. Environmental Buffer (Otterbourne Lake)

In Gate 1 it was proposed to construct a fully lined lake, Otterbourne Lake, to act as an engineered EB at Otterbourne WSW. This Option allows SW to blend recycled water with natural sources (when available), which provides additional re-mineralisation, reduces the perceived risk of using solely recycled water for drinking water treatment from a regulator and customer point of view and provides a risk buffer for transfer failures. In addition, Otterbourne Lake allows the WRP to operate at a steady state low flow basis during normal conditions. The lake also allows for future raw transfer connections from other sources e.g. Thames to Southern Transfer.

The EBL is the final point in the system for the WSP of the WRP, thus becomes the Regulation 15 point for Otterbourne WSW. For both B.2 and B.5 it is sized for 75 Ml providing 24 hr retention when the WRP is operating at full capacity for B.5 and circa 29 hr retention for B.2. When the WRP is operating at 75 (or 61) Ml/d there will not be a blend in the EBL with other sources (groundwater/abstraction from rivers). The quality of water produced from the WRP is cleaner than is the water currently being abstracted, therefore the risk of deterioration of the water within the environmental buffer is low, and hence leads to the risk not increasing across this sub-system.

Recycled water from the WRP will be transferred through a 35 km water transmission pipeline into Otterbourne WSW. It is proposed that once the new lake is operational, the new surface water abstraction to the WSW will be from Otterbourne Lake with the existing river abstraction Option acting as a resilience flow when the lake would be out for routine inspection and cleaning. A diagram of Otterbourne Lake is illustrated in the Figure 20 below.

[redacted]

[redacted]

SW has consulted with the EA and NE regarding the concept design of the EBL at Otterbourne WSW and the following actions and recommendations will be completed by SW ahead of finalising the design:

1 Conduct ecological surveys to determine the viability of the Option and the level of mitigation / compensation that will be needed as a result of the supporting habitat for the River Itchen
2 Assessment of bird assemblage via a survey regarding a bird strike report to indicate that the site is unlikely to be used by wetland birds. If a risk is identified, mitigation may be needed if bird foraging and nesting sites are lost as part of the construction.

3 Provide further details on the proposed overflow, including the pipework and construction needed and mitigation / compensation required as part of the loss of habitat from the ecological species and habitats identified from the site surveys
4 Identification of chemicals that may be present in the discharge and the likelihood of the impact to the River Itchen and its notified features
5 Providing further details on the frequency of the overflow being used
6 As part of the routine cleaning of the reservoir, the requirements of the overflow for this process will need to be identified as well as the presence of chemicals and their concentrations during cleaning

2.2.9. Otterbourne WSW proposed pre-treatment Design

Otterbourne WSW is currently undergoing refurbishment to address issues identified by a notice from the DWI to reconfigure a new combined disinfection stream comprising of UV and chlorination of the surface water and ground water stream by 30 June 2020. The DWI have given SW a target date of the 31 December 2026 to construct and commission a long term pre-disinfection treatment at Otterbourne WSW which will replace the old clarification and rapid gravity filtration plant (surface water works) and the membrane plant (groundwater works). Due to the uncertainty in the development of the emerging Preferred Option under the Water for Life Hampshire (WfLH) programme, several water quality profiles, described below, had to be investigated prior to deciding on the most appropriate pre-disinfection technology for Otterbourne WSW as follows:

- A blend of the river and ground water; and
- Recycled water blended with river water (if available) in a new EBL at Otterbourne WSW.

The turbidity of the combined ground and river water quality is approximately 10 NTU (maximum) and 3.0 NTU (average) and TOC of 2.0 mg/l (maximum) and 1.0 mg/l (average) (Process Solutions Parameters Document 17/12/2020). The range in varying raw water quality from the new sources can be seen in Figure 21. This quality of raw water is effectively outside the proven treatment ranges of conventional clarification processes such as Dissolved Air Flotation (DAF), flat bottom clarified and Actiflo and more in the range of MF / UF membranes. However, based on the known challenges of the existing Memcor MF groundwater plant in conjunction with the lack of space at the WSW, the evaluation of ceramic membranes to provide an effective and compact long-term front-end treatment solution has been identified.

SW aims to launch a pilot plant initiative in 2021 to prove the efficacy of ceramic membrane technology. The cost estimate and site layout has been based on the inclusion of a ceramic membrane technology from PWNT given this is the only supplier in the UK with Regulation 31 approval at this stage and represents a worst-case WLC. It is worth highlighting that unless the pilot trial is successful, SW will consider other pre-disinfection technologies to meet the Notice requirement to identify a solution by December 2022.

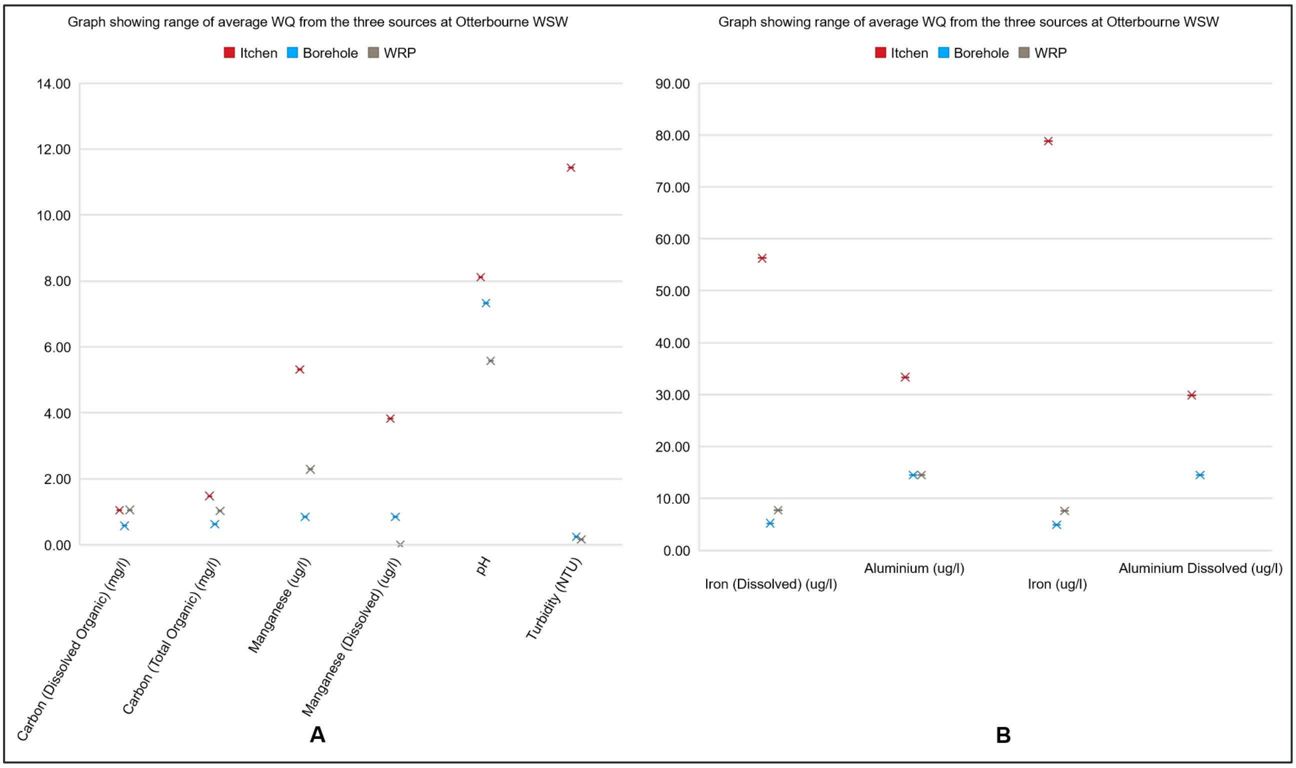
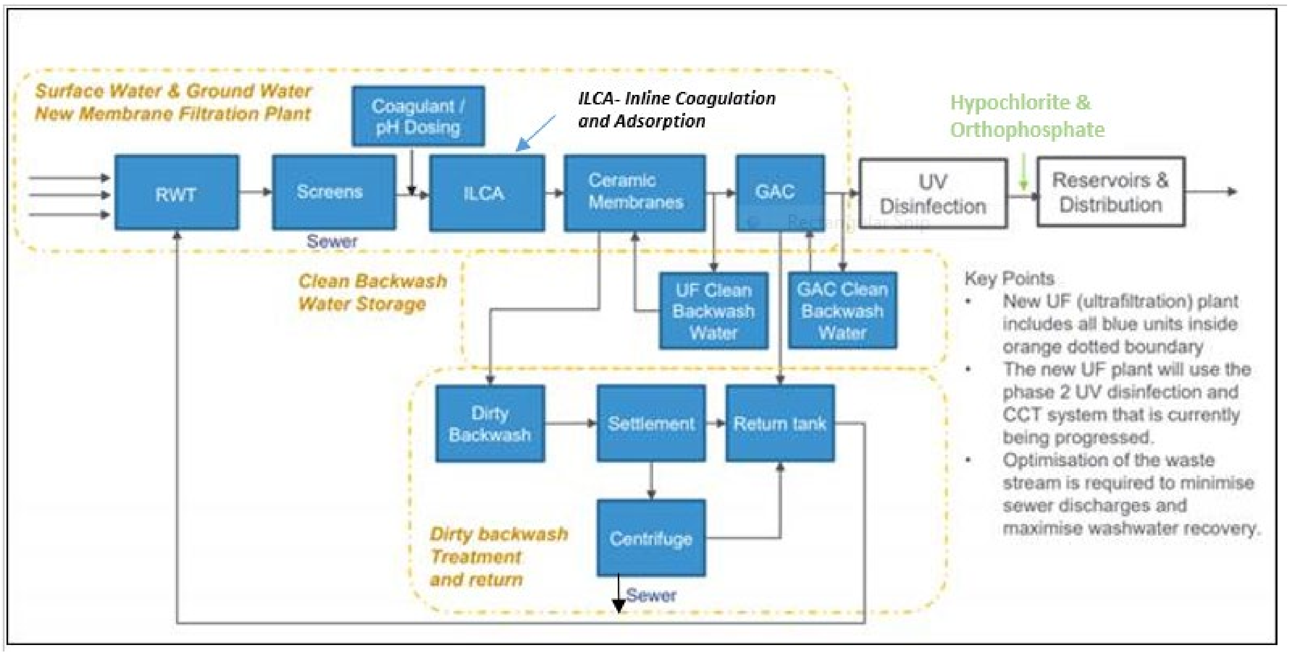


Figure 21 - (A) Graph showing the average WQ for a range of determinants across the River Itchen, Combined Boreholes at Otterbourne WSW and from the WRP (B) Graph showing the average WQ for a range of determinants across the River Itchen, Combined Boreholes at Otterbourne WSW and from the WRP

The initial concept design has been undertaken prior to the results from any pilot trials therefore the process block diagram illustrated in Figure 22 below is based on assumptions regarding treatability and performance expectations. The following assumptions were made:

- Backwash water for the Ceramic Membrane Plant (CeraMac) shall be obtained from the membrane backwash tank;
- Backwash water for the GAC (Granular Activated Carbon) Contactors shall use GAC treated water from a GAC backwash tank;
- The chemicals identified are based on previous membrane treatment design experience. Pilot trials shall confirm actual chemical and dose rates to reflect the raw water treatment challenges.
- With losses and returns the pre-treatment and membrane filtration units will need to treat a throughput of circa 100 Ml/d therefore 14 x CeraMac units are considered appropriate until pilot trials have been concluded;
- To provide resilience there are a minimum of 2 process streams operating in parallel with one stream able to treat a flow of 75 Ml/d;
- Each CeraMac uses a dedicated local backwash tank to discharge and wash the membranes which uses compressed air as motive energy source;
- Backwashing, enhanced chemical backwashing and CIP processes work automatically based on pilot trial findings; and
- Backwash water can be treated (settlement and thickening) with sludge disposed to sewer and reclaimed water recycled to the head of the works.

The output of the membrane plant will pass through to the revised disinfection plant currently being developed during Asset Management Plan 7 (AMP7). The available land for the treatment plant is small with access road bounding the land that is used by neighbours adjacent to the allocated area. The proposed layout of the changes at Otterbourne WSW are illustrated below in Figure 23.



Key Points

- New UF (ultrafiltration) plant includes all blue units inside orange dotted boundary
- The new UF plant will use the phase 2 UV disinfection and CCT system that is currently being progressed.
- Optimisation of the waste stream is required to minimise sewer discharges and maximise washwater recovery.

Figure 22 - Simplified PBD, spatial general arrangement has been based on the proposed new process units, including three feed types to head of works

[redacted]

[redacted]

2.2.9.1. Otterbourne Plant Constructability

In broad constructability terms, the construction would be similar to the WRP, and also presents the opportunity to employ both traditional building methods as well as offsite modular approaches. The area is within the existing WSW, adjacent to other commercial users and also residential properties on the access route. Various cladding systems to suit the desired appearance could be used. A similar approach to the buildings for the plant has been assumed with smaller mechanical and electrical equipment being housed in kiosks in the location where it is required.

As the proposed location is within the existing WSW, there are complications:

- The existing works will need to be operational during construction. This limit working areas and imposes logistical development challenges;
- There are often unknown or historic buried assets within older WSW sites that need to be located and potentially diverted; and
- For such a significant build there is limited space and sequencing of the re-development will be required to produce an optimal facility.

Key Engineering Risks and Opportunities

Structured What If Technique (SWIFT) workshops have been undertaken for both the infrastructure and non-infrastructure elements of the project. The actions identified have been addressed risks included in the project Risk Register.

Key engineering, construction risks and opportunities critical to the deliverability of the Option have been captured in this section. Further information can be found in Section 2.7 Risk and Environment.

Process Plant

- Risk that the estimated electrical upgrade scope as provided by the DNO is not sufficient for the final scheme design, leading to additional costs and a programme extension;
- Risk that the ground conditions encountered are worse than those assumed, leading to a change in foundation design, increased costs and delays to the programme;
- Risk that as there are no current regulations on expected hydraulic retention time for environmental buffers in the UK, the DWI could request a significant increase in this retention time, leading to the requirement for an environmental buffer that cannot be accommodated at Otterbourne WSW. Although this is highlighted as a risk, feedback from regulators thus far, has not highlighted any concerns on the hydraulic retention time in the EBL during a drought scenario;
- Risk of having to install further pre-treatment infrastructure in order to ensure FE quality does not impact on the operation of the WRP, leading to additional assets being required at additional cost; and
- Following conversations with the EA / NE, the EA raised an opportunity to use the land parcel South of the EBL as an emergency overflow (O/F) discharge location instead of a tributary to the Itchen or the river Itchen itself. The benefit of this proposal is to allow energy dissipation prior to the flow entering the river Itchen thereby preventing sediments scouring in the river. Conversations are ongoing to manage and mitigate this risk.

2.2.10. Pipeline Transfers

2.2.10.1. Option B.2

All pipeline routes from the WRP will require a trenchless crossing of main rivers, roads, railways and the Esso Pipeline. The key engineering risk and opportunities (illustrated by Figure 24), are as follows:

- All route corridors encounter significant risks in the [redacted] (B.2177) area, multiple constraints including PW Farlington WTW, Aquind Interconnector scheme to the South [redacted] [redacted], Portsmouth golf course and PW service reservoir to the North. There are also a significant number of high-risk services located within the B.2177 and PW are planning upgrade their transfer mains between Bedhampton Springs and Farlington WSW, following a similar route alignment;
  - Site selection and design work is being undertaken to consider alternative routes and construction methods, including micro-tunnelling and installing a larger segmental tunnel. Collaboration with PW is also underway to understand the location and time scale of their proposed works to maximise opportunities for joint working.
  - Archaeological desk studies and investigations will be undertaken to inform the design if this Option is taken forward and appropriate construction methodologies selected to minimise any potential impacts
- The proposed pipeline corridor into Otterbourne WSW presents multiple constraints, including crossing the South West Mainline railway and the River Itchen valley and associated environmental designations. The pipeline route will also be in close proximity to existing SW strategic mains and a number of SW boreholes and wells, which feed Otterbourne WSW and Twyford WSW;
  - A detailed desk study has been undertaken at this location, including review of SW existing utilities, geotechnical desk study and a constructability review. Two potential trenchless methods were identified, one to pass under all constraints, the other to use a combination of trenchless construction and open cut through an existing Railway underpass.
  - There is an opportunity to consider a larger diameter tunnel to negotiate the constraints around Otterbourne WSW. Tunnelling presents less risks during construction and could be used as a conduit to house additional pipelines (Gater's Mill to Otterbourne WSW AMP7 Scheme) or for future resilience – to facilitate larger diameter / additional pipelines.
  - Further assessment and consultation regarding the alignment and construction methodology will be undertaken should this Option be taken forward
- Pipeline corridors 1&2 are routed through a [redacted]
  - An alternative route to the north of Creech Woods could be utilised
  - Further investigation to determine if existing access tracks through [redacted] could be utilised or to determine if solar panels can be relocated will need to be determined if this Option progresses

[redacted]

[redacted]

2.2.10.2. Option B.5 (in addition to B.2)

The risks for Option B.5 are in addition to those highlighted for B.2, as are illustrated by Figure 25.

[redacted]

All pipeline routes from PC will require a trenchless crossing of the key rivers, roads and railways. The key engineering risks and opportunities, are as follows:

- Shortly after leaving PC WTW the route has a similar alignment to the planned Stubbington Bypass
  - Consultation with the Highways Agency (HA) will be undertaken if this Option is taken forward and opportunities to lay the pipeline during bypass construction works will be explored
- Careful consideration of the route alignment North of the M27 will be required due to a number of scheduled monuments ([redacted] Forts) and potential for archaeology
  - Archaeological desk studies and investigations will be undertaken if this Option is taken forward and appropriate construction methodologies selected to minimise any potential impacts
- Greater risks on the pipeline corridor where there is commonality between WRP to Otterbourne WSW and Peel Common WTW to WRP (B.2177, A3 (M) and the A27)
  - A desk study has been undertaken to consider the use of a single larger diameter tunnel to house both pipelines at critical crossings and pinch points and associated risks have been captured

2.2.11. Water Safety Planning

2.2.11.1. Water Recycling Plant WSP Development Plan

The following section defines the methodology for the development of the WSP, how gaps within the data have been resolved as well as limitations in the sampling data.

The DWI expects any water company to adopt a drinking WSP approach, a derivation of WHO approach, to identify the inherent risk to the source water. The systematic nature of the water safety planning strategy has allowed for the suitability in ensuring the safety of water in the supply system. SW's Risk & Resilience Team is the expert team in the organisation, and the current WSP methodology is defined by WSP Risk Assessment & Monitoring Methodology (WSP301), a methodology aligned with the specifications of British Standards document BS EN 15975-2:2013 (BS15975-2).

At Gate 1 it was not possible to complete a WSP for the system due to this being an on-going project with site selection, detailed design, and operating plans to still be confirmed, and the limited availability of water quality data. Since Gate 1 the following progress has been made:

1. A Water Recycling Pilot System has been commissioned at PC WTW alongside a sampling plan to gather extensive water quality data
2. Hazards have been identified in the water supply system that impact microbial and chemical parameters that are required as part of compliance with water quality standards
3. Donor site selection has been conducted to confirm the source water for the water recycling plant
4. WSP have been developed, with a committee of water treatment practitioners and experts with knowledge and experience in public health
5. Several meetings with the DWI were undertaken on 16/09/2020, 15/12/2020, 22/12/2020 and 20/04/2021 to share findings and gather implications of findings from a regulatory standpoint and to resolve issues and concerns arising from the findings

The key inputs at Gate 2, building on the Gate 1 work, was the definition of the system and the catchment sampling plan that was used for the analysis. The WSP is available on request and has already been provided to, and discussed with, the DWI.

2.2.11.2. Definition of Water Supply System

SW's WSP risk assessment follows a source-to-tap process whereby upstream assets are risk assessed and the controlled risk scores are cascaded down to the downstream assets. There are six asset sub-system types, illustrated in order of occurrence in the source-to-tap process. Due to the water from EBL being fed into Otterbourne WSW rather than being supplied into the distribution network, WSPs were created to the storage sub-system, EBL, as the downstream sub-system are covered by existing assets which will be updated based on the new source of water, with new WSPs.

There is one source which feeds into the WRP (Option B.2) and two sources that feed into the WRP (Option B.5), hence individual WSPs have been made for the catchment and abstraction at BF WTW (Figure 25) and PC WTW (for Option B.5). Boundaries were defined for each of the sub-systems as stated:

- Catchment has been defined as all the influent into the WTW, including domestic sewage, trade effluent, infiltration flow and surface run-off;
- Abstraction has been defined as the WTW as the final effluent is the influent of the WRP;
- Treatment is the WRP; and
- Storage is defined as the EBL which is blended with water from the River Itchen.

A hazard and hazardous event identification session was carried out at Gate 1 and the participants included SW's water quality and public health team, water risk team, external participants included [redacted]

[redacted] This panel enabled SW to develop the framework for the WSPs and consider hazards directly linked to the compliance-based parameters within the Water Supply & Water Quality Regulations 2018 with the addition of several other hazards such as Cryptosporidium, Somatic Coliphage and Loss of Supply hazards. In addition to regulated constituents being sampled, a range of unregulated chemical compounds, including pharmaceuticals and personal care products, endocrine disrupting compounds and non-regulated disinfection by-products have been considered in the WSPs to demonstrate the wholesomeness of the water to protect both public and environmental health.

Hazards at each stage of the water recycling supply system were adequately risk assessed to ensure protection of public health, compliance with regulated parameters and to ensure a continuous water supply. For these hazards an implemented sampling plan has allowed for the collection of a large dataset at various points described below. Assessment of specific determinants has been determined at a sub-system level. Determinants assessed have been decided based on existing permits (where applicable), removal rates expected across treatment processes, sampling data, Prescribed Concentration Values (PVCs) and WHO guidelines.

Consequences scores are aligned to the DWI's parameter-based scoring mechanism, with suitable scores designated by SW's experts where data is not available. Likewise, likelihood ratings were scored through a range of different metrics, based on comparing the sampling data to the PCV and WHO guideline values where a PCV was not available, the rate of removal across treatment and comparing the blending scenarios downstream of the WRP. For consistency in the source-to-tap system, the risk scoring has cascaded from upstream processes to downstream WSPs i.e. the controlled risk scoring for BF and PC WTW's Catchments became the uncontrolled risk score for the BF and PC WTW's Catchment Final Effluent.

Limitations arose in the development of the WSP such as:

- The identification of a few determinants (e.g. vinyl chloride) whereby the Minimum Detection Limit (MDL) was greater than the PCV, therefore further investigations are required to determine more representative sampling results to determine the risk;
- Several determinants tested did not have a DWI code assigned, as a result holding codes were assigned to the list of determinants to include the additional compounds being tested as part of the catchment sampling plan; and
- The risk customer acceptance associated with the changes in the taste of water is not yet determined. This aspect of the delivery of the project can be considered through the "Risk Management and Communication" component of the WHO's WSP Framework.

A draft of the WSPs has since been submitted to the DWI (13/04/21) for review and no comments received. The WSPs have been reviewed and authorised for issue by SW's water quality and water risk team.

2.2.11.3. WSP Summary

The following section will summarise risks identified in the WSPs. A selection including metals, organics, inorganic and bacteriological risks has been selected to illustrate the risks from source, i.e., wastewater catchment, through to the multi-barrier system in place at the wastewater treatment plant, the WRP and the drinking WSW as an overall system, to eliminate the risks.

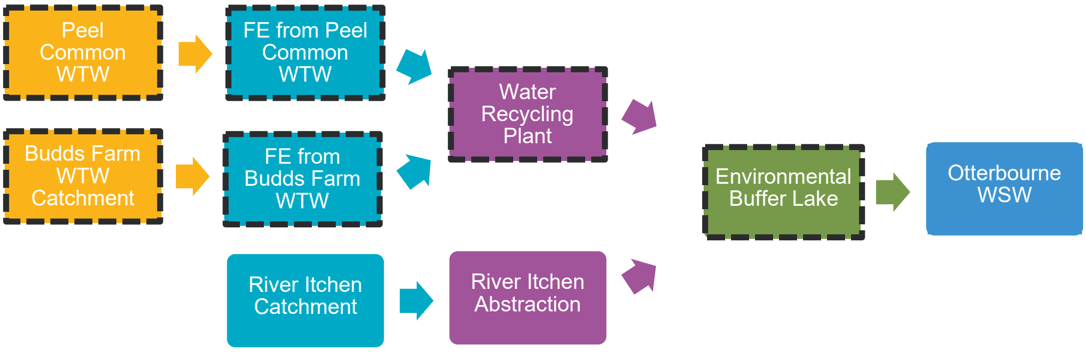


Figure 26 - Water supply sub-system used for WSP

2.2.11.4. Budds Farm WTW and Peel Common WTW Catchment

Whilst the statistical analysis has identified that Budds Farm WTW and PC WTW catchment are identical, two separate WSPs have been produced. The development of the catchment WSP considered sampling data as well as control measures such as trade discharge permits existing within the respective catchments.

Based on the source of wastewater coming into the catchment ranging from domestic sewage, industrial waste and surface run-off, the likelihood of pathogenic, faecal contamination, microbial and chemical concentration to be high is expected when comparing the quality of water to drinking water standards. As a result, it was identified that the sampled water quality exceeds the PCV for drinking water hence a rating of 10 was given as the pre-likelihood score for those that showed an elevated risk. However, not all determinants were given a pre-likelihood score of 10. This is due to comparing the water quality sampling results to the PCV; in the context of Chromium the amount of dilution as well as the maximum detected value being less than the PCV by several magnitudes led to the pre-likelihood rating of 5. In addition, as there are trade discharge permits in place due to the presence of metal plating and chrome electroplating companies in the catchment, the post likelihood was reduced to a 3 as the detected values are not close to the upper consensual limits for trade discharges. Chloroform was detected at levels less than PCV however as there are no control measures in place to control the presence of this determinant in the catchment the risk scoring for the likelihood has remained the same.

The risk tables also include the risk rating for a known pharmaceutical seen predominantly in domestic catchments, Ibuprofen, and 1,4-Dioxane, a compound of concern that is targeted as part of monitoring and control of WRPs particularly in the US and Australia.

Table 6 and Table 7 detail a selection of determinants to show the changes in risk within the catchment. The WSPs extract clearly show that the two catchments are similar in terms of risk profile; this can be attributed to the equal proportion of domestic, trade and sludge imports that both catchments receive.

Table 6 - Extract from PC WTW Catchment WSP

Asset Name	Stage	Hazard	Pre-Likelihood	Pre-Consequence	Risk	Control Measure Details	Post Likelihood	Residual Risk
PC WTW	Catchment	A002 - Turbidity	10 - Almost Certain	5 - Health Risk	50		10 - Almost Certain	50
PC WTW	Catchment	A022 - Iron (Total)	10 - Almost Certain	4 - Health Risk Indicator	40	Trade discharge permit is present for this hazard	3 - Medium	12
PC WTW	Catchment	B004 - Chromium (Total)	5 - Probable	5 - Health Risk	25	Trade discharge permit is present for this hazard	3 - Medium	15
PC WTW	Catchment	C001 - Total Coliforms (Confirmed)	10 - Almost Certain	5 - Health Risk	50		10 - Almost Certain	50
PC WTW	Catchment	C002 - E. coli (faecal coliforms Confirmed)	10 - Almost Certain	5 - Health Risk	50		10 - Almost Certain	50
PC WTW	Catchment	D011A - Trichloromethane-Chloroform (Total)	3 - Medium	5 - Health Risk	15		3 - Medium	15
PC WTW	Catchment	F097 - Ibuprofen	10 - Almost Certain	4 - Health Risk Indicator	40		10 - Almost Certain	40
PC WTW	Catchment	F153 - 1,4-Dioxane	10 - Almost Certain	4 - Health Risk Indicator	40		10 - Almost Certain	40

Table 7 - Extract from Budds Farm WTW Catchment WSP

Asset Name	Stage	Hazard	Pre-Likelihood	Pre-Consequence	Risk	Control Measure Details	Post Likelihood	Residual Risk
Budds Farm WTW	Catchment	A002 - Turbidity	10 - Almost Certain	5 - Health Risk	50		10 - Almost Certain	50
Budds Farm WTW	Catchment	A022 - Iron (Total)	10 - Almost Certain	4 - Health Risk Indicator	40	Trade discharge permit is present for this hazard	3 - Medium	12
Budds Farm WTW	Catchment	B004 - Chromium (Total)	5 - Probable	5 - Health Risk	25	Trade discharge permit is present for this hazard	3 - Medium	15
Budds Farm WTW	Catchment	C001 - Total Coliforms (Confirmed)	10 - Almost Certain	5 - Health Risk	50		10 - Almost Certain	50

Asset Name	Stage	Hazard	Pre-Likelihood	Pre-Consequence	Risk	Control Measure Details	Post Likelihood	Residual Risk
Budds Farm WTW	Catchment	C002 - E. coli (faecal coliforms Confirmed)	10 - Almost Certain	5 - Health Risk	50		10 - Almost Certain	50
Budds Farm WTW	Catchment	D011A - Trichloromethane-Chloroform (Total)	3 - Medium	5 - Health Risk	15		3 - Medium	15
Budds Farm WTW	Catchment	F097 - Ibuprofen	10 - Almost Certain	4 - Health Risk Indicator	40		10 - Almost Certain	40
Budds Farm WTW	Catchment	F153 - 1,4-Dioxane	10 - Almost Certain	4 - Health Risk Indicator	40		10 - Almost Certain	40

2.2.11.5. FE from Budds Farm and Peel Common WTW

The WSPs for the FE from Budds Farm WTW and PC WTW, as stated it can be seen the post likelihood from the catchment WSP has cascaded into the pre likelihood for the FE WSP.

Evaluation of the post likelihood scoring was based on the effectiveness of removal from the respective WTW as well as comparing the sampling results to the PCV. As expected, the microbial and inorganic contents remain high within the FE when compared to drinking water but the risk when compared to the influent has reduced due to the treatment. For example at PC the average number of E. Coli detected at the influent in over 38 samples was 3.79x106 /100mL and in the final effluent and average of 15x103 /100mL were detected across in 98 samples, showing the effectiveness of the treatment but still presenting the risk as the acceptable amount per 100mL is 0. The WTW can reduce the concentration of what is being fed from the catchment but there is still residual chemical and biological load leading to the high residual risk being maintained.

Table 8 and

Table 9 follow through with the selection from the catchment to show the effectiveness of the treatment at the respective treatment works but still present the risk due to the quality of the final effluent.

The development of the WSP for the FE from Budds Farm WTW and PC WTW demonstrate the need for a treatment process that can remove salinity and microbiological pathogens as well as remove organic and metals from the FE stream to produce water of a similar quality to what is currently being abstracted at Otterbourne WSW. Hence, there is a need for membranes, disinfection, and remineralisation treatment to treat the FE.

Table 8 - Extract from PC WTW FE WSP

Asset Name	Stage	Hazard	Pre-Likelihood	Pre-Consequence	Risk	Control Measure Details	Post Likelihood	Residual Risk
PC WTW	Abstraction	A002 - Turbidity	10 - Almost Certain	5 - Health Risk	50	PST>ASP>FST	5 - Probable	25
PC WTW	Abstraction	A022 - Iron (Total)	3 - Medium	4 - Health Risk Indicator	12	PST>ASP>FST	3 - Medium	12
PC WTW	Abstraction	B004 - Chromium (Total)	3 - Medium	5 - Health Risk	15	PST>ASP>FST	3 - Medium	15

Asset Name	Stage	Hazard	Pre-Likelihood	Pre-Consequence	Risk	Control Measure Details	Post Likelihood	Residual Risk
PC WTW	Abstraction	C001 - Total Coliforms (Confirmed)	10 - Almost Certain	5 - Health Risk	50	PST>ASP>FST	10 - Almost Certain	50
PC WTW	Abstraction	C002 - E. coli (faecal coliforms Confirmed)	10 - Almost Certain	5 - Health Risk	50	PST>ASP>FST	10 - Almost Certain	50
PC WTW	Abstraction	D011A - Trichloromethane-Chloroform (Total)	3 - Medium	5 - Health Risk	15	PST>ASP>FST	3 - Medium	15
PC WTW	Abstraction	F097 - Ibuprofen	10 - Almost Certain	4 - Health Risk Indicator	40	PST>ASP>FST	2 - Unlikely	8
PC WTW	Abstraction	F153 - 1,4-Dioxane	10 - Almost Certain	4 - Health Risk Indicator	40	PST>ASP>FST	10 - Almost Certain	40

Table 9 - Extract from Budds Farm WTW FE WSP

Asset Name	Stage	Hazard	Pre-Likelihood	Pre-Consequence	Risk	Control Measure Details	Post Likelihood	Residual Risk
Budds Farm WTW	Abstraction	A002 - Turbidity	10 - Almost Certain	5 - Health Risk	50	PST>ASP>FST	5 - Probable	25
Budds Farm WTW	Abstraction	A022 - Iron (Total)	3 - Medium	4 - Health Risk Indicator	12	PST>ASP>FST	3 - Medium	12
Budds Farm WTW	Abstraction	B004 - Chromium (Total)	3 - Medium	5 - Health Risk	15	PST>ASP>FST	3 - Medium	15
Budds Farm WTW	Abstraction	C001 - Total Coliforms (Confirmed)	10 - Almost Certain	5 - Health Risk	50	PST>ASP>FST	10 - Almost Certain	50
Budds Farm WTW	Abstraction	C002 - E. coli (faecal coliforms Confirmed)	10 - Almost Certain	5 - Health Risk	50	PST>ASP>FST	10 - Almost Certain	50
Budds Farm WTW	Abstraction	D011A - Trichloromethane-Chloroform (Total)	3 - Medium	5 - Health Risk	15	PST>ASP>FST	3 - Medium	15
Budds Farm WTW	Abstraction	F097 - Ibuprofen	10 - Almost Certain	4 - Health Risk Indicator	40	PST>ASP>FST	2 - Unlikely	8
Budds Farm WTW	Abstraction	F153 - 1,4-Dioxane	10 - Almost Certain	4 - Health Risk Indicator	40	PST>ASP>FST	10 - Almost Certain	40

2.2.11.6. Water Recycling Plant

The WSP across the WRP determined the effectiveness of the multibarrier controls in place to produce drinking water. The presence of membranes, disinfection and remineralisation has resulted in water that is significantly cleaner than the FE from the WTW. This can be seen by the reduction in risk before and after the control measures are considered.

Table 10 details the reduction in risk as a result of the multibarrier treatment that is in place at the WRP. Monitoring will be present on site to ensure that the residual risks are controlled.

Comparison with River Test and River Itchen were also conducted when comparing the effluent from the pilot plant and identified that in certain aspects such as turbidity, sulphate, and nitrite the quality of water is significantly greater than what is currently being abstracted for treatment. This further quantified the effectiveness of treatment and is represented in the WSP as the residual risk is low for all determinants.

The sampling data from the pilot effluent identifies that the risk across the treatment stage would not increase for determinants as the concentration of organic compounds are low therefore the risk of disinfection by-products does not arise for this system. In addition, the pilot effluent data shows that for most compounds that have a PCV associated with them the sampled results do not exceed this value. One determinant that is flagged is 1,4-dioxane as the concentration at the FE exceed the PCV (100,000 ng/l), however, the concentration is less than what is being measured in the River Test (160,000 ng/l) and equal to what is being measured in the River Itchen (100,000 ng/l). Noticeably, pharmaceuticals measured at the WRP effluent had a concentration of below the MDL. The maximum concentration across all pesticides tested was 20 ng/l and microbials determinants were undetected.

Table 10 - Extract from WRP WSP

Asset Name	Stage	Hazard	Pre-Likelihood	Pre-Consequence	Risk	Control Measure Details	Post Likelihood	Residual Risk
WRP	Treatment	A002 - Turbidity	5 - Probable	5 - Health Risk	25	MF>RO>UV>Remin	1 - Most Unlikely	5
WRP	Treatment	A022 - Iron (Total)	3 - Medium	4 - Health Risk Indicator	12	MF>RO>UV>Remin	1 - Most Unlikely	4
WRP	Treatment	B004 - Chromium (Total)	3 - Medium	5 - Health Risk	15	MF>RO>UV>Remin	1 - Most Unlikely	5
WRP	Treatment	C001 - Total Coliforms (Confirmed)	10 - Almost Certain	5 - Health Risk	50	MF>RO>UV>Remin	1 - Most Unlikely	5
WRP	Treatment	C002 - E. coli (faecal coliforms Confirmed)	10 - Almost Certain	5 - Health Risk	50	MF>RO>UV>Remin	1 - Most Unlikely	5
WRP	Treatment	D011A - Trichloromethane-Chloroform (Total)	3 - Medium	5 - Health Risk	15	MF>RO>UV>Remin	1 - Most Unlikely	5
WRP	Treatment	F097 - Ibuprofen	2 - Unlikely	4 - Health Risk Indicator	8	MF>RO>UV>Remin	1 - Most Unlikely	4
WRP	Treatment	F153 - 1,4-Dioxane	10 - Almost Certain	4 - Health Risk Indicator	40	MF>RO>UV>Remin	3 - Medium	12

2.2.11.7. Environmental Buffer Lake

The EBL is the last point in the system for the WSP of the WRP, thus becomes the Regulation 15 point for Otterbourne WSW. The WSP for this sub-system was conducted by comparing the water quality of the UV-AOP treated permeate from the pilot plant to the water quality of the River Itchen. For all the determinants except for turbidity and nitrite the risk remains the same with a low score. However, based on the turbidity of the river being greater than 1 NTU the risk has increased due to the blend. The vast reduction in risk when comparing the catchment risk scores to the residual risk in the EBL further quantifies the effectiveness of the multi-barrier treatment and significant dilution of the river water and recycled water will reduce the risk. Table 11 details the selection of determinants and the changes in the risk where expected as a result of the blend with the river water. When operating at 75 Ml/d whereby there will not be a blend in the EBL, the quality of water is cleaner than the water that is currently being abstracted, therefore the risk of deterioration of the water within the environmental buffer is low hence leads to the risk not increasing across this sub-system.

As the quality of water is better than the water currently being abstracted there will not be any implications on the treatment downstream at Otterbourne WSW. A pilot trial will be conducted, treating a range of blends of water from the groundwater and surface water abstraction points; once the effectiveness is proven, the pilot trial will show the capability of being able to treat a range of water qualities.

The WSP have been evaluated based on the current data and as of the current data, there is no increase in the residual risk. Further sampling will provide a more representative risk evaluation of this asset. Note that 1-4 Dioxane detected in the pilot data and not in the river samples therefore rated as medium risk however, this risk will reduce with dilution from river water when available. 1-4 Dioxane was measured at [redacted] and [redacted], the higher concentrations have been detected by [redacted] and have been used for the WSP. The [redacted] method procedure is a general method used to quantify volatile and semi-volatile organics whereas [redacted] is specific for 1-4 Dioxane. To determine the cause of unreliability, SW will work with the [redacted] to prepare spiked samples of known 1-4 Dioxane concentrations. Results can then be used to assess quality issues, which can be brought forward to the laboratories.

Table 11 - Extract from EBL WSP

Asset Name	Stage	Hazard	Pre-Likelihood	Pre-Consequence	Risk	Control Measure Details	Post Likelihood	Residual Risk
EBL	Storage	A002 - Turbidity	1 - Most Unlikely	5 - Health Risk	5	EBL at Otterbourne WSW and River Itchen blend	3 - Medium	15
EBL	Storage	A022 - Iron (Total)	1 - Most Unlikely	4 - Health Risk Indicator	4	EBL at Otterbourne WSW and River Itchen blend	1 - Most Unlikely	4
EBL	Storage	B004 - Chromium (Total)	1 - Most Unlikely	5 - Health Risk	5	EBL at Otterbourne WSW and River Itchen blend	1 - Most Unlikely	5
EBL	Storage	C001 - Total Coliforms (Confirmed)	1 - Most Unlikely	5 - Health Risk	5	EBL at Otterbourne WSW and River Itchen blend	1 - Most Unlikely	5
EBL	Storage	C002 - E. coli (faecal coliforms Confirmed)	1 - Most Unlikely	5 - Health Risk	5	EBL at Otterbourne WSW and River Itchen blend	1 - Most Unlikely	5
EBL	Storage	D011A - Trichloromethane-Chloroform (Total)	1 - Most Unlikely	5 - Health Risk	5	EBL at Otterbourne WSW and River Itchen blend	1 - Most Unlikely	5
EBL	Storage	F097 - Ibuprofen	1 - Most Unlikely	4 - Health Risk Indicator	4	EBL at Otterbourne WSW and River Itchen blend	1 - Most Unlikely	4
EBL	Storage	F153 - 1,4-Dioxane	3 - Medium	4 - Health Risk Indicator	12	EBL at Otterbourne WSW and River Itchen blend	3 - Medium	12

2.2.11.8. Quantitative Microbial Risk Assessment and Chemical Risk Assessment

To demonstrate that augmenting the water supply with recycled water does not create undue risk a Quantitative Microbial Risk Assessment (QMRA) and Quantitative Relative Chemical Assessment (QRCA) was undertaken to define the distribution of risks associated with blending recycled water with river water due to microbial pathogens and hazardous chemicals. The results of the QMRA and QRCA will identify whether the level of treatment that is being demonstrated at the PC WTW pilot plant is sufficient to mitigate undue risks associated with recycled water.

QMRA methods were used to quantify pathogen exposure on a per consumption (e.g., per drink / ingestion of water) basis while considering pathogen concentration, treatment performance (in this case pilot data at PC WTW), and water consumption distribution data. Exposure values were converted to a probability of adverse effects for each consumption event (e.g. drink / ingestion of water) using established dose-response models. Longer term exposures were also modelled to quantify the combined risk of consuming recycled water over a daily and an annual period. There is natural variability associated with QMRA inputs, such as pathogen concentrations, so a stochastic approach, using R software, was implemented to account for this inherent variability of input parameters. QRCAs have traditionally been conducted to compare the quality of recycled water to drinking water supply using chemical criteria. QRCA estimates were generated by combining measured chemical data with established toxicity factors to evaluate both threshold-based analysis and linear-response analysis indices associated with water recycling.

Biological risk distributions generated for 36 unique scenarios via QMRA analysis comprised the following combinations:

- 3 hypothetical failure scenarios;
- 3 scenarios with different consumption events assumptions;
- 2 treatment performance scenarios, and
- 2 treatment trains.

Scenarios were selected to bound model inputs and provide insight into a comprehensive range of potential risk distribution outcomes. These scenarios were modelled for 5 pathogens: protozoans (Cryptosporidium and Giardia), bacteria (Campylobacter), and virus (Adenovirus and Enterovirus) were evaluated along with an additional indicator bacteria (Enterococci) model. This study emphasized stress testing of model inputs through extensive scenario analysis, which provided a more holistic view of the recycled water risk profile and outlines ways in which this risk analysis should inform the design, operations, and monitoring protocols for the future WRP.

Redundancy of treatment processes was considered, as opposed to treating each treatment process as a singular unit process, which simulated real world conditions and their actual complexity. Additionally, this study evaluated 32 chemicals for a linear-response cancer-based analysis and 255 chemicals for a threshold-based analysis to assess risks associated with water recycling and the existing drinking water supply at Otterbourne WSW. The study suggests that water produced via water recycling could serve as an added water supply, while maintaining wholesome WSW product water, for biological and chemical hazards. Moreover, the data identified that the indices were comparable to or less than Otterbourne WSW's existing source water indices. Therefore, the use of WRP effluent as a water source to augment Otterbourne WSW's water supply would not pose undue chemical risk compared to the existing source water.

The 75 Ml/d scenario whereby the EBL is supplied by the WRP solely identified that the WRP provides sufficient treatment in terms of the producing water that is equal to or better than the current source at Otterbourne WSW. Under the 15 Ml/d scenario whereby River Itchen also supplies the EBL, the WRP does not drive risk expect for when modelled hypothetical failures are considered, the 15 Ml/d case is most similar to current practice at Otterbourne WSW.

2.2.12. Resilience benefits

2.2.12.1. Background

A quantitative assessment of resilience for the Options progressed at Gate 2, which built on the methodology presented at Gate 1, and is based on SW's Asset Resilience Tool. The tool is designed to assess a number of factors which constitute resilience, hence providing quantified resilience scores for comparison. The tool assesses risk drivers (Impact, Duration, Likelihood, and Vulnerability) and resilience control factors (Redundancy, Response & Recovery, Resistance, and Reliability) for each site. These control factors align to both Ofwat's resilience expectations and the resilience criteria defined by both RAPID and WRSE.

The use of the SW Asset Resilience Tool has further ensured that the approach is focused on the ability of SW's key assets and sites to cope with and recover from shocks and stresses. It assesses the ability of sites within a water supply zone or catchment to endure these shocks through the controls already in place. The approach is consequence led in that a resilience assessment tool is used to quantify the potential consequence to customers, drawing out the risk drivers / causes and the strength of each control factor. This in turn enables the prioritisation of site improvement.

2.2.12.2. Approach

Testwood and Otterbourne WSW account for half of the total zonal risk in the Hampshire region. [redacted]

For the purpose of this assessment, resilience has been assessed from two perspectives:

1. The non-drought resilience benefit provided by the SRO in a Business as Usual (BAU) situation
2. The resilience benefit provided by the SRO in the event of a 1-in-200-year (stressed) drought

This assessment will enable SW to:

1. Understand how the number of properties that will lose supply will change in the event of non-operation of either site in a drought or in a non-drought condition in comparison to a baseline situation in which no SRO is implemented
2. Quantify how much more resilient Otterbourne will be when facing the four key shocks and stresses, raw water loss, severe flood, contamination and critical asset failure
3. Align to Ofwat's resilience expectations and assess against the resilience criteria defined by both RAPID and WRSE in the Gate 2 resilience criteria

2.2.12.3. Results

To assess the resilience benefit of the SRO Options using the SW Resilience Assessment Tool a number of assumptions were made and a number of key steps were taken in assessing the resilience to ensure that RAPID and WRSE resilience criteria would be met. This included the following:

1. Assessing the impact on the number of properties served
2. Assessing the impact on Redundancy of Testwood WSW and Otterbourne WSW
3. Assessing the impact on Response & Recovery, Resistance and Reliability for Testwood WSW and Otterbourne WSW
4. Assessing the impact on the risk drivers (Impact, Duration, Likelihood, and Vulnerability), where applicable, for Testwood and Otterbourne WSW

Theoretically it was realised, in undertaking the resilience assessment, that the Redundancy element was the significant difference between the SRO Options in the BAU and stressed scenarios. Table 12 below details the peak output flows, average daily flows and the calculated headroom flows that were used to assess for Redundancy and provide the rationale for assessing the Redundancy scores in the SW Resilience Assessment Tool.

[redacted]

[redacted]

Table 13 details the high level and quantitative resilience benefits for the SRO Options as well as the Baseline - BAU (i.e. a no SRO Option in place).

[redacted]

[redacted]

[redacted]

The Consequence Score is an absolute measure of customer risk to loss of supply and is also known as Properties at Risk. Whereas the Resilience Score is a ratio between the total number of properties and the Consequence Score. The closer to 1, the greater the resilience.

[redacted] baseline BAU scenario, as shown by the lower total zonal scores and higher resilience scores for both Options.

It is important to note that the SW approach to resilience is developed and evaluated on the basis of assessing the resilience of the overall system, rather than simply the resilience of each individual asset or SRO. Resilience of each individual asset or SRO is done via analysing the resilience contribution of each asset or SRO to the overall system. The difference in peak output flow (B.5 and B.2) is irrelevant when Otterbourne WSW has failed, hence, the scores remain the same. Table 14 details the resilience impact for the Water Recycling SRO Options via Otterbourne WSW.

Table 14 - Water Recycling Options B.2 and B.5 resilience impact summary

Resilience Criteria	Assessment
Integration with existing network strengthening solutions / plans	As these Options do not operate as WSW in their own right and are dependent on Otterbourne WSW and are limited by the resilience of Otterbourne WSW. Nevertheless, they still significantly increase the zonal resilience when compared to the baseline BAU scenario.
Adaptability of operation emergency response in a stressed situation (e.g. peak week demand)	In a stressed scenario the SROs can be leveraged to increase resource availability to the maximum possible that can be processed at Otterbourne. [redacted] Nevertheless, the increase in raw water sources and the decrease in critical points of failure at Otterbourne following upgrades contribute to a lower likelihood of this occurring. Therefore, only 8,402 more properties are at risk of losing supply in a drought where Otterbourne dependent SROs are chosen.
Regional resilience	The zonal resilience score is more than doubled in BAU and stressed conditions. This highlights that the resilience of Otterbourne is crucial to the zone as a whole. Building redundancy and reliability into the system through the extra headroom and new raw water sources brings positive benefit to the region overall.

Resilience Criteria	Assessment
	As stated, the lower zonal resilience score for the Otterbourne dependent SROs is due to the increase in asset criticality of Otterbourne WSW.

2.2.13. Preferred Model of Ownership and Operation Expectation

2.2.13.1. Model of Ownership

The model of ownership is covered under the Commercial Section 2.11.1

2.2.13.2. Operational Utilisation

The operational utilisation is covered under Section 2.2.3 Redundancy and Operational Strategy.

2.3. Network Infrastructure – Hydraulic Modelling

2.3.1. Introduction

The WRMP19 sets out SW's response to the water supply challenge in the Western region. The response consists of a strategic new supply source, new and increased bulk supplies from neighbouring water companies, demand management, and new strategic transfer pipelines across the region. SW commissioned a modelling study to confirm the impact of licence reductions (via water resource modelling), and develop a strategic network model to:

- Simulate the connection of a new WRP to the SW distribution network;
- Develop a network infrastructure scheme to transmit the new supply and other proposed WRMP19 additional transfers; and
- Identify how to integrate this new network with existing water distribution systems.

The network model inputs incorporate the outputs from the water resource model, which includes all elements of the WRMP19, including new sources, licence restrictions of existing sources, new and existing bulk transfers and demand management schemes. The model is demand-driven and, in alignment with the water resources model, only uses the capacity of the new WRP required to meet demand. In alignment with the revised residual deficit identified in an earlier phase of the study, and reported in the Gate 1 submission, this is modelled as 61 Ml/d. The outputs from the water resource model are described separately in the Annex 4, Water Resources Modelling.

This section describes how the strategic network model was developed to simulate the new water transfer system and its integration with SW's existing distribution network as an aid to the design process. A key output from the study is a set of options for infrastructure elements that will form the interface between the new bulk transfer network and the existing distribution system; these options will be developed further in a subsequent phase of the study. The objective of the study is not make comparisons between desalination, water recycling or Havant Thicket SRO solutions (the preference for this is being determined in a separate, wider, process), but to inform the optimal preference for transmission network infrastructure elements within each SRO solution. This section describes how advanced modelling software was used to develop a set of optimised solutions for the new integration infrastructure and how this can be controlled effectively. It also outlines how a holistic real-time control system can be deployed to control the proposed new network and identifies the associated Information Technology / Operational Technology (IT / OT) requirements. This section also summarises engineering and environmental feasibility studies undertaken at the network integration sites to ensure the concept designs are feasible to install, and identifies the steps required in a subsequent phase of the study to determine the Emerging Preferred Option for the new interfacing infrastructure.

2.3.2. Overview of Pipeline Routes

Pipeline routes included in the hydraulic modelling study are illustrated schematically in Figure 27. The transfer routes included are:

- Knapp Mill (South West Water (SWW)) to Testwood WSW;
- Testwood WSW to Otterbourne WSW (Southampton Link Main (SLM));
- Gater's Mill (PW) to Otterbourne WSW;
- Otterbourne WSW to Yew Hill Water Service Reservoir (WSR);
- Yew Hill WSR to Crab Wood WSR; and
- Crab Wood WSR to Andover (Micheldever Road Andover WSR / River Way Andover WSW).

The raw water pipeline from the WRP to Otterbourne WSW was not included in the study due to the hydraulic disconnect between it and the distribution network at Otterbourne WSW, as indicated by the dotted line in the schematic below. This This disconnect means the main will not affect the hydraulics of Grid network. The hydraulic performance of the raw water main, and how it is to be controlled, will be studied separately once the preferred route has been determined.

[redacted]

[redacted]

Key routes in the existing distribution network were also modelled to ensure that derived solutions maintain acceptable levels of service. A diagrammatic overview of the entire model is illustrated in Figure 28. These key routes included:

- Otterbourne WSW to Otterbourne Hill WSR;
- Otterbourne Hill WSR to South Hill Southampton WSR;
- Otterbourne WSW to Twyford WSR;
- Testwood WSW to Rownhams WSR;
- Crab wood WSR to Weeke Down WSR (new connection);
- Crab Wood WSR to Sarum Road Winchester WSR;
- River Way Andover WSW to Micheldever road Andover WSR;

- River Way Andover WSW to Upper Enham WSR;
- Testwood WSW to the Isle of Wight; and
- Timsbury distribution zone to include Michelmersh WSR and Broughton Down WSR.

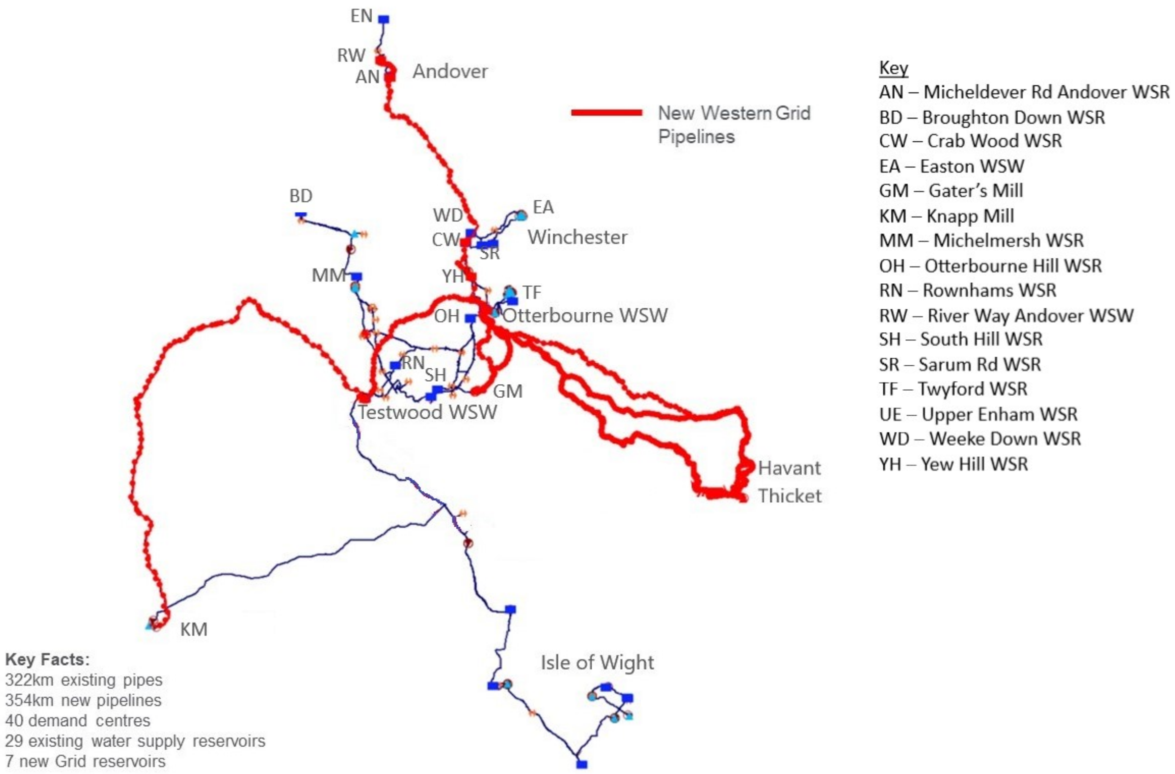


Figure 28 - Western Grid Infoworks WS Pro Model, indicating the extent of new pipelines

2.3.3. Methodology

2.3.3.1. Aim

The aim of the hydraulic modelling project was to identify the optimal configuration and operation of assets to answer the question "What are we going to build?" with respect to infrastructure elements at interface sites between the new grid and the existing distribution network. This is dependent on factors such as operational constraints, capital and operational cost as well as technical and environmental complexities. As such, the study involved close collaboration with other stakeholders such as design teams and Operations.

Studies of the grid interface sites have been undertaken to verify the proposals were feasible with respect to constructability and operation, and in terms of environmental impact. Close liaison and cooperation was required between the modelling, design, enabling and operations teams to ensure the solutions are of acceptable complexity with respect to constructability, and can be operated within current operational constraints.

The design process is illustrated diagrammatically in Figure 29. The high-level solution was developed by the modelling team and fed to the design team, who liaised with Operations and Capital Maintenance design teams regarding control and planned works at the sites. Feedback from this was recorded and shared with the modelling team for amendment. Amendments were then confirmed and verified with the Operations and Capital Maintenance teams.

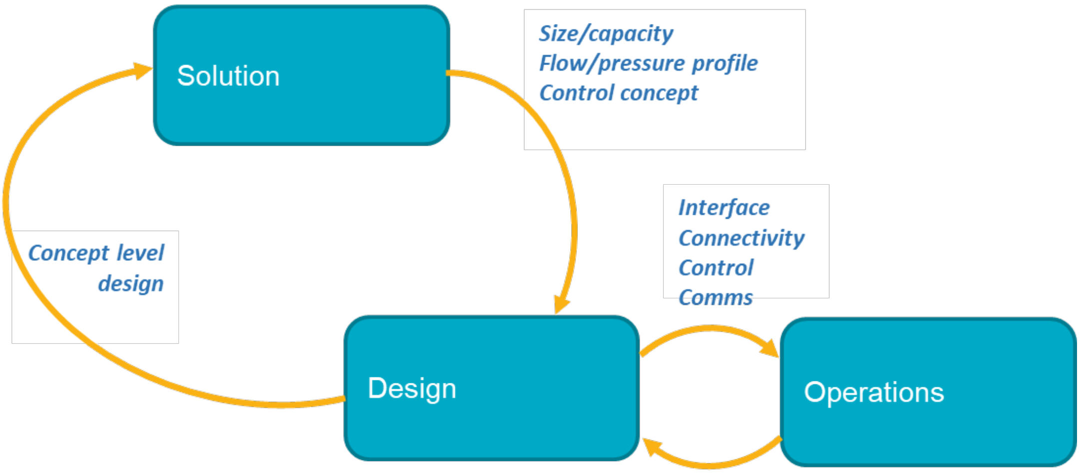


Figure 29 - Iterative modelling/design process

2.3.3.2. Approach

The project used a propriety software product, [redacted], to develop optimal asset configurations, and was chosen to bring efficiencies to the project in terms of program and expenditure (as illustrated by Figure 30). A traditional approach would typically involve a team of hydraulic modellers using an iterative "trial and error" method but the large number of sites included would mean it would be impossible to evaluate all potential Options, and consequently the most efficient outcome might not be identified. Using [redacted] with which the InfoWorks WS Pro network model was linked as an embedded hydraulic engine, enabled the automatic evaluation of many thousands of trial solutions computing cost and performance, and incorporating operating constraints and design criteria.

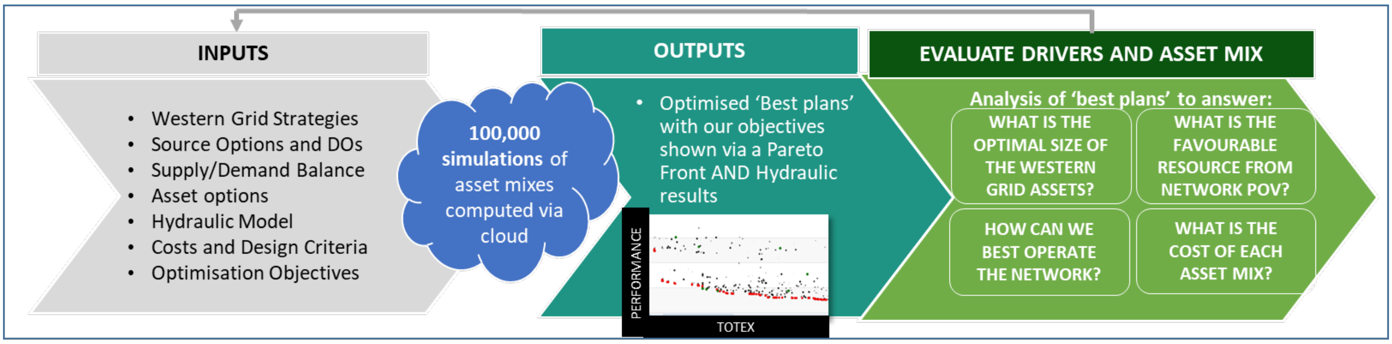


Figure 30 - Modelling approach

The [redacted] model produces a range of least-cost network solutions, including asset sizes (such as Grid tanks (potable water storage reservoirs) to balance inlet and outlet flows, and pipeline diameters) and maximising the efficiency of network operational performance, and considers both “normal day”, in a non-drought and “severe drought day” supply / demand scenarios. The severe drought scenario reflects the 1-in-200-year drought described in WRMP19. Through the simultaneous assessment of cost and hydraulic performance based on data in the hydraulic model, [redacted] models a Pareto curve of plans of prioritised interventions, enabling informed choices about resource and asset allocation (example provided by Figure 31). The tool produces a set of plans along a Pareto front that represent the optimal-performing configuration for a budget cost, and therefore quickly identifies options to be analysed in further detail in the context of risk and operational requirements.

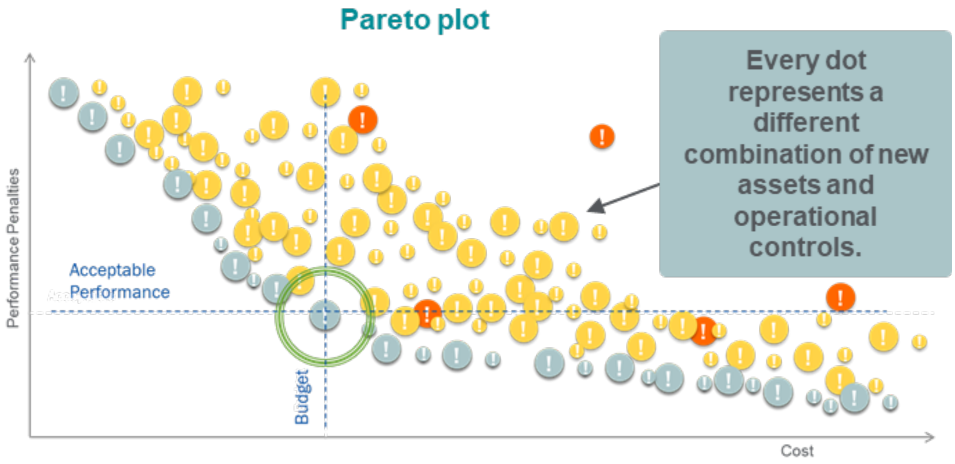


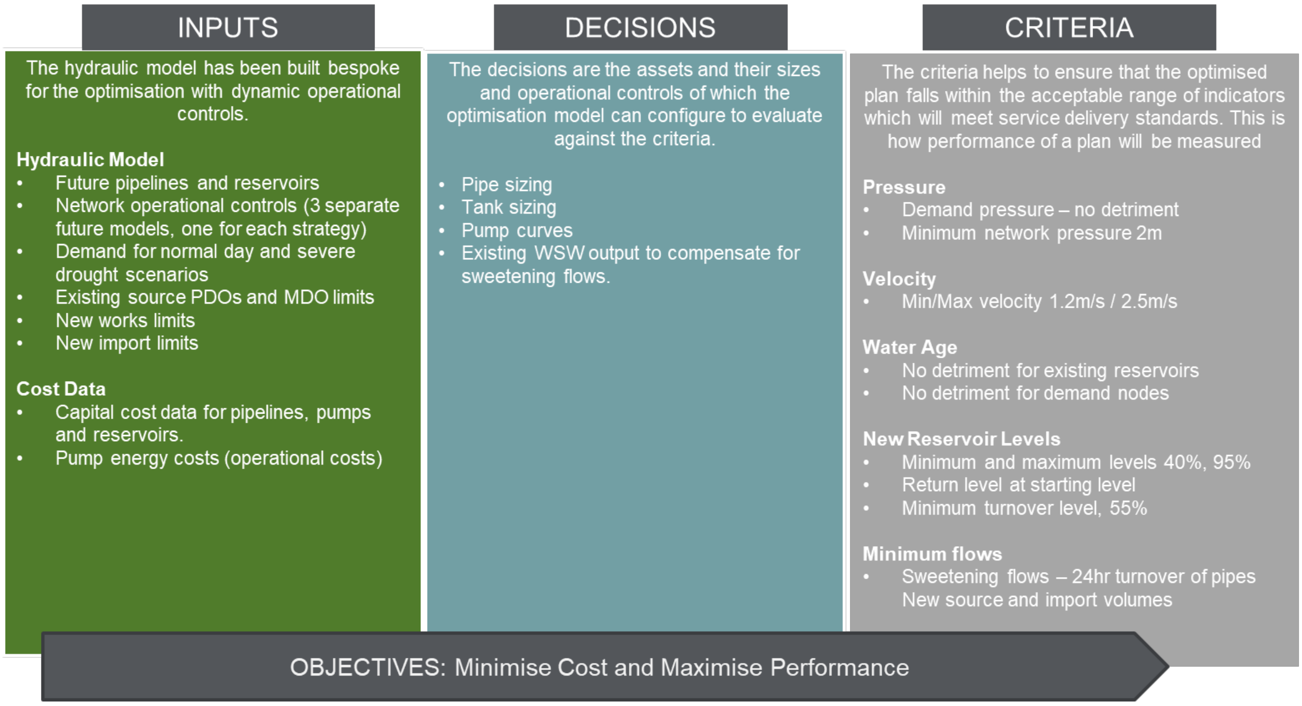
Figure 31 - Example Pareto graph

Developments in Phase 2

Phase 2 has been a refinement to the deliverables in Phase 1, with the key output being a set of results in which there is now a significantly higher level of confidence. Key developments have been the incorporation of the major Capital Works programmes at Testwood WSW and Otterbourne WSW, with the configuration of the hydraulic model updated to reflect these, and there has been further refinement of the operational controls. Phase 2 included model builds of more of the distribution network, which had been previously simplified in Phase 1, and also included the refinement of defined cost and performance metrics.

2.3.3.3. Setting up the Optimisation Model

The optimisation model includes three main components: inputs, decisions and criteria, and the WfLH elements of these are illustrated in Figure 32. The objectives of the optimisation were to find the optimal asset configuration which will minimise cost and maximise hydraulic performance. A key development in Phase 2 was the incorporation of dynamic controls to enable the hydraulic model to react to different operational scenarios.



INPUTS

The hydraulic model has been built bespoke for the optimisation with dynamic operational controls.

Hydraulic Model

- Future pipelines and reservoirs
- Network operational controls (3 separate future models, one for each strategy)
- Demand for normal day and severe drought scenarios
- Existing source PDOs and MDO limits
- New works limits
- New import limits

Cost Data

- Capital cost data for pipelines, pumps and reservoirs.
- Pump energy costs (operational costs)

DECISIONS

The decisions are the assets and their sizes and operational controls of which the optimisation model can configure to evaluate against the criteria.

- Pipe sizing
- Tank sizing
- Pump curves
- Existing WSW output to compensate for sweetening flows.

CRITERIA

The criteria helps to ensure that the optimised plan falls within the acceptable range of indicators which will meet service delivery standards. This is how performance of a plan will be measured

Pressure

- Demand pressure – no detriment
- Minimum network pressure 2m

Velocity

- Min/Max velocity 1.2m/s / 2.5m/s

Water Age

- No detriment for existing reservoirs
- No detriment for demand nodes

New Reservoir Levels

- Minimum and maximum levels 40%, 95%
- Return level at starting level
- Minimum turnover level, 55%

Minimum flows

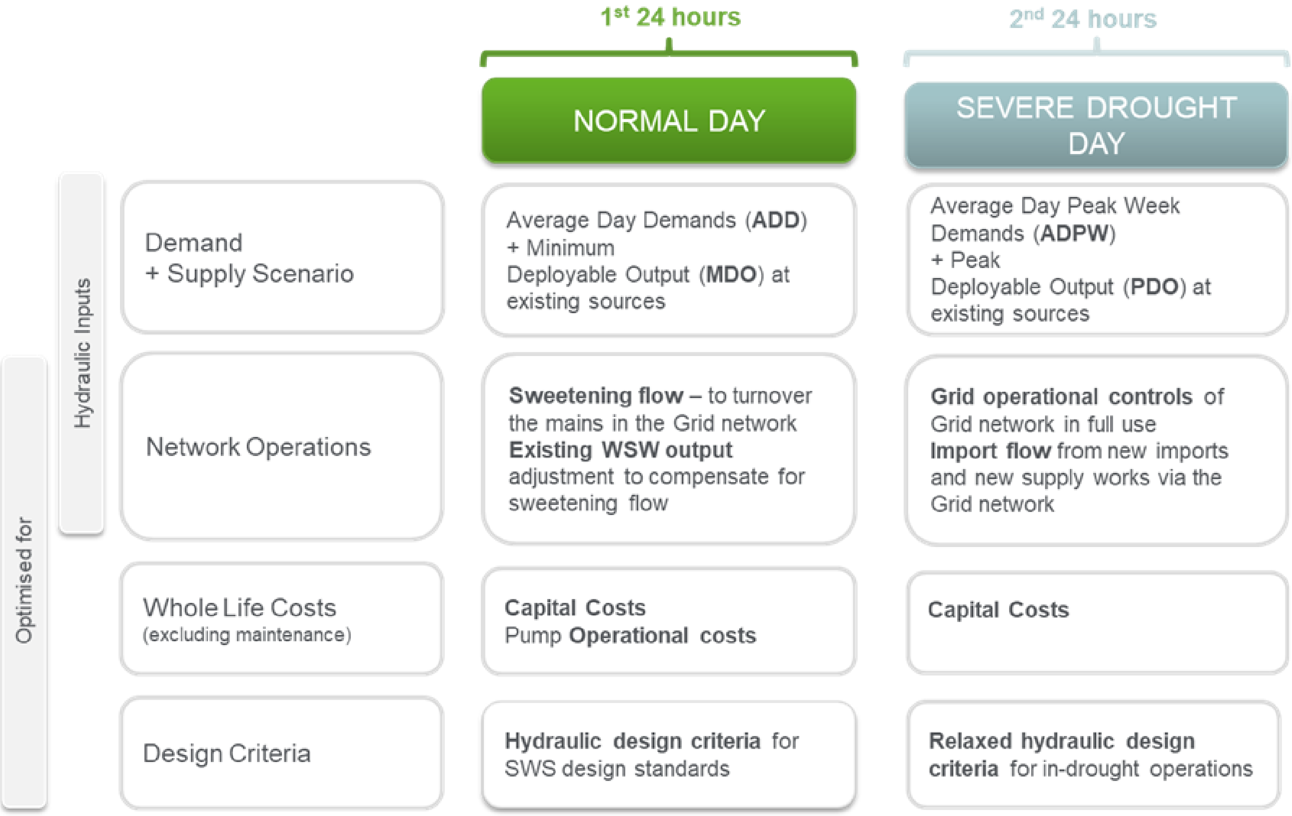
- Sweetening flows – 24hr turnover of pipes
  New source and import volumes

OBJECTIVES: Minimise Cost and Maximise Performance

Figure 32 - Optimisation model components

2.3.3.4. Optimising for both Normal Day and Severe Drought Day

Assets and operational controls were optimised for both ‘normal day’ scenario ‘severe drought day’ scenarios. The hydraulic model was set up for a single 48-hour model run so that the ‘normal day’ is for the first 24 hours and ‘severe drought day’ operations are for the second 24 hours. Figure 33 illustrates the input elements of the model, the differences to the model set up over the 2 periods, and what is being optimised.



			1st 24 hours	2nd 24 hours
			NORMAL DAY	SEVERE DROUGHT DAY
Optimised for	Hydraulic Inputs	Demand + Supply Scenario	Average Day Demands (**ADD**) + Minimum Deployable Output (**MDO**) at existing sources	Average Day Peak Week Demands (**ADPW**) + Peak Deployable Output (**PDO**) at existing sources
		Network Operations	**Sweetening flow** – to turnover the mains in the Grid network **Existing WSW output** adjustment to compensate for sweetening flow	**Grid operational controls** of Grid network in full use **Import flow** from new imports and new supply works via the Grid network
		Whole Life Costs (excluding maintenance)	**Capital Costs** Pump **Operational costs**	**Capital Costs**
		Design Criteria	**Hydraulic design criteria** for SWS design standards	**Relaxed hydraulic design criteria** for in-drought operations

Figure 33 - Normal day and severe drought day optimisation

2.3.3.5. Costs and Penalties

Cost Data

Indicative capital cost data was obtained from SW's Cost Intelligence Team (CIT) and is illustrated by Figure 34. This was based on SW's capital cost curves but omitted elements such as contractor risk and internal and external overheads due to commercial sensitivities. The costs also excluded some ancillary elements such as cabling, fencing, landscaping, land purchase, access roads etc. and so do not represent the true cost of constructing such assets. As such the model does not give a true estimate of cost but provides a comparative cost assessment of different options based on consistent data.

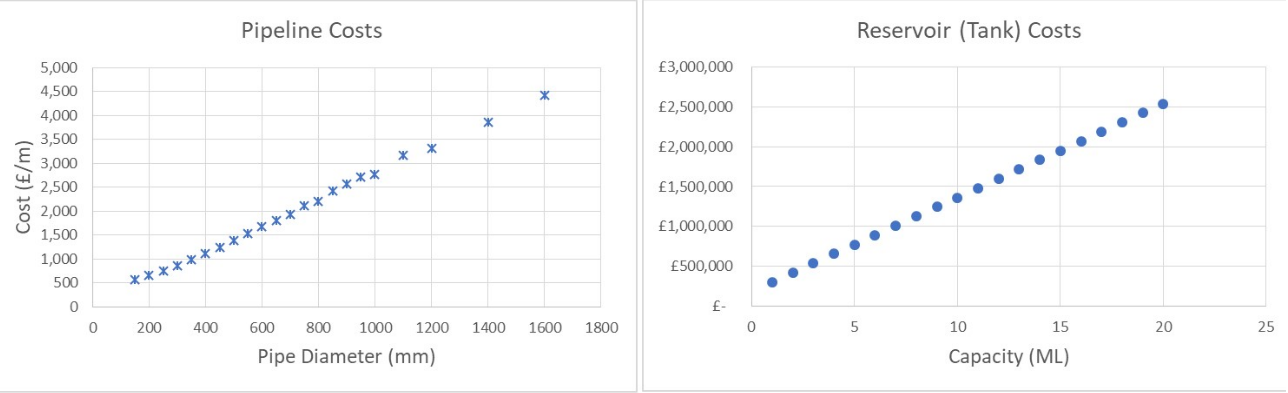


Figure 34 - Indicative capital costs

OPEX costs (pumping energy) were calculated using the formulas below and extrapolated to reflect a 60-year design horizon. Base electricity tariff data was obtained from the SW's energy team.

Annual Operating Cost (Energy)
=
$Q*H*eP*A/(e*C)$

Design Life Energy Cost
=
Annual Operating Cost / $(1+r)^{N}$

Q = flow (L/s)
H = pump head (m)
eP = Energy Price = 0.1kWh
e = efficiency = 1
C = units conversion factor = 102.2
A = annual conversion = 365 days
R = nominal discount rate = 2.4%
N = design life = 60 years

Performance Penalties

The hydraulic performance of a solution is determined by penalties (monetised into £ units) applied when specified constraint criteria are violated; hence the optimisation model seeks to minimise cost penalties and therefore maximise hydraulic performance (as illustrated by Figure 35). The penalties were designed to drive the solutions towards balancing all network storage reservoirs. The higher the penalties applied; the more violations of the constraints have occurred which equates to a poorer network performance. Penalty criteria have been set by capturing operational constraints at existing WSW and WSR sites from operations teams, and from SW's technical standards documents. Different penalty criteria were set for new Grid tanks, to reflect their lower level of criticality to customer supply resilience (as customers are not supplied directly from the Grid tanks, but from existing WSRs). Constraints have also been set to pressures in existing distribution networks so that customers will not experience any detriment. Penalties were set to encourage existing WSRs to return to their level at the start of the model run, and Grid tanks to return to a set depth of 67% - this approach will be reviewed in the next phase to ensure adequate levels of resilience are being maintained.

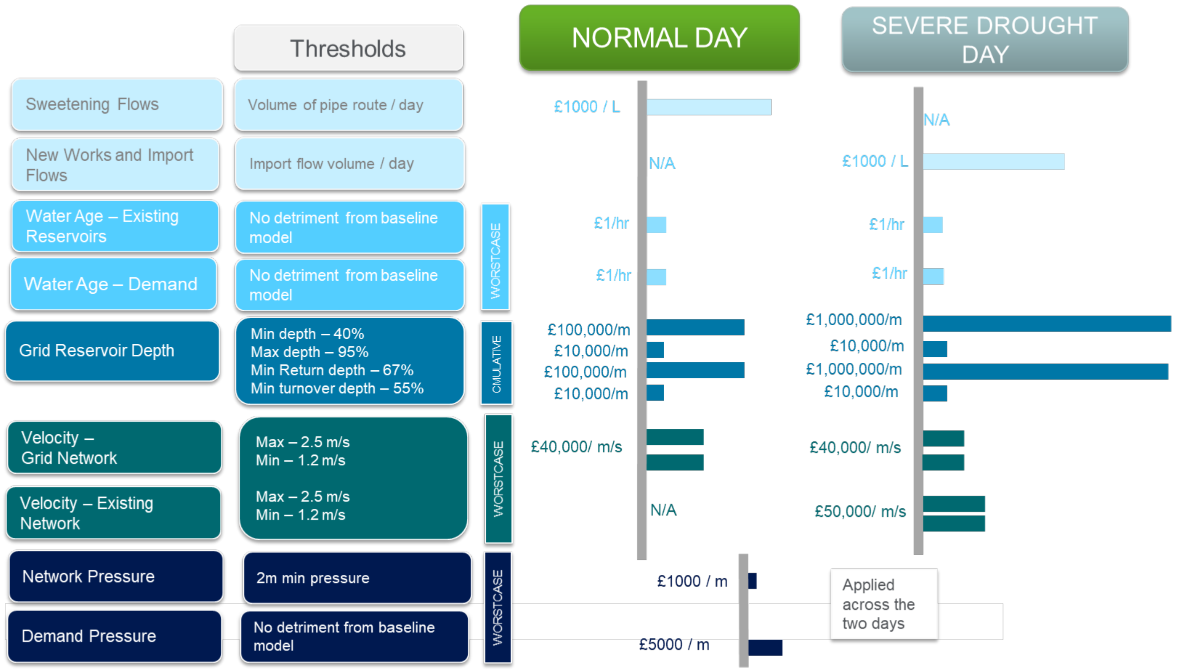


Figure 35 - Performance penalties

2.3.4. Option B Results

The model is demand-driven, and only delivers those supplies required to meet the demand as described in WRMP19. This demand is consistent between WRMP19 and the model and is constant for both Options B.2 and B.5; hence results for both are identical, with the extra capacity of supply in Option B.5 being unused.

The Pareto curve presents results for 166 potential solutions, representing the best performance for a particular cost (illustrated by Figure 36). On inspection of the hydraulic performance of the model results (not shown here) it can be seen that not all solutions present a solution that could be considered potentially feasible, with many results showing hydraulic performance (such as reservoirs or tanks draining to empty or over-topping due to imbalances in the model controls) that would not be acceptable in terms of operational constraints. It has consequently been decided that the Phase 2 results require further development before being considered as part of any Optioneering analysis.

The results reported here, therefore, should be considered as indicative and not as defining the potential solution to be constructed and commissioned. The results have, however, highlighted a number of aspects to be further investigated as part of the modelling and design process and can be considered as a key milestone to defining the infrastructure required as part of the WfLH solution (see Section 2.3.8 Next Steps).

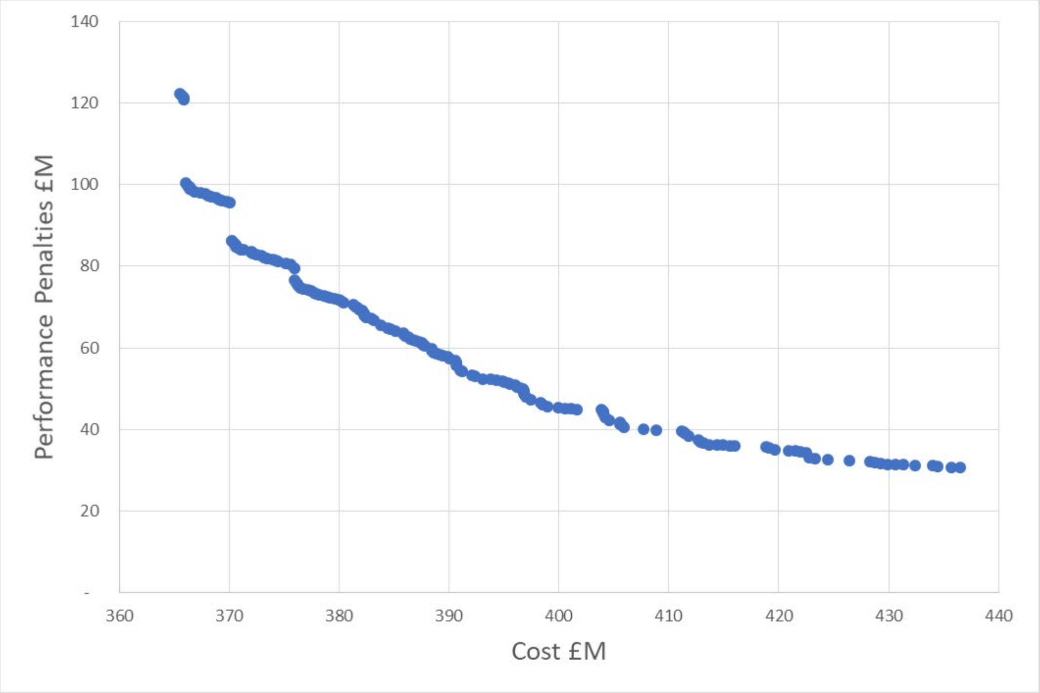


Figure 36 - Pareto curve of Option B results

The results present a selection of infrastructure elements of different sizes. Typically, options with larger infrastructure elements will have better performance (i.e. lower performance penalties) and higher costs. Figure 37 illustrates results for a selection of Options comparing key infrastructure elements (Grid reservoir tanks) at Testwood, Otterbourne and River Way Andover, as well as the SLM that transfers water between Testwood WSW and Otterbourne WSW. The graph shows the modelled volume of grid reservoir tanks (left-hand vertical axis) and the diameter of the Southampton (Soton) Link Main on the right-hand vertical axis.

WLC for the model solutions is also shown on the right-hand vertical axis. On the horizontal axis model solution B.1 represents the least-cost (and worst-performing) option, and model solution B.166 represents the highest-cost and best-performing option. A review of the relationship between performance sacrificed verses cost saved is planned for the next phase.

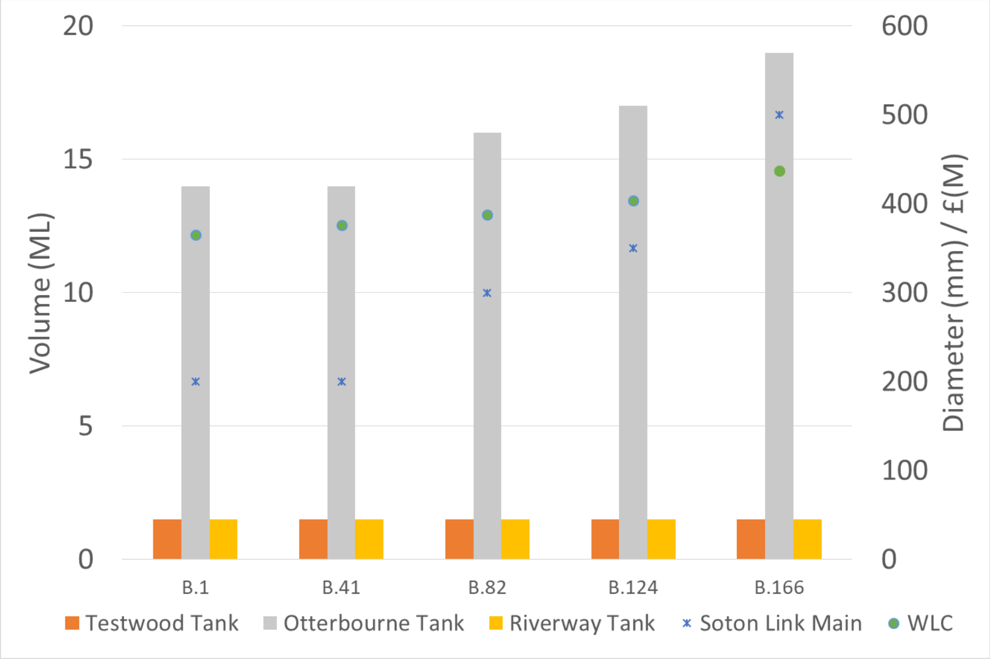


Figure 37 - Selection of results from the Pareto curve

2.3.4.1. Commentary

Results for all options show that there is adequate capacity in the existing infrastructure network from Otterbourne WSW to Yew Hill WSR and Crab Wood WSR, and that installing new transfer pipelines would not be required. Similarly, the model indicates that extra storage in terms of new Grid balancing tanks is not required at Yew Hill WSR or Crab wood WSR. The model also selects transferring directly to River Way Andover WSW rather than interfacing at Micheldever Road Andover WSR – this is a probable consequence of including an operational constraint that blending of different source waters is to be in a tank rather than directly into the pipeline network.

Results indicate that for most solutions a very large tank is required at Otterbourne WSW. Infrastructure feasibility studies (see Section 2.3.5) have shown this site to be highly congested and constructing such a tank there will involve significant complexities. Figure 37 illustrates that mitigating this would involve constructing a similarly large tank at Testwood WSW, and the model solutions present the outcome of a “trade” between the comparative costs of pipelines and reservoirs (with pipelines having a larger impact on costs than reservoirs). It is noted that no option includes additional storage at Yew Hill WSR or Crab Wood WSR (where more space is available) to mitigate this. Aspects relating to this interaction will be investigated further in Phase 3 of the study (see Section 2.3.8 Next Steps).

The assessment has been limited to providing adequate storage to balance the network, and no allowance has been included for resilience at this stage.

Example results are illustrated as charts in Figure 38 and Figure 39. The charts show inlet & outlet flows and tank and WSR levels around Otterbourne WSW. The charts show how pump operations are controlled to maintain reservoir and tank storage levels within defined constraint levels (not shown), and how reservoir and tank levels react to differing inflows and outflows.

The chart titled “Otterbourne (In)” in Figure 38 (Normal Day Operation) illustrates how inlet flows to Otterbourne Grid tank from the SLM and the Gater’s Mill transfer appear to control the tank level within its level constraints of 40%-95%. However, it can be seen that the tank level at the end of the day’s model run is considerably higher than at the beginning (75% versus 55%) which might indicate issues with balancing the tank over a longer period. This is due to immaturity in the development of pump controls and not due to any disparity in the supply-demand balance. Issues such as this will be investigated in the next phase by running the model over a period of several days instead of just one.

The chart titled “Otterbourne (Out)” in Figure 38 (Normal Day Operation) illustrates the flow from Otterbourne WSW to Yew Hill WSR successfully controlling levels in the reservoir within set its constraints. Levels in Otterbourne Hill and Twyford WSRs are controlled as per the original SW InfoWorks network model and not by controls introduced for the wider WfLH transmission grid operation. It can be seen that reservoir levels remain within constraints, but do not balance their end of day level with that of the beginning. In the case of Otterbourne Hill WSR in particular (75% versus 60%) this could result in the reservoir over-filling over a longer model run time. The control of this reservoir has been copied directly from the existing network model and has not yet been further developed in this modelling study but will be addressed in a future phase.

The chart titled “Otterbourne (In)” in Figure 39 (Severe Drought Operation) illustrates that output from Otterbourne WSW falls to zero to reflect restrictions on its abstraction under the severe drought scenario, and that this output is substituted by the flow from the WRP (for Options B.2 and B.5) to Otterbourne. Inlet flows from the SLM and Gater’s Mill successfully maintain levels in Otterbourne Grid tank within constraints, although it can be observed that the level falls from 75% to 65% over the course of the 24-hour model run, indicating that the reservoir might drain to unacceptable levels over a longer period. This is due to immaturity in the development of pump controls and not due to any disparity in the supply-demand balance and will be investigated in the next phase.

The chart titled “Otterbourne (Out)” in Figure 39 (Severe Drought Operation) illustrates the Otterbourne to Yew Hill inlet main controlling levels in Yew Hill WSR adequately, and Twyford WSR remaining within constraints and balancing reasonably well over the 24-hour model run period. However, it can be seen that Otterbourne Hill WSR is over-topping for a period of approximately 4 hours in the morning, which is a level of performance that would not be considered acceptable. It was noted above that Otterbourne Hill WSR did not balance in the 24-hour Normal Day operation model run (that precedes the Severe Drought Operation run), and this is an issue that requires resolving as part of the next phase of solution development.

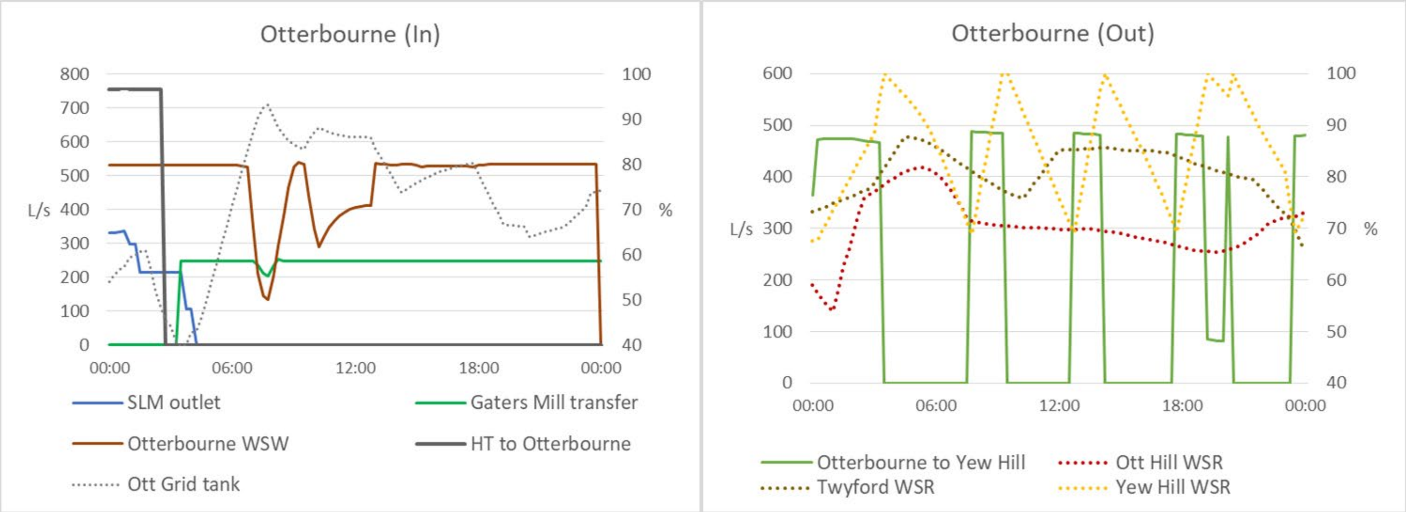


Figure 38 - Example Results: Model solution B.166 Normal Day Operation

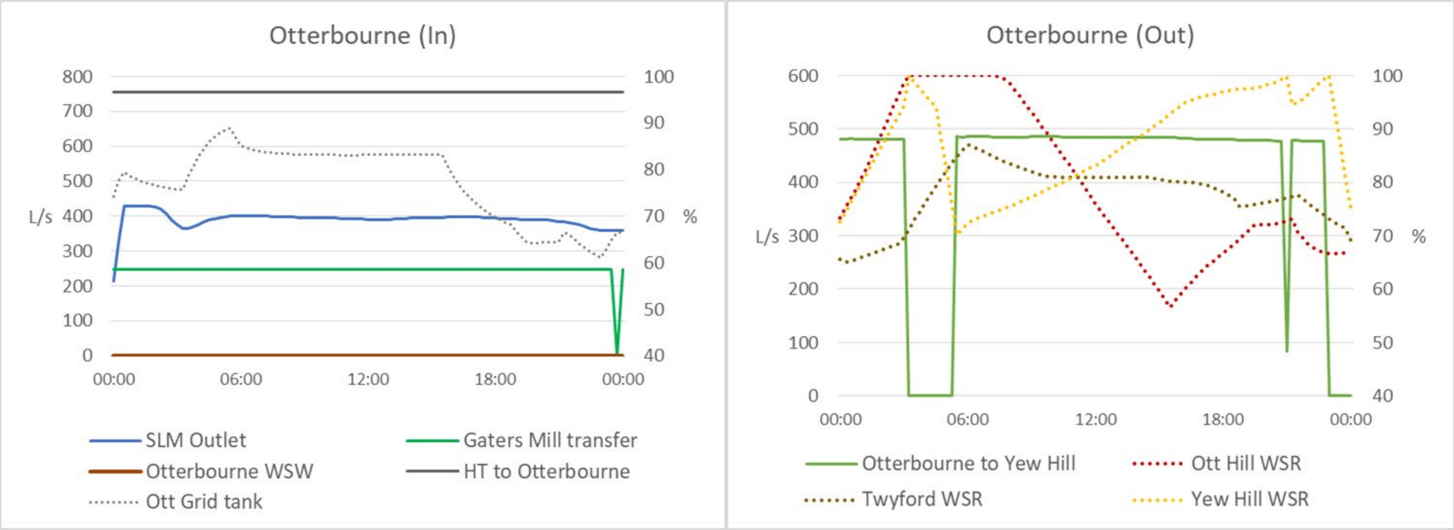


Figure 39 - Example Results: Model Solution B.166 Severe Drought Day Operation

2.3.5. New Transfer Infrastructure

Details of the design of the transfer pipeline from the proposed new source to SW’s distribution network are given in the Section 2.2 Engineering Technical Design and not presented here.

2.3.5.1. Interface Site Infrastructure

Studies have been undertaken to determine the feasibility of installing new infrastructure within existing site boundaries at the following sites that are interfaces between the proposed new Grid and existing distribution networks:

- Testwood WSW;
- Otterbourne WSW;
- Yew Hill WSR;
- Crab Wood WSR;

- Micheldever Road Andover WSR; and
- River Way Andover WSW.

The scope of the feasibility studies included:

- Layout of the existing site;
- Pipeline route corridors into / out of the site;
- Existing utilities;
- Geotechnical study;
- Interaction with other SW projects;
- Environmental impact;
- Land availability; and
- Constructability.

Key Findings

Testwood WSW

- The inlet pipeline routes from Knapp Mill within the Testwood WSW boundary are feasible with respect to engineering and environmental complexities;
- The SLM must cross the River Test [redacted] The Emerging Preferred Option is to utilise the existing 800 mm diameter pipeline under the river. The existing pipe bridge could also provide feasible solutions;
- For the SLM route through the site, the most feasible option is to run underground, using conventional buried pipeline construction;
- A feasible location for the Grid tank up to 20 ML volume has been established and aligns with the separate Phase 2 WSW capital works; and
- Groundwater is known to be an issue on site, and construction methods that limit groundworks should be considered.

Otterbourne WSW

- The pipeline route into Otterbourne WSW from Testwood WSW is feasible but will be slow to construct and presents challenges to ensure access can be maintained;
- The pipeline route into Otterbourne WSW from the east crosses the River Itchen, which is heavily designated, and is highly challenging in terms on engineering and environmental complexities;
- Feasible locations for raw and potable water assets have been established that align with Phase 2 capital works; and
- A Grid balancing tank volume of up to 12 ML can be feasibly sited on ground to the Northern end of the supply works site. A tank larger than this will need to be located to the Southern end of the site where the solar farm is currently located; this Option will require additional pumping to transfer water to the site high-lift pumps.

Yew Hill WSR

All interface options investigated were determined to be feasible and relatively uncomplicated.

There are no works proposed within sensitive designated areas, no conflicts with other utilities and the pipeline routes can be accommodated within existing sites.

Crab Wood WSR

There are no works proposed within sensitive designated areas, no conflicts with other utilities and the pipeline routes can be accommodated within existing sites.

Micheldever Road Andover WSR

There are no works proposed within sensitive designated areas, no conflicts with other utilities and the pipeline routes can be accommodated within existing sites.

River Way Andover WSW

There are no works proposed within sensitive designated areas, no conflicts with other utilities and the pipeline routes can be accommodated within existing sites.

2.3.5.2. Southampton Link Main

In 2016 an outline design was prepared, and information collected for Environmental Impact Assessment (EIA) for a raw water pipeline from Testwood WSW to Otterbourne WSW, and WfLH incorporated this route as its proposed strategic bi-directional potable water transfer linking the two sites. A review of the design outputs was undertaken to identify where further development is required to meet the needs of the project and to ensure the pipeline route is still feasible. As the design of the route is historical and based on different needs, it was concluded that a further reassessment of the design as part of a wider Optioneering study was required, and this will be undertaken in a future phase of the project.

Key findings of the design outputs review are:

- River Test Valley - alternative routes and construction methods to limit the impact on internationally designated sites
- New pipe bridge to cross the Little River Test - alternative trenchless construction methods
- A27 routing within the carriageway - potential to partially route through open land to the South
- M3 crossing - location and length of directional drill crossing
- A gap analysis of the Environmental Statement (ES) has identified a number of the technical assessments and surveys completed in support of the ES have now expired
- New requests for statutory utilities, land referencing, permissions for rail, motorway and main river crossings will also be required

2.3.6. Operational Control Concept

The Grid will have multiple points of interaction with the distribution networks, each requiring operating decisions to be made in a timely manner and to consider the effect of that decision on the wider connected Grid network. Traditional manual control of more localised supply and distribution networks will not be able to achieve such an optimised and efficient outcome. A holistic control system is therefore proposed that will coordinate operations across the whole Grid, from end to end, according to the optimised schedule. To undertake this multiple calculations and decisions are made in real time, which a traditional manual operation system would not be able to achieve. The integrated Grid is a significantly different type of network to the existing network of numerous separate distribution systems, as actions in one area will affect operations throughout the whole region.

Holistic real-time control has advantages of being able to use advanced analytics to predict demand and hence schedule transmissions in a planned and optimal way, rather than simply reacting to changes as they occur. This results in significantly lower pumping costs (a key element of whole life costing) as cheaper electricity tariff bands can be better exploited. It will also lead to more optimal asset sizes as constraints can be more accurately adhered to, meaning less headroom is required as a factor of safety. Such a system, predicting and analysing multiple alternate scenarios over a wide network, requires the optimisation of very high numbers of options, which can only be carried out by centralised control system.

Holistic, real-time control systems can show operational benefits such as calm networks, reservoir turnover and water quality, as well as providing significant cost savings by optimising operations around energy tariff periods. Holistic real-time control will enable the Grid to be operated proactively – predicting network changes and planning the optimal way to respond – rather than a traditional, reactive system that typically responds to in a less efficient manner.

Holistic real-time control operates as a closed-loop process (as illustrated by Figure 40):

1. **Predict -** Predict demand and associated storage levels over 24-48-hour period based on historical data around seasons, weather, weekday / weekend patterns, events (festivals etc.), using advanced analytics
2. **Plan -** Plan optimal response to predicted demands around operational constraints, utilising best mix of pumping tariff periods, least-cost sources of water, most efficient pumps and cheapest transfer routes
3. **Monitor -** Monitor changes to predicted demands in real time, refresh predicted storage levels and adjust response with a new, optimal solution every 30 minutes

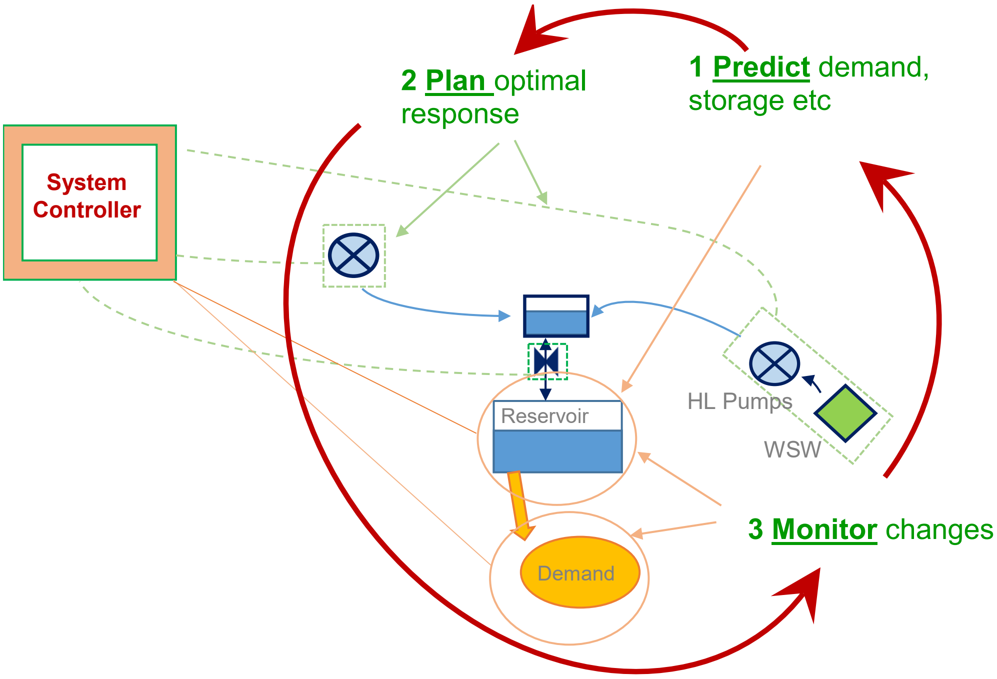


Figure 40 - Closed-loop holistic control

The holistic control system will operate the whole Grid network as a single coordinated system, scheduling pump and flow valve operations to meet operational constraints (such as reservoir storage levels and supply works outputs) and customer demand whilst minimising power costs. The system also selects pumps to operate at their best efficiency point to reduce energy usage and hence carbon impact.

The control system will ensure the network operates consistently within defined operational constraints, whilst ensuring supplies are transmitted to areas of demand or where there would otherwise be deficits. A study has been undertaken to assess the IT / OT capabilities required to support such an integrated monitoring and control process, as well as wider WfLH IT / OT needs and the risks associated with these, and the key outputs of this study are described in Section 2.3.7.3.

To minimise interference with the operation of the existing distribution system the Grid infrastructure will have controlled interfaces at a limited number of strategic locations. These are currently envisaged to be at Testwood WSW, Otterbourne WSW, Yew Hill WSR, Crab Wood WSR and River Way Andover WSW, and are locations where bulk transfers of water between the Grid and distribution networks will be required.

As an example of potential operation, if the control system detected a deficit in Andover (to the North of the network) and needed to provide the supply from the proposed plant (in the South), it would plan the optimal transfer operation required to transfer the water while keeping within BAU operational constraints at WSRs in the distribution system and also maintaining flow, velocity and reservoir level constraints in the Grid infrastructure. This would be undertaken while optimising the pump operation to minimise cost and carbon footprint whilst complying with other requirements such as reservoir turnover, water quality blending requirements and so on. In this way the Grid can be operated in optimal fashion without interfering with the manually controlled operation of the existing distribution network.

2.3.7. IT/OT Assessment

2.3.7.1. Overview

SW's IT team has undertaken an assessment to identify IT / OT requirements to enable the WfLH programme objectives. This section describes the key outputs of the assessment, which built upon the initial technology assessment conducted during Gate 1 to establish the IT and OT requirements to enable the WfLH grid operating philosophy as part of a phased approach to IT / OT design. The IT / OT requirements, and their associated costs and benefits for different solutions, will be included in the Optioneering process when determining the Preferred Option.

The following key business needs were identified and evaluated to determine the IT and OT impact:

- The integrated Grid, made up of multiple assets, requires simultaneous calculations and coordinated decisions to be made in real-time (unlike traditional manual control of localised supply and distribution networks) to balance the end to end network, as actions in one area will affect operations throughout the whole region;
- Data driven, closed feedback loop-enabled intelligent monitoring and control of field assets is required to drive minimal manual intervention and ensure optimum asset performance within stipulated system constraints;
- The network should be designed to operate bi-directionally in all the transfer routes between Testwood and Otterbourne and between Otterbourne and Andover;
- The design should enable the ability to drive cost efficiencies and minimise carbon footprint by utilising the best mix of pumping tariff periods, lowest cost sources of water, most efficient pumps and cheapest transfer routes;
- The design should enable the remote capability to monitor water quality at water sources and at various points of the grid, with an ability to remotely isolate the affected network and re-route water transfer;
- The design should enable the ability to source water from supply that may not be owned or managed by SW into the existing network operations, e.g. WRP/Desalination plant or HT;
- The design should enable the accurate prediction of demand and supply across the Hampshire region using historical data as well as inputs related to planned outages, rainfall, water level etc. and create appropriate production schedules in advance (in the order of days or weeks); and
- The design should enable the ability to monitor the network to proactively locate leakages across the faulty pipeline with a view to minimise water loss.

To address the business needs and corresponding IT / OT requirements for WfLH, a high-level view of the required solution components has been depicted in the IT / OT functional landscape diagram illustrated in Figure 41. The layer model of technology and business systems is informed by ISA-95 standards (international standard from the International Society of Automation for developing an automated interface between enterprise and control systems). Some of these components are dependent on ongoing or planned SW transformation programmes within Asset Management Plan 2007 (AMP7) whereas other components will require either enhancements to existing programmes or new initiatives unique to WfLH.

Site /Field Assets

a) New Assets - For the proposed SRO and the grid network, a distributed network of new PLCs, HMIs, new remote communication devices (such as Remote Terminal Units (RTUs), Edge Gates and sensors) is required. These control system components will be connected to local site SCADA systems

b) Existing Assets – To enable the operating philosophy of an integrated grid, the RTUs, SCADA, PLCs, HMIs and OT communications / instrumentation of existing assets that require uplifting to support integration of control systems between existing and new assets will be assessed as part of the holistic control system feasibility study

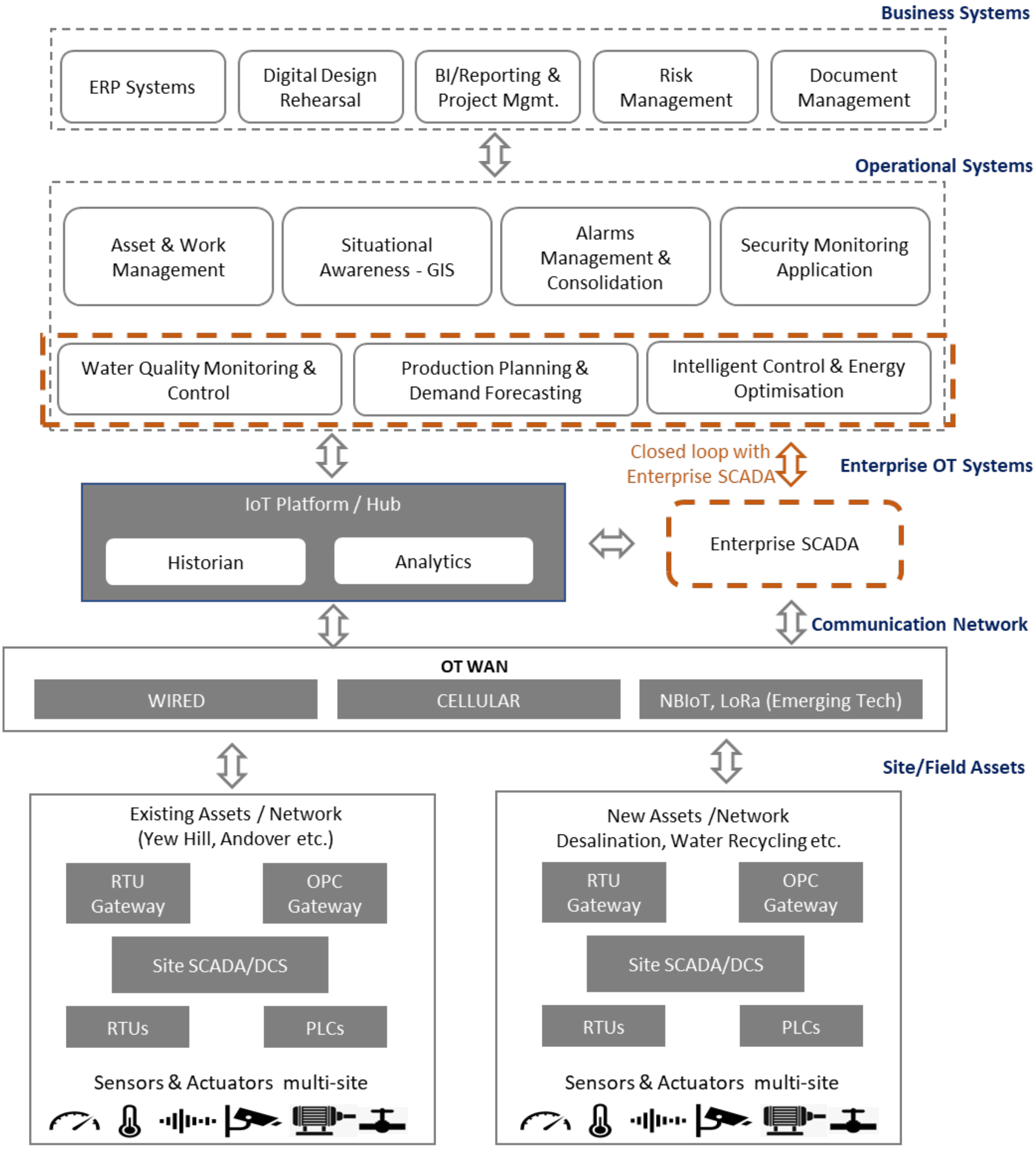


Figure 41 - IT/OT Solution Components across the ISA95 model

Communication Networks

WfLH will require the addition of a large volume of new and upgraded remote communication sensors / devices which will require integration with enterprise Operational Technology (OT) components. WfLH is dependent upon the ongoing OT Transformation programme in AMP7. This programme covers the implementation of technical standards, architecture and approved OT devices to establish resilient and secure OT Wide Area Network (WAN) integration with remote OT components via wired and wireless approaches.

Additionally, to ensure the design of the control system network is compliant to the NIS standards and National Cyber Security Centre (NCSC) cyber security principles, the detailed design of WfLH plant control solutions is dependent upon the secure OT network blueprint architecture currently being put in place as part of the OT Transformation programme.

Enterprise OT systems - Alarm Management and Enterprise IoT Hub

The functionality to monitor the SW owned / operated assets under WfLH programme will be reliant on SW's planned upgrade programme for the current Enterprise Alarm Management system. The upgrade programme is essential to incorporate additional monitoring / control points on new WfLH assets. Data will also be utilised within other SW OT systems and new enterprise asset management systems (OAM) for ongoing operational management. A subset of the control system data will be extracted from the plant control system via an Open Platform Communications (OPC) gateway and securely transmitted to the enterprise Alarm Management system hosted within SW Enterprise Data Centres.

The Enterprise Internet of Things (IoT) Hub platform implementation currently being trialled for the existing SW network will be extended to include WfLH requirements to acquire, store and analyse the field sensor data for analytics and operations. The historian / database within the Enterprise IoT Platform / Hub will be able to store and manage data acquired from sensors on the field assets and publish to operational systems for further analysis and provision of management information.

Operational Systems

The decision-making related to the operational aspects of WfLH will be managed by solution components within 'Operational Systems'.

a) A combination of solutions within the Operational Systems layer act as the integration and management point for the supply works control system, the telemetry outstations and remote sensors. These solutions with integration to Enterprise SCADA and Control systems will enable the closed loop system. As a closed loop system, the systems will monitor water quality at various points on the grid, prepare production plans based on demand forecasts or other operational factors to determine decision logic for automatic grid control actions. The control system will send these control actions to the sensors and RTUs / PLCs in the field, for example the optimal scheduling for pumps based upon multiple factors including energy tariffs, demand, etc. The integration of the Grid Control System and SW Enterprise Control System will require additional investment to pro-actively manage the water balance of the end-to-end network.

b) Leverage a combination of existing and planned SW Enterprise Asset Management solutions to host core asset information for SW owned and operated WfLH assets to enable asset compliance, condition-based monitoring, incident management, and asset specific work management records

c) The existing solution components entailing Enterprise Alarm Management, Network and Security Monitoring with their corresponding visualisation suites will be enhanced to consolidate, monitor and report alarms / events generated by the new SW owned and operated WfLH assets

Business Systems

As subsequent phases of the WfLH programme will entail 3rd party and delivery partner involvement, it is imperative to have aligned business capabilities, stakeholder governance and streamlined business process management between the organisations. To support business operations and enable effective decision-making, existing SW enterprise systems as identified in the landscape will be leveraged to support.

2.3.7.2. Key Findings

The key findings from the assessment are summarised below:

- Further work is required to validate and understand the IT / OT impact on the future business operating model of the Grid (involving third party as well as SW owned and operated assets)
- The OT on the existing downstream network assets may require a significant uplift to enable integration of existing SW network assets with the new Grid assets, and this may impact the scope of planned or ongoing IT / OT initiatives
- A holistic enterprise control system is required to manage the new bi-directional Grid network to enable end-to-end balance with the existing SW network
- The proposed IT / OT landscape for the Grid builds upon the strategic SW initiatives including OT Transformation, Strategic Projects Digitalisation, and Operational Asset Management. However, additional investments are required to either enhance the existing initiatives or mobilise new initiatives to enable the operating vision of the Grid. This will include potential changes to the SW operating model.
- As business needs evolve in the subsequent stages of the WfLH programme, additional IT / OT impact may need to be considered

2.3.7.3. Summary of key risks

Outlined below are the potential key risks that could delay delivery of IT / OT enablers thereby impacting WfLH programme objectives:

- There is dependency on the successful delivery of some of the foundational capabilities delivered via strategic and planned AMP7 initiatives. Any delay in implementation timelines or change in scope of these initiatives may have an impact on delivering to WfLH programme timelines.
- Additional system enhancements may be required beyond the planned scope of some of the ongoing or planned AMP7 transformation programmes. Without these additional enhancements or capabilities, the planned IT and OT capabilities would fall short of delivering to WfLH programme’s envisioned operating philosophy.
- As the WfLH programme is currently at concept stage, there is a risk that further business needs may evolve during subsequent design and build phases of the programme. These incremental business needs may not be considered in scope for current planned or existing transformation initiatives and would need to be retrospectively developed leading to additional change implementation costs.
- Significant uplift maybe required to OT components of the existing network such as field instrumentation, sensors, communication networks and existing site-level SCADA / telemetry systems. Without this OT uplift, the integration required between existing network and new supply solutions or new network assets to deliver end to end balanced network management might not be possible.
- The proposed WfLH grid includes new water supply solutions to be owned / operated by 3rd party and new network assets to be owned / operated by SW. Without an overarching governance and clear operating model that includes new WfLH and existing SW network assets, it would lead to disparate operational system processes causing overheads and inefficiencies in managing the network.
- Due to the long-term horizon of the WfLH programme, there is a potential risk that the technology being proposed or considered might become obsolete at the time of commissioning the grid and additional investments for uplift, refresh or upgrade might be required

2.3.8. Next Steps

Network Control and Optimisation

The next phase of the network infrastructure integration project (Phase 3) will develop the initial network solutions identified in Phase 2 into a short list of options, which will then be considered in more detail, to determine the Emerging Preferred Option that will be proposed as part of the WfLH solution. The short list options must therefore be developed to a sufficient level of detail and confidence that will enable the successful design of the assets. A high level of liaison with operations, environmental and engineering teams will therefore be needed as part of the solution development. Pipeline routing will not be defined in this study but will be included in the engineering design phase, where considerations of planning and environmental implications will be addressed.

2.3.8.1. Model Review

The optimisation model will be reviewed with respect to the impact of penalties and capital costs. The current model results include options in which reservoirs empty or overflow which clearly cannot be considered feasible. Some solutions contain balancing reservoirs that are now understood to be too large to be easily constructed at congested sites (particularly Otterbourne WSW), and solutions will be developed that reflect engineering constraints identified in the site feasibility studies, while also considering the impacts of future resilience to support additional supplies in future.

Capital Costs

The [redacted] model configuration and inputs will be reviewed to ensure results are representative and have a higher level of confidence than at present. For example, capital costs will be reviewed with the CIT to ensure they accurately represent the balance between pipeline and reservoir capital costs as there is a possibility that the current set-up might be underestimating the cost of storage infrastructure. The engineering team has recently commissioned a number of detailed CIT estimates for WfLH infrastructure as part of their feasibility studies, it is intended that this more accurate information be used in the study.

Operating Costs

Consideration will be given to better reflecting the energy tariff structure, which will have a significant impact on pumping costs and tariff avoidance. The current solution development regularly sets pumps to be active during peak / TRIAD periods.

Penalties

[redacted] penalties will be reviewed to ensure that the relative consequences of breached constraints are being captured. For example, the current solution development shows reservoirs or tanks breaching constraints at some points during the day which is clearly not acceptable in any solution, and it might be that [redacted] considers the penalty for this to be more beneficial than building more storage volume or the hydraulic model controls need to be adjusted. [redacted] results inform the decision-making process with respect to infrastructure choices, but SW will determine the preferred configuration by considering a number of varied factors. The review will ensure that penalties applied for breaching key constraints have sufficient impact on the solution such that the breach is avoided altogether.

2.3.8.2. Model Configuration

Reservoir volumes

Grid tank sizes will be limited to reflect the outcome of the engineering feasibility studies – especially at Otterbourne WSW. This might result in the [redacted] solutions placing storage at other sites where construction is more feasible, such as Yew Hill WSR or Crab Wood WSR.

Gater's Mill (Lower Itchen) Transfer

The current solution development assumes this transfer connects with SW network at Otterbourne WSW. However, it might be beneficial to transfer the water to Twyford WSR or Moorhill WSR, and a study will be undertaken to investigate.

Otterbourne to Yew Hill main

The current solutions use the existing mains for the WfLH transfer. The feasibility of this needs to be confirmed, and in particular to include the operating regime which at present is for a number of short transfers at high flow rates.

Southampton Link Main

The route of this main was developed for an earlier project (not commissioned) to transfer raw water from Testwood WSW to Otterbourne WSW and might not be optimal for the WfLH solution. Alternative routes will be considered, especially the concept of transferring via Rownhams WSR and Yew Hill WSR using a combination of new and existing infrastructure. This might result in Grid tank storage being selected at Rownhams WSR or Yew Hill WSR instead of at Testwood or Otterbourne WSW.

2.3.8.3. Solution Development

Initial solutions identified in the Phase 2 modelling study will be further developed to a level of detail and confidence so that they can be considered as feasible solutions. The level of detail developed in Phase 2 is not yet sufficient to achieve this with respect to operational constraints and engineering and environmental feasibility.

Operational Control

Pump Operations

The current solutions sometimes include multiple changes to pump status as flows react to reservoir levels. Consideration will be given to the feasibility of this, particularly when using older existing infrastructure. Smoother operation of pumps is more desirable and could also help reduce the required volumes of the new Grid tanks.

Sweetening Flows

Sweetening flows are currently operated at a fixed flow rate to reflect the daily turnover volume. This has the disadvantage of leaving the main unconditioned to higher, drought-scenario flows, and a mains conditioning process would need to be designed as part of the commissioning plan. This added complexity can be avoided by pumping sweetening flows for a shorter duration at higher, drought-scenario flows (and hence keeping the main conditioned to that flow), but at the detriment of more variance in reservoir levels and less calm networks. Consideration will be given to developing a solution that can maintain conditioning flows as the normal day operating scenario.

Bi-directional Flows

For reasons of improved resilience, the WfLH network is to be designed so it can operate bi-directionally in all the transfer routes (i.e. Testwood / Otterbourne and Otterbourne / Andover). The current solutions have not yet been developed to incorporate this. Bi-directional flow does not need to be optimised but must be shown to be feasible.

2.3.8.4. Operating & Commissioning Plan

A formal, approved Operating & Commissioning Plan will be developed for the Preferred Option. This will detail how the solution is to be operated on a 'normal' daily scenario and in a 'severe drought' stressed scenario, including the diurnal scheduling and flows of bulk transfers. Information on the strategic utilisation of the transfers (in terms of duration and frequency of use) is described in the Annex 4, Water Resources Modelling. The plan will also detail how the network is safely transitioned (i.e. commissioned) from one state to the other. Approval of the plan will be by the Western Region Operations Manager.

Bulk Transfer Imports

The current model optimises the operation of bulk transfer imports according to the need to meet demand, and without consideration of any supply and / or operational constraints at the supply point. Recognising that these constraints need to be included in the network control and optimisation model, the next phase of the project will include liaison with PW and SWW to identify any constraints to the availability of the bulk transfer imports and will incorporate these constraints into the wider solution. The network control and optimisation model will then identify the diurnal usage profile of the bulk transfer import, incorporating constraints and operational requirements, as a key output.

2.3.8.5. Holistic Control

A study will be undertaken to determine the feasibility and requirements of using real-time, holistic control to operate the network identified in the Emerging Preferred Option. It will specify infrastructure and hardware requirements and identify cost benefits associated with such a system.

IT / OT Assessment

To validate assumptions and mitigate risks identified as part of the IT / OT assessment, the following activities will be carried out between Gate 2 and Gate 3:

1. Perform detailed design analysis of IT / OT changes based on ongoing engagement with broader stakeholder groups from across the WfLH programme and SW functions to continuously align with delivery timelines and scope of planned / ongoing transformation initiatives
2. Review the impact of and identify additional IT / OT changes based upon conclusion of the feasibility study to determine the OT uplift required on the downstream SW network assets due to integration constraints on the current legacy asset estate
3. Establish the extent to which asset and site-specific OT requirements will be delivered by delivery partners or 3rd parties. Additional detailed assessment will be required to identify handoffs of site / asset specific OT into SW IT and OT systems for appropriate integration.
4. Analysis of business operating models, capability needs and impact assessment of operational handoffs between 3rd party owned / operated assets and SW owned / operated assets (both new and existing) to review impact and alignment of operating model on technology changes, transitional arrangements, overall ongoing business management and governance
5. Develop an end-to-end OT business and technical design for the WfLH grid encompassing the water source solutions, the network assets and other WfLH work-streams; subsequently validate the IT / OT changes upon finalisation of the OT design and further refine the IT / OT costs in line with the evolution of technical design for WfLH

6. Determine the overall total cost of ownership and impact across all work-streams of the WfLH from a Capital Expenditure (CAPEX) and OPEX perspective, and the overall impact of the wider programme on SW

2.4. Site Selection

2.4.1. Site Selection Methodology

The site and route selection methodology is provided in Section 3.1 of Annex 5, Options Appraisal Process.

2.4.2. Engagement with Key Stakeholders

The detail of engagement with key stakeholders, for the site and route selection process, is provided in Section 3.1 of Annex 5 (Options Appraisal).

2.4.3. Site Selection Outcomes for Option B.2 and B.5

There are two Options for water recycling assessed within the document: both using an EBL at Otterbourne WSW as an environmental buffer, namely Option B.2 and Option B.5.

The two Options are detailed in Table 15.

Table 15 - Summary of Options

Option no.	Summary
B.2	Transfer of FE from Budds Farm WTW to a new 61 Ml/d capacity WRP with recycled water transferred to a new, 75 ML capacity, lined EBL, for re-abstraction and treatment at Otterbourne WSW.
B.5	Transfer of the combined supply of FE from PC WTW and Budds Farm WTW to enable the WRP to treat up to a capacity of 75 Ml/d. Recycled water will be transferred to a new, 75 ML capacity, lined EBL for re-abstraction and treatment at Otterbourne WSW.

The key difference between B.2 and B.5 is the B.5 has the addition of a 25 km FE transfer from PC WTW to enable the WRP to treat up to its full capacity of 75Ml/d. Both solutions include:

- A FE transfer from Budds Farm WTW via a 0.8 km tunnel to a new WRP; and
- 35 km transfer pipeline from the WRP to a new 75 Ml Lake EBL adjacent to Otterbourne WSW.

This section presents a succinct summary of the site selection outcomes for these water recycling Options as the site of the WRP is common to all.

2.3.1.1 Stage 0 Results

The search envelope for the siting of a water recycling plant was determined by two factors:

- At Gate 1 the initial envelope proposed was 500 m so the WRP could be located as close as possible to the FE end point for the waste stream. However, the search envelope was increased to 1.5 km around Budds Farm WTW owing to the level of development already around BF. A larger envelope provided greater flexibility whilst also maintaining a reasonable proximity to the WRP thereby reducing the likelihood of needing increased lengths of interconnecting pipelines and pumping requirements for increased distances; and
- The application of the coastal resilience line (Report Ref: Water for Life Hampshire: Coastal Study for Site Selection Assessment, dated 21st July 2020). The coastal resilience line was formed through the assessment of coastal geomorphology and management policies, to identify projected future rates of coastal change and zones susceptible to sea flooding in order to identify areas along the coastline where major infrastructure development would not be suitable.

Figure 42 illustrates the WRP search envelope.

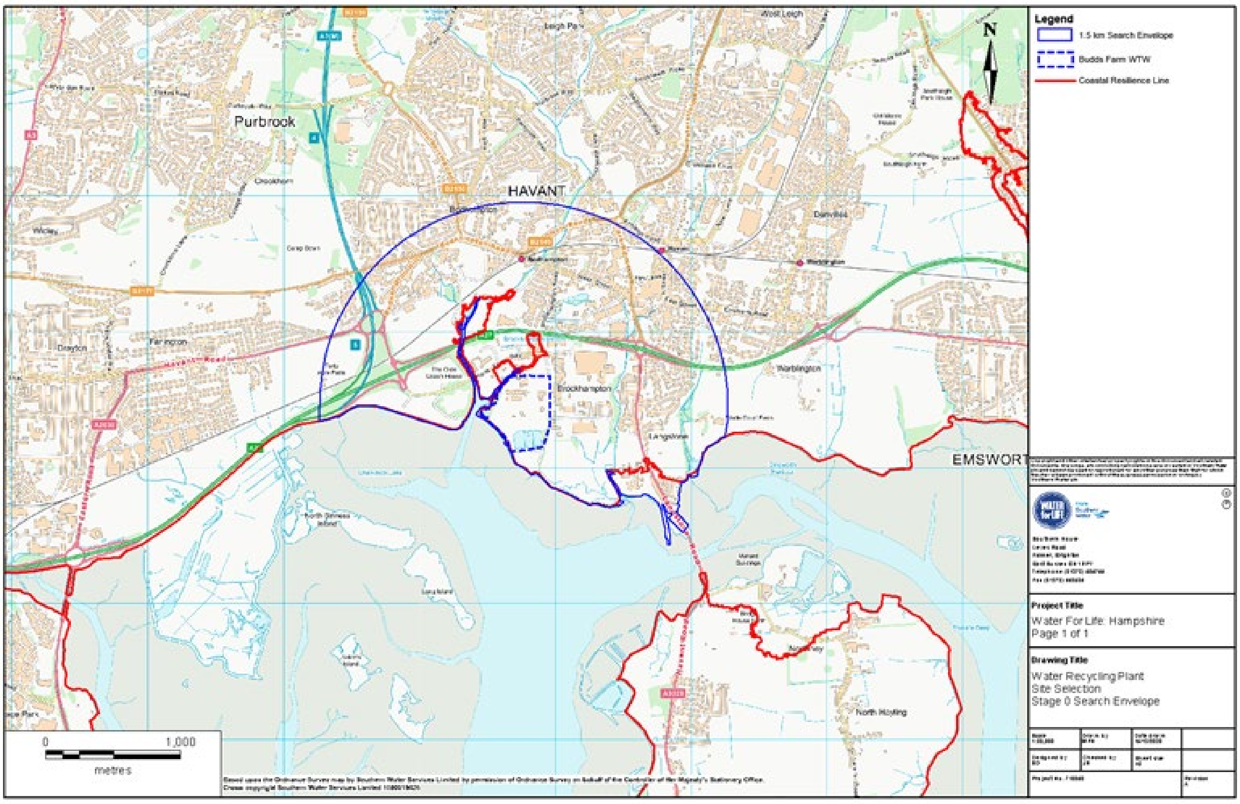


Figure 42 - WRP Search Envelope

2.3.1.2 Stage 1 Results

Following the definition of the search area for the WRP, 17 parcels were identified that met the Stage 1 siting criteria. The output of Stage 1 is illustrated in Figure 43.

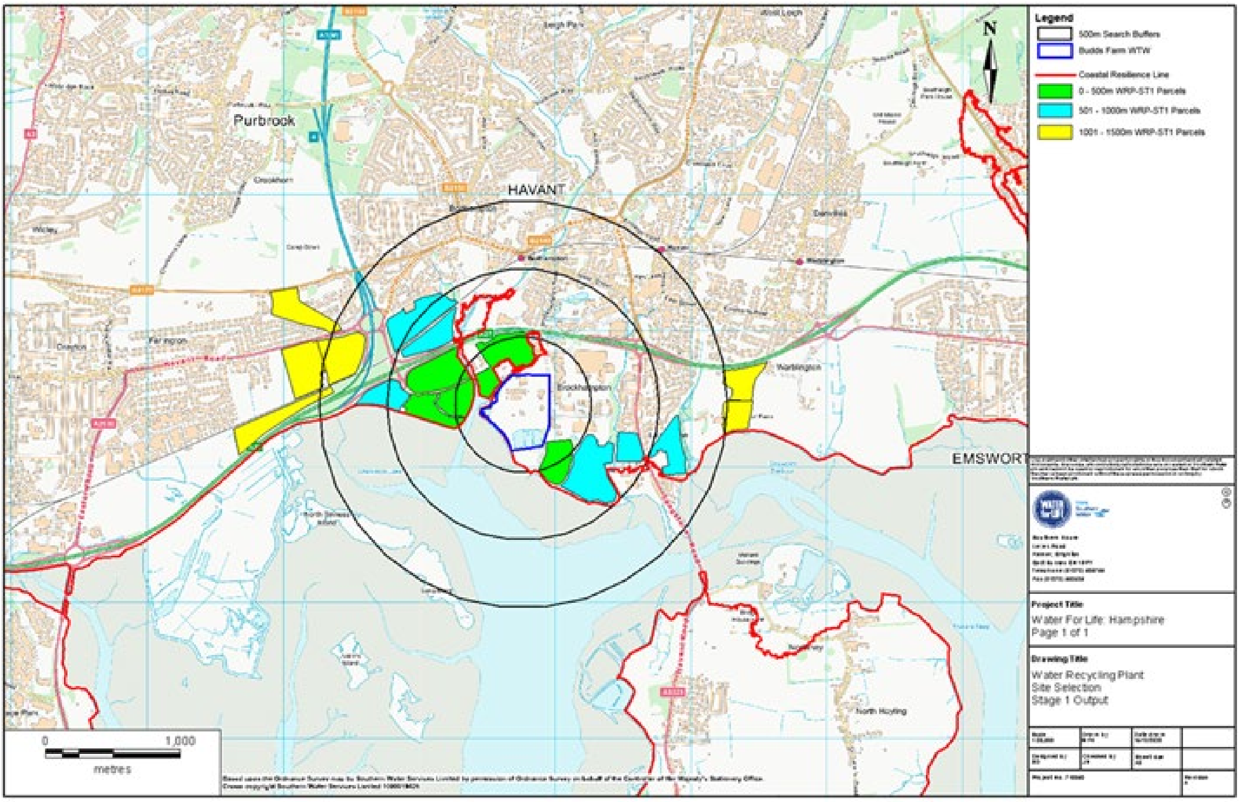


Figure 43 - Water Recycling Plant Site Selection Stage 1 Output

2.3.1.3 Stage 2a Results

The 17 parcels were then scored against the criteria at Stage 2a. The highest scoring parcel was awarded 31 points and the lowest 18. To ensure a sufficient cohort of sites could be compared at later stages the top 25% best performing parcels, progressed to Stage 2b. Two of the 17 parcels fall within a Special Area of Conservation (SAC) / Ramsar / Special Protection Area (SPA) (including potential and candidate sites) and Site of Special Scientific Interest (SSSI) designation. Following Stage 2, seven parcels progressed to Stage 2b which represented 41% of the 17 parcels. A higher percentage than 25% progressed due to the number of parcels being assigned the same score and there being no quantitative and objective differentiation that could be made between them. The output of Stage 2a is illustrated in Figure 44.

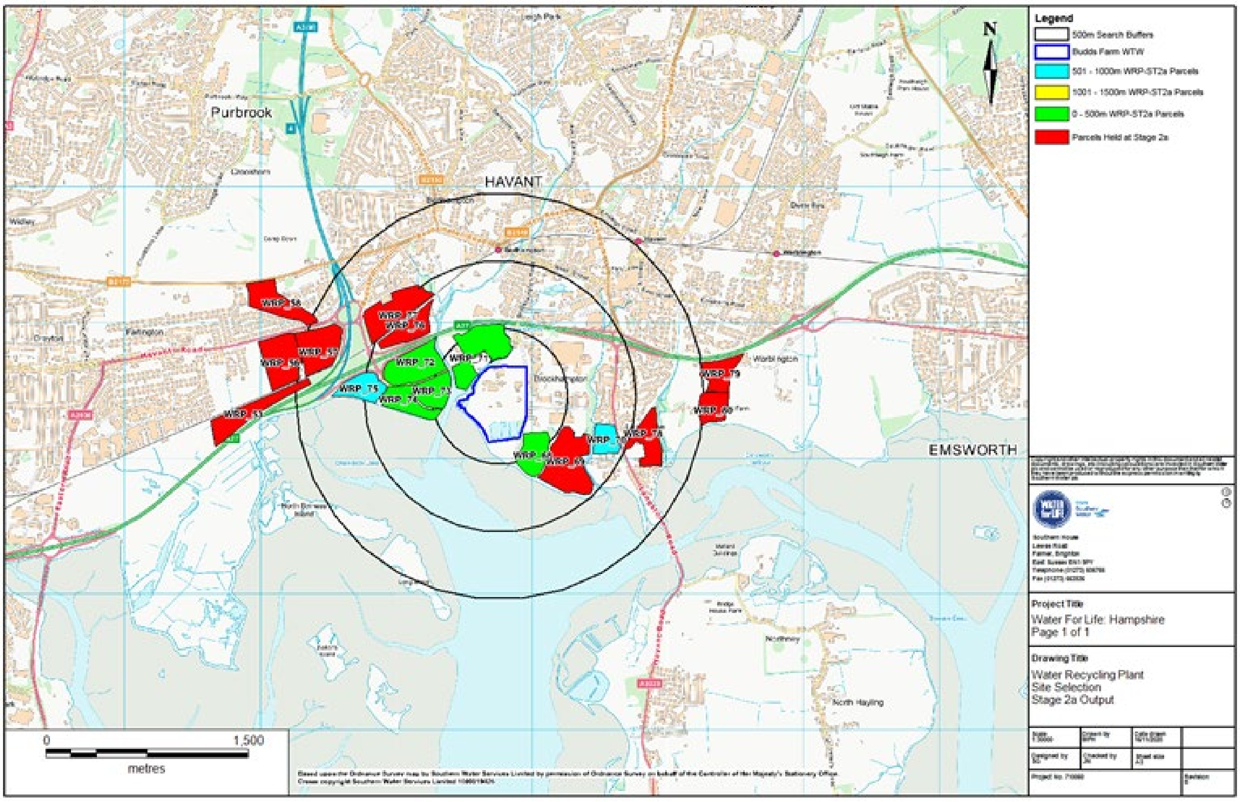


Figure 44 - Water Recycling Plant Site Selection Stage 2a Output

2.3.1.4 Stage 2b Results

Stage 2b of the process considered any conflict of the best performing parcels from Stage 2a with major developments. A compatibility score was calculated for each parcel, the higher the score the better the parcel performs. The top 50% of best performing parcels, to a maximum of 10 parcels, were taken forward to Stage 3. None of the best performing parcels from Stage 2a had any conflict with Development Consent Order (DCO) developments (within last five years), development subject to Transport and Works Act Orders (TWAO) under the Transport and Works Act 1992 and screened / scoped or validated and approved within the last three years in accordance with the relevant EIA Regulations. As such all parcels proceeded to Stage 3. The outcome of Stage 2b is illustrated in Figure 45.

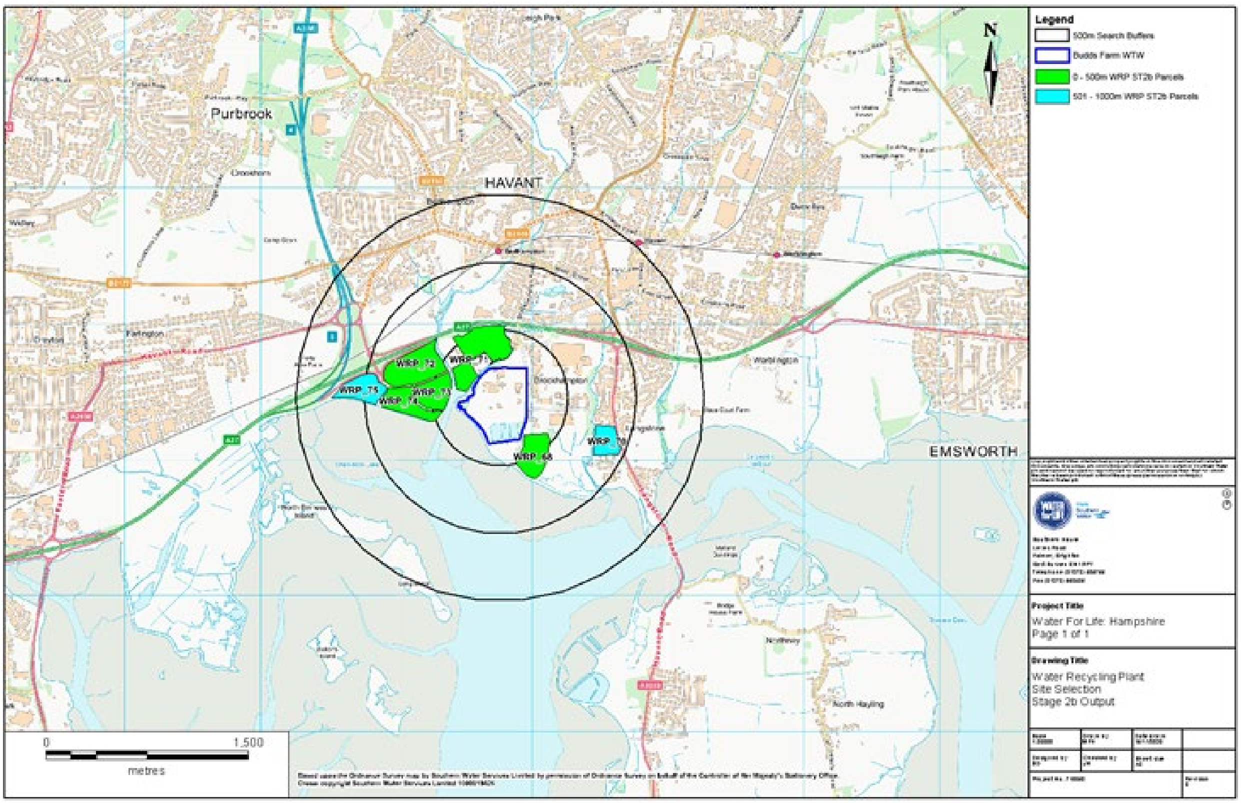


Figure 45 - Water Recycling Plant Site Selection Stage 2b Output

2.3.1.5 Stage 3 Results

Seven parcels proceed to Stage 3 with all being scored for their performance against additional site selection criteria. The higher the score the better the parcel performed. The highest score attributed to a parcel was 80 points with the lowest being 75. Given that the parcels have been scored against 39 criteria with each criteria awarding a maximum of three and a minimum of zero points, a variance of five points between the seven parcels illustrates little differentiation could be made between the best performing and least well performing parcels through mapping and criteria application alone. The outcome of Stage 3 of the process was that five parcels (68, 70, 71, 72 and 75) proceeded to the next stage. Figure 46 illustrates the location of the parcels (those in green and blue).

None of the parcels were designated Grade 1 and 2* Registered Parks and Gardens, the curtilage of Listed Buildings or within Battlefield Sites, Ancient Woodland or SAC / Ramsar / SPA (including potential and candidate sites), SSSI or National Nature Reserve (NNR) designations.

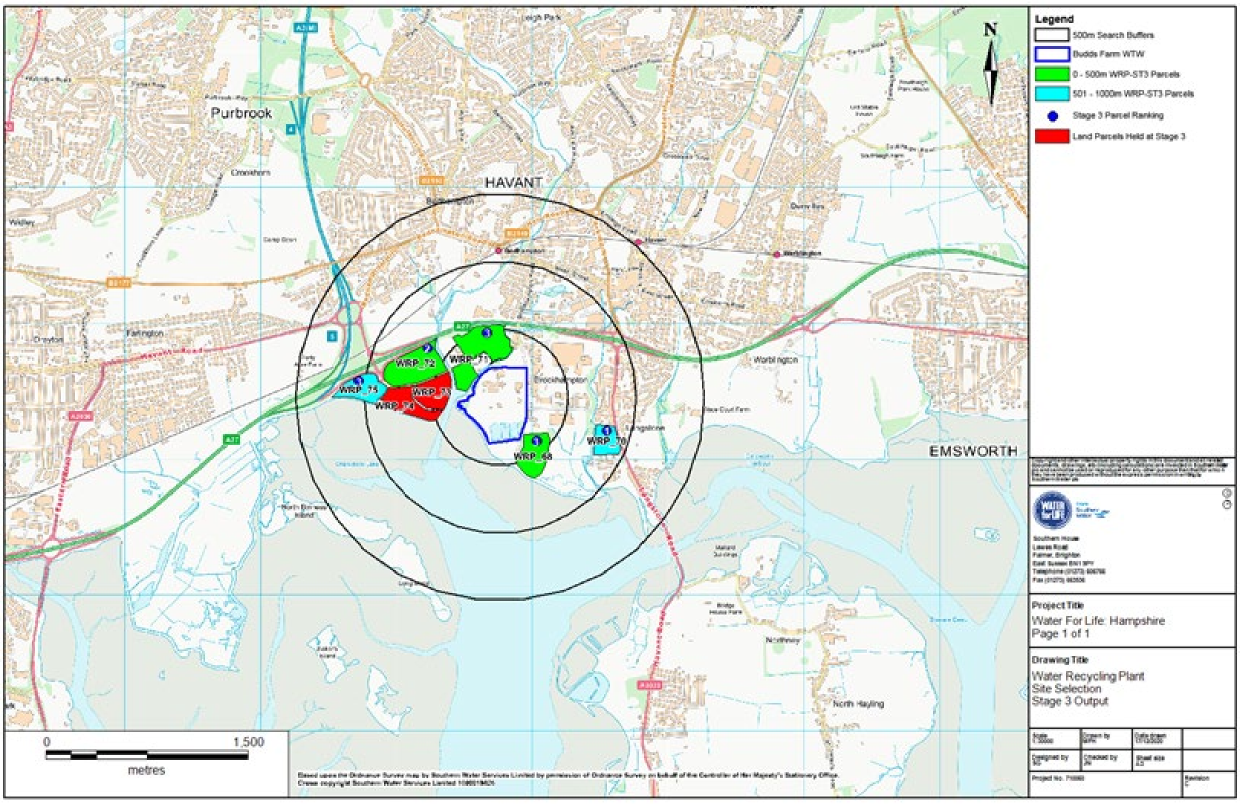


Figure 46 - Water Recycling Plant Site Selection Stage 3 Output

2.3.1.6 Stage 4 Results

Following completion of stages 0 to 3 of the site selection process, five parcels (in Figure 46) proceeded to the Stage 4 site selection evaluation.

The parcels for the location of the WRP (which is common to all three options) were evaluated for their consenting risk with the results of this process detailed in Table 16.

Table 16 - Summary of Site Selection Outcomes for WRP Parcels

Option	Summary of Site Selection Outcomes	Consenting Risk
Parcel WRP 68	This parcel lies adjacent to a Site of Importance for Nature Conservation (SINC). The Draft National Policy Statement (dNPS) states: *“Sites of regional and local biodiversity and geological interest (which include Local Geological Sites, Local Nature Reserves and Local Wildlife Sites and Nature Improvement Areas) have a fundamental role to play in meeting overall national biodiversity targets, in contributing to the quality of life and the well-being of the*	The SINC is not considered to be a reason to not take forward the parcel but the designation of the site as a Secondary Support Area is a potential consenting risk as there are other potential parcels available.

Option	Summary of Site Selection Outcomes	Consenting Risk
	community, and in supporting research and education. The Secretary of State should give due consideration to such regional or local designations. However, given the need for new infrastructure, these designations should not be used in themselves to refuse development consent". (Para 4.3.13) The parcel is also defined as a Secondary Support Area in the Solent and Waders Brent Goose Strategy[1] and therefore would require appropriate mitigation. The strategy and the sites designated as part of it were developed to wherever possible conserve extant sites, and to create new sites, enhancing the quality and extent of the feeding and roosting resource for the internationally important brent goose and wading bird populations within and around the SPA and Ramsar wetlands of the Solent Coast. This site also partially lies within flood zones 2 and 3 and lies within a sand and gravel extraction area.	
Parcel WRP70	This parcel is also defined as a Secondary Support Area in the Solent and Waders Brent Goose Strategy and would therefore require mitigation. The site also lies directly adjacent to the Chichester Harbour Area of Outstanding Natural Beauty although the parcel is separated from the Area of Outstanding Natural Beauty (AONB) by a road (A27).	Whilst the parcel lies in proximity to the AONB this is not considered to be a consenting risk in view of the proximity of existing industrial land uses and the A27. However, the designation of the site as a Secondary Support Area is a potential consenting risk as there are other potential parcels available.
Parcel WRP71	This parcel is allocated within the Havant Borough Council adopted Core Strategy (2011) and Allocations (2014) as a site suitable for B.2 / B8 uses in the heart of the Broadmarsh Industrial Area that could provide 16,300 square metres of new employment floorspace and between 233 and 452 jobs. The site is already developed and comprises existing / active warehousing and office uses.	This parcel is considered to be possible to consent although there are potentially greater challenges associated with the presence of existing infrastructure.

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[1] Solent Waders and Brent Goose Steering Group (2020) Solent Waders and Brent Goose Strategy

Option	Summary of Site Selection Outcomes	Consenting Risk
Parcel WRP72	The Western part of the site is identified as a low use site in the Solent and Waders Brent Goose Strategy and therefore would require appropriate mitigation. The parcel area is designated as a 'gateway' employment site and an outline application for employment uses (class E, B.2, B8) was submitted in Feb 2021. The parcel is also a former landfill site.	Whilst part of the site is identified as a low use site in the Solent and Waders Brent Goose Strategy, it should be possible to implement appropriate mitigation and therefore this is not deemed a reason not to take this parcel forward to the next stage of the planning evaluation. The use of the landfill site is not considered a consenting risk although as noted in the dNPS *“For developments on previously developed land, the applicant should ensure that they have considered the risk posed by land contamination and how it is proposed to address this.*” (extract of para 4.10.8)
Parcel WRP75	This is designated as a Core Area in the Solent and Waders Brent Goose Strategy. This is a significant constraint to future development on this site as this constitutes functional habitat associated with the SPA and Ramsar wetlands of the Solent Coast.	This parcel is not considered to be consentable owing to the Core designation of the site.

On the basis of the site selection and consenting risk review, it was considered that parcels WRP71 and WRP72 had the least consenting risks. WRP 71 is already developed and comprises existing / active warehousing and office uses and is considered potentially more difficult to consent than WRP72. WRP 72 experiences ‘low’ use as defined in the Solent Waders Strategy (Western side of site only); and there is a current outline application on the site for business and commercial use. It was therefore recommended that WRP 72 was taken forward to the Stage 5 evaluation of preferred configurations. It is also proposed to retain WRP71 as a back up to WRP72, subject to completion of further work.

WRP75 is identified as a ‘Core’ Area in the Solent Waders and Brent Goose Strategy. Therefore, as there are other alternative parcels available for use it was not deemed preferable to use this parcel as it would pose a greater level of consenting risk. Parcels WRP68 and WRP70 were both identified in the strategy as Secondary Support Areas and would therefore require Habitats Regulations Assessment (HRA) mitigation.

2.4.4. Route Selection Outcomes for Options B.2 and B.5

Following Gate 1, further pipeline development work was undertaken, regarding the connecting pipelines. This comprised the application of the [redacted] Insight Analytics (SIA) Route Planner Tool to back-check the routes developed at Gate 1, further optimise them and ensure that there was a consistent approach to developing all pipeline Options. As a result of this further work three potential pipeline corridors were identified between the WRP and Otterbourne WSW that were considered in the stage 4 site selection evaluation. Details about the development of these pipeline corridors is provided in Annex 5, Options Appraisal Process. The pipelines considered were (refer to Figure 47 for their location):

- WRP to Otterbourne Route 1;
- WRP to Otterbourne Route 2; and

- WRP to Otterbourne SIA.

[redacted]

The connecting pipelines to Otterbourne WSW (relevant to Options B.2 and B.5) were evaluated for their consenting risk with the results of this process are detailed in Table 17.

Table 17 - Summary of consenting risk evaluation for Otterbourne WSW connecting pipelines

Option	Summary of Site Selection Outcomes	Consenting Risk
Pipeline 1	This corridor would require a crossing of the River Itchen SAC which is a potential HRA risk that would need to be appropriately mitigated to ensure no adverse effects on integrity. There is potential for direct and indirect impact on ancient woodland and this would require appropriate mitigation/engineering solution. The dNPS states: *"The Secretary of State should not grant development consent for any development that would result in the loss or deterioration of irreplaceable habitats including ancient woodland the loss of ancient or veteran trees found outside ancient woodland…". (Para 4.3.14)*	There would be a need for further engineering and environmental assessment work to ensure that there is appropriate routeing and mitigation of the crossing of the River Itchen SAC. This is a potential consenting risk (that applies to all of the pipeline Options). Potential effects on ancient woodland would also need to be further assessed and appropriate mitigation implemented to avoid both direct and indirect effects. Whilst this corridor would run within the National Park, the final pipeline would be buried although there will be a need to undertake future siting work in relation to the location of potential pumping stations at the

Option	Summary of Site Selection Outcomes	Consenting Risk
	This pipeline corridor runs through approximately 3.5 km of the South Downs National Park. There is an interface with the Southampton to London Pipeline (SLP) Route and the Aquind Interconnector both intersect with the pipeline corridor and there will be a requirement for appropriate re-routeing / construction techniques.	next stage of scheme development after Gate 2.
Pipeline 2	This corridor would require a crossing of the River Itchen SAC which is a potential HRA risk that would need to be appropriately mitigated to ensure no adverse effects on integrity. There is potential for direct and indirect impact on ancient woodland and this would require appropriate mitigation / engineering solution. This corridor runs through approximately 2 km of the South Downs National Park. There is an interface with the SLP Route and the Aquind Interconnector both intersect with the pipeline corridor and there will be a requirement for appropriate re-routeing / construction techniques. There are two Scheduled Monuments within 100 m of the centre of the pipeline corridor and whilst they are unlikely to be directly affected there is risk of indirect effects and potential for there to be currently unknown archaeological features that could be impacted.	There would be a need for further engineering and environmental assessment work to ensure that there is appropriate routeing and mitigation of the crossing of the River Itchen SAC. This is a potential consenting risk (that applies to all of the pipeline Options). Effects on ancient woodland would also need to be further assessed and appropriate mitigation implemented to avoid both direct and indirect effects. Whilst this corridor would run within the National Park, the final pipeline would be buried although there will be a need to undertake future siting work in relation to the location of pumping stations at the next stage of scheme development after Gate 2. There will also be a requirement to ensure appropriate routeing of the corridor to reduce potential impacts on nationally designated cultural heritage features.
Pipeline SIA	This corridor would require a crossing of the River Itchen SAC which is a potential HRA risk that would need to be appropriately mitigated to ensure no adverse effects on integrity. There is potential for direct and indirect impact on ancient woodland and this would require an appropriate mitigation / engineering solution.	There would be a need for further engineering and environmental assessment work to ensure that there is appropriate routeing and mitigation of the crossing of the River Itchen SAC. This is a potential consenting risk (that applies to all of the pipeline Options). Effects on ancient woodland would also need to be further assessed and appropriate mitigation implemented to avoid both direct and indirect effects.

Option	Summary of Site Selection Outcomes	Consenting Risk
	This corridor runs through approximately 2 km of the South Downs National Park. There is an interface with the SLP Route and the Aquind Interconnector both intersect with the pipeline corridor and there will be a requirement for appropriate re-routeing / construction techniques.	Whilst this corridor would run within the National Park, the final pipeline would be buried although there will be a need to undertake future siting work in relation to the location of potential pumping stations at the next stage of scheme development after Gate 2.

All three alternative pipelines performed in a very similar way against the evaluation criteria with all requiring a crossing of the River Itchen SAC prior to connecting into Otterbourne WSW and so there would be a need for appropriate mitigation which is likely to comprise re-routeing of the pipeline corridor to ensure no adverse effects on integrity. All routes would run partially through the South Downs National Park and there would also be a need for appropriate design to avoid impacts on ancient woodland. Therefore, the site selection process recommended a combination of Route 1 through to the approximate location of the Forest of Bere and then the need for further feasibility to determine whether the corridor should run through the more northerly corridor (Route 2), albeit through a shorter section of the National Park or retain Route 1 through a more southerly extent of the National Park before all pipeline routes re-join to connect into Otterbourne WSW.

The pipelines would require a pumping station and BPTs to be sited along the route. The siting of these features is partly dependent on the topographical studies of the land and associated hydraulic modelling which will be produced in the next phase of project development. This will mean that an area of search for this infrastructure will need to be established within the recommended pipeline corridors, and for further work to be undertaken to identify a preferred site.

2.4.5. Site and Route Selection Conclusions for Option B.2

The outcome of the site selection process recommended that the following components were taken forward into Stage 5 for Option B.2:

- Parcel WRP 72 (with Parcel WRP71 retained as a backup); and
- Pipeline 1 and Pipeline 2 to connect to Otterbourne WSW.

At the conclusion of Stage 4 there were a number of consenting risks identified that needed to be considered further in the Stage 5 consenting evaluation:

- There remain risks associated with HRA and watercourse crossings that require further design and assessment;
- There needs to be further consideration of how to manage potential impacts on the South Downs National Park; and
- The routeing of the pipeline corridors needs to be reviewed to avoid direct and indirect effects on ancient woodland.

2.4.6. Site and Route Selection Conclusions for Option B.5

Option B.5 would use the same land parcels as Option B.2 and the same pipeline connections to Otterbourne and therefore the recommendations outlined above would apply.

Option B.5 would additionally require a new pipeline connection between PC WTW and the WRP. This pipeline route would need to be routed through a number of urban areas and there are potentially challenging locations such as along [redacted] where there are highway, community and cultural heritage constraints (Listed Buildings and Scheduled Monuments) that will need to be managed through the future scheme development stages. The congested nature of the urban areas that the pipeline would need to pass through, and the associated constraints have resulted in only one possible corridor being identified between PC WT and the WRP.

The outcome of the site selection process recommended that the following components were taken forward into Stage 5 for Option B.5:

- Parcel WRP 72 (with Parcel WRP71 retained as a backup);
- Pipeline 1 and Pipeline 2 to connect to Otterbourne WSW; and
- Pipeline connection between PC WTW and the WRP.

As in B.2, at the conclusion of Stage 4 there were a number of consenting risks identified that needed to be considered further in the Stage 5 planning evaluation:

- There remain risks associated with HRA and watercourse crossings that require further design and assessment;
- There needs to be further consideration of how to manage potential impacts on the South Downs National Park; and
- The routeing of the pipeline corridors needs to be reviewed to avoid direct and indirect effects on ancient woodland.

2.5. Environmental

2.5.1. Environmental Assessment

2.5.1.1. Introduction

The Gate 2 Environmental Assessment builds upon the Environmental Assessments presented in the Gate 1 Submission: Annex 10.2 Environmental Assessment (September 2020). The following environmental assessments and activities are summarised in this report for SRO B.2, B.4 and B.5:

- Strategic Environmental Assessment (SEA);
- EIA progress and surveys;
- Marine Conservation Zone Assessment (MCZA);
- HRA;
- Water Framework Directive (WFD) Compliance Assessment;
- Invasive Non-Native Species (INNS) Risk Assessment;
- Biodiversity Net Gain (BNG) and Natural Capital (NC) Assessment; and
- Environmental Mitigation.

Table 18 details the actions agreed for the Environmental Assessment as part of SW's Gate 1 submission to RAPID, and the information which has been requested by RAPID to accompany the Gate 2 Environmental Assessment. Table 18 confirms where this information is located within this section.

Table 18 - Environmental Assessment actions agreed at Gate 1 / Gate 2 Environmental Assessment requirements

Source	Requirement for Gate 2 Environmental Assessment	Location with Gate 2 Environmental Appraisal
RAPID Gate 2 template section 3.5	Option-level environmental assessments that meet local requirements and provide information consistent with SEA, HRA and other statutory assessment requirements including consideration of in-combination effects and identification of environmental risks that need mitigating through the solution design and costing.	All following subsections The HRA includes a consideration of in-combination effects (e.g. in-combination with other plans and projects).
RAPID Gate 1 Final Decision – Action for Gate 2	Provide summaries of the further development of SEA, HRA, WFD assessment, Natural Capital Assessment (NCA), Environmental Social and Economic Valuation and Environmental Net Gain, that have been discussed and agreed with the EA, NE and any other relevant regulators, to meet gate two requirements and timescales.	All following subsections
RAPID Gate 2 template Section 3.5	Environmental, social and economic valuations (or metric benefits) consistent with principles in the draft National Policy Statement for Water Resources Infrastructure and Water Resource Planning Guidelines (WRPG).	2.5.1.3.5, 2.5.3.5, 2.5.4.5 (Biodiversity Net Gain and Natural Capital Assessment)
RAPID Gate 1 Final Decision – Action for Gate 2	Undertake site selection process as detailed in Annex 9.2 in consultation with the Environment Agency and Natural England, to meet gate two requirements and timescales	Section 2.4
RAPID Gate 2 template section 3.5	Include main conclusions and issues arising including results of environmental work carried out to date and plan for future work: • How the solution contributes to environmental net gain	2.5.1.3.5, 2.5.3.5, 2.5.4.5 (Biodiversity Net Gain and Natural Capital Assessment)

Source	Requirement for Gate 2 Environmental Assessment	Location with Gate 2 Environmental Appraisal
RAPID Gate 2 template section 3.5	Include main conclusions and issues arising including results of environmental work carried out to date and plan for future work: • The carbon impact of the solution and initial outline of how the solution will take into account the carbon commitments.	Section 2.5.2.9, 2.5.3.8 and 2.5.4.9
Gate 1 Submission, Annex 20 - Gate 2 delivery plan	Summary of the following (Varying maturity level depending on solution / Option) Activities that have the potential to be accelerated and brought forward from Gate 3 activities into Gate 2 for the Base Case include: • Terrestrial and marine environmental and ecological surveys; • Scope and prepare outline Environmental Monitoring Plans; • Commencement of work to inform the Preliminary Environmental Information Report (PEIR)	2.5.1.2 Progress on Environmental Impact Assessment
RAPID Gate 1 Final Decision Action for Gate 2	• Provide details of an 'Evidence Planning Strategy, which has been discussed and agreed with the EA and NE, to meet Gate 2 requirements and timescales. Baseline methodologies and scopes to inform survey work needs to be agreed as a priority.	2.5.1.2 Progress on Environmental Impact Assessment

The purpose of this section of the CDR is to provide a concise summary of each of the above assessments for B.2, B.4 and B.5. These assessments are reported in detail in the technical documentation which has been prepared in parallel with the Gate 2 submission.

The summaries in this section aim to explain the approach taken to each of the assessments and summarise the key findings. Due to the intended length of the CDR, it is not possible to include full details of every aspect of the assessments in this section.

The environmental assessments undertaken for Gate 2 have been undertaken at strategic level, based on the level of concept design information and evidence available in relation to each SRO at this stage in the scheme development process. Following Gate 2 and the selection of the Preferred Option, project level environmental assessments will be undertaken to support the DCO application. These assessments will be undertaken in compliance with the requirement of the dNPS for Water Resources Infrastructure and supported by a full suite of environmental surveys, further technical appraisal, and further consultation and engagement.

Assessments at this stage are based on a qualitative expert-judgement approach, augmented by high-level quantitative data where appropriate. Where gaps in information (e.g. survey data, modelling etc) have been identified.

Method Statements outlining the proposed approach to the Gate 2 environmental assessments for the SEA, HRA, MCZA, INNS Assessment and WFD assessment were circulated to NE, the EA and the Marine Management Organisation (MMO) for comment prior to Gate 2. Drafts of the BNG Assessment and NCA, including details of the applied methodology, were also circulated to relevant regulators for comment.

It is not possible to summarise all comments and responses within the intended length of this CDR document, however a summary of the key themes emerging from consultation are summarised below in Table 19:

Table 19 - Consultation summary - key themes

Comment Theme	Response
Gaps in baseline information	Several data gaps have been filled since Gate 1 (for example dispersion modelling associated to the impacts to discharges from Budds Farm/Peel Common Long Sea Outfalls resulting from operation of the Water Recycling Plan); however it is recognised that there are some gaps in baseline information (e.g. surveys), and assessments draw upon desk-based information where available. The level of baseline information available at this stage is considered proportionate and sufficient to support the Gate 2 SRO selection, however further surveys will be undertaken, and data gaps will be filled for the final project level consent application.
Uncertainty over scope of Gate 2 assessments and relationship with project level consent application assessments	The assessments undertaken for Gate 2 have been undertaken at a strategic level and have been used to support and inform site selection and options appraisal. For example, the principles of WFD, HRA, and SEA have been applied to support option selection, recognising that full environmental assessments will be required for the project level consent application, following the identification of the EPO.
Specific comments on guidance and best practice to be used in assessments	Assessments have been updated to ensure they reflect specific guidance referenced by stakeholders.

The environmental assessments reported in this section are based on the SRO designed as detailed for Options B.2 and B.5 as detailed in Section 2.2.

The configurations of B.2 and B.5 identified through the Site Selection process are detailed in Table 20 below:

Table 20 - Water Recycling Configurations assessed at Gate 2

Component	Location/Routes	B.2 61 Ml/d Water Recycling to Otterbourne EBL	B.5 75 Ml/d Water Recycling (Budds and Peel) to Otterbourne EBL
Effluent transfer from Budds Farm WTW to WRP		x	x
Effluent transfer from PC WTW to WRP			x
WRP	Site 72	x	x
Waste-stream to BF and out Eastney LSO		x	x
Transfer pipeline WRP to EBL at Otterbourne	Routes 1 and 2	x	x
Second stage pumping stations and BPT (along pipeline routes)		x	x

Component	Location/Routes	B.2 61 Ml/d Water Recycling to Otterbourne EBL	B.5 75 Ml/d Water Recycling (Budds and Peel) to Otterbourne EBL
Otterbourne EBL with emergency discharge pipeline to Otterbourne watercourse **OR** to overland discharge area		x	x
Transfer pipeline WRP to HTR	Routes 1 and 2		
HTR HLPS	HTPS 5		
Transfer pipeline HTR to Otterbourne WTW	Routes 3 and 4		
Pre-disinfection ceramic membrane plant at Otterbourne WSW		x	x

The key components of B.2 and B.5 are illustrated in the Figures below.

[redacted]

[redacted]

[redacted]

It should be noted that all environmental assessments and appraisals have been completed using the principles of formal HRA and SEA. As a result, all assessments and appraisals completed to date are non-statutory as there has been no formal trigger to initiate formal assessments and appraisals in the project.

2.5.2. Strategic Resource Option B.2

2.5.2.1. Strategic Environmental Assessment

Methodology

As with the approach taken at Gate 1, and in line with the requirements of the RAPID Accelerated Gate 2 Submission Template, environmental assessments that provide information consistent with SEA have been undertaken at option level for each SRO. A statutory SEA is not required for Gate 2.

The first step of Stage B was to undertake a screening exercise, to assess the potential effects of each option against the baseline environment, and to determine whether they are affected by the proposals (in this context 'screening' is used to describe an option level source-pathway-receptor approach taken to identify where impacts may occur, not SEA screening in the sense of deciding whether a whole plan requires an SEA).

The SEA undertaken at Gate 1 (Appendix 10.2 Environmental Assessment, Water Recycling Appendices: Appendix B to the Gate 1 submission) has been updated to reflect changes in the concept design and potential pipeline routes, and open source data sources have been updated.

In line with approach taken at Gate 1, the principles of SEA assessment have been applied to identify potential impacts for each SRO. The first three steps of the following five steps of SEA have been followed in this assessment:

- Stage A - Setting the context, establishing the baseline and deciding on the scope
- Stage B - Developing and refining alternatives and assessing effects
- Stage C - Preparing the environmental report
- Stage D - Consultation
- Stage E - Monitoring implementation of the plan or programme

A summary of the above stages is provided below, with full details available in the technical report.

Stage A - Setting the context, establishing the baseline and deciding on the scope

Baseline information on the study area for each SRO was collated centrally in a GIS and data repository to provide the basis for predicting environmental effects. This included open source data, survey data and environmental assessments conducted in the preparation of other relevant plans and programmes. Baseline information also included the emerging findings of other environmental assessments being completed for the Gate 2 submission (e.g. WFD, HRA and MCZ assessments). At this stage, the SEA objectives were also defined around a number of key themes including biodiversity, fauna and flora, population and human health, material assets and resource use, water, soil, geology and land use, air and climate, archaeology and cultural heritage; and landscape. The objectives were consistent with the SEA objectives outlined at WRM19 and Gate 1 to enable consistency and comparison of effects. The purpose of the SEA objectives was to establish a framework for assessing the environmental effects of the SRO, and to enable comparison with other SROs. In this instance, each component of the SRO was assessed separately against the SEA objectives to allow different configurations (e.g. pipeline routes) so be considered.

At this stage, a list of other development was also collated to enable and assessment of cumulative effects during Stage B. This list was consistent with the list used for the HRA cumulative (referred to as 'in-combination').

Stage B - Developing and refining alternatives and assessing effects

The first step of Stage B was undertaking a screening exercise, to assess the potential effects of each option against the baseline environment, and to determine whether they are affected by the proposals. A source-pathway-receptor approach was taken to identify where impacts may occur. Where environmental effects were not predicted (e.g. no source, or no pathway etc), these were 'screened out' from further assessment.

The screening stage was followed by an assessment of environmental effects and consideration against the SEA objectives defined in Stage A. This stage also identifies whether mitigation measures are likely to be required where adverse environmental effects are deemed to be likely.

The environmental assessment stage adheres to a number of guidance documents including ODM (2005), UK Water Industry Research (UKWIR) (2021) and WRSE (2020) to ensure a fair comparison, across all SROs, for the Gate 2 submission.

Each SRO component was assessed against each SEA objective, with positive as well as negative effects being considered. Uncertainties regarding the nature and significance of effects were also recorded.

For each SEA objective, the residual effect is determined using a significance of effect matrix. This considers the value / sensitivity of the receptor and the magnitude of the assessed effect.. The significance matrix determines effects on a scale ranging from 'major beneficial' to 'major adverse', as set out below in Table 21.

Table 21 - SEA Appraisal Matrix

		Magnitude					
		Negative Impact			**Positive Impact**		
		High	**Medium**	**Low**	**Low**	**Medium**	**High**
Sensitivity	**High**	Major	Major	Moderate	Moderate	Major	Major
	Medium	Major	Moderate	Minor	Minor	Moderate	Major
	Low	Moderate	Minor	Negligible	Negligible	Minor	Moderate

Where major adverse effects are predicted, measures envisaged to prevent, reduce (and as far as possible, offset) these effects on the environment (because of implementing the measure) are outlined where relevant / appropriate.

Stages C, D and E

- Stage C: Preparing the environmental report - The SEA has been summarised in the Gate 2 documentation, with the full detail provided in the technical documentation;
- Stage D: Consultation - a formal SEA, including consultation, will be undertaken in respect of SW's WRMP24, which will include the Selection Option; and
- Stage E: Requirements for monitoring will be identified and carried forward to the project stage assessment.

A summary of the key findings of the SEA for B.2 is provided below.

SEA Screening

There is the potential for major adverse effects to biodiversity in relation to the operation of the Waste Stream via Eastney LSO from Budds Farm WTW component, as a result of potential adverse effects on the National Site Network Sites. The construction of the ceramic membrane plant at Otterbourne WSW (including the washwater recovery area), required for all SROs, has the potential to have a major adverse effect on the qualifying species of the River Itchen SAC (and SSSI which underpins the SAC designation). Ancient Woodland also borders the Otterbourne WSW site and therefore there is the potential for temporary adverse effects during construction.

The construction of the transfer pipeline WRP to the EBL at Otterbourne (Routes 1 and 2) and the operation of the EBL (with emergency discharge pipeline or overland flow) have the potential to have major adverse effects on biodiversity (notably, the River Itchen SAC/SSSI). There is also the potential for major adverse effects on cultural heritage associated with the Route 2 transfer pipeline (WRP to EBL) and the EBL itself due to the proximity to numerous Scheduled Monuments and Listed Buildings, and the potential for undiscovered archaeological remains. Negligible impacts are anticipated on cultural heritage along the pipeline during operation as the infrastructure will be buried. However, there is the potential for adverse impacts on the setting of the heritage asset (Moated site at Otterbourne Manor) which is located within 500 m of the component, during the proposed location of the EBL.

Budds Farm to new WRP: Route 1

Summary of component adverse effects

One major adverse effect has been identified, relating to biodiversity flora and fauna (potential Likely Significant Effects (LSEs) for several National Site Network designations). Three moderate adverse effects have been identified, relating to population and human health (impacts towards recreational activities including access to Public Rights of Way (PRoWs) and a national trail), material assets and resource use (small quantities of material for construction waste generated for landfill, in addition to major long term energy and chemicals requirements during operation), archaeology and cultural heritage (potential impacts towards heritage assets (Listed Buildings)).

Summary of component beneficial effects

Five major beneficial effects are anticipated, relating to the provision of a large supply of recycled water which would enable improvements in water use efficiency and lessen the pressure on other sources during severe drought conditions, the minimisation of the risks associated with unsustainable abstraction of groundwater and fresh surface waters, and reducing the vulnerability to risks (drought) associated with climate change effects.

Water recycling plant

Summary of component adverse effects

Two major adverse effects have been identified, relating to biodiversity flora and fauna (potential LSEs for several National Site Network Sites, impacts to national designations due to construction traffic) and air and climate (major long-term energy requirement). Four moderate adverse effects have been identified, in relation to material assets and resource use (small quantities of material for construction and waste generated for landfill, in addition to major long term energy and chemicals requirements during operation), water (localised water quality impacts towards coastal waterbodies and transitional waterbodies in proximity to the Water Reuse Plant), archaeology and cultural heritage (potential for impacts to unknown archaeology),), and landscape and visual amenity (impacts towards visual amenity of an AONB during construction).

Summary of component beneficial effects

Five minor beneficial effects have been identified for this component, relating to population and human heath (more sustainable provision of water during drought conditions), material assets and resources (lessening the pressure on other sources that abstract water from more limited water resources during drought conditions), water (presents an opportunity to reduce impacts to groundwater through water recycling) and air and climate (reduction in vulnerability to climate change), through its contribution to water delivery resourced as part of the overall Water Recycling SRO. The component contributes to a benefit by ensuring water provided by the other components reaches the right customers, communities and businesses. Additionally, the component contributes to reducing the vulnerability to risks (i.e. drought) associated with climate change effects and improves resilience to the likely effects of climate change.

Waste Stream via Eastney LSO from Budds Farm WTW

Summary of component adverse effects

One major adverse effect has been identified, relating to biodiversity flora and fauna (potential LSEs for several National Site Network Sites and national designations due to construction changes in waste stream concentration). Five minor adverse effects have been identified water (localised water quality impacts towards coastal waterbodies and transitional waterbodies in proximity to the Water Reuse Plant), and archaeology and cultural heritage (potential impacts towards protected wreck sites).

Summary of component beneficial effects

Five minor beneficial effects have been identified for this component, relating to biodiversity (small improvement in the waste stream), population and human heath (more sustainable provision of water during drought conditions), material assets and resources (lessening the pressure on other sources that abstract water from more limited water resources during drought conditions), water (presents an opportunity to reduce impacts to groundwater through water recycling) and air and climate (reduction in vulnerability to climate change), through its contribution to water delivery resourced as part of the overall Water Recycling SRO. The component contributes to a benefit by ensuring water provided by the other components reaches the right customers, communities and businesses. Additionally, the component contributes to reducing the vulnerability to risks (i.e. drought) associated with climate change effects and improves resilience to the likely effects of climate change.

Transfer pipeline WRP to EBL WSW: Route 1

Summary of component adverse effects

Four major adverse effects have been identified, relating to biodiversity, flora and fauna (potential dust and air quality impacts of construction works towards National Site Network Sites and national designations), material assets and resource use (large quantities of material for construction and waste generated for landfill in addition to a small long-term energy consumption requirement), archaeology and cultural heritage (the high potential for undiscovered archaeological remains during construction and proximity to national designations) and landscape and visual amenity (impacts on the visual amenity of the landscape of a national park during construction).

Summary of component beneficial effects

Five minor beneficial effects have been identified for this component, relating to population and human heath (more sustainable provision of water during drought conditions), material assets and resources (lessening the pressure on other sources that abstract water from more limited water resources during drought conditions), water (presents an opportunity to reduce impacts to groundwater through water recycling) and air and climate (reduction in vulnerability to climate change), through its contribution to water delivery resourced as part of the overall Water Recycling SRO. The component contributes to a benefit by ensuring water provided by the other components reaches the right customers, communities and businesses. Additionally, the component contributes to reducing the vulnerability to risks (i.e. drought) associated with climate change effects and improves resilience to the likely effects of climate change.

Transfer pipeline WRP to Lake Otterbourne WSW: Route 2

Summary of component adverse effects

Four major adverse effects have been identified, relating to biodiversity, flora and fauna (potential dust and air quality impacts of construction works towards National Site Network Sites and national designations), material assets and resource use (large quantities of material for construction and waste generated for landfill in addition to a small long-term energy consumption requirement), archaeology and cultural heritage (the high potential for undiscovered archaeological remains during construction and proximity to national designations) and landscape and visual amenity (impacts on the visual amenity of the landscape of a national park during construction).

Summary of component beneficial effects

Five minor beneficial effects have been identified for this component, relating to population and human heath (more sustainable provision of water during drought conditions), material assets and resources (lessening the pressure on other sources that abstract water from more limited water resources during drought conditions), water (presents an opportunity to reduce impacts to groundwater through water recycling) and air and climate (reduction in vulnerability to climate change), through its contribution to water delivery resourced as part of the overall Water Recycling SRO. The component contributes to a benefit by ensuring water provided by the other components reaches the right customers, communities and businesses. Additionally, the component contributes to reducing the vulnerability to risks (i.e. drought) associated with climate change effects and improves resilience to the likely effects of climate change.

2nd Stage Pumping Stations and Break Pressure Tank

Summary of component adverse effects

One major adverse effect is identified relating to archaeology and cultural heritage (the high potential for undiscovered archaeological remains during construction). Five moderate adverse identified relating to biodiversity, flora and fauna (potential dust, noise, habitat fragmentation and air quality impacts of construction works towards National Site Network Sites and national designations), population and human health (impacts towards access to areas the national park), material assets and resource use (large quantities of material for construction and waste generated in addition to a small long-term energy consumption requirement), and landscape and visual amenity (impacts on the visual amenity of the landscape of a national park during construction).

Summary of component beneficial effects

Five minor beneficial effects have been identified for this component, relating to population and human heath (more sustainable provision of water during drought conditions), material assets and resources (lessening the pressure on other sources that abstract water from more limited water resources during drought conditions), water (presents an opportunity to reduce impacts to groundwater through water recycling) and air and climate (reduction in vulnerability to climate change), through its contribution to water delivery resourced as part of the overall Water Recycling SRO. The component contributes to a benefit by ensuring water provided by the other components reaches the right customers, communities and businesses. Additionally, the component contributes to reducing the vulnerability to risks (i.e. drought) associated with climate change effects and improves resilience to the likely effects of climate change.

Environmental Buffer Lake (EBL) at Otterbourne with emergency discharge pipeline or overland flow

Summary of component adverse effects

Major adverse effects have been identified, relating to biodiversity, flora and fauna (potential effects on the River Itchen SAC during construction and operation), archaeology and cultural heritage (the high potential for undiscovered archaeological remains during construction and proximity to a Scheduled Monument and Listed Buildings) and landscape and visual amenity (impacts on the visual amenity of the landscape of the South Downs National Park during operation).

Summary of component beneficial effects

Five minor beneficial effects have been identified for this component, relating to population and human heath (more sustainable provision of water during drought conditions), material assets and resources (lessening the pressure on other sources that abstract water from more limited water resources during drought conditions), water (presents an opportunity to reduce impacts to groundwater through water recycling) and air and climate (reduction in vulnerability to climate change), through its contribution to water delivery resourced as part of the overall Water Recycling SRO. The component contributes to a benefit by ensuring water provided by the other components reaches the right customers, communities and businesses. Additionally, the component contributes to reducing the vulnerability to risks (i.e. drought) associated with climate change effects and improves resilience to the likely effects of climate change.

Ceramic membrane plant at Otterbourne WSW, including washwater recovery area

Summary of component adverse effects

Two major adverse effects have been identified, relating to biodiversity, flora and fauna (potential dust, noise and air quality impacts of construction works towards National Site Network Sites and national designations) and archaeology and cultural heritage (the high potential for undiscovered archaeological remains during construction and proximity to national designations).

Summary of component beneficial effects

Five minor beneficial effects have been identified, relating to population and human heath, material assets and resources, water and air and climate, through its contribution to water delivery resourced as part of the overall WRP solution. The component provides a benefit by ensuring water provided by the other components reaches the right customers, communities and businesses. Additionally, the component reduces the vulnerability to risks (drought) associated with climate change effects and improves resilience to the likely effects of climate change.

Summary of B.2 Configuration effects

Adverse effects

There is the potential for major adverse effects to biodiversity in relation to the operation of the Waste Stream via Eastney LSO from Budds Farm WTW component, due to the potential for adverse effects to The Solent and Isle of Wight Lagoons SAC. Solent Maritime SAC, Solent and Dorset Coast SPA and Chichester and Langstone Harbours SPA. The WRP has the potential for major adverse effect due to the long-term energy requirement.

Emergency discharge of the EBL (option 1 (via pipeline into the Otterbourne)) has the potential for a major adverse effect on Itchen SAC through changes in water quality. Crossing the Itchen has the potential for habitat change to features of the Itchen SAC with the potential for barrier effects to Atlantic salmon.

Pipeline options 1 and 2 from the WRP to the EBL have the potential for major adverse effect from the use of resources.

Sparrowgrove Copse and Oakwood Copse ancient woodlands are adjacent to the ceramic membrane plant. Impacts could occur from disturbance issues (noise, visual and lighting) and degradation of habitats through dust dispersion, sediment runoff and localised pollution incidents.

There are a significant number of Listed Buildings, and a high potential for undiscovered archaeological remains, for the footprint of the entire SRO. Therefore, there is the potential for major adverse effects to occur on cultural heritage in relation to the construction all components. However, during operation the potential for adverse effects on heritage assets to occur is very low as these components will be buried.

The pipeline transfers from HT to Otterbourne WSW (Route 1 and 2) cross the South Downs National Park, therefore there is the potential of major adverse landscape and visual amenity effects during construction. These interactions with these designations have the potential to cause major adverse effects during construction and in the operational stage to landscape and visual receptors, although long term operational impacts are likely to be negligible as the infrastructure is buried.

Beneficial effects

This SRO would have minor beneficial effects due to the marginal improvement in output, to biodiversity (from the small reduction in waste stream at BF), population and human heath (more sustainable provision of water during drought conditions), material assets and resources (lessening the pressure on other sources that abstract water from more limited water resources during drought conditions), water (presents an opportunity to reduce impacts to groundwater through water recycling) and air and climate (reduction in vulnerability to climate change).

Cumulative effects

Adverse cumulative effects could occur through changes in water quality and prey resource to the Portsmouth Harbour SPA and Ramsar and changes in water quality dues to contaminants to the Solent and Southampton Water SPA and Ramsar in combination with the Aquind Interconnector project.

The Portsmouth coastal management scheme HRA concludes no effect on the Portsmouth Harbour SPA and Ramsar. As the SRO has potential to cause LSE from disturbance effects, an adverse cumulative effect cannot be ruled out at this stage.

2.5.2.2. Progress on Environmental Impact Assessment (B.2 and B.5)

In addition to Gate 2 specific environmental assessments, work has progressed on the EIA process, namely work in relation to the preparation of methodologies for inclusion in an EIA Scoping Report. The purpose of the Scoping Report is to determine the extent of issues to be considered in the assessment and reported in the ES, required as part of the DCO application.

Development of Outline EIA Methodology Document

An outline EIA methodology document has been prepared which sets out a broad approach to EIA which can be applied to all of the SROs currently being considered by WfLH. The EIA methodology document will be made bespoke for the Selection Option once determined. The document is currently being quality assured, and a bespoke version for the Preferred Option will be prepared and submitted to relevant regulators and stakeholders for comment after Gate 2. As the preferred consenting route for all SROs is a DCO under the Planning Act 2008, the document has been prepared in line with the Planning Inspectorate (PINS) Guidance Notes, including 3 (EIA Notification), 7 (EIA PEIR, Screening and Scoping), 10 (HRA), 17 (Cumulative Effects Assessment) and 18 (WFD Assessment).

The EIA methodology document establishes approaches to:

- Defining baseline

- Assessment of LSEs;
- Assessment of cumulative and in-combination effects; and
- Approach to determining and assessment mitigation.

Specific assessment methodologies have also been prepared for the following EIA Topics:

- Air Quality and Odour;
- Archaeology and Cultural Heritage;
- Biodiversity;
- Land Quality and Ground Conditions;
- Land Use and Agriculture;
- Landscape and Visual Impact;
- Noise and Vibration;
- Traffic and Transport;
- Water Resources and Flood Risk;
- Benthic and Intertidal Ecology;
- Coastal and Marine Processes;
- Commercial Fisheries;
- Fish and Shellfish Ecology;
- Marine Mammals;
- Marine Water Quality;
- Ornithology;
- Shipping and Navigation;
- Other Marine Users;
- Carbon and Climate Change;
- Human Health;
- Major Accidents and Disasters; and
- Socioeconomics, Tourism and Recreation.

Not all of the above topics may be relevant to all of the recycling SROs, noting that a number of marine EIA topics may be able to be scoped out.

The outline EIA methodology document will provide a framework for the EIA Scoping Report which is due to be submitted shortly after a s35 direction is given for the Preferred Option (see Section 2.6 of this CDR).

Development of Planning Policy Document

Taking a similar approach to the outline EIA methodology document, a planning policy document has also been developed to provide a high-level summary of the key relevant national, regional and local policies relevant to the proposed SROs. The document has been developed at programme level (i.e. covering all SROs) and will be tailored to provide a bespoke planning policy section for the EIA Scoping Report following identification of the Preferred Option.

Environmental Surveys

To support the EIA process and other relevant environmental assessments (e.g. HRA and WFD), a wide range of surveys and primary data collection will be required. To ensure that surveys are identified and scoped appropriately with regulators, a number of survey protocols have been developed, as detailed in Table 22 below.

Table 22 - Water for Life Hampshire – Survey Protocols

Survey Protocol	Included Surveys
Terrestrial Ecology	• Badger • Bats • Amphibians • Riparian mammals • Hazel dormice • Birds
Aquatic Ecology	• Aquatic macroinvertebrates • Fish • White Clawed Crayfish • River habitat and corridor surveys
Marine Environment	• Intertidal habitats and species • Subtidal habitats and species • Fish ecology • Marine and coastal ornithology • Glass eel and Ichthyoplankton • Priority marine habitats • Sediment quality • Seawater quality

The purpose of the protocols is to ensure a consistent, transparent and standardised approach to the environmental survey methodologies used for WfLH SROs and the provision of a robust baseline to inform the relevant application documents. The collected baseline survey data will be used to inform the scheme development process, EIA process and the identification of appropriate mitigation measures.

As ecological surveys are seasonally constrained, priority has been given to developing the ecology protocols in the first instance, however protocols will also be developed for other environmental surveys (e.g. land quality, traffic, historic environment etc) after Gate 2. A number of ecology surveys have already commenced for B.2, B.4 and B.5, including a Preliminary Environmental Appraisal (PEA) for Otterbourne and the proposed WRP location.

The survey protocols for those surveys detailed in Table 22 were issued to the EA, NE and the MMO for comment in June 2021. Following agreement of these survey protocols, SRO specific survey specifications will be developed and updated. Some comments have been received from regulators, which SW is currently taking into consideration.

The purpose of the protocols is to identify and agree:

- Types of survey to be undertaken
- Survey methodologies
- Preferred survey windows / seasonal restrictions
- Further desk studies required to inform the development of project level specifications (see below)

Following agreement of the survey protocols, individual specifications will be developed for the Preferred Option, which will:

- Identify suitable study / survey areas

- Provide detailed survey programmes
- Respond to outcomes of desk studies and consultation
- Detailed survey methodologies

Once the Preferred Option formally enters the DCO process, following a s35 direction being given, SW intends to use the Evidence Plan Process (EPP). The purpose of the EPP, a non-statutory and voluntary process now established as best practice for DCO applications, is to provide greater certainty to all parties on the amount and range of evidence that SW is required to collect to support the application and to help address and agree issues early in the pre-application process. In advance of formally entering into the EPP, SW is seeking to agree the extent and scope of surveys with regulators as they are developed, as outlined above.

2.5.2.3. Marine Conservation Zone Assessment

A MCZA has been completed for B.2. The only potential component related to B.2 that could impact on the marine environment is the alteration to the discharge from the Eastney LSO associated with the reduction in wastewater and inclusion of reject water from the recycling process in the Eastney LSO discharge. Marine Conservation Zones (MCZs) included in the assessment include the Yarmouth to Cowes MCZ, The Needles MCZ and Bembridge MCZ. MCZs outside of the Solent are considered to be sufficiently distant so as not to be within the zone of impact for the SROs, and this is supported by the modelling work completed to date.

Modelling work undertaken to inform SRO option appraisal did not model the maximum flow for B.2 at 61 Ml/d but did model the BAU flow rate of 15 Ml/d, which is anticipated to be required for 320 days in an average year. A maximum flow rate of 75 Ml/d was modelled reflecting the maximum flow for B.5, however this requires wastewater transfer from an additional WTW at PC therefore the modelling results would not be comparable to the maximum flow output for B.2. Given the BAU flow would operate for 320 days a year, these results are considered more reflective of average conditions. The current situation using existing wastewater data was also modelled to allow a comparison between the model outputs.

Modelling for both the 75 Ml/d and 15 Ml/d flows indicates that the excess nitrogen concentrations could potentially decrease but this is limited to the Northern area of the Solent and the harbours Portsmouth and Langstone. Very little change is noted in the MCZs for which the plume extent overlaps (The Needles MCZ and Yarmouth and Cowes MCZ) for both flow scenarios. The plume extent, even for the existing situation, does not overlap with the Bembridge MCZ boundaries. The modelled changes to salinity concentrations are relatively minor and limited to close proximity to the outfall therefore are not considered further in this assessment.

Based on the results of the modelling and specifically the extent of the plume are considered sufficient for the MCZ assessment. No pathway for impact exists for other MCZs that are not in the Solent. Where available, NE’s conservation advice has been considered throughout the assessment.

Screening for the Yarmouth to Cowes Marine Conservation Zone

The screening phase of the assessment of Yarmouth to Cowes MCZ for B.2 is detailed in Table 23. As the MCZs conservation objectives are not required to be considered at this stage, in line with accepted industry approach and MMO (2013) Guidance – Marine Conservation Zones and Marine licencing, a precautionary approach has been adopted for the screening, where information is not certain sites and features have been screened in for further assessment. This applies to all future screening assessments for The Needles and Bembridge MCZ. This approach is in line with recommendations made by NE in response to the Gate 2 MCZA Method Statement.

Table 23 - MCZ assessment screening for the Yarmouth to Cowes MCZ for B.2

MMO screening criteria	Yarmouth to Cowes MCZ
Is the plan or project taking place within or near an area being put forward for, or already designated as, an MCZ?	The Eastney LSO for B.2 is located 17.5 km from the MCZ at its closest point. This is not considered to be near the MCZ.
Is the plan or project capable of affecting (other than insignificantly) either: • The protected features of an MCZ; or • Any ecological or geomorphological process on which the conservation of any protected feature of an MCZ is (wholly or in part) dependant?	Construction and decommissioning – there are no components of construction and decommissioning phases that would occur in the marine environment. Operational phase – there would be alterations to current wastewater flows from BF and a discharge of reject water from the water recycling process required to support this water recycling SRO via the Eastney LSO. Therefore, there is the potential for water quality effects on the MCZ. Furthermore, NE's consultation response identifies that the water recycling Options have some limited potential for beneficial effects, if potential impacts elsewhere can be mitigated, to reduce some of the existing water quality impacts within the Solent Habitat sites and therefore contribute to the "better managing" target. Based on the above, this MCZ is screened into a Stage 1 assessment for B.2 for operational effects only.

Stage 1 Assessment for the Yarmouth to Cowes MCZ

This stage of the MCZA considers the potential impacts of B.2 on Yarmouth to Cowes MCZ, which was screened in. Table 24 details the features of interest, their current conservation objectives and any potential impacts that may arise due to B.2.

Table 24 - Stage 1 Assessment for Yarmouth to Cowes MCZ for B.2

Feature	Conservation objective	Description of the impact of B.2 on the conservation objectives	Adverse impact as a result of the proposed project
Subtidal coarse sediment	Maintain in favourable condition	Modelling output is not available for the 61 Ml/d maximum flow for this SRO. It is however available for the current flow scenarios, the 75 Ml/d maximum flow (associated with SRO B.5) and the BAU flow of 15 Ml/d which is applicable to this SRO. The modelling output indicates a reduction in total nitrogen concentrations from the existing situation for both the 75 Ml/d and the 15 Ml/d flows but this reduction is much smaller for BAU flow. Given that the BAU flow is likely to operate for 320 days in an average year, this is the more representative scenario. All three modelled scenarios however indicate an overlap with this MCZ at similar concentrations. Therefore, it is predicted that there would be minimal change to the water quality from the existing situation in this MCZ resulting from this SRO. As such, impacts on the conservation objectives are not predicted.	No adverse impact on conservation objective predicted
Native oyster (Ostrea edulis)	Recover to favourable condition		
Sheltered muddy gravels			
Subtidal chalk			
Subtidal mixed sediments			
Subtidal mud			

Screening for The Needles MCZ

The screening phase of the MCZ assessment of The Needles MCZ for B.2 for is detailed in Table 25.

Table 25 - Screening for The Needles MCZ for B.2

MMO screening criteria	The Needles MCZ
Is the plan or project taking place within or near an area being put forward for, or already designated as, an MCZ?	The Eastney LSO for B.2 is located 35.5 km from the MCZ at its closest point. Based on this, the SRO is not considered to be near an MCZ.
Is the plan or project capable of affecting (other than insignificantly) either: • The protected features of an MCZ; or • Any ecological or geomorphological process on which the conservation of any protected feature of an MCZ is (wholly or in part) dependant?	Construction and decommissioning – there are no components of construction and decommissioning phases that would occur in the marine environment. Operational phase – there would be alterations to current wastewater flows from BF and a discharge of reject water from the water recycling process required to support this water recycling SRO via the Eastney LSO. Therefore, there is the potential for water quality effects on the MCZ. NE's consultation response identifies that the water recycling options have some limited potential of beneficial effects, if potential impacts elsewhere can be mitigated, to reduce some of the existing water quality impacts within the Solent Habitat sites and therefore contribute to the "better managing" target set out in Defra's 25 Year Environment Plan (NE, 2021). Based on the above, this MCZ is screened into a Stage 1 assessment for B.2 for operational effects only.

Stage 1 Assessment for The Needles MCZ

This stage of the MCZA considers the potential impacts of B.2 on The Needles MCZ, which was screened in. Table 26 details the features of interest, their current conservation objectives and any potential impacts that may arise due to B.2.

Table 26 - Stage 1 Assessment for The Needles MCZ for B.2

Feature	Conservation objective	Description of the impact of SRO B.2 on the conservation objectives	Adverse impact as a result of the proposed project
Moderate energy infralittoral rock	Maintain in favourable condition	NE's Supplementary Advice on Conservation Objectives states that some habitat features have 'recover' objectives because of the direct anthropogenic pressure they are subject to (i.e. direct habitat disturbance). Similarly, some species have 'recover' objectives because of anthropogenic pressures. NE's Advice on Operations for this MCZ have been reviewed and the pressures relevant to discharges are nutrient enrichment, organic enrichment, salinity decrease and salinity increase, of which most of the features are sensitive to. Modelling output is not available for the 61 Ml/d maximum flow for this SRO. It is however available for the 75 Ml/d maximum flow (associated with B.5) and the BAU flow of 15 Ml/d which is applicable to this SRO. The modelling output indicates a reduction in TN concentrations from the existing situation for both the 75 Ml/d and the 15 Ml/d flows but this reduction is much smaller for BAU flow. Given that the BAU flow is likely to operate for 320 days in an average year, this is the more representative scenario. Both modelled scenarios however indicate an overlap, albeit small, with this MCZ at similar concentrations. Therefore, it is predicted that there would be minimal change to the water quality from the existing situation in this MCZ resulting from this SRO. As such, impacts on the conservation objectives are not predicted.	No adverse impact on conservation objective predicted
High energy infralittoral rock			
Moderate energy circalittoral rock			
Stalked jellyfish (Lucernariopsis campanulata)			
Subtidal chalk	Recover to favourable condition		
Subtidal coarse sediment			
Subtidal mixed sediments			
Subtidal sand			
Subtidal mud			
Sheltered muddy gravels			
Seagrass beds			
Peacock's tail (Padina pavonica)			
Native oyster (Ostrea edulis)			

Screening for Bembridge MCZ

The screening phase of the MCZA of Bembridge MCZ for B.2 is detailed in Table 27.

Table 27 - Screening for Bembridge MCZ for B.2

MMO screening criteria	Bembridge MCZ
Is the plan or project taking place within or near an area being put forward for, or already designated as, an MCZ?	The Eastney LSO for B.2 is located near the MCZ, approximately 2.5 km from the MCZ at its closest point.

MMO screening criteria	Bembridge MCZ
Is the plan or project capable of affecting (other than insignificantly) either: • The protected features of an MCZ; or • Any ecological or geomorphological process on which the conservation of any protected feature of an MCZ is (wholly or in part) dependant?	Construction and decommissioning – there are no components of construction and decommissioning phases that would occur in the marine environment. Operational phase – there would be alterations to current wastewater flows from BF and a discharge of reject water from the water recycling process required to support this water recycling SRO. Therefore, there is the potential for water quality effects on the MCZ. NE's consultation response identifies that the water recycling options have some limited potential of beneficial effects, if potential impacts elsewhere can be mitigated, to reduce some of the existing water quality impacts within the Solent Habitat sites and therefore contribute to the "better managing" target of Defra's 25 Year Environment Plan (NE, 2021). Based on the above, this MCZ is screened into a Stage 1 assessment for B.2 for operational effects only.

Stage 1 Assessment for Bembridge MCZ

This stage of the MCZA considers the potential impacts of B.2 on Bembridge MCZ, which was screened in. Table 28 details the features of interest, their current conservation objectives and any potential impacts that may arise due to B.2.

Table 28 - Stage 1 Assessment for Bembridge MCZ for B.2

Feature	Conservation objective	Description of the impact of B.2 on the conservation objectives	Adverse impact as a result of the proposed project
Sheltered muddy gravels	Maintain in favourable condition	Modelling output is not available for the 61 Ml/d maximum flow for this SRO. It is however available for the 75 Ml/d maximum flow (associated with SRO B.5) and the BAU flow of 15 Ml/d which is applicable to this SRO. The modelling output indicates a reduction in TN concentrations from the existing situation for both the 75 Ml/d and the 15 Ml/d flows but this reduction is much smaller for BAU flow. Given that the BAU flow is likely to operate for 320 days in an average year, this is the more representative scenario. More importantly however, whilst reductions in TN concentrations are indicated in the Solent area, these are not predicted to occur within the boundaries of the MCZ therefore there is considered to be no pathway for effect. As such, impacts on the conservation objectives are not predicted.	No adverse impact on conservation objective predicted
Short-snouted seahorse (Hippocampus hippocampus)			No adverse impact on conservation objective predicted
Stalked jellyfish (Calvadosia campanulata)			No adverse impact on conservation objective predicted
Stalked jellyfish (Haliclystus species)			No adverse impact on conservation objective predicted
Subtidal coarse sediment			No adverse impact on conservation objective predicted
Subtidal sand			No adverse impact on conservation objective predicted
Maerl beds	Recover to favourable condition		No adverse impact on conservation objective predicted
Peacock's tail (Padina pavonica)			No adverse impact on conservation objective predicted
Native oyster (Ostrea edulis)			No adverse impact on conservation objective predicted
Sea-pens and burrowing megafauna			No adverse impact on conservation objective predicted
Seagrass beds			No adverse impact on conservation objective predicted
Subtidal mixed sediments			No adverse impact on conservation objective predicted
Subtidal mud			No adverse impact on conservation objective predicted

Conclusions

Yarmouth to Cowes MCZ, The Needles MCZ and Bembridge MCZ were included in this MCZA for SRO B.2, all of which were screened into a Stage 1 assessment due to there being a potential for adverse effects as a result of changes to the wastewater discharge, or waste stream, from the Eastney LSO.

The Stage 1 assessment for each site incorporated the modelling results, which concluded that there is no material overlap of the plume extent into the MCZs. For this reason, it is concluded that the effects associated with B.2 will not result in an adverse impact on the conservation objectives of any of the three MCZs considered.

2.5.2.4. Habitats Regulations Assessment

The principles of HRA have been applied to inform the environmental feasibility and deliverability of each SRO for Gate 2. A statutory HRA is not required for Gate 2, however a project level assessment will be undertaken to support the Preferred Option DCO application.

The purpose of the Gate 2 HRA is to test if the SRO could significantly harm the designated features of a Habitats site (SAC, SPA or Ramsar sites). Impacts on any potential SAC (pSAC) and potential SPA (pSPA) are also considered in the HRA. In addition, effects on compensatory measures that have been proposed for other plans and projects to maintain coherence of the network have also been assessed.

The Gate 2 HRA takes a precautionary approach in order to provide conservative conclusions to inform a robust options appraisal for Gate 2. In accordance with the principles of HRA, where there is uncertainty at this stage it is stated that an Adverse Effect on Integrity (AEoI) cannot be ruled out.

Gate 2 Methodology

Stage 1: Screening

Screening is the process which initially identifies the likely effects upon a Habitats site or Ramsar site, either alone or in-combination with other projects or plans and considers whether there is likely to be a significant effect on the Habitats site or Ramsar site or the interest features of the site. In line with feedback received from NE on the Gate 2 HRA method statement, and in accordance with the 2018 European Court of Justice ruling in the case of People Over Wind, Peter Sweetman v Coillte Teoranta (C-323/17), mitigation has not been taken into account at the HRA screening stage.

For the purposes of the Gate 2 HRA screening, a worst-case scenario approach is used which considers the distance / pathway to the closest component of the SRO infrastructure. Recognising the relative similarity of the two pipeline route options (see Section 0) and the high-level nature of the HRA at this stage, these two routes are assessed together, with the worst-case scenario used where applicable.

The screening follows a two-step process, as set out below.

Stage 1a: Pathway for effect

In line with the Gate 1 HRA Stage 1 Screening Tables (Annex 10.2, Appendix C), a study area using a 10 km buffer, from the closest component of the SRO infrastructure has been used to identify sites for consideration in the Gate 2 HRA Stage 1 screening, as well as consideration of any wider potential effects within 200 m of major roads associated with construction traffic, based on an assumption of access via major roads.

This first stage of screening considers the typical range of the designated features (i.e. whether a static or mobile feature) and potential zone of influence from the components of the SRO based on expert judgement, to determine any pathway for potential effect. Where there is no potential pathway for effect, the Habitats site or Ramsar site can be screened out from further assessment.

Stage 1b: Likely Significant Effect

For Habitats sites and Ramsar sites with a potential pathway for effect, Stage 1b considers the condition and sensitivity of the designated features, conservation objectives and any management measures for each Habitats / Ramsar site to determine the potential for a LSE.

At this stage, consideration is also given to whether in-combination effects could occur and whether they contribute to or result in any additional or greater magnitude of LSE on any Habitats sites or Ramsar sites. Where there is no pathway for effect for the SROs there will be no in-combination effects with other plans and projects. The technical report provides screening of plans and projects with potential to interact with B.2. The projects identified for consideration in the water recycling in-combination assessment for B.2 are detailed in Table 29:

Table 29 - Plans and Projects Screened-in to in-combination assessment

Project Name	Status	Description
AQUIND Interconnector	Awaiting decision	Development of AQUIND Interconnector with a nominal net capacity of 2000 MW between Great Britain and France located off the coast of Portsmouth offshore and between Portsmouth and Lovedean substation onshore.
Portsmouth City Council	Granted	Flood and coastal erosion management scheme comprising a combination of encasing sections of the existing sea wall with enhanced stepped revetment, construction of a new vertical sea wall with stepped revetment, improvements to 2no. existing slipways, removal of 1no. existing slipway, reconstruction and raising of the existing coastal footpath, provision of additional seating and viewing areas, creation of an offshore bird island, and all associated works, compounds, removal of trees and landscaping.
Portsmouth Water Farlington WTW	Granted	Construction of new water treatment building (to accommodate DAF plant).
HTR	Granted	Construction of a new reservoir and associated pipeline to Bedhampton pumping station.

It is important to note that the evidence is required to show, on the basis of objective information, that there will be no LSE on any Habitats sites or Ramsar sites; if the SRO may cause LSE on any Habitats sites or Ramsar sites, or it is not known whether the SRO may cause such LSE, that would trigger the need for an Appropriate Assessment.

Below provides a summary of the HRA two-staged screening process.

Stage 2: High-level Appropriate Assessment

Appropriate Assessment is the consideration of the potential AEoI on the Habitat sites and Ramsar sites screened in during Stage 1, either alone or in-combination with other projects or plans. As noted above, there is no statutory requirement to undertake a HRA at Gate 2, and RAPID will not be making a formal ‘appropriate assessment’ under the Habitats Regulations. This section therefore summarises the high-level information relevant for the purposes of Appropriate Assessment, and reflective of the stage of scheme development of the SROs, based on available information for each SRO. The purpose of this is to determine whether there is objective evidence that AEoI of relevant Habitats site(s) or Ramsar sites to the SROs can be robustly ruled out at this stage, with respect to the site’s conservation objectives and its structure and function. This stage also includes the identification of potential mitigation measures to avoid or reduce any possible effects.

The Preferred Option will then be subject to a full project level HRA in accordance with Advice Note Ten to support the DCO application. As further scheme development and consultation will be required in relation to the Preferred Option after Gate 2, will be carried out, recognising that further effects may be identified in the project level HRA of the Selected Option, that can be identifiable through more detailed environmental impact analysis. However, it is considered that this assessment is appropriate for the stage of scheme development and to inform a robust options appraisal process. The DCO application for the Preferred Option will be supported by a Report to Inform Appropriate Assessment (RIAA), as well as screening and integrity Matrices, in accordance with the requirements of the PINS.

The HRA is informed by the following:

- HRA Stage 1 screening undertaken at Gate 1 (Appendix 10.2 Environmental Assessment, Water Recycling Appendices: Appendix C to the Gate 1 submission);
- Technical Report 3: HRA Consenting Risks – Water Recycling (Ricardo, 2021a);
- Technical Report 5: Air Quality Assessment to inform Site Selection and Mitigation (Ricardo, 2021b);
- Technical Report 6: HRA Consenting Risks: Ornithology and Noise Disturbance (Ricardo, 2021c);
- WFD Compliance Assessment - Considerations for operational phases of the desalination and water recycling Options (Royal HaskoningDHV, 2021a);
- WFD Compliance Assessment;
- INNS Risk Assessment; and
- Technical Report 1: Review of Pipeline Watercourse Crossings (Ricardo 2021d).

In combination Effects

Screening of in-combination effects completed to date related to Option B.2 includes considerations of:

- Developments consented and built but not yet operating;
- Developments consented but not yet constructed (or completed); and
- Developments in the consenting process but no decision made.

Only projects which are reasonably well described and sufficiently advanced to provide information on which to base a meaningful and robust assessment have been included in the in-combination assessment. The in-combination effects assessment takes a precautionary approach in order to provide conservative conclusions to inform a robust options appraisal for Gate 2. In accordance with the principles required of HRA, where there is uncertainty at this stage it is stated that an AEoI cannot be ruled out.

2.5.2.5. HRA Screening Summary WR SROs

Table 30 illustrates the potential effects on Habitats and Ramsar sites as a result of each of the Water Recycling SROs have been identified based on the available information for the required SRO infrastructure and assumptions on the construction methodology as set out in the technical report:

Table 30 - Potential effects

Effect Category	Construction Effects	Operational Effects
Subtidal	• N/A	• Indirect effects – Changes to water quality
Terrestrial	• Direct habitat loss if located within a Habitats site	• Direct long-term habitat loss if located within a Habitats site

Effect Category	Construction Effects	Operational Effects
	• Indirect effects – Temporary disturbance due to noise, vibration, human activity and light – Temporary changes to air quality – Changes to ground water and surface water – Introduction of INNS – Barrier to species migration	• Indirect effects – Disturbance due to noise, vibration, human activity and light – Changes to air quality
Ornithology	• Direct habitat loss if located within a Habitats site • Indirect effects – Temporary disturbance due to noise, vibration, human activity and light – Change in supporting habitat quality due to release in sediment during river crossing construction – Barrier to species migration/movement – Changes to prey resource – Changes to air quality	• Direct habitat loss if located within a Habitats site • Indirect effects – Disturbance due to noise, vibration, human activity and light – Barrier to species migration / movement
Freshwater	• Direct habitat loss if located within a Habitats site • Indirect effects – Temporary disturbance due to noise, vibration and human activity – Changes in water quality – Introduction of INNS – Barrier to species migration	• Connectivity with subtidal effects for migratory species • Changes to water quality due to potential emergency environmental buffer lake overflow

The potential effects outlined above apply to each Water Recycling SRO, however the screening of these effects is considered separately for each SRO. This section, along with sections **Error! Reference source not found.** and summarise the HRA Screening process for B.2, B.4 and B.5, respectively.

Table 31 details a summary of the HRA Screening conclusions for B.2.

Table 31 - Habitat sites and Ramsar sites screened in / out for B.2

Sites	Qualifying Features	Closest distance to SRO	Screening conclusion	Summary
Briddlesford Copse SAC	• Bechstein's bat *Myotis bechsteinii*	18.26 km	No pathway	Briddlesford Copse SAC is located on the Isle of Wight at Wootton Bridge. There are no pathways for an impact to occur based on the supporting habitat buffers for the SAC which indicate that the Bechstein's bat feature of the SAC do not forage this far afield (SW, 2020a) and therefore there is no pathway for LSE upon the bat population or any other supporting habitats associated with the SAC.
Butser Hill SAC	• *Taxus baccata* woods of the British Isles. (Yew-dominated woodland) (priority habitat) • Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco Brometalia*). (Dry grasslands and scrublands on chalk or limestone)	10.21 km	Screened-in	The SRO is sufficiently distant with the urban areas of Waterlooville and Horndean in between, and the SAC does not support groundwater features. As such, no pathway for effect is identified from the SRO infrastructure, other than. However, air quality effects, which are screened in due to the SAC being adjacent to the A3, which could be used for some construction traffic.
Woolmer Forest SAC	• Depressions on peat substrates of the Rhynchosporion • European dry heaths • Natural dystrophic lakes and ponds. (Acid peat-stained lakes and ponds) • Northern Atlantic wet heaths with *Erica tetralix*. (Wet heathland with cross-leaved heath) • Transition mires and quaking bogs. (Very wet mires often identified by an unstable ‘quaking’ surface)	25.21 km	Screened-in	The SRO is sufficiently distant with the urban areas of Waterlooville and Horndean in between and does not support groundwater features. As such, no pathway for effect is identified from the SRO infrastructure, However, air quality effects, which are screened in due to the SAC being adjacent to the A3, which could be used for some construction traffic.
Kingley Vale SAC	• *Taxus baccata* woods of the British Isles. (Yew-dominated woodland) (priority habitat) Semi-natural dry	10.93 km	No pathway	The site is situated 10.93 km to the North East of the proposed pipeline routes. As such, no pathway for effect is

Sites	Qualifying Features	Closest distance to SRO	Screening conclusion	Summary
	grasslands and scrubland facies: on calcareous substrates (*Festuco Brometalia*).			identified from the SRO infrastructure and the SAC is not likely to be affected by construction traffic.
Emer Bog SAC	• Transition mires and quaking bogs	6.42 km	No pathway	Emer Bog SAC is located approximately 6.42 km to the west of Otterbourne WTW, and to the west of the River Itchen and Eastleigh and Chandlers Ford urban areas. At this distance, no impacts from construction will are expected to occur. The proposed pipelines will be sufficiently distant and separated by significant areas of urban development, from the designated site and its associated groundwater and surface water buffer zones (shown in Emer Bog and Baddesley Common Hydrological Desk Study 2017; accessed via the Test Valley Borough Council website) such that there is no pathway for LSE effect. The SAC is not situated within 200 m of any roads likely to be utilised by construction traffic for the works.
Mottisfont Bats SAC	• Barbastelle *Barbastella barbastellus*	14.97 km	No pathway	The works at, and in proximity to Otterbourne WSW are c.15 km from the SAC and outside the 6 km buffer zone identified for the SAC based on foraging and commuting distance of the bats (BCT, 2020). Therefore, there is no pathway for effect.
River Itchen SAC	• Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation. (Rivers with floating vegetation often dominated by water-crowfoot) • Atlantic salmon *Salmo salar* • Brook lamprey *Lampetra planeri* • Bullhead *Cottus gobio* • Otter *Lutra lutra* • Southern damselfly *Coenagrion mercurial*	0 km	Screened-in	Construction of the transfer pipeline from WRP to Otterbourne EBL Route 1 and 2 has the potential to impact water quality and habitats as a result of water crossings, overflow from EBL, construction traffic, mobilisation of sediments from haul roads, open-cut excavations, pumping operations, and potential washout events. The following effects are screened in: • Habitat loss • Temporary disturbance due to noise, vibration and human activity • Changes to river water quality

Sites	Qualifying Features	Closest distance to SRO	Screening conclusion	Summary
	• White-clawed (or Atlantic stream) crayfish *Austropotamobius pallipes*			• Fish entrainment and impingement • Barrier to species migration • Introduction of INNS Air quality modelling provided in Technical Report 5, states that typical NRMM (Non-Road Mobile Machinery) or MCPD (Medium Combustion Plant Directive) plant associated with River Itchen pipeline tunnelling does not cause an exceedance of ecological air quality thresholds. The assessment demonstrates that typical NRMM or MCPD plant is unlikely to cause an exceedance of threshold levels at nearby sensitive ecological receptors and therefore there will be no effect on this Habitats site from the use of such plant.
River Meon Compensatory SAC Habitat	• Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation. (Rivers with floating vegetation often dominated by water-crowfoot) • Atlantic salmon *Salmo salar*	0 km	Screened-in	While the River Meon is not a designated site, it is proposed for the development of compensatory measures for adverse effects on the integrity of Atlantic salmon from other schemes (e.g. the Lower Itchen Sources Drought Order). In order to maintain the effectiveness of the River Meon compensatory measures in maintaining the overall coherence of the habitats site network, it is important to assess the effects on Atlantic salmon using the river. The pipeline routes are required to cross the river and as such, the following effects are screened in: • Habitat loss • Temporary disturbance due to noise, vibration and human activity • Changes in river water quality • Barrier to species migration • Introduction of INSS

Sites	Qualifying Features	Closest distance to SRO	Screening conclusion	Summary
				The discharge for water recycling is c.16 km from the mouth of the compensatory SAC habitat and therefore there is no pathway for the localised effect of discharge on subtidal water quality to interact with the River Meon.
River Test Compensatory SAC Habitat	• Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation. (Rivers with floating vegetation often dominated by water-crowfoot) • Southern damselfly *Coenagrion mercurial*	13.5 km	No pathway	The River Test is c.13.5 km from the onshore works for the SRO, separated by major roads, railway and housing. As a result, there is no pathway for effect on the compensatory habitat for damselfly and Type III chalk river within the River Test.
Singleton and Cocking Tunnels SAC	• Barbastelle *Barbastella barbastellus* • Bechstein's bat *Myotis bechsteinii*	18.75 km	No pathway	The works and pipeline routes are 18.75 km from the SAC; however a potential pathway for effect was identified in relation to permanent removal (WRP) or temporarily removal (pipelines) of foraging habitat, and cause fragmentation whilst vegetation re-establishes. The SACO references the South Downs National Park & NE (2015) Sussex Bat Special Area of Conservation Planning and Landscape Scale Enhancement Protocol which has identified key flight lines and foraging areas for the bat species. The SACO also notes that “The land within the West Weald which encompasses Ebernoe Common SAC; The Mens SAC and Singleton & Cocking Tunnels SAC should be regarded as a single landscape utilised by bats from all three SACs.” In addition to the connected SAC, several other areas support important numbers; Petworth Park -Bechstein’s bats use trees within the park as maternity roosts, Slindon - barbastelle bats use this woodland as a maternity roost and woodland north of Chichester -also a maternity roost for barbastelle bats. The following impact zones are recommended around the SAC:

Sites	Qualifying Features	Closest distance to SRO	Screening conclusion	Summary
				• 6.5 km Key conservation area –all impacts assessed • 12 km Wider conservation area –significant impacts or severance to flight lines to be considered The proposed works are c.3 km outside the wider conservation area, and the pipelines have been routed to avoid removal of ancient woodland and woodland priority habitat where possible. In addition, the presence of the major A3(M) road network is likely to hinder movement from East to West. A Core Sustenance Zone (CSZ) (BCT, 2020), as applied to bats, refers to the area surrounding a communal bat roost within which habitat availability and quality will have a significant influence on the resilience and conservation status of the colony using the roost. CSZ for Bechstein's bat are 3 km and for Barbastelle are 6 km, there will be no overlap between the CSZ for either species and the wider conservation area and therefore no indirect impact to either of the qualifying species.
Solent and Isle of Wight Lagoons SAC	• Coastal lagoons (Priority feature)	2.21 km	Screened-in	The WRP is located 2.21 km from the SAC therefore a potential pathway is identified. The following effects on the coastal lagoon habitat are screened in: • Changes to water quality • In-combination effects
Solent Maritime SAC	• Annual vegetation of drift lines • Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) • Coastal lagoons* • Spartina swards (*Spartinion maritimae*). (Cord-grass swards) • Estuaries	5 km	Screened-in	The WRP is located 5 km from the SAC and the pipeline would be required to cross the River Hamble which runs into the SAC therefore a potential pathway is identified. The following effects are screened in: • Temporary changes to water quality • Introduction of INNS • In-combination effects

Sites	Qualifying Features	Closest distance to SRO	Screening conclusion	Summary
	• Mudflats and sandflats not covered by seawater at low tide. (Intertidal mudflats and sandflats) • Perennial vegetation of stony banks. (Coastal shingle vegetation outside the reach of waves) • Salicornia and other annuals colonising mud and sand. (Glasswort and other annuals colonising mud and sand) • Sandbanks which are slightly covered by sea water all the time. (Subtidal sandbanks) • Shifting dunes along the shoreline with Ammophila arenaria (white dunes). (Shifting dunes with marram) • Desmoulin's whorl snail Vertigo moulinsiana			
Solent and Dorset Coast SPA	• Mediterranean gull Larus melanocephalus • Sandwich tern Sterna sandvicensis • Common tern Sterna hirundo • Little tern Sternula albifrons • Roseate tern Sterna dougalli • Dark-bellied brent geese Branta bernicla bernicla • Teal Anas crecca • Ringed plover Charadrius hiaticula • Black-tailed godwit Limosa limosa	2 km	Screened-in	The SRO is located c.2 km from the SPA; therefore a potential effect is identified. The following effects are screened in: • Temporary disturbance due to noise, vibration, human activity and light • Barrier effects • Changes to air quality • Changes to water quality • Changes to prey availability • In-combination effects The LSO extends into the SPA; however no LSE is identified as a result of connectivity with subtidal water quality changes. The WFD Compliance Assessment shows that a

Sites	Qualifying Features	Closest distance to SRO	Screening conclusion	Summary
				relatively minor beneficial effect is predicted as a result of the water recycling and wastewater discharged, reducing the extent of impact in relation to subtidal water quality overall, compared with the existing discharges.
Chichester and Langstone Harbours SPA & Ramsar	• Bar-tailed godwit Limosa lapponica • Common tern Sterna hirundo • Curlew Numenius arquata • Dark-bellied brent goose Branta bernicla • Dunlin Calidris alpina alpina • Grey plover Pluvialis squatarola • Little tern Sternula albifrons • Pintail Anas acuta • Red-breasted merganser Mergus serrator • Redshank Tringa totanus • Ringed plover Charadrius hiaticula • Sanderling Calidris alba • Sandwich tern Thalasseus sandvicensis • Shelduck Tadorna tadorna • Shoveler Spatula clypeata • Teal Anas crecca • Turnstone Arenaria interpres • Waterbird assemblage • Wigeon Mareca Penelope	0.5 km	Screened-in	The SRO is located close to the SPA / Ramsar; therefore a potential effect is identified. The following effects are screened in: • Temporary disturbance due to noise, vibration, human activity and light • Barrier effects • Temporary changes to water quality • Changes to prey resource • In-combination No LSE is identified as a result of connectivity with subtidal water quality changes. The WFD Compliance Assessment shows that a relative minor beneficial effect is predicted as a result of the water recycling and wastewater discharged, reducing the extent of impact in relation to subtidal water quality overall, compared with the existing discharges.

Sites	Qualifying Features	Closest distance to SRO	Screening conclusion	Summary
	The site is designated as a Ramsar site under: • Criterion 1 – Estuarine habitats • Criterion 5 – Assemblages of international importance • Criterion 6 – species / populations occurring at levels of international importance including those listed above and black-tailed godwit Limosa lapponica (1.1% of the European / Northwest Africa population)			
Portsmouth Harbour SPA and Ramsar	• Black-tailed godwit, Limosa limosa islandica • Dark-bellied Brent goose, Branta bernicla bernicla • Dunlin, Calidris alpina alpina • Red-breasted merganser, Mergus serrator The site qualifies as a Ramsar under the following Criteria: • Criterion 3. Presence of intertidal mudflat, saltmarsh and saline lagoons hosting nationally important species. • Criterion 6 – species / populations occurring at levels of international importance. Qualifying Species / populations (as identified at designation): Species with peak counts in winter: Dark-bellied brent goose, Branta bernicla bernicla,	2.2 km	No pathway	No pathway is identified as a result of effects on these features or their supporting habitat due to the distance between the SRO and SPA / Ramsar. There is unlikely to be disturbance from noise or visual impact at over 2 km. Whilst the behavioural responses of waterbirds to both visual and aural stimuli during to the construction of flood defences on the Humber Estuary and in Cardiff Bay differ depending on the type and nature of construction activity, species, season, site topography, weather, tidal state and degree of habituation studies (Burton et al., (2002), indicate that in general effects are confined to areas within 250m of the sources of disturbance during construction. No pathway for effect is identified as a result of connectivity with subtidal water quality changes. The discharge for water recycling is c.6 km from the SPA and Ramsar and therefore there is no pathway for the localised effect of discharge on subtidal water quality to interact with the SPA and Ramsar.

Sites	Qualifying Features	Closest distance to SRO	Screening conclusion	Summary
	2105 individuals, representing an average of 2.1% of the GB population (5-year peak mean 1998/9-2002/3)			
Solent and Southampton Water SPA and Ramsar	• Black-tailed godwit (Limosa limosa islandica) • Common tern (Sterna hirundo) • Dark-bellied brent goose (Branta bernicla bernicla) • Little tern (Sternula albifrons) • Mediterranean gull (Ichthyaetus melanocephalus) • Ringed plover (Charadrius hiaticula) • Roseate tern (Sterna dougallii) • Sandwich tern (Thalasseus sandvicensis) • Teal (Anas crecca) • Waterbird assemblage The site qualifies as a Ramsar under the following Criteria: • Criterion 1 – wetland habitats: saline lagoons, saltmarshes, estuaries, intertidal flats, shallow coastal waters, grazing marshes, reedbeds, coastal woodland and rocky boulder reefs. • Criterion 2 – The site supports an important assemblage of rare plants and invertebrates. • Criterion 5 – Assemblages of international importance: Species with peak counts in winter: 51343	3 km	No pathway	No pathway is identified as a result of effects on these features or their supporting habitat due to the distance between the SRO and SPA / Ramsar. There is unlikely to be disturbance from noise or visual impact at over 2 km. Whilst the behavioural responses of waterbirds to both visual and aural stimuli during to the construction of flood defences on the Humber Estuary and in Cardiff Bay differ depending on the type and nature of construction activity, species, season, site topography, weather, tidal state and degree of habituation studies (Burton et al., (2002), indicate that in general effects are confined to areas within 250 m of the sources of disturbance during construction. No pathway for effect is identified as a result of connectivity with subtidal water quality changes. The discharge for water recycling is c.4 km from the SPA and Ramsar and therefore there is no pathway for the localised effect of discharge on subtidal water quality to interact with the SPA and Ramsar.

Sites	Qualifying Features	Closest distance to SRO	Screening conclusion	Summary
	waterfowl (5-year peak mean 1998/99-2002/2003) • Criterion 6 – species / populations occurring at levels of international importance (same species as listed under the SPA).			

High-level Appropriate Assessment

Butser Hill SAC

Temporary changes to air quality

The SAC is adjacent to the A3, which could be used for some construction traffic accessing the construction site south of Havant, and the some of the construction areas for the pipeline routes. However, final pipeline routes and construction traffic routes are not yet confirmed, so detailed analysis considering temporary changes in air quality during construction are yet to be assessed at this stage.

The typically applied threshold for construction vehicle movements is unlikely to be exceeded (threshold of 1000 AADT or 200 HGV movements per day). However, this will be verified in the project level HRA, once construction routes and vehicle movements are known, and therefore it is not considered possible to rule out an AEoI at this stage.

In-combination

The following projects are screened in as having potential to interact with the receptors of relevance to this SAC:

- Aquind Interconnector;
- Portsmouth coastal defence;
- PW Farlington WTW; and
- HTR.

None of the HRAs for these projects identify this SAC as being within the study area for the HRA Screening (i.e., there will be no pathway for effect) and therefore there will be no in-combination effect on the SAC between these projects and the B.2 SRO.

Potential mitigation

The following mitigation measures may be required to ensure there will be no AEoI on the SAC:

- Construction Traffic Management Plan (CTMP) drafted with measures to limit HGV movements and therefore potential emissions; and
- Enforcing of a ‘no idling’ rule for construction traffic, ensuring all vehicles turn off engines when stationary.

Woolmer Forest SAC

Temporary changes to air quality

The SAC is adjacent to the A3, which could be used for some construction traffic accessing the construction site south of Havant, and the some of the construction areas for the pipeline routes. However, final pipeline routes and construction traffic routes are not yet confirmed, so detailed analysis considering temporary changes in air quality during construction are yet to be assessed at this stage.

The typically applied threshold for construction vehicle movements is unlikely to be exceeded (threshold of 1000 AADT or 200 HGV movements per day). However, this will be verified in the project level HRA, once construction routes and vehicle movements are known and therefore it is not considered possible to rule out an AEoI at this stage.

In-combination

The following projects are screened in as having potential to interact with the receptors of relevance to this SAC:

- Aquind Interconnector;
- Portsmouth coastal defence;
- PW Farlington WTW; and
- HTR.

None of the HRAs for these projects identify this SAC as being within the study area for the HRA Screening (i.e., there will be no pathway for effect) and therefore there will be no in-combination effect on the SAC between these projects and the B.2 SRO.

Potential mitigation

The following mitigation measures may be required to ensure there will be no AEoI on the SAC:

- CTMP drafted with measures to limit HGV movements and therefore potential emissions; and
- Enforcing of a ‘no idling’ rule for construction traffic, ensuring all vehicles turn off engines when stationary.

River Itchen SAC

Habitat loss

To avoid any non-temporary direct impacts on larger or particularly sensitive watercourses (e.g. sensitive main rivers and ordinary watercourses, and any watercourses that may be too wide or deep to cross using conventional alternatives), river crossings will be undertaken with directional drilling / trenchless crossings, therefore it is highly unlikely there would be an AEoI of the SAC, including the restoration targets, detailed in the Supplementary advice on conserving and restoring site features, as a result of the river crossings.

Temporary disturbance due to noise, vibration and human activity

Works at Otterbourne, including the EBL, pipelines, washwater recovery area and ceramic membrane are located c.150 m to the east of the River Itchen SAC (on the other side of the railway line). Noise, vibration and human activity during construction have the potential to disturb features of the SAC, including otter and southern damselfly.

The potential for adverse effects on the integrity of these features would be subject to the presence of these species and supporting habitat within the potential zone of effect of the construction works and therefore cannot be ruled out at this stage. The project HRA for the Preferred Option will be informed by an Extended Phase 1 Habitat survey, followed by species-specific Phase 2 surveys as recommended by the Extended Phase 1 Habitat survey.

Changes in water quality

There is the potential for construction of the required infrastructure at Otterbourne WSW to impact upon water quality elements of the River Itchen SAC. This could principally occur from the mobilisation of sediment caused by construction traffic, ground clearance and any required excavations. Accidental spillage of contaminants or oils, lubricants and fuels from construction machinery is also a potential risk.

The proposed site for the EBL is within 100 m of the Otter Bourne. This watercourse flows directly into the River Itchen SAC. In addition, the pipeline is required to cross the Itchen and adjoining Rosemary leet and Kingfisher Stream. As such, there is a clear pathway for impact from any sediments and contaminants that may be released from construction. Increased fine sediment in the water body could smother bed habitats, reducing light penetration and dissolved oxygen. Changes to physico-chemistry could also lead to loss or modification of in-channel and riparian habitats and as a result an AEoI cannot be ruled out at this stage.

The WFD Compliance Assessment shows there is the potential for some impacts to groundwater flow to the River Itchen, although it is expected that the upstream flow contribution to the river around the crossing will lead to small scale, localised impacts only.

Any operational activities such as periodic maintenance of marginal planting, debris clearance and silt removal from the EBL would also have the potential to affect water quality in the River Itchen SAC.

During operation, there will be a requirement to allow emergency discharge (overflow or drawdown) from the lake under the Reservoirs Act 1975, although highly unlikely to be required. There are two potential discharge routes for this operational activity. Option 1 involves overflow and drawdown discharge to the Otter Bourne (a tributary of the River Itchen) and under option 2 overflow and drawdown to ground via a discharge to priority floodplain and coastal grazing marsh to the south of the proposed EBL.

Option 1 has potential to impact upon the water quality of the River Itchen SAC, however it is considered that the concentration of contaminants (nutrients, heavy metals, or other anthropogenic compounds) would be at the same or at lower levels than are currently measured in the River Itchen. A proposed pumping station as part of the EBL infrastructure will monitor water quality and ensure raw water from the EBL is suitable for discharge into the SAC.

During emergency overflow, there is potential for impact on hydromorphology of the Itchen because of increased flow rate and volume to the Otter Bourne. This has potential to alter the quantity and dynamics of flow, the structure and substrate of the riverbed and width and depth of the channel. To prevent such adverse impacts, the proposed energy dissipation structure would reduce the rate of flow to the river during emergency discharge. The discharge structure on the Otter Bourne will be designed to reduce rates of scour. With appropriate designs, any impacts from increased flow are likely to be localised and temporary in nature.

Furthermore, the installation of channel erosion protection will reduce potential for any significant changes in reach scale erosion and deposition processes of the Otter Bourne and the Itchen. Erosion protection will be tied into the existing bank to prevent any morphological instability upstream and downstream.

If option 2 is preferred, the presence of the proposed energy dissipation structure and discharge to floodplain and coastal grazing marsh, would significantly reduce any input of raw water to the River Itchen SAC and is unlikely to cause an AEoI, although AEoI for option 1 cannot be ruled out at this stage.

Fish entrainment and impingement

Intake of water from the River Itchen to establish and maintain the EBL has potential to cause impingement and entrainment of Atlantic salmon and their prey species. The intake is likely to use existing infrastructure and should reduce the overall likelihood of intake issues compared with current extraction, however there is insufficient information to rule out an AEoI at this stage.

Barrier to species migration

Changes to river water quality has the potential to deter upstream migration of Atlantic salmon. This has potential to affect spawning. The conservation status of salmon in the River Itchen SAC is currently ‘inadequate’ and therefore an AEoI of this feature cannot be ruled out at this stage.

The levels of subtidal water quality changes are not predicted to represent a barrier to migration of Atlantic salmon at the LSO location. The WFD Compliance Assessment shows the effect of the future scenario where water is recycled and wastewater discharged is to reduce the extent of impact overall, compared with the existing discharges.

Introduction of INNS

The movement of personnel and plant has the potential to spread INNS. This could include the transfer of new INNS into the SAC or increasing the spread of existing INNS within the River Itchen SAC.

The River Itchen SSSI Channel Unit Condition Assessment (UCL, 2014) reports that the extent of invasive plant species along the River Itchen is relatively limited, noting that there has been ongoing management to control known INNS such as Japanese knotweed and Himalayan balsam. However, UCL (2014) states INNS were recorded at most sites, in low abundance. The main riparian plants observed include Orange balsam Impatiens capensis and Monkey flower Mimulus guttatus. Himalayan balsam was observed at the downstream end of the river. An AEoI cannot be ruled out at this stage and the project HRA for the Preferred Option will be informed by an Extended Phase 1 Habitat Survey which would include the identification of INNS.

In-combination

The Aquind interconnector HRA identifies LSE for indirect effects on Atlantic salmon due to changes in water quality due to suspended sediments and potential pollution, concluding no adverse effect on the integrity of the SAC.

The Fawley Waterside HRA identifies LSE for disturbance to migratory fish in relation to the River Itchen SAC.

As B.2 has potential to cause effects on Atlantic salmon, an in-combination adverse effect with the Aquind interconnector and cannot be ruled out at this stage.

The Portsmouth coastal defence, PW Farlington WTW and HTR HRAs do not identify this SAC as being within the study area for the HRA Screening for these projects (i.e., there will be no pathway for effect) and therefore there will be no in-combination effect with B.2 on this SAC.

Potential mitigation

Table 32 - Potential mitigation in the River Itchen SAC

Effect	Potential mitigation requirements
Habitat loss	• Horizontal Directional Drilling (HDD) / trenchless crossing
Temporary disturbance	• Application of appropriate buffer zones around protected habitats • Use of noise dampening features such as mufflers and acoustic barriers • Construction lighting only operational when required and positioned and directed to avoid sensitive ecological receptors
Changes to water quality	• Best practice construction methods may comprise of: – Bunding and appropriate storage of sediment; – Onsite treatment / polishing of silted water; – Use of sediment traps; – Regular cleaning of haul roads prevent runoff of construction waste dirt; – Appropriate storage and application of both hazardous and non-hazardous waste and chemicals (i.e. diesel); and, – Application of onsite mitigation measures such as spill kits and barrier booms
Barrier to movement	• As per water quality
Introduction of INNS	• Best practice biosecurity measures to ensure clothing, boots and machinery are free from propagules to avoid the spread of INNS

River Meon Compensatory SAC Habitat

Habitat loss

To avoid any non-temporary direct impacts on larger or particularly sensitive watercourses (e.g. sensitive main rivers and ordinary watercourses, and any watercourses that may be too wide or deep to cross using conventional alternatives), river crossings will be undertaken with directional drilling / trenchless crossings, therefore there are not expected to be any AEoI in relation to permanent habitat loss.

Temporary disturbance due to noise, vibration and human activity.

The crossing works could result in disturbance to Atlantic salmon and changes to water quality which could limit the effective development of the compensatory habitat and therefore an AEoI cannot be ruled out at this stage.

Changes in water quality

There is potential for pipeline construction activities to impact upon the ecological and chemical quality elements of the river. Damage to the river banks and floodplain from construction traffic, fine sediment input into the watercourse from crossing activity, and accidental pollution from onsite chemicals used in construction could lead to a deterioration in the water quality, therefore an AEoI of the compensatory habitat cannot be ruled out at this stage.

Barrier to species migration

Changes to river water quality has the potential to deter upstream migration of Atlantic salmon. This has potential to affect spawning and therefore the effective establishment of the River Meon as compensatory habitat, therefore an AEoI cannot be ruled out at this stage.

The levels of subtidal water quality changes are not predicted to represent a barrier to migration of Atlantic salmon at the LSO location. As discussed above, the WFD Compliance Assessment shows the effect of the future scenario where water is recycled and wastewater discharged is to reduce the extent of impact in relation to subtidal water quality changes overall, compared with the existing discharges.

Introduction of INNS

The movement of personnel and plant has the potential to spread INNS. This could include the transfer of new INNS into the River Meon or increasing the spread of existing INNS within the River Meon. The spread of INNS would have potential to undermine the objectives of the compensatory habitat and therefore an adverse effect on integrity cannot be ruled out at this stage. The project HRA for the Preferred Option would be informed by an Extended Phase 1 Habitat Survey which would include the identification of INNS.

In-combination

The following projects are screened in as having potential to interact with the receptors of relevance to this compensatory habitat:

- Aquind Interconnector;
- Portsmouth coastal defence;
- PW Farlington WTW;
- HTR; and
- Fawley Waterside.

The HRAs for these projects do not identify this compensatory SAC habitat, however as this is not a formally designated site at this stage, there is potential that it has not been considered. Therefore, there is insufficient information to assess the in-combination effects on this compensatory habitat at this stage.

The project level HRA for the Preferred Option will consider and assess this, should sufficient information become available for these projects in relation to the compensatory habitat and potential for in-combination effects along with B.2.

Potential mitigation

Table 33 - Potential mitigation in the River Meon Compensatory Habitat

Effect	Potential mitigation requirements
Habitat loss	• HDD / trenchless crossing
Temporary disturbance	• Application of appropriate buffer zones around protected habitats • Use of noise dampening features such as mufflers and acoustic barriers • Construction lighting only operational when required and positioned and directed to avoid sensitive ecological receptors
Changes to water quality	• Best practice construction methods may comprise of: – Bunding and appropriate storage of sediment; – Onsite treatment / polishing of silted water; – Use of sediment traps; – Regular cleaning of haul roads prevent runoff of construction waste dirt; – Appropriate storage and application of both hazardous and non-hazardous waste and chemicals (i.e. diesel); and, – Application of onsite mitigation measures such as spill kits and barrier booms
Barrier to movement	• As per water quality
Introduction of INNS	• Best practice biosecurity measures to ensure clothing, boots and machinery are free from propagules to avoid the spread of INNS

Solent and Isle of Wight Lagoons SAC

Changes in water quality

Construction of the pipeline from BF crosses a tributary in proximity to the lagoon at Farlington Marshes. Farlington Marshes is part of the Solent and Isle of Wight Lagoons SAC and comprises the Shut Lake waterbody. Potential run-off of sediment and contaminants has potential to cause changes to water quality within the SAC. There is currently insufficient information to rule out an AEoI at this stage.

In-combination

The following projects are screened in as having potential to interact with receptors of relevance to this SAC:

- Aquind Interconnector;
- Portsmouth coastal defence;
- Portsmouth Water Farlington Water Treatment Works; and
- Havant Thicket reservoir.

Aquind Interconnector HRA (available on the PINS website) concludes that there is no connectivity between the zone of influence of the interconnector and the Solent and Isle of Wight Lagoons SAC and therefore there will be no in-combination effect with this project and B.2 on this SAC.

The Portsmouth coastal management scheme, HTR, Farlington WTW and Fawley Waterside HRAs do not identify this SAC as being within the study area for the HRA Screening for these projects (i.e., there will be no pathway for effect) and therefore there will be no in-combination effect with these projects on this SAC.

Potential mitigation

Table 34 - Potential mitigation in the Solent and Isle of Wight Lagoons SAC

Effect	Potential mitigation requirements
Changes to water quality	• Best practice construction methods may comprise of: – Bunding and appropriate storage of sediment; – Onsite treatment / polishing of silted water; – Use of sediment traps; – Regular cleaning of haul roads prevent runoff of construction waste dirt; – Appropriate storage and application of both hazardous and non-hazardous waste and chemicals (i.e. diesel); and, – Application of onsite mitigation measures such as spill kits and barrier booms

Solent Maritime SAC

Changes to water quality

The pipeline requires crossing of the watercourses (Brockhampton and River Hamble) that flows into the SAC. Construction could result in potential sedimentation and accidental pollution into the watercourses and ultimately the SAC. There is currently insufficient information to rule out an AEoI at this stage.

Introduction of INNS

The movement of personnel and plant and potential run-off into the SAC has the potential to transfer of new INNS into the Solent SAC. Best practice mitigation is expected to avoid any AEoI of the SAC as a result of INNS.

In-combination

The Aquind interconnector HRA identifies LSE for increased suspended sediment and deposition (smothering), concluding no AEoI of the SAC. In addition, the HTR identifies LSE on the receptors of the SAC due to run-off, concluding no AEoI. As the onshore construction of the pipelines associated with the WRP have potential to cause run-off into the SAC, an in-combination AEoI with these projects cannot be ruled out at this stage.

The Fawley Waterside HRA identifies LSE for disturbance to migratory fish, changes to coastal habitat, intertidal habitat and water quality. As the construction of B.2 has potential to cause changes to water quality through run-off into watercourses flowing into the SAC, an in-combination AEoI cannot be ruled out at this stage.

The Portsmouth coastal management scheme HRA screened out this SAC due to no pathway for effect, therefore there will be no in-combination AEoI with this project on the Solent Maritime SAC.

Farlington WTW and HTR HRAs do not identify this SAC as being within the study area for the HRA Screening for this project (i.e., there will be no pathway for effect) and therefore there will be no in-combination AEoI with these projects on the Solent Maritime SAC.

Potential mitigation

Table 35 - Potential mitigation in the Solent Maritime SAC

Effect	Potential mitigation requirements
Changes to water quality	• Best practice construction methods may comprise of: – Bunding and appropriate storage of sediment; – Onsite treatment / polishing of silted water; – Use of sediment traps; – Regular cleaning of haul roads prevent runoff of construction waste dirt; – Appropriate storage and application of both hazardous and non-hazardous waste and chemicals (i.e. diesel); and, – Application of onsite mitigation measures such as spill kits and barrier booms
Introduction of INNS	• Best practice biosecurity measures to ensure clothing, boots and machinery are free from propagules to avoid the spread of INNS

Solent and Dorset Coast SPA

Disturbance

Common tern, little tern and sandwich tern breed on the RSPB islands within the harbour, the closest to the WRP site being North Binness and Long Island. Further South are Baker’s Island, South Binness Island and Round Nap Island. The Technical Report (Noise assessment) identifies a 3 dB noise increase to breeding tern during construction activities. This would result in an AEoI of the site.

In the absence of survey data, it has been assumed that tern could be foraging within 500 m of construction. All terns are highly sensitive to visual disturbance with low resistance and resilience to disturbance, therefore the potential for an AEoI of the site from visual disturbance of terns cannot be ruled out at this stage.

Barrier effects

Given the relatively localised effects described above, it is unlikely that this would result in barrier effects and therefore there is not expected to be an AEoI for this effect.

Changes to air quality

Construction plant and traffic around Farlington has potential to increase emissions in proximity to the SPA and Ramsar. Any changes will be highly localised in the context of the wider SPA, therefore there is not expected to be an AEoI for this effect.

Changes to water quality

The pipeline construction has potential to interact with watercourses that discharge to Langstone Harbour, which is a component of the SPA. Construction could result in potential sedimentation and accidental pollution into streams feeding the SPA. There is currently insufficient information to rule out an AEoI at this stage.

Changes to prey availability

Changes to water quality has the potential to affect prey resource for the features of the SPA. There is currently insufficient information to rule out an AEoI at this stage.

In-combination

The Aquind interconnector HRA identifies LSE for disturbance, and changes in water quality and prey resource, concluding no AEoI of the SPA.

In addition, the HTR identifies LSE on the receptors of the SPA due to run-off, concluding no AEoI.

As the onshore construction of the pipelines associated with the WRP have potential to cause disturbance effects and run-off into the SPA, an in-combination AEoI cannot be ruled out at this stage.

The Portsmouth coastal management scheme HRA screens out an LSE based on the small scale of potential effects; however consideration will be given in the project level HRA for the Preferred Option as to whether these small effects could interact to provide an AEoI when combined with the SRO.

Farlington WTW and Fawley Waterside HRAs do not identify this SPA as being within the study area for the HRA Screening for these projects (i.e., there will be no pathway for effect) and therefore there will be no in-combination effect with these projects on the Solent and Dorset Coast SPA.

Potential mitigation

Table 36 - Potential mitigation in the Solent and Dorset Coast SPA and Ramsar

Effect	Potential mitigation requirements
Disturbance	• Seasonal restrictions on certain construction activities may be required to ensure disturbance effects do not result in an adverse effect on site integrity
Changes to water quality	• Best practice construction methods may comprise of: – Bunding and appropriate storage of sediment; – Onsite treatment / polishing of silted water; – Use of sediment traps; – Regular cleaning of haul roads prevent runoff of construction waste dirt; – Appropriate storage and application of both hazardous and non-hazardous waste and chemicals (i.e. diesel); and, – Application of onsite mitigation measures such as spill kits and barrier booms
Changes to prey resource	• As per water quality

Chichester and Langstone Harbours SPA & Ramsar

Temporary disturbance due to noise, vibration, human activity and light

A worst-case assessment of noise impact within Chichester and Langstone Harbours SPA & Ramsar have been completed It concludes that, assuming a flight response could occur above 55dB, during piling works at LAmax, an area of approximately 85.5 ha within the North East of Langstone Harbour would be within this contour. The Northern part of Langstone Harbour is characterised by mudflat habitat and therefore, disturbance at low tide could result in an AEoI of the site.

The presence of people and construction activities also have the potential to affect the qualifying species and flight responses could have an AEoI of the site.

Barrier effects

Given the relatively localised effects described above, it is unlikely that this would result in barrier effects and therefore there is not expected to be an AEoI for this effect.

Temporary changes to water quality

The pipeline from BF to the WRP requires crossing of the Brockhampton Mill lake that flows into the SPA. Construction could result in potential sedimentation and accidental pollution into the watercourse and ultimately the SPA. There is currently insufficient information to rule out an AEoI at this stage from onshore works.

The WFD Compliance Assessment shows the effect of the future scenario under the water recycling SRO is to reduce the extent of impact in relation to subtidal water quality changes overall, compared with the existing discharges and therefore no AEoI is predicted as a result of subtidal discharges.

Changes to prey resource

Prey resources could potentially be affected by both:

- Deoxygenation from an increase in area and density of algal blooms smothering the sediment (sandbank qualifying feature) leading to changes in the invertebrate and macrophyte assemblages, and a resulting effect on the prey availability for foraging terns; and
- Changes in salinity resulting in a change in availability or composition of prey species for birds.

Analysis completed concludes that as coastal waters and estuaries have a more variable salinity than the offshore environment due to the greater influence of freshwater input in coastal regions, it would be unlikely that changes in salinity offshore would be persistent or major enough to affect food availability for qualifying bird features. Therefore, there is not expected to be an AEoI for this effect.

In-combination

The Aquind interconnector HRA identifies LSE for disturbance, and changes in water quality and prey resource, concluding no AEoI of the SPA. As the onshore construction of the pipelines associated with the WRP have potential to cause disturbance effects and run-off into the SPA, an in-combination AEoI cannot be ruled out at this stage.

The Portsmouth coastal management scheme and HTR HRAs identify LSE on the receptors of the SPA and Ramsar, concluding no AEoI. As the SRO has potential to cause disturbance, an in-combination AEoI cannot be ruled out at this stage.

Farlington WTW and Fawley Waterside HRAs do not identify this SPA and Ramsar as being within the study area for the HRA Screening for these projects (i.e., there will be no pathway for effect) and therefore there will be no in-combination effect with these projects on the Chichester and Langstone SPA and Ramsar.

Potential mitigation

Table 37 - Potential mitigation in the Chichester and Langstone Harbour SPA and Ramsar

Effect	Potential mitigation requirements
Disturbance	• Seasonal restrictions on certain construction activities may be required to ensure disturbance effects do not result in an adverse effect on site integrity
Changes to water quality	• Best practice construction methods may comprise of: – Bunding and appropriate storage of sediment; – Onsite treatment / polishing of silted water; – Use of sediment traps; – Regular cleaning of haul roads prevent runoff of construction waste dirt; – Appropriate storage and application of both hazardous and non-hazardous waste and chemicals (i.e. diesel); and, – Application of onsite mitigation measures such as spill kits and barrier booms

2.5.2.6. Water Framework Directive

Introduction

This assessment aims to determine whether the construction, operation and decommissioning of the proposed water recycling SROs are compliant with the requirements of the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (as amended).

This report builds on the WFD compliance assessment that was undertaken in support of the Gate 1 submission (September 2020). The findings of the earlier assessment have been updated where appropriate to reflect the latest scheme information, and the updates in the baseline WFD classification data that were published in September 2020.

Approach

The WFD Compliance Assessment undertaken at Gate 1 has been updated to reflect further SRO details and additional assessments that have been undertaken (e.g. plume modelling) and has been restructured to reflect the stages set out in PINS Advice Note 18: Water Framework Directive, which provides an outline methodology for considering the WFD as part of the DCO process. This guidance represents the most comprehensive and up to date guidance for WFD compliance assessments.

Further consideration has also been given to the following guidance and case law:

- 'Clearing the waters for all' (EA, 2017): Outlines a detailed methodology for assessing impacts on transitional and coastal water bodies;
- 'WFD risk assessment' (EA, 2016a): This provides information on how to assess the risk of a proposed activity, as well as guidance for proposed developments planning to undertake activities that would require a flood risk activity permit;
- 'Protecting and improving the water environment' (EA, 2016b): Provides guidance on the WFD compliance of physical works and other activities in river water bodies; and
- EUECJ C-461-13. Bund für Umwelt und Naturshutz Deutschland eV v Bundesrepublik Deutschland (ECJ, 2015). This case confirms the detail around determining a deterioration in the status of a water body.

The WFD Compliance Assessment comprises three stages:

- Stage 1 Screening: This stage consists of an initial screening exercise of the key components of the SROs and identifying relevant water bodies which have the potential to be impacted by the construction, operation and decommissioning of each SRO;
- Stage 2 Scoping: This stage identifies whether there is potential for deterioration in water body status or failure to comply with WFD objectives for any of the water bodies identified in Stage 1. Activities are carried forward to Stage 3 if potential impacts on any WFD element are identified in this stage; and
- Stage 3 Outline WFD Impact Assessment: This stage assesses whether any project activities that have been carried forward from Stage 2 have the potential to cause deterioration and whether any such deterioration will have a significant effect on the status of one or more WFD quality elements at water body level.

Stage 1: Screening

For the purposes of this assessment, B.2 has been divided into the following key components:

- New WRP in the vicinity of Budds Farm WTW;
- Effluent transfer from Budds Farm WTW to WRP, underground pipeline connection;
- EBL at Otterbourne, including emergency discharge to the Otterbourne;
- Underground transfer pipeline from WRP to Otterbourne EBL;
- 2nd Stage Pumping stations and BPT along transfer pipeline from WRP to EBL;
- Pre-disinfection ceramic membrane plant at Otterbourne WSW, including washwater recovery area; and
- Reject water to BF and discharged through Eastney LSO.

In accordance with guidance set out above, screening and scoping is only undertaken for water bodies in which activities occur. If a risk is identified in this water body, then adjoining water bodies are considered in the Stage 3 assessment.

The surface and groundwater bodies screened in to the WFD compliance assessment are detailed in Table 38 which also highlights the relevant SRO components that could potentially impact upon each water body.

Table 38 - Water bodies screened in for B.2

SRO component	Water body name	Justification for screening in
WRP	• Langstone Harbour (GB.580705130000) • East Hants Chalk (GB.40701G502700)	Surface water bodies: Screened in because components are located within the catchment of this water body and therefore, could affect its biology, hydromorphology and physico-chemistry. Groundwater bodies: Screened in because the proposed activities are underlain by these water bodies and, therefore, could affect the quality and quantity of groundwater.
Effluent transfer from Budds Farm WTW to WRP	• Langstone Harbour (GB.580705130000) • East Hants Chalk (GB.40701G502700)	Surface water bodies: Screened in because components are located within the catchment of this water body and therefore, could affect its biology, hydromorphology. Groundwater bodies: Screened in because the proposed activities are underlain by these water bodies and, therefore, could affect the quality and quantity of groundwater.
EBL at Otterbourne and emergency discharge	• Itchen (GB107042022580) • Central Hants Lambeth Group (GB.40702G503800) • River Itchen Chalk (GB.40701G505000)	Surface water bodies: Screened in because components are located within the catchment of this water body and therefore, could affect its biology, hydromorphology and physico-chemistry. Groundwater bodies: Screened in because the proposed activities are underlain by these water bodies and, therefore, could affect the quality and quantity of groundwater.

SRO component	Water body name	Justification for screening in
Transfer pipelines from WRP to Otterbourne (Routes 1 and 2)	• Potwell Trib (GB107042016400) • Upper Wallington (GB107042016350) • Wallington below Southwick (GB107042016360) • Meon (GB107042016640) • Main River Hamble (GB107042016250) • Upper Hamble (GB107042016280) • Horton Heath Stream (GB107042016270) • Moors Stream (GB107042016260) • Bow Lake (GB107042016650) • Itchen (GB107042022580) • Itchen Navigation (GB70710008) • Langstone Harbour (GB.580705130000) • East Hants Chalk (GB.40701G502700) • Central Hants Lambeth Group (GB.40702G503800) • South East Hants Bracklesham Group (GB.40702G503000) • South Hants Lambeth Group (GB.40701G502700) • River Itchen Chalk (GB.40701G505000) • East Hants Lambeth Group (GB.40702G500800)	Surface water bodies: Screened in because components are located within the catchment of these water bodies and therefore, could affect its biology, hydromorphology and physico-chemistry. Groundwater bodies: Screened in because the proposed activities are underlain by these water bodies and, therefore, could affect the quality and quantity of groundwater.
2nd Stage Pumping Stations and BPTs	• Upper Wallington (GB107042016350) • Potwell Trib (GB107042016400) • Upper Hamble GB107042016280) • East Hants Chalk (GB.40701G502700) • East Hants Lambeth Group (GB.40702G500800)	Surface water bodies: Screened in because component is located in the vicinity of this catchment of this water body and therefore, could affect its biology, hydromorphology and physico-chemistry. Groundwater bodies: No pathway for effect identified.

SRO component	Water body name	Justification for screening in
Ceramic membrane plant and washwater recovery area	• Itchen (GB107042022580) • Itchen Navigation (GB70710008) • River Itchen Chalk (GB.40701G505000)	Surface water bodies: Screened in because components are located within the catchment of this water body and therefore, could affect its biology, hydromorphology and physico-chemistry. Groundwater bodies: Screened in because the proposed activities are underlain by these water bodies and, therefore, could affect the quality and quantity of groundwater.
Reject water to BF and discharged through Eastney LSO	• Langstone Harbour (GB.580705130000) • Langstone Oysterbeds (GB.510070073000) • Solent (GB650705150000) • Portsmouth Harbour (GB.580705140000) • Chichester Harbour (GB.580705210000) • Isle of Wight East (GB650705530000)	Surface water bodies: Solent water body screened in because direct changes could occur as a result of alterations to current wastewater discharges and addition of the reject water to this water body. With respect to Portsmouth Harbour, Chichester Harbour, Langstone Harbour, Langston oyster beds and Isle of Wight East, these water bodies are screened in because there is a mechanism for potential impacts resulting from changes to current wastewater discharges to the Solent water body. Groundwater bodies: No pathway for effect identified.

Stage 2: Scoping

This section describes whether there is potential for construction, operation and decommissioning impacts from the components associated with B.2 on the status of the surface (Table 39) and groundwater bodies (Table 40) scoped into the assessment. Note that further details are provided in the Level 4 WFD Compliance Assessment.

Table 39 - Scoping assessment for screened in surface water bodies for Option B.2

SRO component	Water body name	Ecological quality elements	Chemical quality elements	Protected areas	RBMP mitigation measures
WRP	Langstone Harbour (GB.580705130000)	Although onshore construction and decommissioning activities could result in the accidental release of fine sediment and contaminants into the surface watercourses that drain directly into the water body, the application of best practice pollution prevention and control measures would minimise impacts and ensure that they are not sufficient to affect biology, hydromorphology or physico-chemistry at water body scale. Although there is potential for the accidental release of pollutants into the surface watercourses that drain directly into the water body during operation, the application of best practice pollution prevention and control measures would minimise impacts and ensure that they are not sufficient to affect biology, hydromorphology or	The activity will not cause the release of priority substances, priority hazardous substances or other potentially hazardous chemicals into the water body. There is therefore no mechanism for impacts on chemical quality elements.	No mechanism for impacts on Drinking Water Safeguard Zones or areas protected under the Habitats and Species, Conservation of Wild Birds, Bathing Waters, Shellfish Waters and Urban Waste Water Treatment Directives have been identified.	No mechanisms for the activity to reduce the effectiveness or prevent the future implementation of mitigation measures associated with flood and coastal protection have been identified.

SRO component	Water body name	Ecological quality elements	Chemical quality elements	Protected areas	RBMP mitigation measures
		physico-chemistry at water body scale.			
Effluent transfer from Budds Farm WTW to WRP	Langstone Harbour (GB.580705130000)	Although onshore construction and decommissioning activities could result in the accidental release of fine sediment and contaminants into the surface watercourses that drain directly into the water body, the application of best practice pollution prevention and control measures would minimise impacts and ensure that they are not sufficient to affect biology, hydromorphology or	The activity will not cause the release of priority substances, priority hazardous substances or other potentially hazardous chemicals into the water body. There is therefore no mechanism for impacts on chemical quality elements.	No mechanism for impacts on Drinking Water Safeguard Zones or areas protected under the Habitats and Species, Conservation of Wild Birds, Bathing Waters, Shellfish Waters and Urban Waste Water Treatment Directives have been identified.	No mechanisms for the activity to reduce the effectiveness or prevent the future implementation of mitigation measures associated with flood and coastal protection have been identified.

SRO component	Water body name	Ecological quality elements	Chemical quality elements	Protected areas	RBMP mitigation measures
		physico-chemistry at water body scale. Although there is potential for the accidental release of pollutants into the surface watercourses that drain directly into the water body during operation, the application of best practice pollution prevention and control measures would minimise impacts and ensure that they are not sufficient to affect biology, hydromorphology or physico-chemistry at water body scale.			
EBL	Itchen (GB107042022580)	Construction and decommissioning activities could result in the accidental release of fine sediment and contaminants into the water body. Although the application of best practice pollution prevention and control measures would minimise impacts, there remains some potential for impacts on the biology, hydromorphology and physico-chemistry of the water body. Emergency discharges during operation of the	Construction and decommissioning activities could potentially result in the accidental release of priority substances into the water body, for example through the accidental spillage of contraction materials or fuel and lubricants from construction equipment. Although the application of best practice pollution prevention and control measures would minimise impacts, there remains some potential for impacts on the chemistry of the water body.	There is potential for construction, operation and decommissioning to impact on areas protected under the Habitats and Species Directive.	The River Basins Management Plan (RBMP) does not identify mitigation measures for the Itchen water body.

SRO component	Water body name	Ecological quality elements	Chemical quality elements	Protected areas	RBMP mitigation measures
		environmental buffer could potentially affect the biology, hydromorphology and physico-chemistry of the water body.			
Transfer pipeline from WRP to EBL	Potwell Trib (GB107042016400) Upper Wallington (GB107042016350) Wallington below Southwick (GB107042016360) Meon (GB107042016640) Upper Hamble (GB107042016280) Main River Hamble (GB107042016250) Horton Heath Stream (GB107042016270) Moors Stream (GB107042016260) Bow Lake (GB107042016650) Itchen (GB107042022580) Itchen Navigation (GB70710008) Langstone Harbour (GB.580705130000)	Construction and decommissioning activities could directly affect the hydromorphology and biology of the water bodies as a result of watercourse crossings. Furthermore, although construction and decommissioning activities could result in the accidental release of fine sediment and contaminants into the water bodies, the application of best practice pollution prevention and control measures would minimise impacts and ensure that they are not sufficient to affect biology, hydromorphology or	Construction and decommissioning activities could potentially result in the accidental release of priority substances into the water body, for example through the accidental spillage of contraction materials or fuel and lubricants from construction equipment. Although the application of best practice pollution prevention and control measures would minimise impacts, there remains some potential for impacts on the chemistry of the water body.	No mechanism for impacts on Drinking Water Safeguard Zones or areas protected under the Habitats and Species, Conservation of Wild Birds, Bathing Waters, Shellfish Waters and Urban Waste Water Treatment Directives have been identified.	No mechanisms for the activity to reduce the effectiveness or prevent the future implementation of mitigation measures associated with each water body have been identified.

SRO component	Water body name	Ecological quality elements	Chemical quality elements	Protected areas	RBMP mitigation measures
		physico-chemistry at water body scale. Although there is potential for the accidental release of pollutants into the water bodies during operation, the application of best practice pollution prevention and control measures would minimise impacts and ensure that they are not sufficient to affect biology, hydromorphology or physico-chemistry at water body scale.			
2nd Stage Pumping Stations and BPT	Upper Wallington (GB107042016350) Hermitage Stream GB107042016370 Potwell Trib (GB107042016400) Moors Stream (GB107042016260) Upper Hamble GB107042016280) East Hants Chalk (GB.40701G502700) East Hants Lambeth Group (GB.40702G500800)	Although construction and decommissioning activities could result in the accidental release of fine sediment and contaminants into the water body, the application of best practice pollution prevention and control measures would minimise impacts and ensure that they are not sufficient to affect biology, hydromorphology or physico-chemistry at water body scale.	The activity will not cause the release of priority substances, priority hazardous substances or other potentially hazardous chemicals into the water body. There is therefore no mechanism for impacts on chemical quality elements.	No mechanism for impacts on Drinking Water Safeguard Zones or areas protected under the Habitats and Species, Conservation of Wild Birds, Bathing Waters, Shellfish Waters and Urban Waste Water Treatment Directives have been identified.	The RBMP does not identify mitigation measures for these water bodies.

SRO component	Water body name	Ecological quality elements	Chemical quality elements	Protected areas	RBMP mitigation measures
		Similarly, although there is potential for the accidental release of pollutants into the water body during operation, the application of best practice pollution prevention and control measures would minimise impacts and ensure that they are not sufficient to affect biology, hydromorphology or physico-chemistry at water body scale.			
Ceramic membrane plant and washwater recovery area	Itchen (GB107042022580)	Construction and decommissioning activities could result in the accidental release of fine sediment and contaminants into the water body. Although the application of best practice pollution prevention and control measures would minimise impacts, there remains some potential for impacts on the biology, hydromorphology and physico-chemistry of the water body. Similarly, there is also potential for the accidental release of pollutants into	Construction and decommissioning activities could potentially result in the accidental release of priority substances into the water body, for example through the accidental spillage of contraction materials or fuel and lubricants from construction equipment. Although the application of best practice pollution prevention and control measures would minimise impacts, there remains some potential for impacts on the chemistry of the water body.	There is potential for construction, operation and decommissioning to impact on areas protected under the Habitats and Species Directive	The RBMP does not identify mitigation measures for the Itchen water body.

SRO component	Water body name	Ecological quality elements	Chemical quality elements	Protected areas	RBMP mitigation measures
		the water body during operation, which could affect the biology, hydromorphology and physico-chemistry of the water body.			
Reject water to BF and discharged through Eastney LSO	• Langstone Harbour (GB.580705130000) • Langstone Oyster beds (GB.510070073000) • Solent (GB650705150000) • Portsmouth Harbour (GB.580705140000) • Chichester Harbour (GB.580705210000) • Isle of Wight East (GB650705530000)	This activity would not require offshore construction activities, and as such no mechanism for impact during the construction phase has been identified. During operation. the discharge of reject water and changes to the existing wastewater discharges could alter water quality which could impact on biology and physico-chemistry.	This activity would not require offshore construction activities, and as such no mechanism for impact during the construction phase has been identified. During operation, the discharge of reject water could potentially release priority substances into the water body.	There is potential for construction, operation and decommissioning to impact on areas protected under the Habitats and Species, Conservation of Wild Birds, Urban Waste Water Treatment and Shellfish Waters Directives.	No mechanisms for the activity to reduce the effectiveness or prevent the future implementation of mitigation measures associated with flood and coastal protection have been identified.

Table 40 - Scoping assessment for screened in groundwater bodies for B.2

SRO component	Water body name	Quantitative quality elements	Chemical quality elements	Protected areas
WRP	East Hants Chalk (GB.40701G502700)	Construction and decommissioning activities could potentially affect groundwater levels through dewatering and changes to the rate of groundwater recharge. Any changes in groundwater levels could potentially impact upon the surface drainage network and associated Groundwater Dependent Terrestrial Eco-systems (GWDTEs). However, and changes are likely to be highly localised and are therefore unlikely to be sufficient to result in deterioration in water body status. Any minor changes to groundwater flows or recharge during the operational phase of the activity are likely to be highly localised and are therefore unlikely to be sufficient to affect groundwater quantity.	Construction and decommissioning activities could potentially introduce new sources of contamination and remobilise existing sources of contamination. This could introduce a new pathway for the contamination of GWDTEs and other dependent surface water features. However, the application of best practice pollution prevention and control measures would minimise impacts and ensure that they are unlikely to be sufficient to affect groundwater quality at water body scale. Similarly, although there is potential for the accidental release of pollutants into the groundwater body during operation, the scheme will be designed to minimise impacts and ensure that they are unlikely to be sufficient to affect groundwater quality at water body scale.	No mechanisms for this activity to impact upon Drinking Water Protected Areas were identified.

SRO component	Water body name	Quantitative quality elements	Chemical quality elements	Protected areas
Effluent transfer from Budds Farm WTW to WRP	East Hants Chalk (GB.40701G502700) South Hants Lambeth Group (GB.40701G502700)	Construction and decommissioning activities could potentially affect groundwater levels through dewatering and changes to the rate of groundwater recharge. Any changes in groundwater levels could potentially impact upon the surface drainage network and associated GWDTEs. However, and changes are likely to be highly localised and therefore unlikely to be sufficient to result in deterioration in water body status. Any minor changes to groundwater flows or recharge during the operational phase of the activity are likely to be highly localised and therefore unlikely to be sufficient to affect groundwater quantity.	Construction and decommissioning activities could potentially introduce new sources of contamination and remobilise existing sources of contamination. This could introduce a new pathway for the contamination of GWDTEs and other dependent surface water features. However, the application of best practice pollution prevention and control measures would minimise impacts and ensure that they are unlikely to be sufficient to affect groundwater quality at water body scale. Similarly, although there is potential for the accidental release of pollutants into the groundwater body during operation, the scheme will be designed to minimise impacts and ensure that they are unlikely to be sufficient to affect groundwater quality at water body scale.	No mechanisms for this activity to impact upon Drinking Water Protected Areas were identified.
Environmental Buffer Lake	Central Hants Lambeth Group (GB.40702G503800) River Itchen Chalk (GB.40701G505000)	Construction and decommissioning activities could potentially affect groundwater levels through dewatering and changes to the rate of groundwater recharge. Any changes in groundwater levels could potentially impact upon the surface drainage network and associated GWDTEs. However, and changes are likely to be highly localised and therefore unlikely to be sufficient to result in deterioration in water body status. Any minor changes to groundwater flows or recharge	Construction and decommissioning activities could potentially introduce new sources of contamination and remobilise existing sources of contamination. This could introduce a new pathway for the contamination of GWDTEs and other dependent surface water features. However, the application of best practice pollution prevention and control measures would minimise impacts and ensure that they are unlikely to be sufficient to affect groundwater quality at water body scale.	No mechanisms for this activity to impact upon Drinking Water Protected Areas were identified.

SRO component	Water body name	Quantitative quality elements	Chemical quality elements	Protected areas
		during the operational phase of the activity are likely to be highly localised and are therefore unlikely to be sufficient to affect groundwater quantity.	Similarly, although there is potential for the accidental release of pollutants into the groundwater body during operation, the scheme will be designed to minimise impacts and ensure that they are unlikely to be sufficient to affect groundwater quality at water body scale. Any emergency discharges would consist only of treated water, and although there could be slight differences in water chemistry this would not affect the chemical quality elements.	
Transfer pipeline from WRP to EBL	East Hants Chalk (GB.40701G502700) East Hants Lambeth Group (GB.40702G500800) Central Hants Lambeth Group (GB.40702G503800) River Itchen Chalk (GB.40701G505000) South East Hants Bracklesham Group (GB.40702G503000)	Construction and decommissioning activities could potentially affect groundwater levels through dewatering and changes to the rate of groundwater recharge. Any changes in groundwater levels could potentially impact upon the surface drainage network and associated GWDTEs. However, and changes are likely to be highly localised and are therefore unlikely to be sufficient to result in deterioration in water body status. Any minor changes to groundwater flows or recharge during the operational phase of the activity are likely to be highly localised and are therefore unlikely to be sufficient to affect groundwater quantity.	Construction and decommissioning activities could potentially introduce new sources of contamination and remobilise existing sources of contamination. This could introduce a new pathway for the contamination of GWDTEs and other dependent surface water features. However, the application of best practice pollution prevention and control measures would minimise impacts and ensure that they are unlikely to be sufficient to affect groundwater quality at water body scale. Similarly, although there is potential for the accidental release of pollutants into the groundwater body during operation, the scheme will be designed to minimise impacts and ensure that they are unlikely to be sufficient to affect groundwater quality at water body scale.	No mechanisms for this activity to impact upon Drinking Water Protected Areas were identified.

SRO component	Water body name	Quantitative quality elements	Chemical quality elements	Protected areas
2nd Stage Pumping Stations and BPT	East Hants Chalk (GB.40701G502700) East Hants Lambeth Group (GB.40702G500800) Central Hants Lambeth Group (GB.40702G503800) River Itchen Chalk (GB.40701G505000) South East Hants Bracklesham Group (GB.40702G503000)	Construction and decommissioning activities could potentially affect groundwater levels through dewatering and changes to the rate of groundwater recharge. Any changes in groundwater levels could potentially impact upon the surface drainage network and associated GWDTEs. However, and changes are likely to be highly localised and are therefore unlikely to be sufficient to result in deterioration in water body status. Any minor changes to groundwater flows or recharge during the operational phase of the activity are likely to be highly localised and therefore unlikely to be sufficient to affect groundwater quantity.	Construction and decommissioning activities could potentially introduce new sources of contamination and remobilise existing sources of contamination. This could introduce a new pathway for the contamination of GWDTEs and other dependent surface water features. However, the application of best practice pollution prevention and control measures would minimise impacts and ensure that they are unlikely to be sufficient to affect groundwater quality at water body scale. Similarly, although there is potential for the accidental release of pollutants into the groundwater body during operation, the scheme will be designed to minimise impacts and ensure that they are unlikely to be sufficient to affect groundwater quality at water body scale.	No mechanisms for this activity to impact upon Drinking Water Protected Areas were identified.

SRO component	Water body name	Quantitative quality elements	Chemical quality elements	Protected areas
Ceramic membrane plant and washwater recovery area	River Itchen Chalk (GB.40701G505000)	Construction and decommissioning activities could potentially affect groundwater levels through dewatering and changes to the rate of groundwater recharge. Any changes in groundwater levels could potentially impact upon the surface drainage network and associated GWDTEs. However, and changes are likely to be highly localised and therefore unlikely to be sufficient to result in deterioration in water body status. Any minor changes to groundwater flows or recharge during the operational phase of the activity are likely to would be highly localised and therefore unlikely to be sufficient to affect groundwater quantity.	Construction and decommissioning activities could potentially introduce new sources of contamination and remobilise existing sources of contamination. This could introduce a new pathway for the contamination of GWDTEs and other dependent surface water features. However, the application of best practice pollution prevention and control measures would minimise impacts and ensure that they are unlikely to be sufficient to affect groundwater quality at water body scale. Similarly, although there is potential for the accidental release of pollutants into the groundwater body during operation, the scheme will be designed to minimise impacts and ensure that they are unlikely to be sufficient to affect groundwater quality at water body scale.	No mechanisms for this activity to impact upon Drinking Water Protected Areas were identified.

The parameters scoped in for further assessment are summarised in Table 41.

Table 41 - Scoping assessment for screened in groundwater and surface water bodies for B.2

SRO component	Surface waters				Groundwater bodies		
	Ecological Quality elements	Chemical Quality elements	Protected Areas	RBMP Mitigation measures	Quantitative	Quality	Protected Areas
WRP	×	×	×	×	×	×	×
Effluent transfer from Budds Farm WTW to WRP	×	×	×	×	×	×	×
EBL	✓	✓	×	×	×	×	×
Transfer pipeline from WRP to EBL	✓	✓	×	×	×	×	×
2nd Stage Pumping Stations and BPT	×	×	×	×	×	×	×
Ceramic membrane plant and washwater recovery area	✓	✓	×	×	×	×	×
Reject water to BF and discharged through Eastney LSO	✓	×	✓	×	×	×	×

Outline WFD compliance assessment

Environmental buffer lake and ceramic membrane plant

These components have been identified as having the potential to impact upon the biology, hydromorphology, physico-chemistry and chemistry of the River Itchen water body during construction. Furthermore, the EBL has also been identified as having the potential to affect the biology, hydromorphology and physico-chemistry of the River Itchen during operation.

The construction and decommissioning of the EBL; and ceramic membrane plant could potentially impact upon the hydromorphology, physico-chemistry and biology of the River Itchen water body as a result of disturbance to the bed and banks of its tributaries, and the input of fine sediment and contaminants into the watercourse from construction works. However, best practice construction mitigation measures to control the supply of fine sediment, water and contaminants (e.g. the EA's Guidance for Pollution Prevention (GPP) notes, including GPP01, GPP05, GPP08 and GPP21, which remain best practice despite no longer being statutory guidance, and CIRIA's 'Control of water pollution from construction sites: Guidance for consultants and contractors'), will be applied to minimise impacts on the hydromorphology, physico-chemistry and biology of the River Itchen water body. Given the sensitivity of the water body to the supply of fine sediment and contaminants, it is acknowledged that the construction stage drainage strategy and associated pollution prevention and control measures will need to be carefully designed on the basis of the available best practice guidance. Particular attention will be paid to ensuring that particulate and liquid contaminants are captured and retained, and not therefore discharged into the surface drainage network. This will minimise the supply of fine sediment, runoff and contaminants into the drainage network during construction and decommissioning and will ensure that there are no significant adverse effects. Temporary construction and decommissioning effects are therefore unlikely to cause deterioration in water body status or affect the condition of the River Itchen and its tributaries.

Once operational, the presence of the onshore infrastructure is not predicted to impact upon the status of the River Itchen or any connected surface or groundwater bodies. However, the EBL at Otterbourne WSW is expected to be classed as a reservoir under the Reservoirs Act 1975 because it will be able to store in excess of 25,000 m3 water above surrounding ground level. There is therefore a requirement to ensure that emergency overflows can be controlled and provide a mechanism to draw down the reservoir levels in an emergency (i.e. should a failure mechanism of the dam be triggered, there is a need to limit any further progression of the failure by reducing load on the dam by drawing water levels down). The emergency drawdowns could potentially lead to the discharge of water into the catchment of the River Itchen, which could affect its biology, hydromorphology and physico-chemistry.

Two options for this emergency drawdown have been identified; option 1 involves overflow and drawdown discharge to the Otter Bourne (a tributary of the River Itchen), while option 2 involves overflow and drawdown to ground via a discharge to priority floodplain and coastal grazing marsh to the south of the proposed Environmental Buffer Lake. Option 1 could result in direct impacts to the hydromorphology of the Otter Bourne, including erosion of the banks and remobilisation of bed material. This could result in the alteration of habitats for biological quality elements supported in the water body. However, discharges would be limited to a maximum velocity of 140 l/s. Any changes to hydromorphology and biology are therefore likely to be minor and confined to the reach of the Otter Bourne immediately downstream of the outfall. The presence of extensive modifications on the lower reaches of the Otter Bourne, including culverts beneath the railway line, a lock and sluices, creates fixed controls on the hydromorphology of the channel, which means that any hydro morphological responses are unlikely to propagate into the main River Itchen. Option 2 is unlikely to result in significant hydro morphological responses, with the floodplain acting as a buffer to prevent the rapid ingress of water into the surface drainage network prior to it infiltrating to ground.

Both options could potentially affect the physico-chemistry and therefore biology of the water body, through the release of water which, although treated and free from contaminants, could potentially have a slightly different chemical composition to that of the receiving waters of the River Itchen system. However, discharges would only ever be undertaken in an emergency situation and as such would not be regular events. Although potential impacts cannot be ruled out in this situation, any effects on physico-chemistry and biology are likely to be very slight, temporary, naturally reversible and spatially constrained (noting that the water in the reservoir will have been subject to a treatment and remineralisation process to ensure it is similar to the natural waters in the catchment), with “dilution” from the natural receiving waters increasing with distance from the discharge and over time as discharged waters are dispersed. Deterioration in the status of the River Itchen water body is therefore considered to be unlikely as a result of any emergency discharges.

This demonstrates that although the component could result in temporary and / or highly localised effects on biology, hydromorphology and physico-chemistry, the changes are not predicted to be sufficient to result in deterioration of the status of any quality elements in the water body (within or between status classes). Furthermore, any effects would not prevent the implementation or counteract the effects of the mitigation measures identified in the RBMP. This means that this component would not result in deterioration in the status of this river water body or prevent WFD objectives being achieved in this water body in the future.

Transfer pipeline from WRP to Otterbourne

This component has been identified as having the potential to impact upon the biology, hydromorphology, physico-chemistry and chemistry of the River Itchen, Pontwell Trib, Upper Wallington, Wallington below Southwick, Meon, Upper Hamble, Horton Heath Stream, Moors Stream, Bow Lake and Itchen Navigation river water bodies as a result of the construction (and decommissioning if not retained in situ) of watercourse crossings.

To avoid any non-temporary direct impacts on larger or particularly sensitive watercourses (e.g. WFD water bodies, sensitive main rivers and ordinary watercourses, and any watercourses that may be too wide or deep to cross using conventional alternatives), river crossings will be undertaken with directional drilling/trenchless crossings where possible. These will prevent the direct disturbance of the bed and banks of the watercourse and prevent impacts to in-channel habitats. Furthermore, site-specific ground investigations will be undertaken prior to implementation of any trenchless watercourse crossings to identify the appropriate locations of entry and exit pits, the optimal depth of pipe burial, and ensure that the breakout of inert drilling fluid does not occur. This will minimise adverse impacts on the hydromorphology, physico-chemistry and biology of the watercourses.

The proposed pipeline will be installed using standard open cut excavation methods conventionally used for a cross-country pipeline. Open cut excavation will be used for most of the route, including watercourse crossings (notwithstanding the exclusions outlined above). A maximum working corridor of 25 m between perimeter fences has been assumed for the pipeline installation. This will allow sufficient room for open excavation, storage of excavated material, construction plant transit and handing of pipelines. The depth of the trench will vary dependent on the ground conditions but will be a minimum of 0.9 m in open fields. The installation or removal of the pipeline using open trench crossings would result in the direct disturbance of the bed and banks of the affected watercourse and the habitats that they support. However, the working corridor will be reduced where construction allows and to minimise impact (e.g. when crossing watercourses).

Although construction methodologies have not yet been finalised, trenching is likely to be undertaken within a dewatered area of channel (e.g. within a coffer dam, with flow over-pumped, piped or flumed). Where possible, the use of these barriers could potentially be confined to the amount of time required to install and reinstate the trench, thereby minimising impacts on the movement of flow, sediment and biota within each watercourse. In addition, the valuable gravel substrates which are found in many of the watercourses could potentially be stripped and stored separately from surrounding soils and sediments so that they can be successfully reinstated. Finally, the banks would be reinstated prior to the restoration of natural flows.

During construction or decommissioning in areas in proximity to watercourses, a minimum 8 m or 16 m buffer has been assumed from non-tidal riverbanks and tidal riverbanks, respectively (in line with the requirements of the Land Drainage Act 1991 and Environmental Permitting Regulations 2016). This will minimise direct impacts on the watercourses. However, indirect impacts on river water bodies could occur from mobilisation of sediments from haul roads, open-cut excavations, pumping operations and potential washout events. Greater areas of impermeable surfaces and disturbed ground could alter surface water drainage pathways throughout each catchment, resulting in changes to volume, energy or distribution of flows. Increased fine sediment input to the water body could smother bed habitats, reducing light penetration and dissolved oxygen. Changes to physico-chemistry could also lead to loss or modification of in-channel habitats. The accidental spillage of oils and lubricants from construction equipment and subsequent runoff into watercourses could potentially impact upon the physico-chemistry and chemistry of the water bodies

However, best practice measures to minimise the runoff of sediment and contaminants from construction components will be implemented to prevent deterioration in water body status. These are likely to include:

- Bunding and appropriate storage of sediment;
- Onsite treatment / polishing of silted water;
- Use of sediment traps;
- Regular cleaning of haul roads prevent runoff of construction waste;
- Appropriate storage and application of both hazardous and non-hazardous waste and chemicals (i.e. diesel); and
- Application of onsite mitigation measures such as spill kits and barrier booms.

These measures will minimise adverse impacts on biology, hydromorphology, physico-chemistry and chemistry of the River Itchen, Pontwell Trib, Upper Wallington, Wallington below Southwick, Meon, Upper

Hamble, Horton Heath Stream, Moors Stream, Bow Lake and Itchen Navigation by minimising the supply of fine sediment and other contaminants into the surface drainage network that makes up each water body.

This demonstrates that, although the component could result in temporary and/or highly localised effects on hydromorphology and biology, the changes are not predicted to be sufficient to result in deterioration of the status of any quality elements in the water bodies (within or between status classes). This means that this component would not result in deterioration in the status of this river water body or prevent WFD objectives being achieved in these water bodies in the future.

Reject water to Budds Farm and discharged through Eastney LSO

This component has been identified as having the potential to impact on the biology and physico-chemistry of the Southampton Water or Solent water bodies and adjoining water bodies Portsmouth Harbour, Langstone Harbour, Chichester Harbour and Isle of Wight East during operation. During operation, there is a requirement to discharge reject water via the Eastney LSO. Modelling using MIKE21 was undertaken on several flows to determine the envelope of effects covering all three SROs. The current situation using existing wastewater discharge information was also modelled to enable a comparison (i.e. presents a baseline). As summary of the modelled scenarios are detailed in Table 42 below.

Table 42 - Summary of modelling output for B.2

Modelled flow	Comment on output
15 Ml/d	This represents the nominal BAU flow for B.2 and B.5 and the maximum flow for B.4. This modelled scenario is most likely to reflect the maximum flow output for B.2 (61 Ml/d) given that there is no transfer of water from PC WTW for B.2.
Existing situation	Enables comparison of effects associated with each flow as outline above – effectively represents the baseline. Likely to represent effects associated with lower BAU of 5 Ml/d.

For the purposes of understanding the potential effects associated with B.2, the modelled output for the 15 Ml/d and the output for the existing situation are therefore described below.

Model simulations were carried out for the existing and future scenarios for a period in excess of a 30 days (two spring / neap tidal cycles). Only changes in salinity and TN were modelled. Reject water from the water recycling process is positively buoyant and will mix through the water column as it rises towards the surface. The model assumed a simple low velocity discharge into the water column therefore outfall dimensions and potential diffuser arrangements were not built into the model output.

The results show that there is a very small improvement in the Solent and Portsmouth Harbour WFD water bodies in TN concentrations over the existing situation for the 15 Ml/d. This is considered to be because the process removing nitrogen from the wastewater is not 100% effective and therefore not all TN is discharged back into the marine environment. It is likely that an additional improvement would be noted for flows of 61 Ml/d given the removal of additional nitrogen, but this is unlikely to be significantly different to that presented for 15 Ml/d.

Overall therefore, a deterioration in WFD water bodies on a water body scale is not predicted. There could be a small decrease in the discharge of nitrogen concentrations over the existing situation, but this would vary with flows through the SRO depending on weather conditions.

With respect to salinity, very little difference in salinity changes were predicted and therefore a deterioration in salinity within the WFD water bodies is not predicted. With respect to Urban Waste Water Treatment Directive (UWWTD) sensitive areas and shellfish waters, an improvement in nitrogen assists in reducing nutrient concentrations which aligns with the aims of this directive.

Summary of WFD compliance

The previous sections demonstrate that, although there could be a small improvement in nitrogen concentrations, this is unlikely to be significant on a water body scale. The changes would not result in deterioration of the status of any quality elements in the water body (within or between status classes). This means that this component would not result in deterioration in status or prevent WFD objectives being achieved in this water body in the future. INNS Risk Assessment

Significance of Invasive Non-Native Species

Raw water is considered to be water in its natural state (e.g., a river or groundwater body). Water is abstracted and transferred from sources such as groundwater, rivers and reservoirs, via SW's raw water network, to WSW for treatment and subsequent distribution for potable water supply. The transfer of raw water has been identified as a key potential pathway of concern for the introduction, transfer and spread of INNS by the Department for Environment Food & Rural Affairs (Defra) and the Great British Non-Native Species Secretariat (GBNNSS).

Invasive, non-native, alien or exotic species are species that have been released into an environment beyond their native bio-geographic range or habitat, either accidentally or intentionally. On arrival in a new environment, a non-native species may or may not become established, depending on its tolerances to the prevailing conditions, or other influencing factors such as predation. A species is classed as 'invasive' when it adapts too well to the new environment and out-competes native species. This has a detrimental impact on native habitats and native species, i.e. decimation of a native species population.

The transfer of raw water between two points may increase the risk of spreading INNS. The introduction of INNS to a waterbody can have a significant effect such as:

- Detrimental impact on ecosystem structure and function;
- Jeopardise compliance with environmental legislation;
- Failure to achieve WFD objectives;
- Compromise the quality of drinking water; and
- Compromise the safe return of treated wastewater to the environment, preventing effective treatment.

Legislation and Policy

The transfer of INNS is subject to national legislation such as the Wildlife and Countryside Act 1981 (as amended), Invasive Non-native Species (Amendment etc.) (EU Exit) Regulations 2019, Invasive Alien Species (Enforcement & Permitting) Order 2019 and the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017.

Objectives of this Assessment

An INNS Risk Assessment for each SRO has been completed for Gate 2. The overall objective of the Risk Assessment is to understand the physical and operational infrastructure of the proposed water transfer network and identify the risk of spread of INNS within the SW raw water transfer network. The Risk Assessment is both descriptive and quantitative.

In accordance with the EA (2017) position statement Managing the Risk of Spread of Invasive Non-Native Species Through Raw Water Transfers, the assessment is focused on the pathways by which INNS can spread within the proposed raw water transfer network, rather than on the current distribution of INNS.

Risk Assessment Methodology

The Risk Assessment tool used for this assessment was originally developed by Wessex Water and amended by Northumbrian Water Group to meet the requirements of the EA's PR19 guidance on the assessment of raw water transfers. The tool takes a pathway-based approach and is centred around a comprehensive list of functional groups of INNS. The use of functional groups accounts for all potential INNS at risk of spread, rather than just focusing on the species that are currently present within the source water body.

The assessment is based on a variety of data, which includes, but is not limited to, the following:

- Nature of the connection (e.g. piped, natural);
- Distance of each connection;
- Time passage and volume of water;
- Frequency of operation;
- Details on operational activities;
- Details of barriers to passage; and
- Details of processing / storage.

The Risk Assessment uses a scoring matrix which is based on the above data to score the inherent risk for the water transfer. Mitigation measures and actions that might decrease or increase risk are added to the adjusted risk score. A final weighted risk score accounts for known INNS in source waters and protected sites and species near the receptor.

The following data sources (Table 43) detailed have been used to gather the data used to populate the Risk Assessment Matrices.

Table 43 - INNS Raw Water Transfer Risk Assessment Data Sources

Data Source	Description of data utilised
SW	Raw water transfers in Geographical Information Systems (GIS) INNS management plans Biological records Biodiversity records centre data and incidental records received by SW Ecologists
Biological Records Centre	Protected species and INNS data for Kent, Surry, Sussex, and Isle of Wight Local wildlife site data for Kent, Surry, Sussex, and Isle of Wight
NE Open Data	Designated sites
UKWIR	INNS implications on the Water industry (UKWIR, 2016)
EA	UK Technical Advisory Group (UKTAG) high impact list of invasive non-native species Environment Agency Water Body Risk Assessments (EA, 2014)
MAGIC	UK Government’s Multi Agency Geographic Information for the Countryside (MAGIC) website (www.magic.gov.uk)

A list of known non-native species present at the various stages of the raw water transfer were obtained from the sources detailed in Table 43 above. The resulting non-native species records were then cross-referenced against the WFD UK Technical Advisory Group high impact list of INNS, UKWIR on INNS implications on the Water industry (UKWIR, 2016) and INNS list used by Northumbrian Water for conducting raw water Risk Assessments. The lists are not fully comprehensive when compared to the 2,000 INNS species identified by GBNNSS. However, it was considered that the source-pathway-receptor risk assessment approach based on these key species is sufficient to manage the risks of introduction and spread of INNS within the proposed transfers.

Data on the known location of protected species and INNS was collated using the local biodiversity records centre data and incidental records received from SW ecologists. No comprehensive surveys for INNS have been carried out for this Risk Assessment, therefore if no records exist, the absence of INNS cannot be assumed.

The proposed water transfer components of the SRO have been assessed by defining a start and end point (e.g. WTW to Water Recycling, Water Recycling to Otterbourne EBL) in line with approach set in EA (2017) Position Statement (Managing the Risk of Spread of Invasive Non-Native Species Through Raw Water Transfers. Position 1321_16).

The initial unweighted or 'inherent risk' calculation is calculated by multiplying the pathway occurrence by the pathway INNS score. This takes account of the frequency, volume and distance of the transfer. The 'adjusted risk' uses the inherent pathway INNS scores are adjusted to account for factors that may mitigate or increase the risk posed by the transfer. For example, screening or navigation, respectively. The final 'weighted risk' adds a weighting to the adjusted risk scores to allow for known INNS in source waters and protected species and designated sites near the receptor.

B.2

B.2 requires the creation of new raw water transfers that will operate continuously all year round. The transfer will only be required to operate at 61 Ml/d to supply potable water during a 1-in-200-year drought event. However, this assessment has undertaken a conservative, worst-case approach and a transfer of 75 Ml/d was assumed and applied for the 61Ml/d, B.2, Option.

This transfer will require some alterations to the existing reject water outfall at Eastney. However, given this is an existing transfer and the alterations would not increase the INNS transfer risk, it was not assessed as part of this assessment.

This SRO can be divided into the following raw water transfer options detailed in Table 44:

Table 44 - B.2 Raw Water transfer options

SRO Route Options	Raw Water Transfers
Budds Farm WTW to WRP	Transfer of water from WTW to Recycling Plant
WRP to Otterbourne WSW	Transfer of treated water from WRP to Otterbourne WSW EBL (via pipeline Routes 1 and 2)
River Itchen to Otterbourne EBL	Additional abstraction from the River Itchen to Otterbourne EBL
Otterbourne EBL Emergency Discharge	Emergency discharge from Otterbourne EBL to the River Itchen

The transfer will only be required to operate at 61 Ml/d to supply potable water during a 1-in-200-year drought event. However, this assessment has undertaken a conservative, worst-case approach and a transfer of 61 Ml/d was assumed.

This transfer will require some alterations to the existing reject water outfall at Eastney. However, given this is an existing transfer and the alterations would not increase the INNS transfer risk, it was not assessed as part of this assessment.

Transfer from Budds Farm WTW to Water Recycling Plant

Water will be transferred from the existing Budds Farm WTW to a new WRP. The transfer will be upstream within the Langstone Harbour WFD water body (GB.580705130000). The transfer will require construction of a new pipeline. Laying new pipeline represents a greater risk than utilising existing pipeline in terms of potential INNS transfers than utilising existing pipeline as this creates a new, additional pathway. Japanese Knotweed Fallopia japonica is known to be present at Budds Farm WTW and the proposed WRP and is classified as high risk. There is no pathway for the transfer of INNS from recreational activities either at the source (Budds Farm WTW) or along the transfer. It has been assumed that no methods to reduce the risk of INNS spreading (e.g. Screening, chlorination) will be employed for this transfer.

Water Recycling Plant to Otterbourne WSW

The proposed routes would provide a continuous transfer of water between the WRP and Otterbourne EBL at Otterbourne WSW. The transfer would be between WFD operational catchments for an approximate length of 36 km for both pipeline routes. Both the pipeline routes have the same level of INNS transfer risk. The transfer through underground pipelines represent little risk to INNS transfer during its transport. Japanese Knotweed Fallopia japonica is known to be present at the WRP and is classified as high risk. Water will be stored in a large reservoir (EBL) upon reaching Otterbourne WSW. This increases the likelihood of INNS spreading due to the open-top design of the reservoir creating a potential pathway. However, no recreational activities which would further increase the risk of INNS transfer will be permitted. Furthermore, <2 mm mesh screening will be used before the water enters the EBL which reduces the risk of INNS spreading by blocking the pathway for certain INNS. Mesh screening of this size is most effective at reducing the risk of INNS spread for INNS Groups 1, 2 and 4 species; it has a smaller impact on INNS Group 3 species (Mobile / free swimming animal with free eggs / infective units).

River Itchen to Otterbourne WSW

Water is currently transferred from the River Itchen to the Otterbourne WSW. Part of this existing transfer will be diverted to flow into the EBL. The transfer would be upstream within the same WFD water body. The transfer would utilise existing underground pipelines which represent little risk to INNS transfer during transport. The abstraction pipeline feeding the EBL will prevent water from flowing back down the pipeline and into the River Itchen. <2 mm mesh screens will be used at the abstraction as well on entry to the EBL. This transfer is subject to the same level of risk associated with the storage of water in the EBL.

Otterbourne Environmental Buffer Lake Emergency Discharge

An emergency discharge from the Otterbourne EBL has the potential to transfer INNS to the Otter Bourne, which is a tributary of the Itchen. The transfer frequency will be very rare (e.g. pipe or EB: burst) which represent a smaller risk of spreading INNS than more frequent / continuous transfers. It was assumed a maximum of 75 Ml/day could be transferred. It would represent a transfer upstream within the same WFD water body. Raw water will be conveyed in an open channel or via sheet flow to the south of the EBL. This presents a greater risk than conveying raw water through pipeline. The water within the EBL will be subject to <2 mm mesh screening upon entry.

INNS Risk Scores

The total risk of transfer for B.2 is detailed in Table 45. The greatest INNS transfer risk is associated with the transfer between the WRP and Otterbourne WSW, primarily associated with the transfer between WFD Management Catchments and the long-term storage of water in a large reservoir at Otterbourne EBL. The emergency discharge represents the least risk of INNS transfer due to the very rare likelihood of occurrence.

Table 45 - B.2 INNS Risk of spreading

Risk type	Input variable	B.2
Inherent	Transfer pathway	New raw water transfers will be set up that include an emergency water discharge. The River Itchen to Otterbourne WSW represent an existing transfer
	Transfer frequency	Year-round – Continuous Emergency Discharge – Very rare
	Transfer volume	61 Ml/day water transfer
	Transfer distance	BF to WRP – Upstream within same WFD Waterbody

Risk type	Input variable	B.2
		WRP to Otterbourne WSW – Between WFD Management Catchments Itchen to Otterbourne WSW – Upstream within same WFD water body Otterbourne Emergency Discharge – Upstream within same WFD water body
	Score	**973**
Adjusted	How raw water is conveyed	Whole length – underground pipeline Otterbourne Emergency Discharge via open channel / sheet flow
	Facilitation works	Water transfer will require new underground pipeline, with the exception of the Itchen to Otterbourne WSW transfer which will re-valve existing pipeline
	Storage at transfer destination	Water will be stored long term in a large reservoir an Otterbourne EBL
	Navigation along transfer route	Not applicable to pathway
	Recreation at source / along transfer route	Not applicable to pathway
	Recreation at transfer destination	No
	Screening at source	<2 mm mesh screen upon entry to Otterbourne EBL <2mm mesh screen at abstraction from River Itchen
	Chlorination at source or along route	No
	Transfer of water direct to WSW	No
	Treatment of transferred water	Not applicable to pathway
	Screening before discharge to receptor waterbody	No
	Salt water barrier	No
	Specific operational protocol to mitigate risk	No
	Score	**2,483**
Weighted	Weighting of known INNS at raw water transfer source	Japanese Knotweed (High Risk) is known to be present at BF and the WRP
	Protected species in or near receptor	Yes
	Protected sites at or near receptor	Internationally designated
	Presence of existing connections between source and receptor	Water co. water transfer is only link
	Score	**9,672**

2.5.2.7. Biodiversity Net Gain and Natural Capital Assessment

A high-level Natural Capital Assessment, underpinned by a Biodiversity Net Gain Assessment, has been undertaken for Gate 2 to determine the potential for each SRO to deliver environmental net gain. In this case, Environmental Net Gain has been utilised as wider term, which includes Biodiversity Net Gain. The latest methodologies for BNG and NC as set out by ACWG's current guidance to SRO Environmental Assessment2 have been applied. The requirements and outputs of the assessment are consistent with those in the WRSE Regional Plan Environmental Assessment Methodology Guidance, as well as the WRPG for Water Resource Management Plan 2024 (WRMP24) and its supplementary guidance 'Environmental and Society in Decision Making' and UKWIR Environmental Assessment Guidance. Outputs are related to that required for Gate 2 activities in the context of Biodiversity and Natural capital accounting related to more

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[2] All Company Working Group (2020). WRMP environment assessment guidance and applicability with SROs

detailed feasibility than at Gate 1 of the conceptual design of a range of scheme configurations / components. In addition, it should be noted that for the accelerated Gate 1 BNG and NCA no formal guidance was available and as such this assessment has had to account for current guidance in the context of the Gate 2 conceptual design updates. It should also be noted that in the context of the BNG assessment this has been based on the application of Defra's Biodiversity tool 'The Biodiversity Metric 2.0' (Defra BNG Metric) as a means of scoring the biodiversity gain or loss of each component. The updated Metric 3.0 was released in early July 2021 and will need to be used at Gate 3 at which point additional field data collection will be included noting that key current limitations with the current tool is that it primarily focuses on terrestrial habitats, with limited ability to calculate loss and mitigation for river and intertidal habitats. Furthermore, marine habitats not currently included. Consequently, the outputs are likely to both underestimate both losses and potential gain opportunities. As part of the BNG assessment a strategic assessment of offsite opportunity areas has been undertaken to identity suitable parcels of land where the best biodiversity gain and hence overall environmental net gain, such as certain priority habitats: furthermore marine habitats loss will require further assessment at Gate 3 together with gaining more evidence in terms of habitat quality as well as quantity for ground truthing.

The outputs of the BNG (losses and potential net gain opportunities) currently provide habitat type data upon which the NCA is compiled and account for the NC biodiversity metric. The NCA has been carried out to identify the potential environmental benefits of the SRO components with consideration of the socio-economic aspects of impacted features. Key ecosystem services have been assessed and monetised in accordance with the ACWG guidance (i.e., climate and natural hazard regulation) in terms of both NC loss (temporary and permanent) and on- and off-site creation related to the BNG calculations. In the context of recreation and amenity value this, at Gate 2, can only be assessed as a loss given uncertainty regarding where habitat creation may be sited and local ambitions, whilst agriculture is also shown as temporary and permanent loss, noting that agricultural loss is accounted for as grassland within the BNG tool and hence valued as part of climate regulation and biodiversity net gain. Water purification has been provided in quantitative high-level assessment terms due to limited local data for this gate as Outdoor Recreation Valuation Tool (ORVAL) data for example is too coarse for comparison: more data collection will be required at Gate 3. At this stage water regulation has not been included given that the overall aim of each water recycling option is related to water regulation so limited differential: this is especially so given that the assessment has focused on terrestrial habitats, due to the limitations of aquatic data at this stage. Overall, the aim of the NCA has been to include an assessment of baseline natural capital assets and their ability to provide ecosystem services, and how these are likely to change as a result of the SROs (see Technical Report 2: Biodiversity Net Gain and Natural Capital Assessments and associated NC and BNG report for more details).

For both the BNG and NC the assessment initially provided outputs per scheme component and subsequent to the completion of the site selection work, assessments of the key SRO configurations were completed to inform both the MCDA assessment and provide the outputs for the key BNG and NC documented outputs. These tables include key NC elements as outline in the ACWG plus an assessment of both temporary and where known permanent habitat losses and total off-site habitat creation requirements for 10% net gain overall in hectares).

No cumulative assessment with other schemes or plans has been undertaken, as the assessment assumes that for any biodiversity loss not fully mitigated, compensation (offsetting) will be undertaken with then an additional provision of 10% net gain. Cumulative assessment would only be necessary / feasible when specific land parcels are identified and if these have been identified and providing mitigation or net gain opportunity for another scheme. Once land parcels have been identified a cumulative assessment of opportunity net gain potential would be necessary to ensure no double counting of habitat uplift.

Table 46 below summarises the configurations and components assessed for Water Recycling SROs. The summary data for each configuration and additional components can be found in Table 47 and Table 48.

Table 46 - Water Recycling Components Assessed for MCDA

	B.2 BF to Lake Otterbourne	B.5 BF and PC to Lake Otterbourne
Marine intake and outfall		
Site	Parcel 72	Parcel 72
Pipeline route	Route 1 (WRP to Lake Otterbourne) *Route 2*	Route 1 (WRP to Lake Otterbourne) *Route 2*
Other Infrastructure / Components (included in the configurations)	EBL Eastney LSO (No new infrastructure but would be change to discharge) Pipeline BF – WRP (only 1 Option)	EBL Eastney LSO (No new infrastructure but would be change to discharge) Pipeline PC to BF Pipeline BF – WRP (only 1 Option)

*= related to configuration *Italic* = component only

Table 47 - B.2 Budds Farm WTW WRP to Lake Otterbourne Environmental Buffer (MCDA)

Configuration	Metric	Assessment	Units
B.2 Budds Farm WTW WRP to Lake Otterbourne Environmental Buffer Configuration - Route 1 (WRP to Lake Otterbourne)	Biodiversity		**Hectares (ha)**
		Total temporary habitat lost during construction	-87.40
		Total permanent habitat loss	-16.77
		Total on-site re-instatement / creation	104.00
		Total off-site habitat creation / BNG uplift	42.38
	Climate regulation		**£2019/year**
		Change in non-traded carbon sequestration value for temporary habitat loss during construction	£-1719.46
		Change in non-traded carbon sequestration value for permanent habitat loss	-£112.90
		Non-traded carbon sequestration value for on-	£1,687.86

Configuration	Metric	Assessment	Units
		site re-instatement / creation	
		Non-traded carbon sequestration value for off-site habitat succession	£2,012.83
	Natural hazard regulation		**£2019/year**
		Change in natural hazard regulation value for temporary habitat loss during construction	-£453.31
		Change in natural hazard regulation value for permanent habitat loss	-£182.44
		Natural hazard regulation value for on-site re-instatement / creation	£2,997.11
		Natural hazard regulation value for off-site habitat succession	£691.74
	Recreation & tourism		**£2019/year**
		Estimated Welfare Value	-£419,979
		Estimated visits	-122,450
	Agriculture		**£2019/year**
		Temporary loss estimated agriculture value	-£34,534.30
		Permanent loss estimated agriculture value	-£7,058.83
	Water purification	***Current provision:*** grassland, greenfield and woodland habitats. *Impact related to land change = potential decline:* Hermitage Stream flows adjacent to the WRP land parcel and the WFD waterbody is currently achieving Moderate status. Construction of WRP could potentially decline water purification service. Also a pre-disinfection ceramic membrane plant and a BPT will be constructed in close proximity to River Itchen resulting land cover change and	

Configuration	Metric	Assessment	Units
		negative water purification with potential impact on the River Hamble (Upper Hamble) nearby where the WFD waterbody is currently achieving Moderate status. *Impact on receiving waterbody = potential decline*: Budds Farm WTW currently discharges water via the Eastney LSO. The WRP waste stream will be mixed with the remaining FE at Budds Farm WTW before being transferred to Eastney Outfall which could result in a decline in dilution of pollutants.	

Table 48 - Summary of BNG and Natural Capital Assessment for B.5 (remaining components from Stage 4 of Site Selection)

Configuration	Metric	Assessment	Units
B.2/B.5 WRP to Lake Otterbourne environmental buffer Route 2 component	Biodiversity		-155.86
		Total temporary habitat lost during construction	-17.37
		Total permanent habitat loss	189.31
		Total on-site re-instatement / creation	60.33
		Total off-site habitat creation / BNG uplift	**£2019/year**
	Climate regulation		-£3,267.92
		Change in non-traded carbon sequestration value for temporary habitat loss during construction	-£116.84
		Change in non-traded carbon sequestration value for permanent habitat loss	£4,433.11
		Non-traded carbon sequestration value for on-site re-instatement/creation	£2,318.82
		Non-traded carbon sequestration value for off-site habitat succession	**£2019/year**

Configuration	Metric	Assessment	Units
	Natural hazard regulation		-£1,033.16
		Change in natural hazard regulation value for temporary habitat loss during construction	-£200.53
		Change in natural hazard regulation value for permanent habitat loss	£3,632.97
		Natural hazard regulation value for on-site re-instatement / creation	£796.90
		Natural hazard regulation value for off-site habitat succession	**£2019/ year**
	Recreation & tourism		-£430,091
		Estimated Welfare Value	-212,336
		Estimated visits	**£2019 year**
	Agriculture		-£62,162.98
		Temporary loss estimated agriculture value	-£7,317.95
		Permanent loss estimated agriculture value	-155.86

2.5.2.8. Environmental Mitigation

The purpose of this section is to summarise potential environmental mitigation measures requiring further consideration for this SRO. The EIA Regulations, and a number of supporting assessments (e.g. HRA, WFD), require a description of the measures envisaged to avoid, prevent, reduce or (where possible) offset any significant adverse effects on the environment. Mitigation measures are also required to address some of the risks outlined in Section 2.7 of this CDR.

This summary is not exhaustive. Example mitigation measures have been identified based on emerging concept designs and current understanding of potential impacts. Mitigation measures have been summarised from the individual environmental assessments (e.g. HRA, WFD) reported above.

Details of the approach to decommissioning have not been confirmed at this stage, however any mitigation measures associated with decommissioning would be developed in line with industry best practice. A full suite of mitigation (and potentially compensatory) measures will be further developed and assessed during the scheme development, EIA and detailed design processes, and where appropriate agreed with relevant regulatory bodies prior to submission of the DCO. SW proposes to submit a Mitigation Route Map with the DCO application to confirm how mitigation measures will be delivered / secured.

For the purposes of this preliminary assessment, two types of mitigation are discussed, as defined within the Institute of Environmental Management and Assessment (IEMA) Guide to Shaping Quality Development (IEMA, 2015):

- Primary (inherent) mitigation – an intrinsic part of the project design - For example, reducing the height of a development to reduce visual impact; and
- Secondary mitigation – requires further activity in order to achieve the anticipated outcome – For example, description of certain lighting limits that will be subject to submission of a detailed lighting layout as a condition of approval.

Tertiary (i.e. inexorable) mitigation is not considered specifically here, however will be identified through the EIA process where appropriate.

To align with the EIA assessment process, mitigation measures for this SRO are detailed in Table 49 in relation to anticipated EIA Topics (see leftmost column). Some EIA topics, such as Health, typically draw from impacts and mitigation measures identified in other chapters (in this example noise, air quality etc) so have not be identified separately.

Table 49 - Environmental Mitigation for B.2

EIA Topic	Example potential impact occurring during construction, operation and decommissioning	Example potential embedded mitigation measures to be explored during scheme development and EIA	Example potential secondary mitigation measures to be explored during EIA
Air Quality	• Impacts of dust and particulate matter on dust soiling, human health and nature conservation designations • Impacts of emissions from construction phase plant on human and ecological receptors • Impacts of emissions from increased traffic movements on human and ecological receptors (construction and operation)	• Routing of infrastructure, pipelines and construction routes to avoid sensitive sites where possible (see mitigation for traffic and transport, biodiversity etc) • Emissions during operation (e.g. back-up generators) designed / located to reduce air quality impacts	• HGV movements and construction vehicles could be routed and potentially timed to avoid peak traffic periods and sensitive receptors • Development and implementation of Construction Environmental Management Plans • Dust suppression measures could be utilised during construction • Air quality monitoring could be undertaken if required / where appropriate (with an adaptive plan in place to manage unacceptable effects arising) • Low emissions plant and vehicles could be used
Archaeology and Cultural Heritage	• Direct (physical) impacts • Indirect (physical) impacts • Indirect (non-physical) changes to the setting of heritage assets	• Pipeline route to seek to avoid direct impact to sites and buildings of cultural and heritage importance • Design / layout of above ground infrastructure to consider setting of listed building / scheduled monument • Archaeological assessment of pre-construction survey data, including high resolution geophysical data to inform scheme development	• Recording and removing / relocating archaeological material (preservation by record) • Archaeological Exclusion Zones could be established around sensitive interest features • Develop protocol for archaeological discoveries to account for unexpected finds • Written Scheme of Investigation (WSI) to set out measures for ground clearance appropriate to the categorisation of the area • Heritage awareness initiatives with local interest groups / schools
Biodiversity	• Degradation or loss of habitats	• Pipeline routes to seek to avoid nationally or internationally important terrestrial and marine	• Clearance of vegetation to be undertaken prior to the breeding season where possible.

EIA Topic	Example potential impact occurring during construction, operation and decommissioning	Example potential embedded mitigation measures to be explored during scheme development and EIA	Example potential secondary mitigation measures to be explored during EIA
	• Killing or injuring of fauna through the removal of resting or breeding sites • Loss of foraging or breeding areas • Loss of ecological connectivity • Introduction of INNS	habitats where possible, or areas identified as functionally linked or supporting protected / notable species. • Sensitive selection of pipeline river crossings to minimise impacts to groundwater flows and water dependent habitats. Use of trenchless techniques where appropriate. • Design measures to reduce risk of INNS (e.g. screens). • Appropriate design of emergency discharge from EBL to consider potential impacts to aquatic ecology. • Sensitive design around Root Protection Areas.	• Restoration or compensation of terrestrial, coastal or marine habitat where possible on completion of construction. • Translocation of species prior to construction. • Appropriate isolation, removal and post-construction control measures implemented to minimise spread of INNS. • Avoid significant dust dispersion, sedimentation runoff, nitrogen deposition (from construction traffic and lane closures holding traffic in queues). Consideration will also need to be given to the location of construction compounds to avoid designated areas. Traffic may need to be routed away from any sensitive habitats to avoid increases in nitrogen loading.
Land Quality and Ground Conditions	• Exposure of workforce and the public to contaminated soils and groundwater and associated health impacts • Impacts on ground water quality and groundwater resources • Impacts on surface water quality • Sterilisation of future mineral resources	• Avoidance of known areas of contaminated land through design of the SRO using good design principles • Avoidance of mineral sterilisation through design of the SRO using good design principles	• Reinstatement of land following construction where possible • Remediation if required • In-situ ground improvement techniques or excavation and replacement of poor material
Land Use and Agriculture	• Loss of agricultural production on agricultural land and disruption of farming practices • Loss or disruption to recreational assets • Loss or diversion of PRoW and / or cycle paths	• Routing of the pipeline to avoid agricultural land where possible • Routing of the pipeline to avoid recreational land and PRoW where possible • Take appropriate mitigation measures to address adverse	• Topsoil retained and replaced once construction is complete • Where green infrastructure is affected, the functionality and connectivity of the green infrastructure network should aim to be maintained

EIA Topic	Example potential impact occurring during construction, operation and decommissioning	Example potential embedded mitigation measures to be explored during scheme development and EIA	Example potential secondary mitigation measures to be explored during EIA
		effects on National Trails, other PRoW and open access land and, where appropriate, to consider what opportunities there may be to improve the network and other areas of open space and improve access	
Landscape and Visual Impact	• Effects to landscape fabric and features • Effects to landscape / townscape / seascape character • Effects to visual amenity within landscape designations (including consideration of wildlife and natural beauty) • Effects to visual amenity	• Appropriate siting of above ground infrastructure to consider viewpoints / tranquillity / landscape designations • Sensitive lighting design in accordance with best practice • Landscaping schemes to screen infrastructure. • Materials and finishes of infrastructure to be given careful consideration	• Preparation and implementation of Landscape Management Plan
Noise and Vibration	• Noise impacts to humans from construction plant, vehicles or vessels • Noise impacts to ecology from construction plant, vehicles or vessels (above ground and underwater) • Vibration impacts to humans (construction) • Vibration impacts to buildings (construction)	• Construction methods selected to reduce noise • Adequate distance between source and noise-sensitive receptors • Layout of structures or buildings to screen noise	• Reduction of noise at point of generation and containment of noise generated • Restriction of activities allowed – specifying noise limits or times of use • Potential use of acoustic barriers
Traffic and Transport	• Driver delay to road users including pedestrians, cyclists and equestrians • Severance or loss or pedestrian / cycle amenity • Reduction in road safety	• Selection of route Options which avoid heavily congested areas / roads • Consideration could be given to the utilisation of waterborne and rail transport to deliver large quantities of construction materials	• HGV movements and construction vehicles could be routed and timed to avoid peak traffic periods and sensitive receptors • Use of best practice methods including the development and implementation of CTMP

EIA Topic	Example potential impact occurring during construction, operation and decommissioning	Example potential embedded mitigation measures to be explored during scheme development and EIA	Example potential secondary mitigation measures to be explored during EIA
			• Siting and construction activities could be undertaken so as to minimise any short-term adverse effects on public rights of way • Control numbers of HGV movements to and from the site in a specified period during construction and operation where possible and consider the impacts of alternative transport routes
Water Resources and Flood Risk	• Changes to flood risk and the hydrology of surface watercourses • Changes to the geomorphology of surface watercourses • Changes to the geomorphology and quality of surface waters • Temporary or permanent changes to surface and groundwater quality • Changes to groundwater recharge and groundwater levels resulting from changes to surface and sub-surface hydrology	• Sustainable drainage approaches and other measures such as planting could be adopted to ensure no net change in fluvial, estuarine or surface water flood risk, arising from site run-off • Where required flood storage measures could be included in the design of development	• Adherence to pollution control practice and pollution prevention guidance • Best practice used to prevent silt, concrete or fuel oil polluting water courses or ground water
Marine Water Quality	• Potential benefits to water quality as a result of water recycling process (benefits in term of total nitrogen and salinity) as indicated by preliminary modelling results	• N/A	• N/A
Ornithology	• Disturbance and displacement (e.g. noise, light and human activity) • Direct habitat loss and fragmentation • Indirect impacts through effects on habitats and prey species	• Informed by surveys, sensitive location of infrastructure and construction compounds to avoid impacts to sensitive features (e.g. nests, breeding / feeding areas)	• Timing of construction works to minimise potential impacts to breeding / overwintering birds where possible
Carbon and GHG	• Embodied Green House Gases (GHGs) within construction materials	• New infrastructure could be designed to incorporate the use of energy efficient materials, building techniques and energy efficient	• The use of low emission plant during construction could be considered

EIA Topic	Example potential impact occurring during construction, operation and decommissioning	Example potential embedded mitigation measures to be explored during scheme development and EIA	Example potential secondary mitigation measures to be explored during EIA
	• GHG emissions from construction and operation vehicle and vessel movements • GHG emissions from construction and operation site activities	pumping and water treatment equipment • Opportunities could be sought for the use of, or generation of, renewable energy to help offset additional operational carbon emissions	• Maximising the use of on-site materials could reduce HGV movements • Use of prefabricated construction materials and off-line build to minimise materials used
Major accidents	• Flooding • Storm surges, other extreme weather • Cyber attacks • Disease • Industrial action	• The design of the proposed SRO will be informed by the appropriate health and safety regulations, design codes and other legal requirements. Adhering to these requirements will minimise the risk of major accidents and disasters.	• Management plans developed, in line with best practice guidance and relevant legislation, to minimise operational risks associated to major accidents and disasters

2.5.2.9. Carbon

Carbon, both Capital, Operational and WLC for each SRO, has been estimated and included within the MCDA and Consenting Evaluation work.

Capital carbon emissions were based on scoping information in CIT costing sheets developed by SW. Where costs were developed using a bottom-up approach or based on quotes from suppliers rather than cost models, a general approach to account for additional capital carbon was applied based on the relative proportion of the total cost. For example, if 90% of the total cost was based on cost models and 10% was bottom up, the total capital carbon was scaled up accordingly to account for the additional assets.

Operational carbon emissions were calculated based on quantities for power use, chemical use, transport and operational maintenance requirements.

The whole life carbon estimates comprise the capital carbon emissions, annual operational emissions and additional emissions associated with capital maintenance. The estimated annual carbon emissions profile was based on the whole life cost profile, as summarised below:

- Years 1-4: planning;
- Years 5-8: construction;
- Year 5: Proportional to 25% of planning costs and 20% remaining CAPEX costs;
- Year 6: Proportional to 25% of planning costs and 35% remaining CAPEX costs;
- Year 7: Proportional to 25% of planning costs and 35% remaining CAPEX costs;
- Year 8: Proportional to 25% of planning costs and 10% remaining CAPEX costs; and
- Years 9-108: operation & capital maintenance.

The monetised cost of carbon was also calculated using the traded and non-traded carbon price forecasts from the Green Book Supplementary Guidance: Valuation of energy use and GHGs for appraisal (Table 3, Carbon prices and sensitivities 2010-2100 for appraisal, 2018 £/tCO2, central price). The traded carbon price was applied to power related emissions only, with the non-traded carbon price applied to all other emissions.

The current estimate of emissions provides a view of how much the options would add to SW's existing emissions once commissioned. Under SW's net zero operational emissions by 2030 commitment these operational emissions will need to be reduced and potentially offset by 2030. The potential costs of offsets have not been included, at this stage, as this would be considered as part of SW's overall net zero and offsetting strategy.

Table 50 summarises the capital carbon, operational carbon (associated with chemical use, power and transport), whole life carbon (includes capital maintenance in addition to operational carbon over 100 years) and the non-discounted monetised cost of carbon for B.2.

Table 50 - Summary of Carbon Calculations for B.2

Operating regime	Flow (Ml/d)	Capital carbon (tco2e)	Operational carbon (tco2e)	Whole life carbon (tco2e)	Monetised whole life carbon (£m)
			B.2		
MAX (DO)	61	68,000	11,200	872,000	230
MIN	15	68,000	3,400	357,000	87
AVERAGE	15.46	68,000	3,500	362,000	89

The water sector has not yet defined how the sector's net zero ambition will apply at programme, project, or company level whilst also accounting for its duty to maintain efficient and affordable services for customers.

Once industry wide net zero plans are finalised, it will be easier to understand which programmes of work will be most cost-effectively capable of meeting net zero targets.

2.5.3. Strategic Resource Option B.5

2.5.3.1. Strategic Environmental Assessment

Several of the components of B.5 are shared with B.2, including the WRP itself, changes to Eastney LSO and ceramic membrane, as reported in Section X. Potential effects of the additional components of B.5 are summarised in the following section.

As noted in the SEA section for Option B.2, as with the approach taken at Gate 1, and in line with the requirements of the RAPID Accelerated Gate 2 Submission Template, environmental assessments that provide information consistent with SEA have been undertaken at option level for each SRO. A statutory SEA is not required for Gate 2.

The first step of Stage B was to undertake a screening exercise, to assess the potential effects of each option against the baseline environment, and to determine whether they are affected by the proposals (in this context ‘screening’ is used to describe an option level source-pathway-receptor approach taken to identify where impacts may occur, not SEA screening in the sense of deciding whether a whole plan requires an SEA).

SEA Screening

For all Options (B.2, B.4 and B.5) there is the potential for major adverse effects on biodiversity in relation to the operation of the Waste Stream via Eastney LSO from Budds Farm WTW component, due to the potential for adverse effects to the National Site Network Sites. The construction of the ceramic membrane plant at Otterbourne WSW (including the washwater recovery area), required for all SROs, has the potential to have a major adverse impact on the qualifying species of the River Itchen SAC (and SSSI which underpins this designation). Ancient Woodland also borders the Otterbourne WSW site and therefore there is the potential for adverse effects during construction.

For B.2 / B.5 the construction of the transfer pipeline WRP to the EBL at Otterbourne (Routes 1 and 2) and the operation of the EBL (with emergency discharge pipeline or overland flow) have the potential to have major adverse impacts on biodiversity (notably, the River Itchen SAC). There is also the potential for major adverse impacts on cultural heritage associated with the Route 2 transfer pipeline (WRP to EBL) and the EBL itself due to the proximity to numerous Scheduled Monuments and Listed Buildings, and the potential for undiscovered archaeological remains. Negligible impacts are anticipated on cultural heritage along the pipeline during operation as the infrastructure will be buried. However, there is the potential for adverse impacts on the setting of the heritage asset (Moated site at Otterbourne Manor) which is located within 500 m of the component, during the operation of the EBL.

The B.5 component, pipeline from PC WTW to WRP, has the potential to have a major adverse impact on heritage assets due to the proximity to 11 Scheduled Monuments within 1 km of the proposed pipeline. Fort Purbrook Scheduled Monument is located adjacent to the component. In addition, there are numerous Listed Buildings within 1 km of the pipeline and a high potential for undiscovered archaeological remains.

B.5 Pipeline from Peel Common WTW to WRP

Summary of component adverse effects

Two major adverse effects have been identified, relating to biodiversity, flora and fauna (potential dust and air quality impacts of construction works towards National Site Network Sites and national designations), and archaeology and cultural heritage (potential for unknown archaeology).

Summary of component beneficial effects

Five minor beneficial effects have been identified for this component, relating to population and human heath (more sustainable provision of water during drought conditions), material assets and resources (lessening the pressure on other sources that abstract water from more limited water resources during drought conditions), water (presents an opportunity to reduce impacts to groundwater through water recycling) and air and climate (reduction in vulnerability to climate change), through its contribution to water delivery resourced as part of the overall Water Recycling SRO. The component contributes to a benefit by ensuring water provided by the other components reaches the right customers, communities and businesses. Additionally, the component contributes to reducing the vulnerability to risks (i.e. drought) associated with climate change effects and improves resilience to the likely effects of climate change.

B.5 Waste stream via Peel Common WTW LSO

Summary of component adverse effects

One major adverse effect has been identified, relating to Biodiversity, flora and fauna (potential dust, noise and air quality impacts of construction works towards National Site Network and national designations).

Summary of component beneficial effects

Six minor beneficial effects have been identified for this component, relating to biodiversity (small improvement in the waste stream), population and human heath (more sustainable provision of water during drought conditions), material assets and resources (lessening the pressure on other sources that abstract water from more limited water resources during drought conditions), water (presents an opportunity to reduce impacts to groundwater through water recycling) and air and climate (reduction in vulnerability to climate change), through its contribution to water delivery resourced as part of the overall Water Recycling SRO. The component contributes to a benefit by ensuring water provided by the other components reaches the right customers, communities and businesses. Additionally, the component contributes to reducing the vulnerability to risks (i.e. drought) associated with climate change effects and improves resilience to the likely effects of climate change.

Summary of B.5 effects (where different to B.2)

Adverse effects

Major effects to biodiversity are associated with construction disturbance to Chichester and Langstone Harbours SPA and Ramsar (coastal saltmarsh and mudflats) and the Solent Maritime SAC (400 m) as the PC WTW pipeline extends west from the WRP. The waste stream has the potential for major adverse effects through interaction with the offshore areas of the Solent Maritime SAC. Potential major adverse effects to biodiversity also arise from the proximity of ancient woodland to the 2nd Stage Pumping stations, BPTs and ceramic membrane plant for this SRO.

Beneficial effects

This SRO would have minor beneficial effects to biodiversity (from the a small reduction in the ed waste stream at BF), population and human heath (more sustainable provision of water during drought conditions), material assets and resources (lessening the pressure on other sources that abstract water from more limited water resources during drought conditions), water (presents an opportunity to reduce impacts to groundwater through water recycling) and air and climate (reduction in vulnerability to climate change).

Cumulative effects

Adverse cumulative effects could occur through changes in water quality and prey resource to the Portsmouth Harbour SPA and Ramsar and changes in water quality dues to contaminants to the Solent and Southampton Water SPA and Ramsar in combination with the Aquind Interconnector project.

The Portsmouth coastal management scheme HRA concludes no effect on the Portsmouth Harbour SPA and Ramsar. As the SRO has potential to cause LSE from disturbance effects, an adverse cumulative effect cannot be ruled out at this stage.

2.5.3.2. Marine Conservation Zone Assessment

A MCZA has been completed for Gate 2. The only potential component related to B.5 that could impact on the marine environment is the alteration to the discharge from the Eastney LSO associated with the reduction in wastewater and inclusion of reject water from the recycling process in the Eastney LSO discharge. In addition, this SRO includes an additional wastewater transfer from PC WTWs which could affect the existing discharge from PC LSO.

MCZs included in the assessment include the Yarmouth to Cowes MCZ, The Needles MCZ and Bembridge MCZ. MCZs outside of the Solent are considered to be sufficiently distant so as not to be within the zone of impact for the SROs, this is supported by the modelling work completed to date.

Modelling work undertaken to inform SRO Option appraisal modelled the maximum flow for B.5 at 75 Ml/d and the BAU flow rate of 15 Ml/d, which is anticipated to be required for 320 days in an average year. The existing situation using existing wastewater data was also modelled to allow a comparison between the model outputs.

Modelling for both the 75 Ml/d and 15 Ml/d flows both indicates that the TN concentrations could potentially decrease but this is limited to the Northern area of the Solent and the harbours Portsmouth and Langstone. Very little change is noted in the MCZs where the plume extent overlaps for both flow scenarios. The plume extent, however, even for the existing situation, does not overlap with the Bembridge MCZ boundaries. The modelled changes to salinity concentrations are relatively minor and limited to close proximity to the outfall therefore are not considered further in this assessment.

Based on the results of the modelling and specifically the extent of the plume, the inclusion of the MCZs mentioned above are considered sufficient for the MCZ assessment. No pathway for impact exists for other MCZs that are not in the Solent. Where available, NE’s conservation advice has been considered throughout the assessment.

Screening for the Yarmouth to Cowes Marine Conservation Zone

The screening phase of the MCZA of Yarmouth to Cowes MCZ for B.5 is detailed in Table 51.

Table 51 - MCZ assessment screening for the Yarmouth to Cowes MCZ for B.5

MMO screening criteria	Yarmouth to Cowes MCZ
Is the plan or project taking place within or near an area being put forward for, or already designated as, an MCZ?	The Eastney LSO for B.5 is located 17.5 km from the MCZ at its closest point. This is not considered to be near the MCZ.
Is the plan or project capable of affecting (other than insignificantly) either: • The protected features of an MCZ; or • Any ecological or geomorphological process on which the conservation of any protected feature of an MCZ is (wholly or in part) dependant?	Construction and decommissioning – there are no components of construction and decommissioning phases that would occur in the marine environment. Operational phase – there would be alterations to current wastewater flows from BF and a discharge of reject water from the desalination plant required to support this water recycling SRO via the Eastney LSO. Therefore, there is the potential for water quality effects on the MCZ. Furthermore, NE’s consultation response identifies that the water recycling Options have some limited potential for effect, if potential impacts elsewhere can be mitigated, to reduce some of the existing water quality impacts within the Solent Habitat sites and therefore contribute to the “better managing” target . Based on the above, this MCZ is screened into a Stage 1 assessment for B.5 for operational effects only.

Stage 1 Assessment for the Yarmouth to Cowes MCZ

This stage of the MCZA considers the potential impacts of B.5 on Yarmouth to Cowes MCZ, which was screened in Table 51 - the features of interest, their current conservation objectives and any potential impacts that may arise due to B.5.

2.6. Planning and Consenting

2.6.1. Executive Summary

This planning strategy builds on the planning strategy submitted as part of SW's Gate 1 submission. It outlines the variety of consenting activities undertaken since Gate 1 to progress the development of the Water Recycling Options, including the development of a consenting programme for delivery and review of the consenting route for the proposed options.

The consenting programme provides helpful visibility and certainty to the delivery programme, enabling key consenting, engagement, scheme development and environmental assessment activities to be properly defined, planned, integrated and executed.

The consenting route review reaffirms SW's initial view at Gate 1 that a DCO is the preferred route to consent based on a number of factors, including the need for the options and benefits of timely delivery, the scale and significance of the options, their complex terrestrial interfaces and various consents required, and likely significant impacts across a 'larger than local' area.

The strategy also confirms that, based on current understanding of the characteristics of the options, access into the DCO consenting regime would not be automatic, i.e. the options do not currently meet the thresholds for being defined as a Nationally Significant Infrastructure Project (NSIP). Projects can however be directed into the DCO regime through a s35 direction by the Secretary of State – SW's consideration of the factors to support a request for such a direction suggest that a strong case can be made.

In addition, the strategy outlines the likely DCO application deliverables, the secondary consents and licences required in conjunction with planning consent and potential land acquisition powers (identifying those which can be included in a DCO as part of a single authorisation), the approach to environmental assessment and potential consenting risks. Key next steps are also set out, which will include ongoing review and refinement of this strategy should any of the Water Recycling options be developed beyond Gate 2. An update of progress on consenting activities will be provided at Gate 3.

2.6.2. Background & Objectives

As part of its Gate 1 submission in September 2020, SW provided an early planning strategy to primarily establish an initial view of a likely consenting route for the delivery of the preferred strategic resource Option, which was the Desalination Base Case as set out in SW's WRMP 19[3].

That strategy considered the pros and cons of the two principal consenting routes under the TCPA and the Planning Act 2008 (i.e. the DCO process). Based on the emerging characteristics of the project at that time, it was determined that the DCO consenting route offered the most beneficial pathway to achieving consent.

The planning strategy set out a number of commitments and requirements in respect of the planning activities and outcomes that should be achieved for Gate 2. These were supplemented by additional requirements in subsequent RAPID and Ofwat documentation detailed below.

The objectives of this strategy are broadly to demonstrate progress against those requirements, update on the preferred consenting route for the Water Recycling Options and set out key next planning steps and activities for the consenting process, including to Gate 3.

2.6.3. Introduction

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[3] Water Resources Management Plan 2020–70 (southernwater.co.uk)

2.6.3.1. Overview

The Gate 2 Planning Strategy builds upon the initial consideration of the principal consenting route presented in the Gate 1 Submission: Annex 13 Planning Strategy (September 2020).

The Planning Strategy is structured around the following sections:

- **Executive summary, background and objectives;**
- **Introduction:** Includes an overview of the Planning Strategy and confirmation of how actions agreed at Gate 1 have been addressed;
- **Overview of work undertaken since Gate 1:** Details the work since Gate 1 to initiate early pre-application work, including that to inform selection of a principal consenting route;
- **Development description:** Defines the preliminary description of development and development assumptions;
- **Preferred consenting route:** Confirmation of preferred consenting route for the Water Recycling Options, informed by further legal and planning advice;
- **Schedule of main application deliverables and responsibilities:** Review and update of principal deliverables and responsibilities;
- **Consenting programme for delivery;**
- **Summary of consenting risks and countermeasures;** and
- **Conclusions & next steps.**

2.6.3.2. Actions Agreed at Gate 1 & Gate 2 Requirements

Table 52 details the actions agreed for the Planning Strategy as part of SW's Gate 1 submission to RAPID, and the information which has been requested by RAPID to accompany the Gate 2 Planning Strategy. Table 52 also details where this information is located within the Gate 2 Planning Strategy.

Table 52 confirms that the requirements of the Gate 2 Planning Strategy specified in the Gate 1 submission and subsequent Gate 2 template and guidance have been fulfilled by this document.

Table 52 - Planning Strategy actions agreed at Gate 1 / Gate 2 Planning Strategy requirements

Source	Applicable Option	Requirement for Gate 2 Planning Strategy	Location within the Gate 2 Planning Strategy
Gate 1 Planning Strategy (SW)	All Options	Engagement with Defra, DLUHC (previously MHCLG), PINS and the local authorities	2.6.4: Overview of work undertaken since Gate 1.
Gate 1 Planning Strategy (SW)	All Options	Further assessments to confirm the development parameters for each progressed solution and Option type	2.6.4: Overview of work undertaken since Gate 1. 2.6.5: Development description
Gate 1 Planning Strategy (SW)	All Options	Defining preliminary description of development, application boundary and development assumptions	2.6.5: Development description
Gate 1 Planning Strategy (SW)	All Options	Consenting risk workshop	2.6.4: Summary of consenting risks & countermeasures

Source	Applicable Option	Requirement for Gate 2 Planning Strategy	Location within the Gate 2 Planning Strategy
Gate 1 Planning Strategy (SW)	All Options	Preparation of an updated technical note supported by further legal and planning advice on selection and confirmation of preferred consenting route	2.6.6: Preferred consenting route
Gate 1 Planning Strategy (SW)	All Options	Approach to EIA and associated assessments (e.g. HRA, WFD)	2.6.8: Approach to EIA & associated assessments
Gate 1 Planning Strategy (SW)	All Options	Preparation of a Planning Strategy setting out the deliverables and strategy for the preferred principal consenting route	2.6.6: Preferred consenting route 2.6.7: Schedule of main application deliverables and responsibilities
Gate 1 Planning Strategy (SW)	All Options	Review and update the application programme; review inputs / outputs, dependencies and critical path	2.6.10: Consenting programme for delivery
Gate 1 Planning Strategy (SW)	All Options	Review and update principal deliverables and responsibilities	2.6.7: Schedule of main application deliverables and responsibilities
Gate 1 Planning Strategy (SW)	All Options	Establish application documents and plans (and owners)	2.6.7: Schedule of main application deliverables and responsibilities
Gate 1 Planning Strategy (SW)	All Options	Develop approach to other consents and licences	2.6.9: Approach to Other Licences & Consents
Gate 1 Planning Strategy (SW)	All Options	Monitor the progress of consent applications being prepared by PW (HT) and Bristol Water (Cheddar 2 Reservoir) and consider implications for consenting strategy	2.6.4: Overview of work undertaken since Gate 1
Gate 1 Determination (Ofwat)	All Options	Recommendation: Provide further detail on the planning risks and the planned mitigation measures	2.6.11: Summary of consenting risks and countermeasures
Gate 2 Submission Template (RAPID)	All Options	Explain the preferred consenting route – DCO or TCPA	2.6.6: Preferred consenting route
Gate 2 Submission Template (RAPID)	All Options	Pre-planning application activity plan (land referencing, field surveys, environmental permitting plans)	2.5 Environmental 2.6.4 Overview of work undertaken since Gate 1

Source	Applicable Option	Requirement for Gate 2 Planning Strategy	Location within the Gate 2 Planning Strategy
Gate 2 Submission Template (RAPID)	All Options	Highlight key planning steps and risks	2.6.6: Preferred consenting route 2.6.11: Summary of consenting risks and countermeasures 2.6.12 Next steps

2.6.4. Overview of work undertaken since Gate 1

Since the Gate 1 submission, SW has progressed a number of key activities to initiate and progress early pre-application work, including that relating to the selection of a principal consenting route for the Water Recycling Options and to support the site and scheme selection activities. These activities include:

- The appointment of a Planning & Consenting Lead for the WfLH programme, supported by a Town Planning team;
- Delivery of a programme of consenting route workshops;
- The design and implementation of a robust planning-led evaluation exercise as part of site / route and scheme selection for Gate 2 (see Section 2.4);
- Assessment work to confirm development parameters;
- Stakeholder engagement – guided by a comprehensive approach to consultation and engagement;
- Land referencing and engagement with landowners to secure land access for surveys;
- Full consenting schedule reviews for each of the SROs (including the Water Recycling Options);
- Progression of the procurement process to source the planning/consenting and consultation resource required to deliver consent for the Selected Option;
- Identification of consenting risks; and
- Monitoring of DCO applications for other strategic water resources.

2.6.4.1. Consenting Route Workshops

A series of internal consenting route workshops for each of the SROs were undertaken to define and test the development parameters and characteristics for each option and its component parts in order to identify the key pertinent factors that will influence the development of the consenting strategy (e.g. temporary / permanent physical development required; land requirements; protected sites and species; utilities; transport undertakings; local policy; local authority administrative areas; and EIA).

Those attending the consenting route workshops were project engineers, programme managers, land agents, environmental specialists, town planners and legal advisors.

2.6.4.2. Assessments to Confirm Development Parameters

The consenting route workshops enabled an assessment of the proposed development against relevant legislation and guidance to further consider the principal consenting regime for the Water Recycling Options. SW will continue to review the approach to consenting route beyond Gate 2 should the Water Recycling Options be developed further.

It has also enabled SW to identify the secondary consents and licences required to support each Option, confirm consultation requirements and define a consenting programme.

2.6.4.3. Stakeholder Engagement

SW's overall approach to pre-application engagement for each of the SROs comprises different 'stages' of engagement, including specific public consultation exercises, which SW will undertake for the Selected Option prior to submission of an application for consent.

In accordance with this approach, a non-statutory consultation exercise was undertaken between February 2021 and April 2021 ('the Stage 1 Consultation'). This focused on the previous Base Case (Desalination at Fawley) and introduced the alternative Water Recycling and Havant Thicket Reservoir-based options, with a broadcast element to raise awareness of the WfLH programme. A Consultation Feedback Report, summarising issues raised in response to the consultation, was published in September 2021 to raise awareness and provide transparency in respect of the feedback received. The feedback received was considered in the work to develop the SROs for Gate 2 and SW will report on how that feedback has been taken into account and influenced its proposals at the next public consultation stage for the project. Section 2.8 Stakeholder & Customer briefly describes the nature of feedback received.

Following completion of the non-statutory consultation, ongoing engagement continued up to the Gate 2 submission. This included engagement with many of the key stakeholders specified under the various planning and regulatory regimes applicable to the delivery of SW's SRO, including Defra, PINS, statutory environmental bodies (EA, NE, MMO) and local authorities. This engagement principally focused on SW's site, route and scheme selection process, including methodology, assessment criteria and outcomes from the various process stages. The feedback helpfully flagged key issues important to those stakeholders in terms of technical inputs and outcomes and enabled SW to progress confidently towards Gate 2. Engagement specifically in respect of site, route and scheme selection is detailed within Chapters 2 and 3 of Annex 5, Options Appraisal Process.

Whilst the Gate 1 Planning Strategy stated that engagement with MHCLG (now Department for Levelling Up, Housing and Communities (DLUHC) should be undertaken, SW does not consider that this is necessary at this stage in the programme or would be of benefit to the development of the approach to planning and consenting.

Beyond Gate 2, engagement will continue with key stakeholders across a number of technical disciplines (e.g. planning, environmental assessment, scheme development) as SW progresses the pre-application activities for the Preferred Option. This will include up to two additional stages of public consultation (both statutory and non-statutory) if SW progresses along the DCO consenting route. This will enable all interested parties to provide meaningful input into SW's emerging proposals.

2.6.4.4. Section 35 Direction

SW had previously developed a case for obtaining a direction under s35 of the Planning Act 2008 for the Desalination Base Case and is currently updating that work to reflect its Emerging Preferred Option for Gate 2. Many of the factors that supported a case as to why the previous Desalination Base Case was considered by SW to be capable of being designated as of 'national significance' would apply equally to the Water Recycling

Key factors relate to:

- The need for the development and its significance in maintaining crucial water supplies in a drought (as set out in WRMP19)
- The contribution to meeting UK environmental objectives (WFD and delivering water abstraction reductions)
- The size of the project and the potential impacts over a 'larger than local' area (potentially stretches over 6 local authority administrative areas)
- The timely delivery of consents

- The benefits of the single authorisation process under the Planning Act 2008 (noting multiple licenses, consents and powers, including compulsory acquisition, will be needed in addition to planning consent)

These factors would be developed into a coherent 'case for national significance' as part of any request for a direction under s35. SW acknowledges that achieving a s35 direction is not precluded simply because a project does not automatically fall within the NSIP thresholds for the purposes of the Planning Act 2008 – the case for 'national significance' is based on a number of factors that need to be taken together. This is considered further later in this chapter.

2.6.4.5. Land Referencing, Access and Surveys

SW has undertaken the following activities prior to Gate 2:

- All potential main sites have been referenced and identified registered owners contacted to obtain information on known land interests and constraints; and
- Crown land and 'special' interests in, or categories of land under, s 127 to s 132 of the Planning Act 2008 have been identified along the pipeline corridors.

Activities proposed in the period to Gate 3 will include:

- Referencing of pipeline corridors/routes and identifying and contacting registered owners to obtain information on known land interests and constraints;
- Site notices on unregistered land requesting those with an interest in the land to make contact;
- Collation of information to inform the development of the proposals and the Book of Reference;
- Contacting land interests to secure agreement where access is required for engineering and ecological surveys;
- Engaging with persons with an interests in land in accordance with s 42(1)(d) of the Planning Act 2008; and
- Early negotiations with landowners over potential Option agreements for securing land interests.

2.6.4.6. Planning Application Monitoring

The Gate 1 Planning Strategy identified that SW should monitor the progress of consent applications being prepared by Bristol Water (Cheddar Reservoir 2) and PW (HTR) and consider implications for the consenting strategy. SW has closely monitored the progress of these two schemes, for possible learnings.

Bristol Water – Cheddar Reservoir 2

The monitoring of this proposal was initially proposed on the basis that the Cheddar Reservoir 2 scheme could provide a potential source of water supply to SW. An extant (unimplemented) hybrid planning permission exists for the second reservoir at Cheddar but expires in November 2021 and it is understood that this will not be implemented by Bristol Water. At the time of writing, SW is not aware that Bristol Water has progressed either with the implementation of the extant consent or with the preparation or submission of a further planning application for the Cheddar Reservoir 2 project. Moreover, SW's own consideration of this scheme has shown that it would not be a feasible water supply proposition. It is considered that the current planning status of this scheme does not therefore have implications for the Water Recycling Options.

Portsmouth Water – Havant Thicket

Hybrid planning applications for the HTR scheme, made under the TCPA, were submitted by PW to East Hampshire District Council and Havant Borough Council in November 2020. An outline planning application for the associated pipeline was submitted to Havant Borough Council at the same time. The hybrid approach to the reservoir planning application sought full planning permission for components of the scheme and outline planning permission for others.

Following completion of a s106 Agreement, planning permissions for the reservoir and its associated pipeline works were issued by the two Councils on 15 October 2021. The approval of the reservoir scheme will provide certainty to the deliverability of SW's Havant Thicket Reservoir-based options given the necessary interface with the new reservoir. The delivery of the reservoir will, however, be independent of the Water Recycling Options (Options B.2 and B.5) considered here.

2.6.5. Development Description

Site selection work has been undertaken prior to Gate 2 to determine the likely locations for key components of the Water Recycling Options (i.e. sites for plant and corridors for pipelines). This has been necessary to determine the consentability of all SROs in order to confirm SW's preferred solution for delivery.

Post Gate 2, more detailed site and pipeline route planning will take place as part of further scheme development for the Selected Option to determine land requirements and ultimately inform any application boundary. Construction methods for the Water Recycling Options are being assessed at a level commensurate with the maturity of the proposals. Further consideration, including the method for laying of the pipelines, will be developed through the engagement, design and contracting processes.

It is important to note that any DCO application could, in places, adopt a maximum 'design parameters' approach to design detail for the project rather than a detailed design that might be expected for a traditional full planning application approach.

Work undertaken to date to select likely locations for scheme plant and pipeline components has been based on areas of interest and indicative corridors. Sites and routes would be further defined through any DCO consenting process, including through comprehensive consultation and engagement, to determine appropriate application boundaries (or order limits) for the various aspects of the scheme. At this early stage of the process, it is not therefore possible or appropriate to indicate an application boundary.

2.6.5.1. Proposed Development

The two Water Recycling options, Options B.2 and B.5, incorporate a 61 and a 75 Ml/d water recycling plant respectively, transferring recycled water to a new environmental buffer lake (EBL) at Otterbourne WSW.

The principal elements of the Water Recycling Option B.2 that a consent application would be sought for are:

- Modifications to outlet channels at BF WTW to transfer up to 87 Ml/d wastewater during drought conditions via a short (c.0.5 km) pipeline to the WRP;
- WRP with a capacity of 87 Ml/d, to treat and produce up to 61 Ml/d of recycled water during drought conditions;
- C.47 km pipeline to transfer up to 61 Ml/d recycled water from the WRP to a new EB;
- EBL and retention basin, providing approximately 75 million litres of water storage; and
- Short connecting pipeline to transfer water from the EB to Otterbourne WSW.
- Along the main transfer pipeline at separate points, there is expected to be:
    - High lift pumping stations
    - Second stage pumping station, and
    - Break pressure tank

The principal elements of the Water Recycling option B.5 that a consent application would be sought for are the same as those for Option B.2 but with the addition of:

- Modifications to outlet channels at PC WTW to transfer c.39 Ml/d wastewater during drought conditions via a c.24 km pipeline to the WRP; and

- WRP with a capacity of c.97 Ml/d to be received from both BF and PC WTWs, to treat and produce up to 75 Ml/d of recycled water during drought conditions.

These principal elements of the development for the various Options would be supported by 'associated development'. This could include (but is not limited to) receiving / blending tank infrastructure at Otterbourne WSW, temporary works to support construction, permanent works to support operation / maintenance, landscaping, accesses and utility connections for the site including electrical substation, telecoms, water and sewerage facilities, and environmental mitigation, enhancement and compensation measures.

2.6.5.2. Site Location

The proposals for the Water Recycling Options could be located within the administrative areas of Havant Borough Council, Winchester City Council, Eastleigh Borough Council, City of Portsmouth Council, Fareham Borough Council and South Downs National Park, and Hampshire County Council as county authority.

In so far as relevant, site selection work leading up to Gate 2 has had regard to consultation and engagement feedback to inform the preferred site location for the plant and route corridor alignment for the pipeline infrastructure.

The broad location of the WRP element would be located in Havant, located approx. 0.5 km North-West of the existing SW Budds Farm WTW, within Havant District Council's administrative area. The Otterbourne WSW is located in Otterbourne, north of Eastleigh, situated within Winchester City Council's administrative area.

Some elements of the Water Recycling Options (pipeline infrastructure) could be located within the South Downs National Park, which carries a high level of protection under national planning policy to ensure the protection of natural beauty, wildlife and cultural heritage.

2.6.6. Preferred Consenting Route

2.6.6.1. Overview

As set out in SW's Gate 1 Planning Strategy, two principal consenting routes are potentially available for the Water Recycling Options: planning permission under the TCPA and a DCO under the Planning Act 2008.

The benefits and disbenefits of each principal consenting route were included in the Gate 1 Planning Strategy. This assessment and consideration of consenting route has been reviewed and developed following the further appraisal and consultation work which has been undertaken since September 2020.

2.6.6.2. Assessment

For the Water Recycling Options, the opportunities and risks for each principal consenting route are detailed in Table 53 for the TCPA regime and Table 54 for the DCO regime.

Table 53 - TCPA regime – opportunities and risks associated with the consenting regime

Opportunities / Benefits	Disadvantages / Risks
• More common consenting route, familiarity by local authorities • The mechanisms for material amendments under the TCPA are established and understood and are likely to	• Multiple planning permissions required due to the scale of the project, may present difficulties in terms of coordination of approach / lead authority and inconsistent consents, or risk of one element of the project failing at a late stage and delaying the ability to implement other elements.

Opportunities / Benefits	Disadvantages / Risks
be considerably quicker to secure than amendments through the DCO process • Likely to be quicker to obtain Planning Permission over a DCO (assuming no lengthy public inquiry which cannot be guaranteed) • A lower level of pre-application consultation and associated evidence required at submission, less 'front loaded'	• Increases the number of separate secondary consent applications required. • Determined in accordance with the local development plan. • Lower requirements for community / stakeholder pre-application consultation, hence unforeseen risks / issues may arise during determination. • A full planning application is likely to require a much higher level of design detail than a DCO, based upon precedent from other similar projects and planning applications. • Potential for greater risk to challenge on EIA (no requirement for the preparation of a PEIR under TCPA). • No supplementary powers are available through the TCPA process when compared to the wide range of powers and consents that can be 'wrapped up' in a DCO. • No mechanisms of regulating relationships with key stakeholders, particularly in terms of asset protection (in contrast to a DCO, which can include 'protective provisions' for regulating key interfaces). • The ability to secure compulsory acquisition and temporary possession powers in respect of land required fall outside of the TCPA process – therefore a separate process would be required after the planning permission is granted in the event that land purchase cannot be agreed. This would potentially create significant delay in the programme if required.

Table 54 - DCO regime – opportunities and risks associated with the consenting regime

Opportunities / Benefits	Disadvantages / Threats
• The certainty of timely delivery and the largely single authorisation of consents enabled by the Planning Act 2008 regime would be critical for SW to meet its section 20 Agreement obligations - absent this, a range of different consenting applications would be required, which increases risks in terms of programme and delivery. • The DCO regime would provide for a more flexible consent on an adaptive basis in terms of Deployable Output (DO) enabling greater capacity to be secured if future modelling requires higher water resource requirements. • Provides policy certainty as the dNPS establishes the needs case where schemes are specified in a water company's WRMP.	• Secretary of State may refuse a request for a direction to make the project qualify as a project of nation significance (see section 2.6.10 below). • Likely to take longer to secure than Planning Permission (if no public inquiry or compulsory acquisition hearings and TCPA advisory timescales are met – this is not guaranteed, so in reality the timescales may well be similar). • Requires significant investment upfront - 'front loaded' approach (e.g. surveys, consultation with stakeholders and the community, issue resolution). • Overall cost is likely to be more for DCO compared to TCPA (cost of front-loading, documentation, consultation and examination, expert team, etc)

Opportunities / Benefits	Disadvantages / Threats
• The DCO regime has now been in place for some time, meaning it is a tried and tested method for achieving consent for large infrastructure projects. Linked to this, good practice has evolved significantly – as such, no need to 're-invent the wheel' in respect of preparatory work. • High success rate, particularly for projects with NPS support. Front loaded nature and PINS acceptance gate before examination helps to reduce successful judicial review challenges. • Land requirements (in terms of both the need for land to be acquired compulsorily and occupied temporarily) - a DCO would avoid the need for separate processes which could otherwise create delays and risk in programme – dealing with issues once means 'making the case' for compulsory acquisition can be more straightforward. • Greater potential to avoid historic issues of lengthy / costly delays during consideration of the application. Inquisitorial examinations are typically more favourable than adversarial inquiries. • Reduces the number of separate consent / permit applications required. Enables the Applicant to incorporate a range of other critical consents and powers within the one instrument, including the ability to compulsorily acquire land and to agree protective provisions where third party interests may be affected, resulting in a consistent consent in terms of requirements / conditions. • Suited to developments crossing large areas and multiple local authorities (e.g. pipelines). • DCO consents typically build in a greater level of design flexibility through assessments based on 'envelopes' ('Rochdale Envelope' - a parameters-based assessment, for example setting maximum building size / footprint). A DCO typically also includes 'limits of deviation' to allow flexibility during detailed design/construction. • Can incorporate mechanisms to deal with key interfaces (e.g. assets of statutory undertakers and other bodies) through protective provisions and therefore meaning objector management can be more straightforward. • Judicial reviews are less likely to succeed given the rigour of the process	• Retaining flexibility in the design (e.g. the 'envelope' or parameters-based environmental assessment) may result in conservative assessments and greater impacts reported. • Material amendments to DCOs have not been tested (the first is currently going through the process) and the material amendment procedure is similar to that for making a new DCO application but in a shortened form (only non-material amendments have been approved to date and that is a well understood process). Some Applicants revert to TCPA to amend consent as a result (in terms of development that does not constitute the NSIP).

2.6.6.3. Consenting Strategy

The consenting strategy set out in this section represents SW's current preferred approach, which may be subject to change if the Water Recycling options considered here are developed further.

Drawing on the benefits and disbenefits of the principal consenting routes for the Water Recycling Options, a DCO is the favoured consenting route for each option at this stage due primarily to:

- The certainty of timely delivery and the largely single authorisation of consents enabled by the Planning Act 2008 regime which is critical for SW to meet the need for new water resource infrastructure - absent this, a range of different consenting applications would be required, which increases risks significantly in terms of programme and delivery;
- The ability to include powers to compulsorily acquire and temporarily occupy land, as well as other critical consents, which would otherwise need to be sought separately - a DCO would avoid the need for separate processes which could otherwise create delays and risk in the programme);
- The scale and complexity of the Water Recycling Options, which would impact the number and extent of consents ordinarily required. The need to obtain a number of different consents from multiple local authorities (given the linear nature scheme) would place a burden on the determining authorities;
- Clarity and support of national policy, in the form of the expected National Policy Statement for Water Resources Infrastructure, which confirms the 'need' for a particular scheme when it is included in a WRMP;
- High success rate, particularly for projects with NPS support. Front loaded nature and PINS acceptance gate before examination helps to reduce successful judicial review challenges;
- Significant opportunities for public participation; and
- The scope of powers and other provisions that can be included, beyond traditional consents (e.g. in relation to operation and for multiple marine and terrestrial licenses).

Whilst a DCO is SW's preference, the activities and schedule for a TCPA consenting route have been broadly considered, should further detailed work show that a TCPA route is more preferable or that a s35 direction is not forthcoming. The work in respect of the TCPA route is not included here for brevity, although the high level learning from that work is that whilst a TCPA consenting route may appear to offer a quicker route to secure planning permission, it does not offer the certainty of consenting timescales provided by the DCO route including, including in relation to land acquisition powers and other consents also required for the delivery of the options. It is therefore an inherently more risky consenting route.

It is recognised that the Water Recycling options do not automatically qualify as NSIPs under the Planning Act 2008 since the water transfer elements fall short of the 80 Ml/d qualifying threshold on DO (as defined in Section 28 of the Planning Act 2008). Water recycling technology is also not currently a category of 'automatic' NSIP. Therefore, it can only proceed under the DCO consenting route where it is the subject of a s35 direction. As the options are in the 'field' of 'water', it is permissible to seek a s35 direction for a technology that is not a category of 'automatic' NSIP.

The key test in deciding whether to give such a direction is whether the Secretary of State considers a project to be 'nationally significant' under s35 (2)(c) of the Planning Act 2008. This is not based on bare 'DO' figures alone – instead, a range of factors will need be considered 'in the round', as outlined earlier in this chapter. On the basis of the factors identified, SW considers that a coherent case can be made that the Water Recycling options are of 'national significance'.

2.6.7. Schedule of Main Application Deliverables and Responsibilities

Table 55 details an indicative schedule of the main application deliverables and responsibilities for the Water Recycling Options on the basis that the DCO regime is the principal consenting route for these Options.

Regulations 5, 6 and 7 of the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 ('the Regulations') set out the statutory requirements for what must accompany an application for development consent made under the Planning Act 2008.

In formulating the schedule, SW has given regard to the 2009 Regulations as well as guidance issued by the DLUHC and relevant Advice Notes published by PINS[4].

The schedule of main application deliverables is, at this time, indicative. In due course, SW will engage with PINS to discuss the schedule as part of any pre-application discussions. The precise list of application deliverables would be confirmed nearer to the submission of the DCO application.

The 'Responsible workstream' column in Table 55 reflects workstreams of qualified professionals established within SW to develop the DCO application.

Table 55 - Indicative schedule of main application deliverables and responsibilities

Category	Document Type	Responsible Workstream
Application cover documents	Application form	Planning & Consenting
	Introduction to the Application	
	s 55 Checklist	
	Glossary	
	Electronic Index	
	Signposting Document	
	Copies of newspaper notices	
Plans / Drawings / Sections	Location Plan	Engineering & Design
	Land plans	
	Works plans	
	Access / Rights of way plan	
	Site layout plan	
	Elevation drawings	
	Floor plans	
	Access / Parking / Landscape	
	Drainage / Surface water	
	Other detailed plans	
	Plan of statutory / non-statutory sites or features	

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[4] Planning Inspectorate (2021) Advice Note Six: Preparation and submission of application documents. Available at: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-six-preparation-and-submission-of-application-documents/

Category	Document Type	Responsible Workstream
	Plan showing statutory or non-statutory historic or scheduled monument sites	
Draft DCO	Draft proposed DCO	Legal
	Explanatory memorandum to draft DCO	
Compulsory Acquisition Information	Statement of reasons	Land & Property
	Funding statement	
	Book of reference	
Reports / Statements	Consultation report	Planning & Consenting
	Project Overview	
	Funding Statement	Strategy & Regulation
	Transport Assessment	Environmental
	WFD Assessment	
	Details of other consents and licences	Planning & Consenting
EIA & habitat regulations information	ES	Environmental
	ES technical appendices	
	Non-technical summary	
	Scoping opinion	
	HRA	
	Mitigation Route Map	
	Publicity requirements	Stakeholder Engagement
Photographs	Photographs and photomontages	Engineering & Design and Environmental

2.6.8. Approach to Environmental Impact Assessment and Associated Assessments

Outlined below is a summary of SW's approach to undertaking an environmental assessment of the Water Recycling Options, including other associated assessments. Further detail can be found in the Environmental Chapter of this report.

In accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations), and as the project is likely to fall within the remit of the EIA Regulations, a formal EIA will be required as part of the application for a DCO. An ES, the report documenting the EIA process, will be prepared. The ES will describe the likely significant effects predicted to occur as a result of the construction and operation of the Project, whether alone or in combination with other relevant development. It supports, and is submitted as part of, the DCO application.

In summary, the EIA process will consist of the following key stages:

- **EIA Screening**: Screening is normally undertaken to determine, in cases where it is not clear if a development requires an EIA to be undertaken. It is anticipated that the Water Recycling Options would require an EIA and therefore it is unlikely that a screening report would be required;
- **EIA Scoping**: Scoping is the first major milestone of the EIA process and sets out the initial project description, identifies the key topics of potential environmental impact and sets out the proposed methodologies by which these impacts are proposed to be investigated and assessed. The 'Scoping Opinion' published by the PINS is a crucial part of the Scoping process, in which it outlines its response to the scope, and level of detail the Applicant is proposing to include in the ES. In accordance with Regulation 14(3)(a) of the EIA Regulations, where a Scoping Opinion has been adopted, the Applicant's ES should "*be based on the most recent scoping opinion adopted (so far as the proposed development remains materially the same as the proposed development which was subject to that opinion)*";
- **Preliminary Environmental Information (PEI)**: PEI is the overarching term that describes a range of information that is provided by the Applicant in advance of the formal submission of the final ES alongside the DCO to assist consultees in understanding the likely environmental effects of the Project, and to inform their consultation responses. The PEI can include an early version of the ES, although it is not a requirement, to allow stakeholder feedback to inform the final submission and aims to reach agreement with key stakeholders on key impacts and mitigation proposals in advance of the DCO examination where possible; and
- **Environment Statement (ES)**: The ES is the final report which sets out the methods, data, assessments, consultation and recommendations of the EIA process to inform the decision-makers during the examination and determination process.

A key role of the EIA process will be to set out measures envisaged to avoid, prevent, reduce or (where possible) offset any significant adverse effects on the environment.

To date, SW has progressed work on the EIA process, namely in relation to the preparation of an EIA Scoping Report. An EIA methodology document has been prepared and is currently being quality assured. The EIA methodology document will provide a framework for the EIA Scoping Report, which will be submitted to PINS (or the Local Planning Authorities in the event of a TCPA consenting route). SW will engage with relevant statutory and non-statutory bodies, including local authorities, on the development of this methodology as a precursor to engage on the subsequent scoping report.

The EIA process will be supported by a number of other assessments, including for example an assessment under the Habits Regulations (HRA) and a WFD compliance assessment.

The HRA for the Preferred Option will follow the four-stage process defined by PINS (2012), as summarised below.

- Stage 1: Screening is the process which initially identifies the likely impacts upon a National Site Network site of a project or plan, either alone or in-combination with other projects or plans and considers whether these impacts may be significant. It is important to note that the burden of evidence is to show, on the basis of objective information, that there will be no significant effect; if the effect may be significant, or is not known, that would trigger the need for an Appropriate Assessment (Stage 2);
- Stage 2: Appropriate Assessment is the detailed consideration of the impact on the integrity of the National Site Network site of the project or plan, either alone or in-combination with other projects or plans, with respect to the site's conservation objectives and its structure and function. This is to determine whether there is objective evidence that adverse effects on the integrity of the site can be excluded. This stage also includes the development of mitigation measures to avoid or reduce any

possible impacts. Where adverse impacts on the integrity of a site cannot be ruled out, it is necessary to proceed to Stage 3;

- Stage 3: Assessment of alternative solutions is the process which examines alternative ways of achieving the objectives of the project or plan that would avoid adverse impacts on the integrity of the National Site Network site, should avoidance or mitigation measures be unable to prevent adverse effects. Where no alternative solution can be identified which would meet the strategic objectives of the project, and adverse effects remain, it is necessary to proceed to Stage 4; and
- Stage 4: At Stage 4 an assessment is made as to whether the development is necessary for Imperative Reasons of Overriding Public Interest (IROPI) and, if so, of the compensatory measures needed to maintain the overall coherence of the National Site Network.

A WFD compliance assessment will be required to assess compliance of the proposed construction, operation and decommissioning activities with The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. This assessment will comprise of screening, scoping and detailed assessment stages, in accordance with guidance from the PINS (PINS, 2017) and the EA (Environment Agency, 2016). It will outline any appropriate mitigation measures required to ensure compliance with the WFD.

2.6.9. Approach to Other Consents and Licences

Table 56 below details an update of the table presented within SW's Gate 1 Planning Strategy which sets out the secondary licences and consents that may be required for the Water Recycling Options. As set out previously, the list, which is not exhaustive at this stage of design development, presents the licences and consents that may be required as part of the solution design, scheme construction and operational phases of the project.

To reiterate, under a DCO consenting route, some secondary consents will be automatically disapplied by the Planning Act 2008 (Category A), some will only be included (or 'deemed') with the agreement of the consenting body (Category B), and the need for others can be overridden by powers in the DCO itself (Category C). This enables the DCO to act, as far as possible, as a single overarching consent.

Table 56 - Secondary licences and consents

Activity	Licence / Consent / Permit or Permission	Regulating or Consenting body	Timescale to prepare application documents (approx.)	Timescale for determination	Surveys and assessments Required	Category	Notes	Option B.2	Option B.5
Land based developments (EB, booster stations, pipelines)									
Works within, or with the ability to effect, a SSSI	SSSI Assent	NE	4 weeks	28 Days	Phase 1 Ecology Survey	C	The consent is personal to the owner / occupier of the land included in the SSSI (s 28E WCA 1981). Where consent is required for operations within a SSSI, this must be sought from NE by the owner / occupier so that those operations may lawfully be carried out.	Yes All pipeline routes have the potential to impact SSSIs (e.g. River Itchen SSSI)	Yes All pipeline routes have the potential to impact SSSIs (e.g. River Itchen SSSI)
Works that could disturb European protected species (e.g. badger, bats, great crested newt, listed birds)	European Protected Species Licence	NE	Species-dependent	30 Days	Protected species surveys	B	Some species may require translocation under licence	Yes Desk-based assessment has indicated presence of protected species within study area	Yes Desk-based assessment has indicated presence of protected species within study area
Works affecting an important hedgerow, if the hedge is: • A rural hedge, more than 20 m long (or any part of such a length) • Less than 20 m long but meets another hedge at each end Located on or next to: • Land used for agriculture or forestry • Land used for keeping horses, ponies or donkeys • Common land • A SSSI • A local nature reserve • A PRoW	Hedgerow Removal Notice	Local Planning Authority (LPA)	4 weeks	6 weeks	Phase 1 Habitat Survey High Resolution Aerial Photography Hedgerow condition assessment.	C	The hedgerow removal notice must be served by either the owner of the hedgerow or a 'relevant utility operator' (as defined by the Hedgerow Regs 1997, if to be removed by or on behalf of that operator) who is not the owner, following which the LPA will either serve on that person written notice that the hedgerow may be removed, or the 42-day period has expired without the LPA serving a hedgerow retention notice (Regulation 5, HR 1997). Reg 6(1)(e) of the Hedgerow Regs permits hedgerow removal if it is required for development authorised by a planning permission or deemed planning permission - hence may perhaps be disapplied by grant of a DCO.	Yes Aerial photography has indicated the presence of hedgerows along pipeline routes which are likely to be deemed important through survey	Yes Aerial photography has indicated the presence of hedgerows along pipeline routes which are likely to be deemed important through survey
Works to trees with Tree Preservation Orders	Tree Preservation Order Consent	LPA	6 weeks	8 weeks	Arboriculture Impact Assessment and Method Statement	C	Regulation 13 Tree Preservation Regs 2012 states that subject to the exceptions in regulation 14, no person shall—(a) cut down;(b) top;(c) lop;(d) uproot;(e) wilfully damage; or(f) wilfully destroy, any tree to which an order relates, or shall cause or permit the carrying out of any of the activities in sub-paragraphs (a) to (f) to such a tree, except with the written consent of the authority and, where such consent is given subject to conditions, in accordance with those conditions	Potentially applies To be confirmed through desk study, maps to be obtained from relevant LPAs	Potentially applies To be confirmed through desk study, maps to be obtained from relevant LPAs
Works to trees located within a Conservation Area	Notification of works	LPA	6 weeks	6 weeks	Arboriculture Impact Assessment and Method Statement	A	The outcomes are either: the local authority makes a Tree Preservation Order (TPO) to protect the tree; or does not make a TPO and allows the work to go ahead	Potentially applies Conservation Areas to be mapped as part of planning policy review	Potentially applies Conservation Areas to be mapped as part of planning policy review
Tree Felling Licence required where more than 5 m^3 per quarter for non-statutory functions, i.e. habitat restoration / management	Tree Felling Licence	Forestry Commission	4 weeks	12 weeks	Arboricultural survey Arboriculture Impact Assessment	B	An application for a felling licence may be made by 'a person having such an estate or interest in the land on which the trees are growing as enables him, with or	Yes Whilst impacts to trees to be avoided, some	Yes Whilst impacts to trees to be avoided, some trees may

Activity	Licence / Consent / Permit or Permission	Regulating or Consenting body	Timescale to prepare application documents (approx.)	Timescale for determination	Surveys and assessments Required	Category	Notes	Option B.2	Option B.5
					and Method Statement		without the consent of any other person, to fell the trees' (s 10 FA 1967)	trees may require felling (e.g. WRP)	require felling (e.g. WRP)
Requirement to temporarily close a PRoW	Temporary Closure Order	LPA	2 weeks	8 weeks	PRoW condition assessment	A	The DCO would include a schedule of roads and PRoW to be closed. However, there would still be a requirement to serve notice of the closure. Closures and diversions are likely to be required at multiple stages.	Yes A number of pipeline routes are constructed in / along / near to PRoW	Yes A number of pipeline routes are constructed in / along / near to PRoW
Requirement to permanently close or divert a PRoW	Stopping up or extinguishment of a PRoW	LPA	2 weeks	16 weeks	PRoW condition assessment	A	As above	Yes Some established access across WRP sites	Yes Some established access across WRP sites
Works of demolition, alteration or extension to a listed building that affect its character as a building of special architectural or historic interest. The requirement applies to all types of works and to all parts of those buildings covered by the listing protection (possibly including attached and curtilage buildings or other structures), provided the works affect the character of the building as a building of special interest.	Listed Building Consent	LPA	2 weeks	8 weeks	HER Records Search Heritage statement	A		Potentially applies A number of Listed Buildings located along route, potential impacts associated to HGV movement, setting etc	Potentially applies A number of Listed Buildings located along route, potential impacts associated to HGV movement, setting etc
Works and other activities that physically affect a scheduled monument	Scheduled Monument Consent	Historic England	8 weeks	8 weeks	HER Records Search Heritage statement	A		Potentially applies Whilst no direct impacts anticipated, potential impacts to setting to be confirmed through assessment	Potentially applies Whilst no direct impacts anticipated, potential impacts to setting to be confirmed through assessment
Works in, over, under or affecting the flow of an ordinary watercourse	Ordinary Watercourse Consent	LPA or Internal Drainage Board	4 weeks	8 weeks	Flood Risk Assessment	B	s 120(3) of the Planning Act 2008 states that an order granting development consent may make provision relating to, or to matters ancillary to, the development for which consent is granted. s 120(4) and Schedule 5 state that this may include in particular the diversion of navigable or non-navigable watercourses. s 23(1) of the LDA 1991 provides that no person shall erect any mill dam, weir or other like obstruction to the flow of any ordinary watercourse or raise or otherwise alter any such obstruction or erect a culvert in an ordinary water course or alter a culvert in a manner that would be likely to affect the flow of an ordinary watercourse, without the consent of the drainage board concerned. s 23(6) states that nothing in this section shall apply to any works carried out or maintained under or in pursuance of any Act or any order having the force of an Act. The DCO is an order having the force of an Act, so land drainage consent is not required.	Yes A number of pipeline routes are constructed in, or near to, Ordinary Watercourses	Yes A number of pipeline routes are constructed in, or near to, Ordinary Watercourses

Activity	Licence / Consent / Permit or Permission	Regulating or Consenting body	Timescale to prepare application documents (approx.)	Timescale for determination	Surveys and assessments Required	Category	Notes	Option B.2	Option B.5
Works on or near a main river, on or near a flood defence structure, in a flood plain or, on or near a sea defence	Standard or Bespoke Flood Risk Activity Permit EA	12 weeks Flood Risk Assessment	4 weeks		Topographic Survey Flood Risk Assessment WFD Compliance Assessment Phase 1 Ecology Survey	B	Environmental Permits are granted to the 'operator' of a regulated facility ((Reg 13, EPR 2016). The 'operator' is the person who has control of the facility (Reg 7, EPR 2016). The regulator (the EA in England) may transfer an Environmental Permit to a proposed transferee on the joint application of the operator and proposed transferee (Reg 21, EPR 2016).	Yes All pipeline routes cross Main Rivers (e.g. Itchen)	Yes All pipeline routes cross Main Rivers (e.g. Itchen)
	Flood Risk Activity Exemption	EA	4 weeks	7 days	-				
Discharging liquid or wastewater into surface water that does not comply with the ‘Temporary dewatering from excavations to surface water’	Standard or Bespoke Environmental Permit for dewatering	EA	4 weeks	12 weeks	Flood Risk Assessment Protected Species Surveys	B		Potentially applies Requires Early Contractor Involvement (ECI)	Potentially applies Requires ECI
New water discharge activity	Standard or Bespoke Environmental Permit	EA	8 weeks	12 weeks	Flood Risk Assessment	B		Yes	Yes
Operation of a Part A1 Low Impact Installation	Standard or Bespoke Environmental Permit	EA	8 weeks	16 weeks	Protected Species Surveys HRA EIA WFD Assessment	B			
Operation of Part B Activities related to Local Air Pollution Prevention and Control (this includes the processing of used concrete with a mechanical crusher (for use onsite or at another designated site)	Environmental Permit	LPA	12 weeks	4 weeks’ notice of deployment	EIA	B		Yes	Yes
New requirement to abstract over 20 cubic metres a day and / or impound water by creating a new sluice, weir or dam	Abstraction / Impoundment Licence	EA	12 weeks	16 weeks	Protected Species Surveys HRA WFD Assessment	B		No	No
Temporary abstraction of more than 20 cubic metres of water a day over a period of less than 28 days	Temporary abstraction licence	EA	12 weeks	28 days	-	B		Potentially applies, to be confirmed by ECI	Potentially applies, to be confirmed by ECI
Connection to a mains sewer		Local Water Authority	8 weeks	Varies	-	C		Yes	Yes
New potable mains water connection		Local Water Authority	8 weeks	Varies	-	C		Yes	Yes
For connection of a business to the main sewer supply	Trade Effluent Consent	Local Water Authority	8 weeks	Up to 2 months	-	C		Yes	Yes
Activities involving use, treatment, disposal or storage of waste (e.g. screening and blending of waste, aerosol crushing, composting, etc.)	Standard or Bespoke Environmental Permit for using, treating, storing and disposing of waste	EA	8 weeks	Up to 4 months	-	B		Yes	Yes
	Exemption for using, treating, storing and disposing of waste	EA	8 weeks	5 working days	-	B		Yes	Yes
Treatment of waste bricks, tiles and concrete by crushing, grinding or reducing in size	T7 waste treatment exemption	LPA	4 weeks	5 working days	Ground investigation	C		Potentially applies	Potentially applies

Activity	Licence / Consent / Permit or Permission	Regulating or Consenting body	Timescale to prepare application documents (approx.)	Timescale for determination	Surveys and assessments Required	Category	Notes	Option B.2	Option B.5
								To be confirmed through ground investigation	To be confirmed through ground investigation
Approval for noise generating activities during construction	Section 61 consent (noise and / or vibration)	LPA	4 weeks	4 weeks	Noise Impact Assessment	C		Yes Proximity of development to residential / sensitive receptors	Yes Proximity of development to residential / sensitive receptors
The operation of a mobile plant for the treatment of soils and contaminated material, substances or products	Standard rules mobile plant permit	EA	8 weeks	Up to 4 months	Ground Investigation	B		Potentially applies	Potentially applies
Permanent alterations or improvements to a public highway	Section 278 highways agreement	LPA	8 weeks	Up to 6 months	Topographical Survey Traffic Count Data Visibility Splays	C		Potentially applies May be required for WRP, or to enable construction activities	Potentially applies May be required for WRP, or to enable construction activities
Transport of an Abnormal Load	Notification	Police, Highways Authorities and bridge and structure owners like Network Rail	8 weeks	1 week	-	C	An 'abnormal load' is a vehicle that has any of the following: • a weight of more than 44,000 kg • an axle load of more than 10,000 kg for a single non-driving axle and 11,500 kg for a single driving axle • a width of more than 2.9 metres • a rigid length of more than 18.65 metres	Potentially applies, requires ECI involvement	Potentially applies, requires ECI involvement
Transport of a Special Load	Notification	Police, Highways Authorities and bridge and structure owners like Network Rail	8 weeks	Up to 10 weeks	-	C		As above	As above
Applications for road closures and other restrictions which require a Temporary Traffic Regulation Order (TTRO). This includes restrictions on county roads, footpaths and bridleways.	Temporary Traffic Regulation Order	LPA	4 weeks	12 weeks	-	C		Yes	Yes
Works affecting Network Rail Land (Within 15 m)	Asset Protection Agreement	Network Rail	12 weeks	8 weeks		C		Yes Pipeline route passes beneath Havant Main Line	Yes Pipeline route passes beneath Havant Main Line
Hold certain quantities of hazardous substances at or above defined limits	Hazardous Substance Consent	LPA	9 weeks	8 weeks	-	C		Potentially applies	Potentially applies
Works within Common Land and / or village greens	Section 38 Consent	PINS	8 weeks	6 months	EIA	C	Land referencing to be completed for Water Recycling options		

2.6.10. Consenting Programme for Delivery

The indicative programme below (Figure 50) illustrates an optimised schedule for DCO delivery. It identifies the key consenting related activities that drive the consenting critical path, including s35 direction, scoping, PEIR, public consultation, EIA, design freeze and DCO application and examination.

The programme provides important visibility of the key consenting stages and timelines for the planning process and enables more detailed activities to be defined and planned moving forward. SW's P6 schedule for each of the SROs contains the detailed deliverables and activities required against the timelines within the indicative consenting programme below.

Key assumptions behind this programme include:

- Only one SRO being progressed post Gate 2 submission into the planning process;
- Any WRMP19 review or WRMP24 consultation does not delay this programme;
- Sufficient resourcing is in place to deliver this programme on time;
- External assurance, dependencies and approvals are in place as and when required;
- Deliverables for subsequent RAPID gates largely represent progress updates aligned to the consenting schedule;
- Two further public consultations are required; and
- The level of design detail for any DCO application will be at a 'maximum design parameters' level of design rather than 'detailed'.

A contingency programme for a TCPA consenting route has also been prepared should the DCO consenting regime not be available.

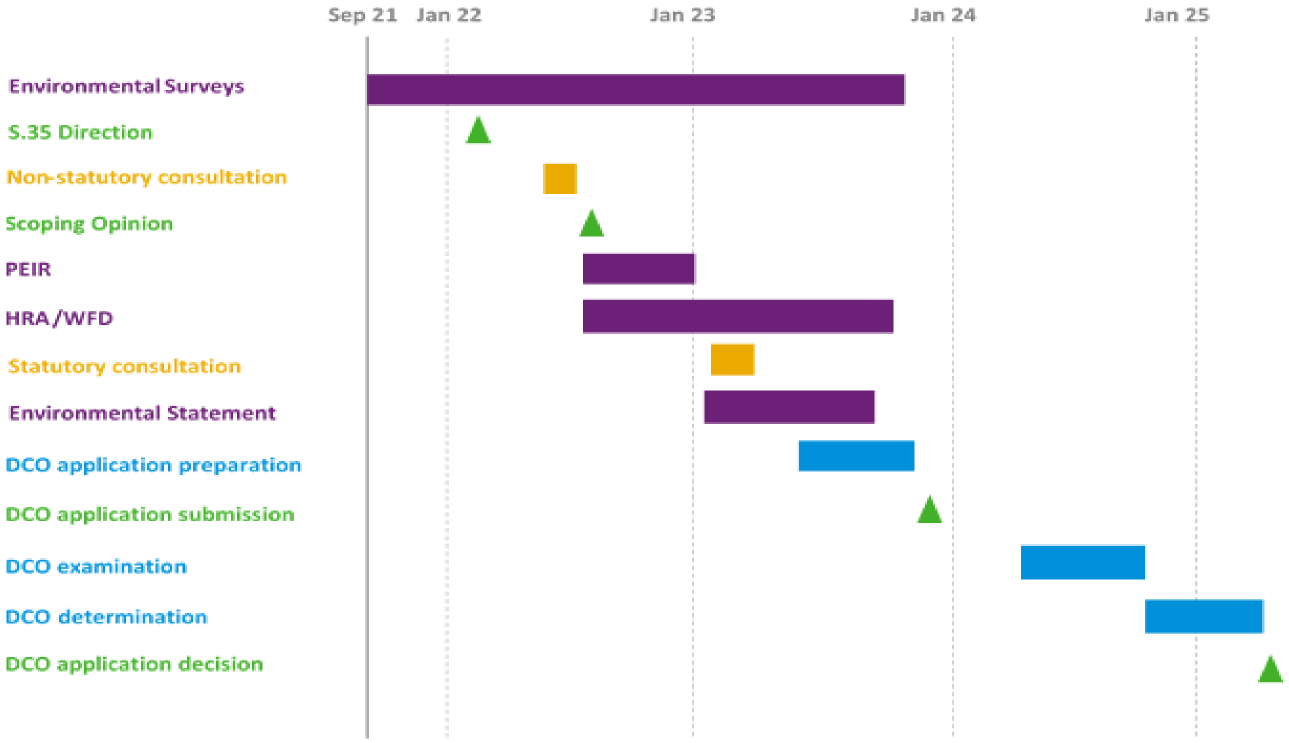


Figure 50 - Water Recycling - indicative DCO consenting programme

2.6.11. Summary of Key Consenting Risks and Countermeasures

The main consenting risks associated with the proposed Water Recycling options are as detailed in Table 57 below. All of these risks sit within either the WfLH Programme level Risk Register or the relevant Project level Risk Registers where they are actively managed in accordance with the WfLH Risk Management Strategy and Process. In addition, in the event that these risks are considered 'key' (see Section 2.7 Risk Management for definition), they are included in more detail in Section 2.7.3 and the risk ID is included below for reference.

Table 57 - Main consenting risks and countermeasures

Risk	Risk Description	Risk Mitigation
s35 Direction (aligned to risk ID Prog-R22. See Section 2.7.3)	SW's preference to utilise the DCO consenting regime cannot be realised because the SRO is below the NSIP thresholds and a s35 direction is not given to bring the SRO into the DCO regime	Continue close engagement with Defra, RAPID, legal and consenting advisors to understand if level of risk requires contingency planning for a TCPA consenting process
s35 Delay (aligned to risk ID Prog-R22. See Section 2.7.3)	Progress of the SRO through the DCO consenting route is frustrated because there is delay in obtaining a timely s35 Direction	As above. Ensure stakeholder awareness of consenting activities that affect critical path.
TCPA route (aligned to risk ID Prog-R22. See Section 2.7.3)	Using the TCPA consenting route (if required) unacceptably extends the consenting period compared to a DCO route, particularly if a planning appeal and compulsory land purchase are required, as well as the multiple other consents required in addition to planning	Ongoing review of consenting route and risks, including contingency planning for a TCPA consenting process. Ensure stakeholder awareness of consenting timescales.
DCO non-acceptance	Any DCO application for the SRO is not accepted by PINS due to inadequate consultation & engagement	Adopt robust consultation and engagement strategies to meet DCO requirements & expectations
DCO refused	The DCO application is refused because the site and scheme selection process is not sufficiently robust	Undertake rigorous planning evaluation to determine consentability of base case and alternatives taking into account key legislative and policy requirements
TCPA refused	The TCPA application is refused because one of the local authorities or a statutory body objects to the potential impacts of the proposal	Undertake comprehensive stakeholder engagement and consultation to ensure project impacts are understood and mitigated as far as possible, and that stakeholder engagement helps shape SW's preferred solution

Risk	Risk Description	Risk Mitigation
Resourcing (aligned to risk ID Prog-83. See Section 2.7.3)	SRO delivery is delayed because the consenting schedule cannot be achieved due to an unrealistic programme and / or resourcing constraints (e.g. external bodies delay handling of consenting requirements or assurances)	Ongoing review of consenting schedule and resourcing requirements to achieve schedule
Alternatives (aligned to risk ID 710060-041. See Section 2.7.3)	Water recycling could not be consented if other less environmentally damaging alternative solutions are available to meet the WRMP19 need	Apply a rigorous planning evaluation as part of site / scheme selection to test the consentability of both base case and alternatives
Water Resources NPS	National Policy support for the SRO is weakened because the dNPS is not progressed to adoption	Engage with Defra to understand timescales for NPS adoption
WRMP alignment (aligned to risk ID Prog-R98 & Prog-R99. See Section 2.7.3)	The need case for an alternative solution is not beyond challenge because it does not explicitly feature in WRMP19 as being the preferred solution to meeting the agreed supply deficit.	Reflect the Selected Option in WRMP19 Annual Review; ensure alignment with the emerging Regional Plan; and include the Selected Option in emerging WRMP24

2.6.12. Conclusions and Next Steps

The consenting route review within this planning strategy reaffirms SW’s initial view at Gate 1 that a DCO is the preferred route for the Water Recycling options. This is based on a number of factors, including the need for the schemes and benefit of timely delivery, the scale and significance of the schemes, their complex terrestrial interfaces and various consents required, and likely significant impacts across a ‘larger than local’ area.

The strategy also confirms that, based on current understanding of the schemes’ characteristics, access into the DCO consenting regime would not be automatic, i.e. the options do not currently meet the thresholds for being defined as NSIPs. Projects can however be directed into the DCO regime through a s35 direction by the Secretary of State – SW’s consideration of the factors to support such a direction suggest that a comprehensive case can be made.

In addition, the strategy identifies likely DCO application deliverables, the secondary consents and licences required in conjunction with planning consent and potential land acquisition powers, the approach to environmental assessment and potential consenting risks. Overall, it demonstrates that sufficient progress has been made in undertaking various planning and consenting activities in line with Gate 1 commitments and Gate 2 requirements.

Listed below are the key next steps in progressing consenting related activities should any of the Water Recycling options be proceed post Gate 2, informed largely by the draft consenting schedule in section 2.6.10 above:

- Ongoing refinement of high-level consenting schedule, aligned with other regulatory and procurement processes, and incorporation of detailed activities to achieve key consenting milestones into P6 schedule;
- Submission of s35 Request to Defra;
- Commencement of early environmental and other impact assessment activities to inform the next stage of public consultation;
- Refinement of the approach, planning for and preparation of the deliverables required for the next stage of public consultation;
- Submission of a Scoping Request to PINS;
- Ongoing resource planning and procurement of resource necessary to progress successfully through the planning process; and
- Increased levels of stakeholder, community and landowner engagement in accordance with SW’s approach to stakeholder engagement.

2.7. Risk Management

2.7.1. Risk Management Methodology

2.7.1.1. Risk Management Strategy Summary

Throughout Section 2.7, unless expressly stated, the term 'risk' incorporates both threats and opportunities. This is explained in more detail in Section 2.7.1.2 Risk Terminology.

The key assumption, risk and issue information contained in the tables within Section 2.7.3 has been captured, assessed and managed in accordance with the WfLH Programme Risk Management Strategy that was detailed within Section 1 of Annex 14 Risk Report WfLH Strategic Programme of the SW, WfLH Gate 1 submission. This document formed part of the formal assurance process undertaken at Gate 1, with approval obtained internally by the Project and Programme team, as well as externally by 3 independent assurers.

The WfLH Programme Risk Management Strategy has been created specifically for the WfLH Programme through utilisation of the defined WfLH Programme Structure (Programme, Workstream and Project), and alignment to the Risk Management Process within the SW Risk Management Handbook, as well as the wider SW Engineering & Construction (E&C) Risk Management Strategy, where appropriate as illustrated in Figure 51. Alignment to the SW E&C Risk Management Strategy was deemed acceptable as the Project types within the WfLH Programme, whilst complex, are sufficiently similar to those delivered by the wider SW organisation. However, for the purposes of Section 2.7, only the elements of the WfLH Programme Risk Management Strategy relating to the SROs are discussed.

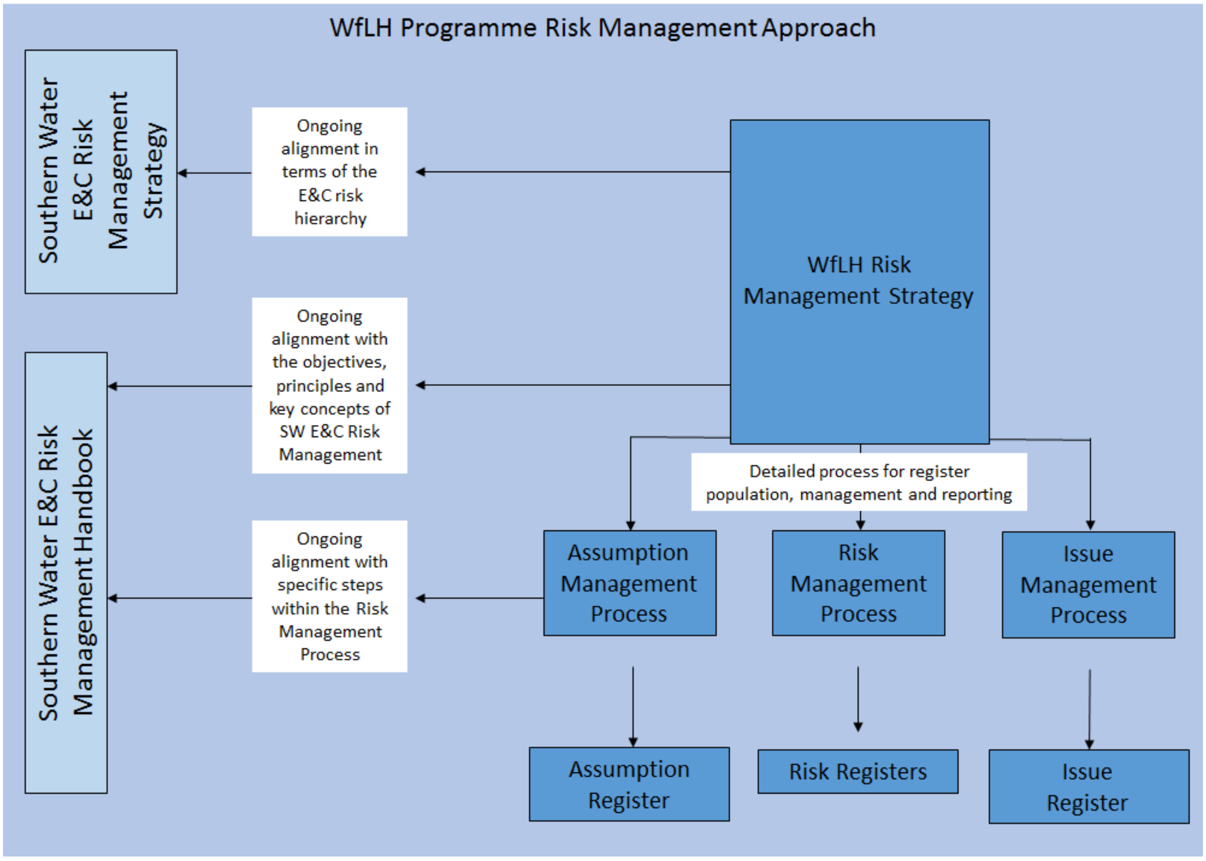


Figure 51 - WfLH Programme Risk Management Strategy

The WfLH Programme Risk Management Strategy has been designed to incorporate all aspects of risk management, and demonstrates a commitment to managing assumptions, risks and issues proactively and comprehensively throughout the lifecycle of the WfLH Programme. It defines and communicates the approach relating to the management of assumptions, risks and issues that could impact on the achievement and satisfactory delivery of all objectives associated with the WfLH Programme. The WfLH Programme Risk Management Strategy is then supported by the relevant Process, which explains in detail how relevant assumptions, risks and issues will be identified, assessed, mitigated, reviewed, escalated and communicated. Therefore, in relation to the SROs within the wider WfLH Programme, this ensures coverage across all aspects of their lifecycle from concept to operation, as illustrated in Figure 52, and through the full extent of the WfLH Programme Structure from Programme, Workstream to Project. An example of this hierarchy, and an indication of the levels within the hierarchy where risk information is captured, is illustrated in the summary diagram in Figure 52. As illustrated in Figure 51, risk information is not captured at the Workstream level which again, is aligned to the wider SW E&C Risk Management Strategy.

For further detail in relation to the specific dates of the future RAPID Gates as well as the tendering, construction and handover phases illustrated in Figure 52, see Section 2.9, Schedule.

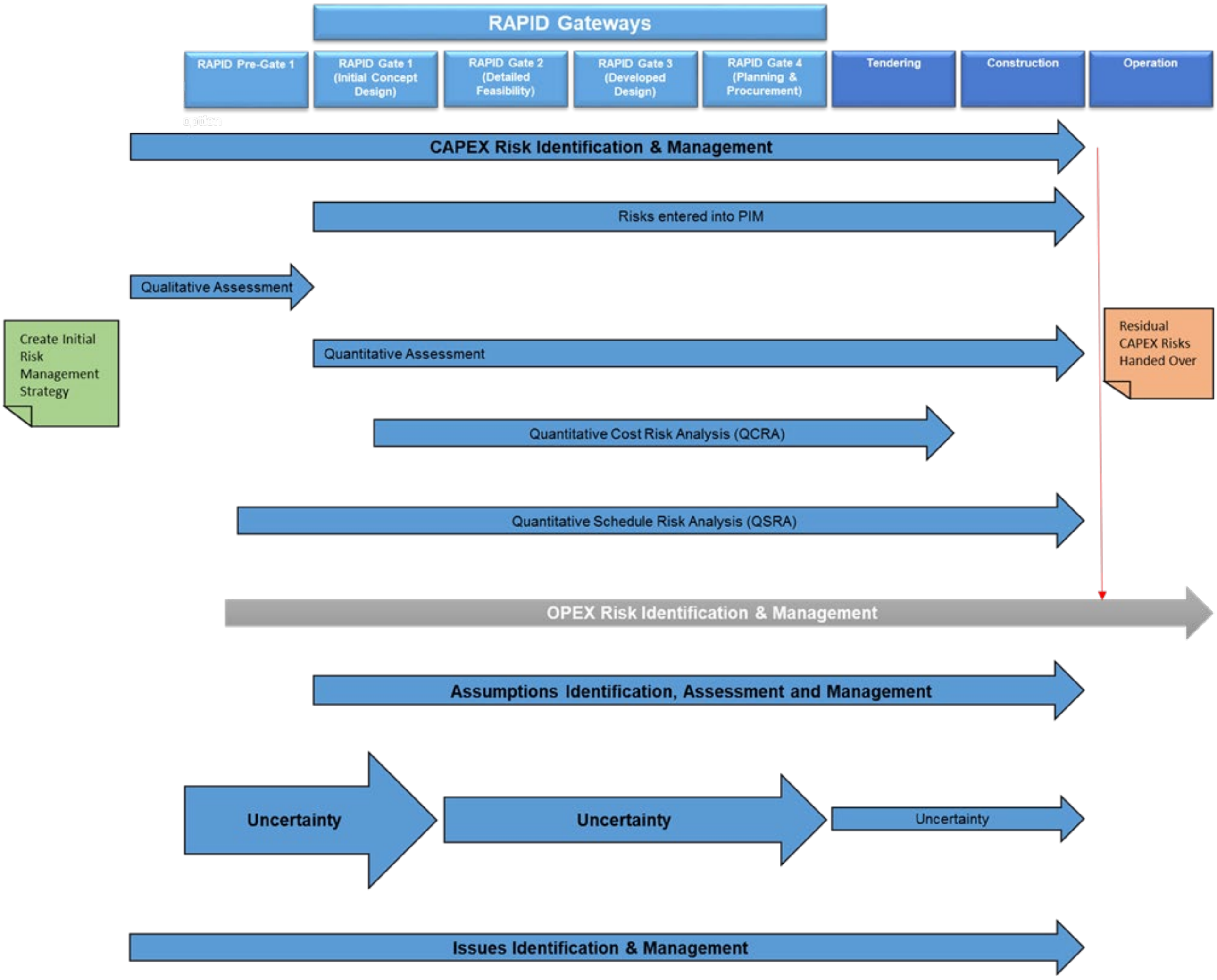


Figure 52 - WfLH Programme Risk Management Timeline

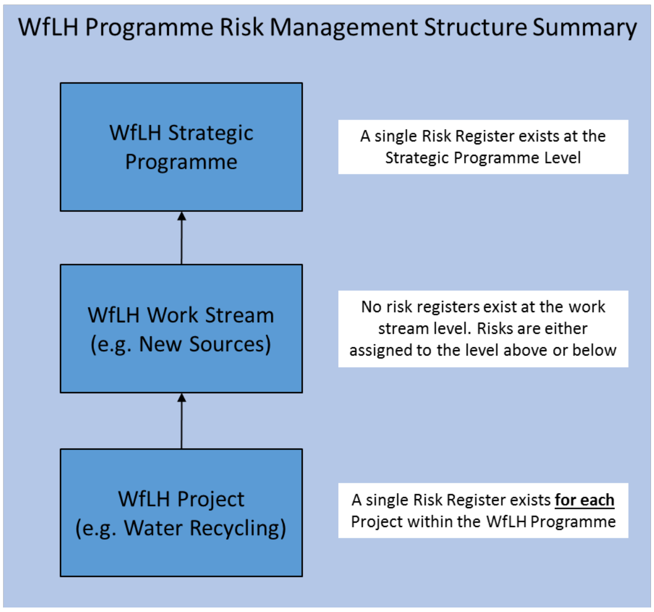


Figure 53 - WfLH Programme Risk Management Structure Summary

Administering this WfLH Programme Risk Management Strategy effectively in relation to the SROs within the WfLH Programme involves undertaking a number of key activities. These activities have included the development of the WfLH Programme Risk Management Strategy utilising the defined WfLH Programme Structure (Programme, Workstream and Project), following the steps within the Assumptions Management, Risk Management and Issues Management Processes, and undertaking any specific, specialist risk management techniques, as indicated within the relevant sections of the WfLH Programme Risk Management Strategy (as illustrated by Figure 53).

Following the completion of Gate 1, the following risk management activities have been completed:

- The entering of risk information into the mandated SW E&C Risk Management System, Programme Insight Manager (PIM) in accordance with SW governance requirements;
- Quantification of new and existing risk information incorporating evolving sources of information and the changing Programme lifecycle stage;
- Reporting of key risk information at the agreed WfLH Programme governance forums including Project Boards, Monthly Performance Reviews, WfLH Programme Steering Group and the WfLH Executive Programme Board as part of the automated monthly reporting cycle;
- Development of the Base Case and Strategic Alternative cost estimates using quantitative cost modelling techniques; and
- Strategic Risk Modelling utilising the latest information in relation to the realisation of the benefits of the schemes contained within the WRMP19 Preferred Strategy to determine the Supply Demand Deficit value.

A Schedule Risk Profile has been applied to each of the P6 development schedules to express the risk and uncertainty contained within the schedule assumptions. Currently, the following risk management activities in motion are:

- The ongoing management and communication of the quantified risks contained within those previously created registers utilising the Risk Management Process as detailed in the Risk Management Strategy;
- The ongoing management and communication of the assumptions contained within the previously created register utilising the process as detailed in the Risk Management Strategy; and

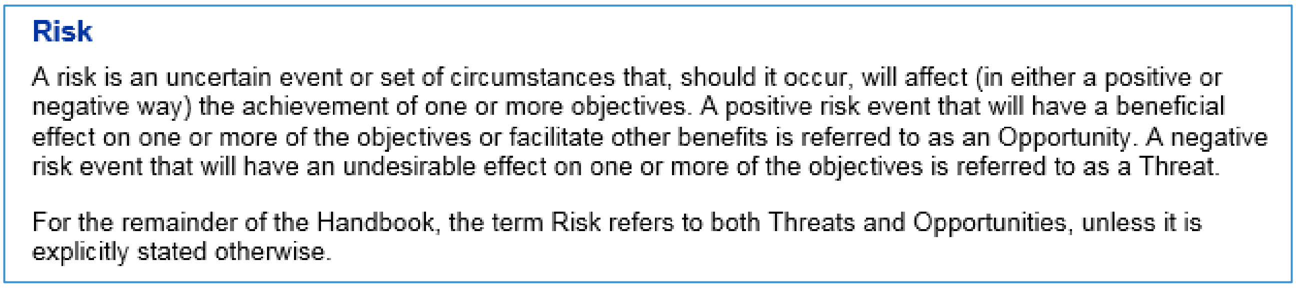
- The ongoing management and communication of the issues contained within the previously created register utilising the process as detailed within the Risk Management Strategy.

Following Gate 2, in addition to the current activities, the following risk management activities will take place:

- Refinement of the Base Case Preferred Option cost estimate, again utilising quantitative cost modelling techniques that integrate base cost, uncertainty and risk; and
- Ongoing review of the P6 schedule to refine the risk profile as schedule detail increase, utilising risk modelling techniques as appropriate.

2.7.1.2. Risk Terminology

Throughout Section 2.7, unless expressly stated, the term ‘risk’ incorporates both threats and opportunities. This is in accordance with Section 1.3 of the SW Risk Management Handbook, the wording of which is set out in Figure 54.



Risk

A risk is an uncertain event or set of circumstances that, should it occur, will affect (in either a positive or negative way) the achievement of one or more objectives. A positive risk event that will have a beneficial effect on one or more of the objectives or facilitate other benefits is referred to as an Opportunity. A negative risk event that will have an undesirable effect on one or more of the objectives is referred to as a Threat.

For the remainder of the Handbook, the term Risk refers to both Threats and Opportunities, unless it is explicitly stated otherwise.

Figure 54 - Threat and Opportunity Terminology

2.7.2. Risk Management Analysis

2.7.2.1. Gate 2 Key Information Selection Approach

Section 2.7.3 communicates the key assumptions, key risks and key issues that have the potential to impact on the successful delivery of the Water Recycling Solution, which incorporates two specific Options (B.2 and B.5) as detailed in Table 58. For more information in relation to the Water Recycling Solution, see Section 2.1, Overview.

Table 58 - Water Recycling Options

Solution	Option No.	Option Name
Water Recycling	B.2	61 Ml/d FE from BF to the WRP to Otterbourne WSW via an EB
	B.5	75 Ml/d FE from BF/PC to the WRP to Otterbourne WSW via an EB

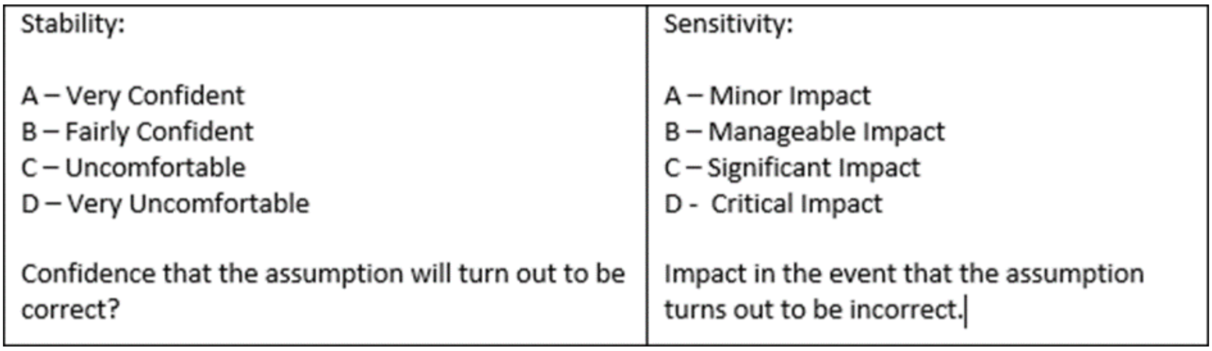
For efficiency, the key assumptions, key risks and key issues are listed first for the Water Recycling Solution in its entirety, with separate tables only being used for specific Options (B.2 and B.5) if specific additional key risks are relevant. All key assumptions and key issues will be shown at the level of the Water Recycling Solution. A summary of the tables and their contents can be found in Table 59 below.

Table 59 - Summary of Section 2.7.2.3 Tables

Content	Key Assumptions	Key Threats	Key Opportunities
Water Recycling	Table 63	Table 64	Table 65
Option B.2	Table 66	Table 67	Table 65
Option B.5	Table 68	Table 64/67	Table 65

Key Assumption Criteria

For the purposes of Section 2.7.3 key assumptions have been selected for inclusion based on a combination of their stability (confidence in the assumption) and sensitivity rating (impact of an incorrect assumption), as per Gate 1 and Figure 55 below. Both stability and sensitivity are scored on a scale of A to D. Similar to risks and issues, assessment is undertaken as the assumption is identified but reassessment takes place through the life of the assumption as further information is obtained. For those assumptions that, when assessed, return a score of CC, CD, DC or DD, they are transferred to the appropriate risk register, and managed as part of the Risk Management Process.



Stability: A – Very Confident B – Fairly Confident C – Uncomfortable D – Very Uncomfortable Confidence that the assumption will turn out to be correct?	Sensitivity: A – Minor Impact B – Manageable Impact C – Significant Impact D - Critical Impact Impact in the event that the assumption turns out to be incorrect.

Figure 55 - Assumptions Analysis Assessment Criteria

The focus of the key assumptions in Section 2.7.3 is therefore not on those assumptions that have already been transferred to the Risk Management Process, but instead on those that are close to being considered as risks. Therefore, to be selected as a key assumption for inclusion within Section 2.7.3, the assumption must score as either BC, CB, BD or DB against stability and sensitivity, respectively.

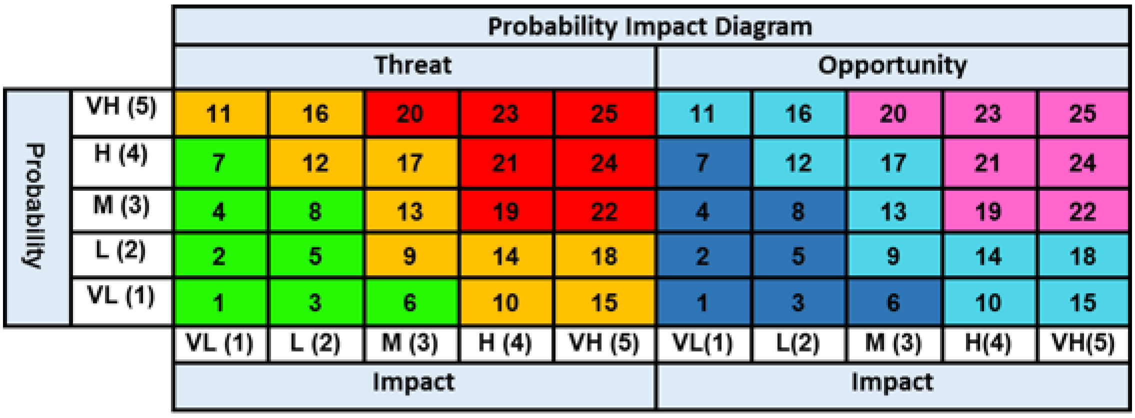
Whilst not a selection criterion for the purposes of this document, in addition to stability and sensitivity, each assumption is also assigned a Red, Amber, Green (RAG) status to indicate the current state of the assumption in terms of management intervention. The RAG status definitions are illustrated in Figure 56.

Basic RAG Definitions	
Red	Escalated. Item requires urgent management action to mitigate or remedy
Amber	Problem(s) identified and/or building up. Expectation is that this can be handled within the Programme Team. However, flagged amber to notify management of potential future escalation
Green	Satisfactorily managed/tolerated. No management action required at this point in time.

Figure 56 - Assumptions RAG status

Key Risk Criteria

The term ‘key risk’ translates within Section 2.7 as ‘key Project risk’. This is to ensure it is distinguished from key technical risks (e.g. key engineering risks) that are referenced in other Sections within this document. In relation to the key risks, the key threats shown throughout Section 2.7.3 have been selected for inclusion based on their Current Risk Score. Key threats are defined as those threats with a Current Risk Score of 19 or greater. This ensures that all threats scored as high (Current Risk Score of 19 or greater) when plotted on the WfLH Programme Probability Impact Diagram (PID) are included, as illustrated in Figure 57.



		Probability Impact Diagram									
		Threat					Opportunity				
Probability	VH (5)	11	16	20	23	25	11	16	20	23	25
	H (4)	7	12	17	21	24	7	12	17	21	24
	M (3)	4	8	13	19	22	4	8	13	19	22
	L (2)	2	5	9	14	18	2	5	9	14	18
	VL (1)	1	3	6	10	15	1	3	6	10	15
		VL (1)	L (2)	M (3)	H (4)	VH (5)	VL(1)	L(2)	M (3)	H(4)	VH(5)
		Impact					Impact				

Figure 57 - WfLH Programme Probability Impact Diagram

All opportunities, regardless of Current Risk Score, are included within the key opportunity tables.

Key Issue Criteria

In relation to the key issues selected, these have been included within Section 2.7.3 based on their impact on the successful delivery of the Solution in the event that mitigations were not undertaken. Issue impact is rated on a scale of negligible, minor, major and critical. For the purposes of the key issues contained within Section 2.7.3 only those issues assessed as having a major or critical impact on the successful delivery of the Solution are included.

2.7.2.2. Gate 2 RAPID Requirements

The following narrative has been prepared to specifically respond to the comments received by RAPID within the Gate 1 Determination.

Actions and Residual Risk Relationship

In order that consideration is given to the effect of each action on the Residual Risk Score (the score associated with the risk following the assumed completion of the listed actions), the following approach is undertaken. Following the identification of each action, discussion takes place between the Programme Risk Manager, Risk Owner and Action Owner to understand whether the identified action:

- Influences the current probability of the risk (proactive action);
- Influences one or more of the current risk impacts (reactive action);
- Influences both the current probability and one or more of the current risk impacts (combined action); and
- Is a necessary step in developing an action aimed at tackling one of the above.

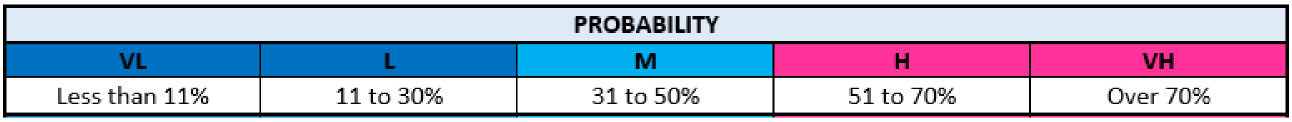
Once the outcome of this discussion has been determined, the extent of the influence on either the probability or impact is agreed and this extent is applied to the appropriate Residual Risk Score input(s), thus updating the Residual Risk Score. This approach is applied to all actions upon their identification, in order to ensure an ongoing link between the identified actions and the Residual Risk Score.

Despite the above, it is still important to note that the approach does not guarantee that the proposed implementation of mitigation actions will result in a change to the Residual Risk Score, when compared to the Current Risk Score. However, it does guarantee that consideration of the mitigation actions will be given when assessing the Residual Risk Score. In addition, it is important to note that the mitigation actions identified at this stage primarily relate to the near-term realistic approach that can be taken (rather than a long-term aspirational approach) in order to commence and develop mitigation of the risk. This reinforces the reason why, in some cases, there is currently no difference between the Current and Residual Risk Score recorded.

Scoring Criteria

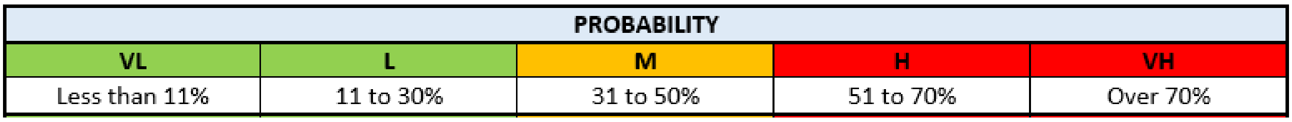
Since Gate 1, the information contained within the key risk tables shown in Section 2.3.7 has been updated to provide greater clarity and transparency in relation to the Current and Residual Risk Scores. This has resulted in the key risk tables now including the input score assigned to the probability and each individual impact, in order that the Current and Residual Risk Score calculations are visible.

For each risk, the probability is assessed in a quantitative manner on a scale of 1% to 99%. This quantitative value is then assigned a qualitative score based on the parameters illustrated in Figure 58 (opportunities) and Figure 59 (threats) below. This approach is in accordance with the wider Risk Management Process as contained within the SW Risk Management Handbook.



PROBABILITY				
VL	L	M	H	VH
Less than 11%	11 to 30%	31 to 50%	51 to 70%	Over 70%

Figure 58 - Qualitative Probabilities for Opportunities



PROBABILITY				
VL	L	M	H	VH
Less than 11%	11 to 30%	31 to 50%	51 to 70%	Over 70%

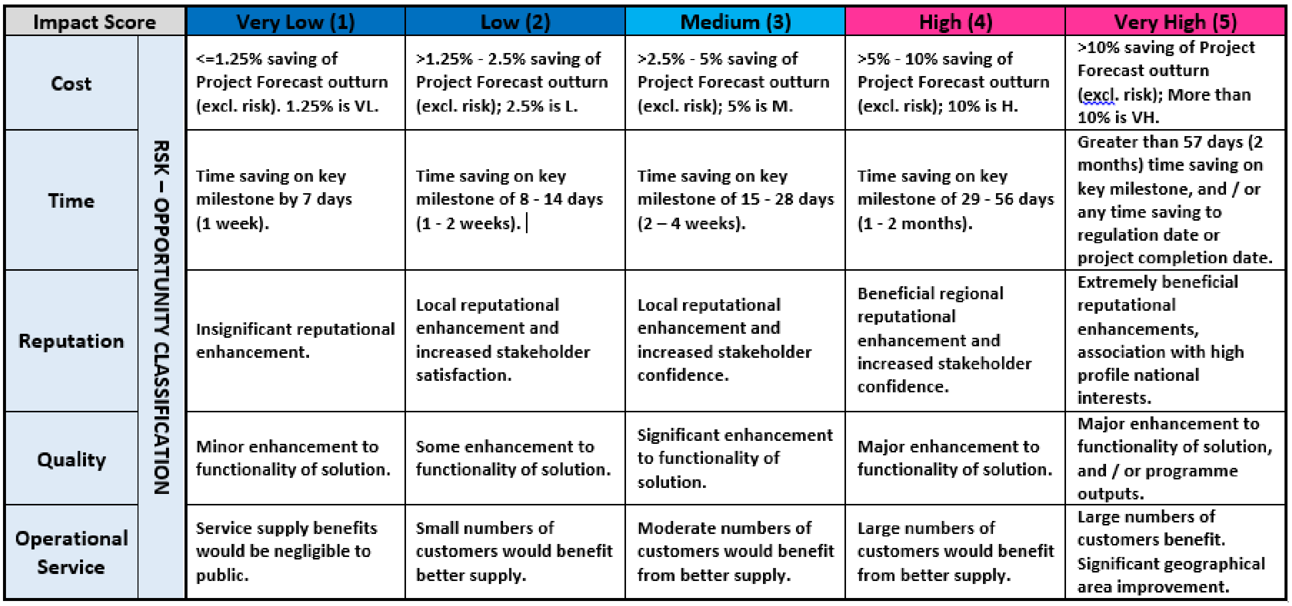
Figure 59 - Qualitative Probabilities for Threats

In addition to the probability, each risk is assessed against 5 potential impacts. These impacts are detailed in Table 60 and can either be positive (opportunities) or negative (threats).

Table 60 - Risk Impact Descriptions

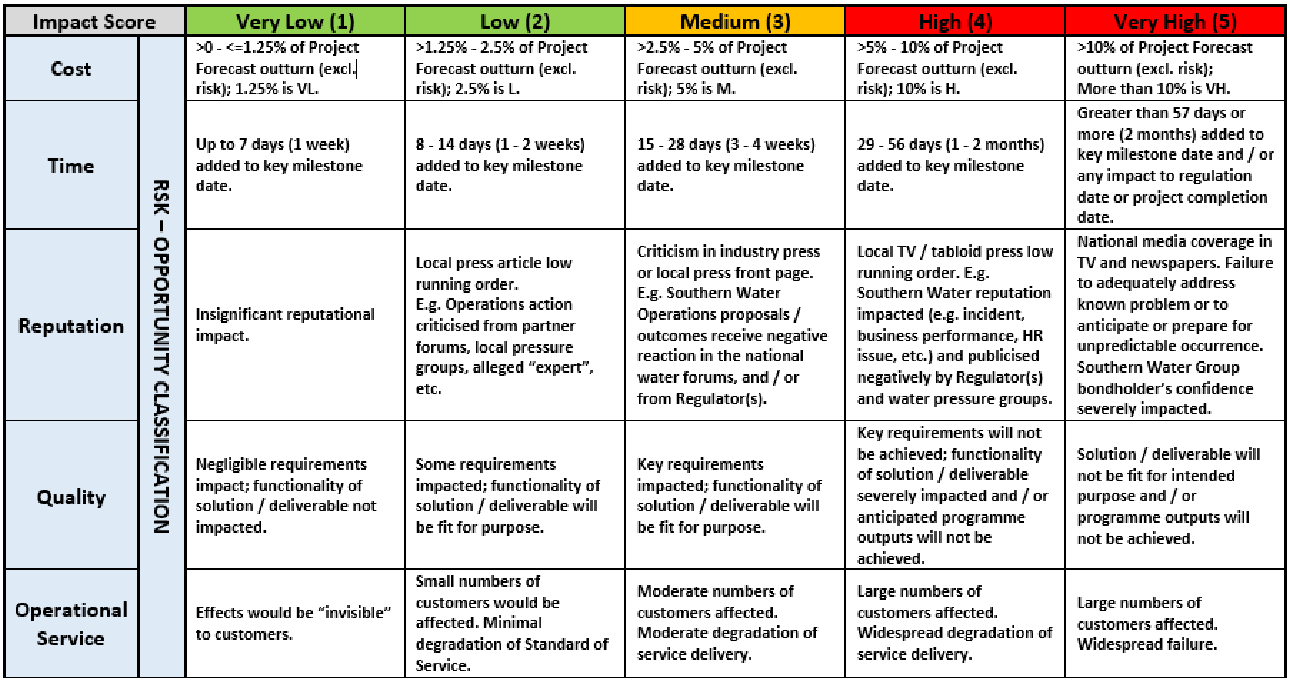
Impact	Impact Description
Cost	The risk results in a financial change to the relevant cost objectives
Time	The risk results in change to the delivery date of one or more key milestones within the schedule
Reputation	The risk results in company exposure to either a regulator, industry press, or the wider media
Quality	The risk results in a change to the suitability of the end product being delivered
Operational Service	The risk results in a change to the service normally received by SW customers

Like the probability assessment, each impact is qualitatively assessed on a scale of 1 (Very Low) to 5 (Very High), as illustrated in Figure 60 (opportunities) and Figure 61 (threats). These Qualitative Impact tables, similar to the Qualitative Probability tables, are utilised as the approach is in accordance with the Risk Management Process within the SW Risk Management Handbook. However, if following assessment of an impact, it is deemed that the impact does not apply to a particular risk, the impact may be scored with a 0 (Negligible). In the event that an impact is scored as 0, this is not included within the key risk tables within Section 2.7.3 It should also be noted the cost impact is now assessed in the first instance as a quantitative impact using a 1 point (Most Likely cost), 2 point (Minimum and Maximum cost) or 3 point (Minimum, Most Likely and Maximum cost) estimate, which is then translated to a qualitative impact for the purpose of calculating the risk score. This is a significant step forward in the risk assessment process since Gate 1 and shows in practice the evolving nature of the Risk Management Strategy designed for the WfLH Programme.



Impact Score		Very Low (1)	Low (2)	Medium (3)	High (4)	Very High (5)
Cost	RSK – OPPORTUNITY CLASSIFICATION	<=1.25% saving of Project Forecast outturn (excl. risk). 1.25% is VL.	>1.25% - 2.5% saving of Project Forecast outturn (excl. risk); 2.5% is L.	>2.5% - 5% saving of Project Forecast outturn (excl. risk); 5% is M.	>5% - 10% saving of Project Forecast outturn (excl. risk); 10% is H.	>10% saving of Project Forecast outturn (excl. risk); More than 10% is VH.
Time		Time saving on key milestone by 7 days (1 week).	Time saving on key milestone of 8 - 14 days (1 - 2 weeks).	Time saving on key milestone of 15 - 28 days (2 – 4 weeks).	Time saving on key milestone of 29 - 56 days (1 - 2 months).	Greater than 57 days (2 months) time saving on key milestone, and / or any time saving to regulation date or project completion date.
Reputation		Insignificant reputational enhancement.	Local reputational enhancement and increased stakeholder satisfaction.	Local reputational enhancement and increased stakeholder confidence.	Beneficial regional reputational enhancement and increased stakeholder confidence.	Extremely beneficial reputational enhancements, association with high profile national interests.
Quality		Minor enhancement to functionality of solution.	Some enhancement to functionality of solution.	Significant enhancement to functionality of solution.	Major enhancement to functionality of solution.	Major enhancement to functionality of solution, and / or programme outputs.
Operational Service		Service supply benefits would be negligible to public.	Small numbers of customers would benefit better supply.	Moderate numbers of customers would benefit from better supply.	Large numbers of customers would benefit from better supply.	Large numbers of customers benefit. Significant geographical area improvement.

Figure 60 - Qualitative Impacts for Opportunities



Impact Score		Very Low (1)	Low (2)	Medium (3)	High (4)	Very High (5)
Cost	RSK – OPPORTUNITY CLASSIFICATION	>0 - <=1.25% of Project Forecast outturn (excl. risk); 1.25% is VL.	>1.25% - 2.5% of Project Forecast outturn (excl. risk); 2.5% is L.	>2.5% - 5% of Project Forecast outturn (excl. risk); 5% is M.	>5% - 10% of Project Forecast outturn (excl. risk); 10% is H.	>10% of Project Forecast outturn (excl. risk); More than 10% is VH.
Time		Up to 7 days (1 week) added to key milestone date.	8 - 14 days (1 - 2 weeks) added to key milestone date.	15 - 28 days (3 - 4 weeks) added to key milestone date.	29 - 56 days (1 - 2 months) added to key milestone date.	Greater than 57 days or more (2 months) added to key milestone date and / or any impact to regulation date or project completion date.
Reputation		Insignificant reputational impact.	Local press article low running order. E.g. Operations action criticised from partner forums, local pressure groups, alleged "expert", etc.	Criticism in industry press or local press front page. E.g. Southern Water Operations proposals / outcomes receive negative reaction in the national water forums, and / or from Regulator(s).	Local TV / tabloid press low running order. E.g. Southern Water reputation impacted (e.g. incident, business performance, HR issue, etc.) and publicised negatively by Regulator(s) and water pressure groups.	National media coverage in TV and newspapers. Failure to adequately address known problem or to anticipate or prepare for unpredictable occurrence. Southern Water Group bondholder's confidence severely impacted.
Quality		Negligible requirements impact; functionality of solution / deliverable not impacted.	Some requirements impacted; functionality of solution / deliverable will be fit for purpose.	Key requirements impacted; functionality of solution / deliverable will be fit for purpose.	Key requirements will not be achieved; functionality of solution / deliverable severely impacted and / or anticipated programme outputs will not be achieved.	Solution / deliverable will not be fit for intended purpose and / or programme outputs will not be achieved.
Operational Service		Effects would be "invisible" to customers.	Small numbers of customers would be affected. Minimal degradation of Standard of Service.	Moderate numbers of customers affected. Moderate degradation of service delivery.	Large numbers of customers affected. Widespread degradation of service delivery.	Large numbers of customers affected. Widespread failure.

Figure 61 - Qualitative Impacts for Threats

Once the probability and impact is assessed for each risk, these input scores, ranging from 1 (Very Low) to 5 (Very High) for probability and 0 (Negligible) to 5 (Very High) for each impact, are automatically plotted on a Probability Impact Diagram (PID), which then determines the overall risk score. Separate assessments are conducted for the current and residual positions. The PID was previously illustrated in Figure 57 with separate PIDs existing for threats and opportunities.

The key risk tables in Section 2.7.3 have therefore been updated to show the both the current and residual qualitative probability score and current and residual qualitative impact scores in order to provide this enhanced clarity of the Current and Residual Risk Scores. In addition, the key impact or impacts that are driving the risk score are highlighted in bold in order to provide further clarity.

Risk Categorisation

As stated in the narrative above, the information within Section 2.7 relates only to key items impacting on the SRO Solution (and specific Options), as per the assessment criteria detailed. As explained at Gate 1, the risk identification process has been designed to be suitably robust to support the agreed scope of risk management as defined in the WfLH Programme Risk Management Strategy. This scope is defined as "those items that have the potential to impact on the successful delivery of their respective benefits and objectives, across all SRO relevant aspects of the WfLH Programme lifecycle from concept to operation, and throughout the SRO relevant extent of the defined WfLH Programme Structure".

In order to constantly review the robustness of this identification process to ensure full coverage of the information captured, assessed, and managed, each assumption or risk is assigned an appropriate SW category depending on whether the risk sits at the Programme level (Table 61) or Project level (Table 62). In addition, these SW categories have been mapped to the RAPID categories used in the Quarterly Dashboards to ensure alignment and consistency for both reporting internally and externally.

Table 61 - Programme Assumption & Risk Categories

WfLH Programme Category	RAPID Category
Programme Scope, Requirements & Benefits	Other
People & Resourcing	Stakeholder
Engineering & Technical	Water Quality
Reputation & Public Perception	Stakeholders
Regulatory	Stakeholders
Budgetary & Financial	Budget
Planning & Consents	Planning
Legal	Planning
Operational	Stakeholder
Schedule	Timetable
Commercial & Supply Chain	Stakeholders

Table 62 - Project Assumption & Risk Categories

WfLH Project Category	RAPID Category
Access	Land
Asset Condition	Stakeholders
Contractor Performance	Stakeholders

WfLH Project Category	RAPID Category
Design Development	Other
Estimating	Budget
Ground & Environmental Conditions	Environment
Handover to Operations	Stakeholder
Procurement	Stakeholders
Scope & Requirements	Other
Stakeholders & Approvals	Stakeholders
Testing & Commissioning	Other

Ongoing analysis of these categories is then undertaken to provide confidence that all types of assumptions and risk have been considered, and that specific types of assumptions and risks are not being overlooked. This has helped to ensure that items relating to cost, benefits, project activities (e.g. environmental, engineering, process design, etc.), dependencies, regulatory barriers, and the long-term operation of the asset have, as a minimum, all been considered, and will continue to be considered, throughout the identification process.

Therefore assumptions, risks and issues may well be referenced throughout other sections of this CDR. However, given the explanation of the criteria used for enabling the inclusion of any key assumptions, key risks and key issues within Section 2.3.7, these items listed elsewhere in this CDR may not be repeated in Section 2.3.7, and therefore may not appear to show appropriate alignment. However, alignment checks have been undertaken and assessment of each of those items has been undertaken. Where those items have been assessed and meet the criteria detailed in the narrative above, alignment will exist with Section 2.3.7. Where those items do not meet the selection criteria, those items will only be listed in their respective technical section.

Sections where assumptions, risk and issues information can be found elsewhere within this Conceptual Design Report include:

- Section 2.2 Engineering Design: Section 2.2.9;
- Section 2.3 Network Infrastructure: Section 2.3.8.3;
- Section 2.6 Planning and Consenting: Section 2.6.11; and
- Section 2.9 Schedule: Section 2.9.3.4.

RAPID Quarterly Dashboard Alignment

The key risks and issues contained within Section 2.7.3 are fully aligned to those contained within the latest RAPID Quarterly Dashboard.

2.7.3. Key Assumptions, Key Risks and Key Issues

Table 63 - Water Recycling Key Assumptions

Assumption ID	Assumption Description	Stability	Sensitivity	Validation / Mitigation Strategy	RAG Status
WfLH-A0076	It is assumed that the quality of the FE at PC WTW will not deteriorate between now and the construction of the WRP in order that SW's treatment assumptions remain valid	C	B	Validation: PC WTW is always required to meet the discharge permit quality. Failure to do this will result in a £3.5 m fine. SW has based the design on ensuring that the permit conditions can be met. Ensure that design has factored in the concerns related to anticipated trade effluent increases over time. Mitigation: Continued measurement of the final effluent under the current sampling programme to confirm that any variations are still within the assumed levels. Additional design has now been undertaken to increase the number of filtration units for turbidity spikes.	**G**
WfLH-A0054	It is assumed that the quality of the FE at BF will not deteriorate between now and the construction of the WRP in order that SW's treatment assumptions remain valid.	C	B	Validation: BF is, always, required to meet the discharge permit quality. Failure to do this will result in a £3.5 m fine. SW has based the design on ensuring that the permit conditions can be met. Ensure that design has factored in the concerns related to anticipated trade effluent increases over time. Further information has now come to light that there are issues with the turbidity at BF and the Blowers may not be currently operating correctly. These will lead to issues with FE quality, which needs to be considered in future stages of the design process. Mitigation: Continued measurement of the FE under the current sampling programme to confirm that any variations are still within the assumed levels. Additional design has now been undertaken to increase the number of filtration units for turbidity spikes. However, further assets (Blowers / Final Settlement Tanks) may be required to mitigate.	G

Assumption ID	Assumption Description	Stability	Sensitivity	Validation / Mitigation Strategy	RAG Status
WfLH-A0024	It has been assumed that there is sufficient market appetite for the DPC process to be utilised whilst still delivering on the Section 20 agreement obligations, including timescales	B	D	Validation: Current concerns over the varying complexity of options being taken through the early gate stages, and the impact this will have on the market.. In addition, there are concerns over the tight timescales for delivery, and the impact this will have on appetite to respond. The procurement process is currently one of the key drivers to successfully delivering the strategic solution in accordance with the Section 20 agreement obligations, including timescales. Informal engagement with potential bidders has taken place to obtain information on the current market appetite and to capture key concerns in order that these can be resolved in advance of the formal tender process. Mitigation: Ensure that evaluation criteria are suitably selected to not discourage potential bidders. Look at benchmarking / lessons learned of other major national projects in order to understand the level of information that will be expected to be available for potential bidders to be interested in the Project. Continue with informal engagement with potential bidders in order that interest is maintained and SW is aware of concerns. Set clear expectations with potential bidders around the management of bid costs.	G

Assumption ID	Assumption Description	Stability	Sensitivity	Validation / Mitigation Strategy	RAG Status
WfLH-A0015	It is assumed that there will be sufficient space for all the raw water connections required at Otterbourne in order to deliver the Preferred Strategy. Connections include Water Recycling, Andover to Otterbourne, etc.	B	C	Validation: Conversations have commenced with the relevant Capital Projects to understand the scope they have been tasked to deliver, and the dates by which it is required. In addition, dates by which any impacts from WfLH Programme are known in order that timely decisions are made. Mitigation: Continue to liaise with the Capital Projects to understand progress and discuss the impacts of any further WfLH Programme requirements as they are confirmed.	A
WfLH-A0086	It is assumed that there is sufficient space at the site of the WRP to accommodate two 10 Ml Break Tanks for Option B.2 in the event that there are turbidity issues at BF	B	C	Validation: Whilst the site is believed to have sufficient acreage to accommodate the tanks, there are concerns over the environmental impact of the large structures, and whether they would be approved for construction. In the event that the Break Tanks were not possible, additional works would be required at BF in order to fix the turbidity issues at source. Mitigation: Undertake further physical investigation of the site to understand the likelihood of sting the Break Tanks. . Continue to monitor turbidity levels through source water sampling to inform treatment requirements. Future source water sampling scheduled following Gate 2. .	A

Assumption ID	Assumption Description	Stability	Sensitivity	Validation / Mitigation Strategy	RAG Status
WfLH-A0084	It is assumed that, to align with SW Standards, a 2nd main is not required to be included within the design at critical crossings for resilience purposes	B	C	Validation: The SW standard is to install a 2nd main at critical crossings. However, the design lead has engaged with the principal and owing to precedent on other works, plus that fact that all assets will be sleeved at critical crossings, it has been agreed that this is not required. Installation of a 2nd main at critical crossings would result in a significant cost increase owing to additional materials. Mitigation: Final confirmation from principal through the design development process to ensure approval of design.	G

Table 64 - Water Recycling Solution Key Threats

Risk ID	Description	SW RBS	RAPID Category	Start Date & Activity ID	Expiry Date & Activity ID	Probability	Impact	Score	Mitigation Strategy	Probability	Impact	Score
Prog-R56	Owing to a number of currently identified risk events, there is a risk that delivery of the Preferred Option, post the s20 required date, (currently forecast delivery date of 2030) , leading to potential legal enforcement and significant reputational damage. Drivers include environmental survey timescales, durations associated with the DCO application preparation and determination, stakeholder consultation timescales, and timescales around the DPC procurement strategy.	Schedule	Timetable	31/3/27 RYWR.KEY.00010	16/122/30 RYWR.KEY.00040	5	**Reputation: 5** Op. Service: 4	25	Utilising the recently developed schedules, continue to provide progress updates to understand the current position against the baseline, and focus opportunity exploration and schedule mitigation on the critical path activities. Continue to keep the regulator informed through formal governance routes of any updates to the latest forecast dates of the SRO. Develop and obtain all necessary approval for the implementation of mitigation schemes as part of the Programme Level Mitigation Project to enable provision of water for the period of time between 2027 and the SRO becoming operational.	5	**Reputation: 5** Op. Service: 4	24

Risk ID	Description	SW RBS	RAPID Category	Start Date & Activity ID	Expiry Date & Activity ID	Probability	Impact	Score	Mitigation Strategy	Probability	Impact	Score
710060-099	Owing to the benefits of being able to apply for a number of consents through a DCO application, this is viewed as the preferred planning route by SW. However, there is a risk that a direction under Section 35 of the Planning Act 2008 might not be made to enable the preferred solution to progress via the DCO consenting process, leading to SW having to utilise the Town and Country Planning process instead.	Planning & Consents	Planning	28/9/20	1/22 RYWR.CON.10130	4	Cost: 1 **Time: 5** Reputation: 4 Quality: 2 Op. Service: 3	22	Prepare and submit a robust and well-reasoned request for s35 direction to the Secretary of State, taking into account any comments resulting from any Defra engagement.	2	Cost: 1 **Time: 5** Reputation: 4 Quality: 2 Op. Service: 3	18
710060-041	. There is a risk that there is a risk that either option is determined to be proves not consentable due to the anticipated environmental impact relative to other options.	Planning & Consents	Planning	18/3/22 RYWR.KEY.00120	21/4/25 RYWR.CON.06230	4	**Quality: 5** Op. Service: 4	22	Work closely with NE and EA as the scheme is developed in order to identify and then mitigate any environmental concerns raised.	2	**Quality: 5** Op. Service: 4	18
710060-027	There will be a need to discharge water from the EBL in times of emergency. The obvious point for discharge is the River Itchen, but NE / EA have already stated they will not allow discharge direct from the WRP into the River Itchen. Therefore, there is a risk that NE / EA do not approve even emergency discharge into the River Itchen, leading to an alternative discharge solution requiring development or the EBL not being able to be located at Otterbourne.	Stakeholders & Approvals	Stakeholders	27/9/21 NSWR.GWY.00040	21/4/25 RYWR.CON.06230	4	**Time: 5:** Reputation: 3 Op. Service: 4	24	Obtain feedback from NE in relation to the survey strategy, implement feedback into revised survey strategy and then commence relevant surveys. Appoint EIA consultant in order to start baselining and scoping processes to support survey information. Utilise the survey information to develop a design solution with feedback from the relevant regulators, to be presented as part of the non-stat consultation process.	2	**Time: 5:** Reputation: 3 Op. Service: 4	22

Risk ID	Description	SW RBS	RAPID Category	Start Date & Activity ID	Expiry Date & Activity ID	Probability	Impact	Score	Mitigation Strategy	Probability	Impact	Score
710060-040	Owing to the spatial constraints (scheduled monuments, Aquind pipeline, etc.) observed in the Waterlooville area, there is a risk that the pipe route construction methodology needs to be converted from a micro tunnel to a 3 m diameter segmental tunnel, leading to an increase in cost, over and above that assumed in the cost estimate.	Scope & Requirements	Other	27/9/21 NSWR.GWY.00040	21/12/22 RYWR.DGN.00830	4	**Cost: 4**	21	Undertake a feasibility study on this route and the alternative options, including examination of further utility information and discussions with local highways teams. In conjunction with the Planning & Consents team, prepare an appropriate methodology to enable the route to be correctly defined. This must ensure that all relevant topics are reviewed. Use ECI (MGJv) to gather more information along route. Look at topics such as traffic, air quality, etc. to help determine the most appropriate route. Focus discussions with the key stakeholders impacted by the route to enable input into the design.	4	**Cost: 4**	21

Risk ID	Description	SW RBS	RAPID Category	Start Date & Activity ID	Expiry Date & Activity ID	Probability	Impact	Score	Mitigation Strategy	Probability	Impact	Score
710060-039	Owing to a number of global factors including shipping costs, import tariffs, the coronavirus pandemic, and other supply / demand volatility, projections are indicating significant increases in costs associated with Steel and Timber. Therefore, there is a risk that the costs associated with these items are significantly higher than assumed within the cost estimate rates, leading to an increase in the cost of the Non-Infrastructure element of the cost estimate (cost increases around pipe materials previously accounted for).	Estimating	Budget	21/12/22 RYWR.DGN.00830	23/9/25 RYWR.PRO.00190	5	**Cost: 4**	23	Continue to monitor material volatility as the estimate is revised throughout the lifecycle. Adjust the base estimate and risk profile accordingly as further information is received. Ensure that contractors, as part of the design process, have started to look at scalability testing and raw water / treated water profiles to determine the most appropriate pipe to use, as this may be informed by cost. Explore alternative procurement approaches to procure materials in advance of contract award and free issue to mitigate against rising costs.	4	**Cost: 4**	21
710060-010	Owing to the fact that Water Recycling technology requires DWI approval, there is a risk that the required approval is not achieved within the required timescales, resulting in delay.	Stakeholders & Approvals	Stakeholders	28/9/20	21/4/25 RYWR.CON.06230	4	**Time: 4** Reputation: 3 Quality: 3	21	Drinking WSP needs to be developed further as design moves on for sign off by the DWI having now shared the initial document with them for comment. Monitor government guidelines on Covid-19 to understand if sampling can still be undertaken as this impacts on the DWSP content. Utilise the Pilot Plant data to demonstrate the suitability of the recycled water process.	3	**Time: 4** Reputation: 3 Quality: 3	19

Risk ID	Description	SW RBS	RAPID Category	Start Date & Activity ID	Expiry Date & Activity ID	Probability	Impact	Score	Mitigation Strategy	Probability	Impact	Score
710060-001	Owing to the Pilot being a complex and time critical process, and in light of the extraordinary circumstances around COVID-19, there is a risk that there is insufficient data generated to support further assessments in relation to water recycling, which could lead to delays in finalising a suitable design.	Contractor Performance	Water Quality	30/1/20	21/12/22 RYWR.DGN.00830	5	Reputation: 3 **Quality: 4**	24	Obtain agreement with Thames Water over NDA and the ability to examine their data for comparison with our own. Ongoing monitoring of the Pilot Plant operation to understand any data gaps that may occur. Ensure that investigation is undertaken into reasons for Pilot Plant being offline in order that any corrective measures can be incorporated as part of the Pilot trial. Communicate with the DWI to discuss the current data gaps and SW proposals for utilising the Pilot to develop future mitigations.	4	Reputation: 3 **Quality: 4**	22
710060-007	Owing to the need for significant power infrastructure and capacity to operate the WRP and associated Pumping Stations, there is a risk that the estimated upgrade scope as provided by the DNO is not sufficient for the final Scheme design, leading to additional costs and a programme extension	Stakeholders & Approvals	Stakeholders	21/12/22 RYWR.DGN.00830	23/9/25 RYWR.PRO.00190	4	Cost: 1 **Time: 4:** Quality: 3 Op. Service: 3	21	Undertake further revision to Plant design to revise the loading assumptions and compare to latest DNO scope. Continue dialogue with DNO to update assumptions about the scope of their works, including timescales. Feedback to DNO in the event that our loading requirements change through the design.	19	Cost: 1 **Time: 4:** Quality: 3 Op. Service: 3	19

Risk ID	Description	SW RBS	RAPID Category	Start Date & Activity ID	Expiry Date & Activity ID	Probability	Impact	Score	Mitigation Strategy	Probability	Impact	Score
710060-014	Owing to the relatively novel technique of Water Recycling, there is a risk that public perception is negatively skewed against Water Recycling, leading to delays to during the planning process as the DWI expects public concerns are addressed, as well as reputational impact on SW. (Perception driven by taste, odour, source, hygiene etc.).	Stakeholders & Approvals	Water Quality	27/9/21 NSWR.GWY.00040	21/4/25 RYWR.CON.06230	4	**Time: 4** **Reputation: 4** **Quality: 4** Op. Service: 3	21	Continue to undertake purposeful customer consultation to build an informed picture of current perception. Details to include Customer Action Group (CAG), the young person's group (Water Futures 2050), Surveys, Analysis, etc. Undertake necessary activities and obtain necessary approvals / funding in order to relocate the Pilot Plant from Peel Common to Budds Farm in order to provide an end to end stakeholder experience for recycled water. Utilise the regulators to assist in promoting a consistent, collaborative message around the use of recycled water.	3	**Time: 4** **Reputation: 4** **Quality: 4** Op. Service: 3	19
710060-009	Owing to the significant number of unknowns in relation to the any mitigated habitat requirements, there is a risk that the level of the mitigations assumed to be required from the HRA / SEA is not sufficient, resulting in increased costs and potential delays depending on the habitat required.	Stakeholders & Approvals	Environment	30/1/21	21/4/25 RYWR.CON.06230	3	Cost: 1 **Time: 4** Reputation: 3 Quality: 3	19	Continue to develop HRA Assessments with a specialist consultant to understand the extent to which habitat mitigation will be required and factor into cost estimate.	3	Cost: 1 **Time: 3** **Reputation: 3** **Quality: 3**	13

Risk ID	Description	SW RBS	RAPID Category	Start Date & Activity ID	Expiry Date & Activity ID	Probability	Impact	Score	Mitigation Strategy	Probability	Impact	Score
Prog-R98	Owing to the Selected Option at Gate 2 being shift away from the 'Base Case' included within WRMP19 (desalination at Fawley), in order to support our future planning application, this needs to be reflected in an update of WRMP19 and consultation on our Selected Option is also required. It has been agreed with Defra and the EA that WRMP19 will be updated to reflect our Selected Option through the annual review process, and consultation on the Selected Option will take place via WRMP24. However, Defra has informed SW that it will issue a direction shortly (Dec '21/Jan '22) that will require SW to produce its WRMP24 submission to an expedited timeline (June '22, as compared with standard submission of August '22). Owing to this expedited WRMP24 timeline, there is a risk that the quality of the information provided in WRMP24 will be unsatisfactory, leading to the potential for public inquiry into our plan, and delay to scheduling and delivery of our scheme.	Regulatory	Stakeholders	1/6/22	7/9/23 RYWR.CON.06140	4	Cost: 1 **Schedule: 5** Reputation: 4 Op. Service: 3	24	Communicate with the EA expressing SW concerns over the expedited WRMP24 timeline and the impact that this may have on submission quality. Seek support from the EA in the form of additional resource in order to assist in the preparation of WRMP24.	3	Cost: 1 **Schedule:** 5 Reputation: 3 Op. Service: 3	22

Prog-R99	Owing to the Selected Option at Gate 2 being shift away from the 'Base Case' included within WRMP19 (desalination at Fawley), in order to support our future planning application, this needs to be reflected in an update of WRMP19 and consultation on our Selected Option is also required. It has been agreed with Defra and the EA that WRMP19 will be updated to reflect our Selected Option through the annual review process, and consultation on the Selected Option will take place via WRMP24. However, Defra has informed SW that it will issue a direction shortly (Dec '21/Jan '22) that will require SW to produce its WRMP24 submission to an expedited timeline (June '22, as compared with standard submission of August '22). Owing to this expedited WRMP24 timeline, there is a risk that the information provided in the WRMP24 consultation will be misaligned with that being produced as part of the WRSE modelling and regional planning process, leading to delays to the regional plan which could undermine our application for planning consent, the potential for public inquiry into our plan, and delay to scheduling and delivery of our scheme.	Regulatory	Stakeholders	1/6/22	7/9/23 RYWR.CON.06140	4	Cost: 1 Schedule: 5 Reputation: 4 Op. Service: 3	24	Communicate with the EA expressing SW concerns over the expedited WRMP24 timeline and the impact that this may have on SW ability to align WRMP24 with the final outputs of the WRSE modelling and regional planning process. SW to work with WRSE in order to find opportunities to reduce the risk of misalignment (e.g. WRMP24 to utilise draft outputs from the WRSE).	3	Cost: 1 Schedule: 5 Reputation: 3 Op. Service: 3	22

Table 65 - Water Recycling Key Opportunities

Risk ID	Description	SW RBS	RAPID Category	Start Date & Activity ID	Expiry Date & Activity ID	Probability	Impact	Score	Realisation Strategy	Probability	Impact	Score
710060-052	Owing to ongoing refinement to the design as more hydraulic information is known, there is an opportunity that the BPTs can be removed from the design, leading to cost saving compared to that assumed in the base estimate.	Scope & Requirements	Other	27/9/21 NSWR.GWY.00040	21/12/22 RYWR.DGN.00830	2	**Cost: 1**	2	Undertake further hydraulic analysis on the routes as part of the advancing design maturity.	2	**Cost: 1**	2
710060-053	There is an opportunity to utilise the existing underpass structure under the South West Mainline thus removing the need to undertake micro tunnelling and therefore leading to a cost saving compared to that assumed in the base estimate.	Design Development	Other	27/9/21 NSWR.GWY.00040	21/12/22 RYWR.DGN.00830	2	**Cost: 1**	2	Undertake a feasibility study on this route and the alternative options, including examination of further utility information and discussions with local highways teams. In conjunction with the Planning & Consents team, prepare an appropriate methodology to enable the route to be correctly defined. This must ensure that all relevant topics are reviewed. Use ECI (MGJv) to gather more information along route. Look at topics such as traffic, air quality, etc. to help determine the most appropriate route. Focus discussions with the key stakeholders (local authority) impacted by the route to enable input into the design to potentially refine the technique that SW is proposing.	2	**Cost: 1**	2

2.7.3.1. Option B.2

Assumptions for Option B.2 are as those listed above, common to both Water Recycling-based options, plus the those included in Table 63.

Table 66 - Option B.2 Key Assumptions

Assumption ID	Assumption Description	Stability	Sensitivity	Validation / Mitigation Strategy	RAG Status
WfLH-A0086	It is assumed that there is sufficient space at the site of the WRP to accommodate two 10 Ml Break Tanks for Option B.2 in the event that there are turbidity issues at BF	B	C	Validation: Whilst the site is believed to have sufficient acreage to accommodate the tanks, there are concerns over the environmental impact of the large structures, and whether they would be approved for construction. In the event that the Break Tanks were not possible, additional works would be required at BF in order to fix the turbidity issues at source. Mitigation: Undertake further physical investigation of the site to understand the likelihood of sting the Break Tanks. Continue to monitor turbidity levels through source water sampling to inform treatment requirements. Future source water sampling scheduled following Gate 2.	A

Table 67 - Option B.2 Key Threats

Risk ID	Description	SW RBS	RAPID Category	Start Date	Expiry Date	Probability	Impact	Score	Mitigation Strategy	Probability	Impact	Score
710060-025	Turbidity issues have been observed at BF WTW. The solids pre-treatment design for the WRP has therefore been increased through the multiple sampling events completed over time. However, there is a risk of having to install further pre-treatment infrastructure in order to ensure FE quality does not impact on the operation of the WRP, leading to additional assets being required at additional cost.	Design Development	Water Quality	27/9/21 NSWR.GWY.00040	21/12/22 RYWR.DGN.00830	4	Cost: 3 Reputation: 3 **Quality: 4** Op. Service: 3	21	Ongoing assessment of the Pilot to understand how it is reacting to final effluent peaks and troughs and assess these against data from around the world. Risk to be discussed as part of a wider asset strategy to resolve issues at source, rather than resolve using new assets if possible. Undertake assessment to provide detail of potential scope involved in fixing problem using the WRP, versus resolving problem at source.	3	Cost: 1 Reputation: 3 **Quality: 4** Op. Service: 3	19

Risk ID	Description	SW RBS	RAPID Category	Start Date	Expiry Date	Probability	Impact	Score	Mitigation Strategy	Probability	Impact	Score
710060-068	Owing to environmental and spatial constraints adjacent to environmental crossings, there is a risk that significant amendments are required to the location and extent of the reception and launch pits, leading to additional requirements and increased costs.	Ground & Environmental Conditions	Environment	8/3/22 NWSR.KEY.00020	21/111/23 RYWR.CON.06090	5	**Cost: 3**	20	Undertake a feasibility study on this route and the alternative options, including examination of further utility information and discussions with local highways teams. In conjunction with the Planning & Consents team, prepare an appropriate methodology to enable the route to be correctly defined. This must ensure that all relevant topics are reviewed. Use ECI (MGJv) to gather more information along route. Look at topics such as traffic, air quality, etc. to help determine the most appropriate route. Focus discussions with the key stakeholders (local authority) impacted by the route to enable input into the design to potentially refine the technique that SW is proposing. Utilise the environmental crossing report that Ricardo have completed for Gate 2 (technical document) to inform design.	5	**Cost: 3**	20

There are currently no specific opportunities identified for Option B.2 that have not already been included within Table 65 (Water Recycling Solution).

2.7.3.2. Option B.5

Assumptions for Option B.5 are as those listed above, common to both Water Recycling-based options, plus the those included in Table 66.

Table 68 - Option B.5 Key Assumptions

Assumption ID	Assumption Description	Stability	Sensitivity	Validation / Mitigation Strategy	RAG Status
WfLH-A0076	It is assumed that the quality of the FE at PC WTW will not deteriorate between now and the construction of the WRP in order that SW's treatment assumptions remain valid	C	B	Validation: PC WTW is always required to meet the discharge permit quality. Failure to do this will result in a £3.5 m fine. SW has based the design on ensuring that the permit conditions can be met . Ensure that design has factored in the concerns related to anticipated trade effluent increases over time. Mitigation: Continued measurement of the final effluent under the current sampling programme to confirm that any variations are still within the assumed levels. Additional design has now been undertaken to increase the number of filtration units for turbidity spikes.	**G**

There are currently no specific threats or opportunities identified for Option B.5 that have not already been included within Table 64 and 65 (Water Recycling Solution) and Table 66 and 67 (Option B.2).

2.8. Stakeholder and Customer

2.8.1. Engagement Overview

This section outlines SW's engagement activities between Gate 1 and Gate 2 in relation to the water recycling options and sets out SW's plans for future engagement. As Option A.1 was the Base Case set out in WRMP19, engagement during this period has been more heavily focused towards that option; however, SW has continued to engage with stakeholders and customers on all the solutions taken forward past Gate 1: desalination, water recycling and water transfer.

Table 69 - A snapshot of examples of engagement with stakeholder, consultee and community groups

<table>
<tr><th colspan="2">Customers</th><th>Stakeholders</th><th>Regulators</th><th>Planning Consultees</th></tr>
<tr><td colspan="5">Non-statutory consultation</td></tr>
<tr><td colspan="2">Customer Action Group</td><td>WfLH Stakeholder Group meetings</td><td>1-1 briefings and discussions</td><td>Briefing and engagement with Local planning authorities</td></tr>
<tr><td>Ongoing Customer Insight</td><td rowspan="2">1-1 briefings and discussions</td><td>Senior Stakeholder Group meetings</td><td colspan="2">Briefing and engagement with statutory bodies</td></tr>
<tr><td>Industry-wide engagement</td><td>Practitioner Workshops</td><td colspan="2">Communications with communities for the Base Case</td></tr>
</table>

Care has been taken to incorporate the other areas of water resource management work in Hampshire into SW's approach to engagement, such as tackling leakage and promoting water efficiency. Incorporating this overarching narrative into its messaging enables SW to communicate its holistic approach to the water resources challenge in the county and its commitment to improving the resilience of water supplies and protecting the environment. It also reduces the likelihood of duplication of engagement.

Tailored and proactive engagement is key to overcoming stakeholder concerns and challenges (a snapshot is provided in Table 69). SW's customer and stakeholder insight for WfLH first focused on immersing it with what SW already knew from WRMP19, PR19 and global experts. SW then built a deliberative programme that was designed through the use of its Participation Principles (Figure 1 within Annex 9, Customer and Stakeholder Methodology) and aligned to best practice guidance by CCW[5].

Customer insight engagement has been undertaken across a range of different forums enabling SW to understand preferences and views in relation to the Water Recycling Solution as it develops the different options.

SW has held a non-statutory public consultation on the Base Case and to introduce the concept of back up alternatives to consultees and members of the public, including the Water Recycling options.

Feedback from regulators, stakeholders, customers and general members of the public has been analysed, and a feedback report has been published reporting on the key themes emerging from the consultation.

Engagement with regulator and other statutory body stakeholders has been managed at both WfLH Programme level and at SRO project level. This reflects the dual basis in which some of these organisations are engaged in relation to the WfLH Programme and each SRO. Annex 9 Customer and Stakeholder Methodology contain a summary of the engagement carried out with the regulators and other statutory bodies.

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[5] https://www.ccwater.org.uk/research/engaging-water-customers-for-better-consumer-and-business-outcomes/

SW has engaged with stakeholders, including local groups, environmental groups and groups active in the water sector, on an ongoing basis between Gate 1 and Gate 2 (as detailed in section 3.3 of Annex 9, Customer and Stakeholder Methodology).

2.8.2. Stakeholder Engagement – Summary of Activity

2.8.2.1. Regulator and other statutory bodies engagement

As explained in section 3.3.1 of Annex 9, Customer and Stakeholder Methodology, SW has continued to engage regularly with regulators and other statutory bodies. Due to the early stage of the Programme and the fact that a wide range of Options were still being considered in between Gate 1 and Gate 2, there has been a focus on engaging with the statutory stakeholders at this stage.

SW's ongoing engagement with RAPID and regulators (Ofwat, Defra, EA, DWI, CCW) has continued since Gate 1 at various levels within the respective organisations. SW has met with RAPID more than 20 times since Gate 1, including at the monthly 'checkpoint' meetings, and held numerous workshops and individual meetings with the regulators and other statutory bodies. These sessions were used to share concepts, discuss ideas and to demonstrate and discuss the processes behind key decisions, such as Option Appraisal Process. The RAPID Checkpoint meetings were used to provide a regular update on progress, expenditure, Key milestones and demonstrate alignment with PW and external bodies such as WRSE.

Ongoing and regular engagement has taken place with the EA, NE and the MMO, in their dual roles as both key statutory environmental bodies and regulators. The EA and NE in particular have been engaged on the scope and outputs of the various environmental reports that have been produced to assess the performance of the Options, as well as on the detail of the assessments.

Feedback from this engagement has informed the scope of environmental reports and judgements on the nature of the likely impacts of the Options, as well as providing confidence in the OAP methodology.

Southern Water has also briefed Historic England and all of the local authorities likely to be affected by the various Options on the methodology and results of the OAP.

Throughout Gate 2 there has been solution specific technical engagement with regulators and other statutory bodies who have a statutory role in the option development process. This has been undertaken on an ongoing basis and focuses on sharing and discussing key elements of the Gate 2 (and beyond) deliverables so that these stakeholders can be taken along on the journey with us. This is summarised in the relevant technical sections of this document:

1. Environmental – Section 2.5.2.2
2. Engineering and design – Section 2.2.11.1
3. Costs and efficiency of expenditure – Annex 6, Efficiency of Expenditure
4. Consultation – Section 2.4.2

Overview of engagement topics and outputs with our regular stakeholder groups is detailed in Table 70 below:

Table 70 - Overview of engagement topics and discussion points with regular stakeholder groups

Name of stakeholder group **(attendees set out in Annex 9)**	**Frequency of meetings**	**Purpose**	**Scope of discussions**
Senior Stakeholder Group	Regularly since March 2021	Senior-level meeting to discuss progress on Programme.	Topics discussed include: • Option Appraisal Process and methodology • Programme milestones • Regulatory milestone updates • Scheme development • Water Industry insights • Customer insights • Non statutory consultation feedback
Practitioner Workshop	Monthly since May 2021	A monthly practitioner-level meeting to discuss progress on programme and key issues arising.	
Water for Life – Hampshire Stakeholder Group	Twice a year since January 2019	Regular meeting to update on Section 20 progress and delivery of the wider programme.	

2.8.2.2. Non-statutory Consultation and Outputs

The largest stakeholder and consultee engagement event was the non-statutory consultation, which was as run as a virtual consultation from February 8 to April 16, 2021. More information on the process for the non-statutory consultation is set out at Section 3.4 of Annex 9, Customer and Stakeholder Methodology of the Gate 2 submission.

2.8.2.3. Information shared on water recycling options

Whilst the consultation was primarily on the Base Case, including the pipeline routes and inlet / outfall locations, it also introduced the back-up alternatives options, which included Option B.2 and Option B.5.

The consultation brochure introduced the five water recycling options that were presented at Gate 1 (Options B.1, B.2, B.3, B.4 and B.5) and set out a description of the different configurations for each option, including the size of water recycling plant and pipeline lengths and the details of any ‘environmental buffer’. Option B.4 is reported on in Annex 3, Havant Thicket Technical, of this submission; however, as the consultation grouped all alternatives with a water recycling element together, the consultation responses relating to the water recycling element of Option B.4 is detailed below.

Figure 62 – Schematic showing water recycling options presented at non-statutory consultation

Consultees were provided with information that explained the water recycling advanced treatment process, including the membrane process and the treated water conditioning. The information shared at consultation reflected the information available on the water recycling options at the time of consultation (February 2021). Further work has been carried out on the scheme development and design process since then.

General information on the process for dealing with waste disposal from the water recycling process was presented to consultees, including releasing brine through the Budds Farm outfall pipe and the different ways being considered to deal with any solid waste. The different types of water recycling, either ‘indirect’ via an ‘environmental buffer’ or ‘direct’ recycling, where recycled water is transferred directly to Otterbourne WSW, were also explained.

2.8.2.4. Response to the consultation Feedback Form on water recycling

A summary of the response to consultation is set out in the Consultation Feedback Report published on SW’s website: https://www.southernwater.co.uk/our-story/water-for-life-hampshire/consultations. It is important to note that when considered the responses to the consultation that a total of 67% of respondents stated that they lived within the local area of the Programme, whilst 38% stated that they lived close to the proposed Base Case option. As a result, we can expect the issues and preferences of those local to the Base Case to be better represented in the consultation feedback.

A significant proportion of respondents agreed that water recycling alternatives would be an acceptable alternative solution to address potential water resource challenges in Hampshire should the Base Case not be delivered, with only 12% indicating disagreement, and 28% in total responding, ‘don’t know’ or ‘neither agree or disagree’.

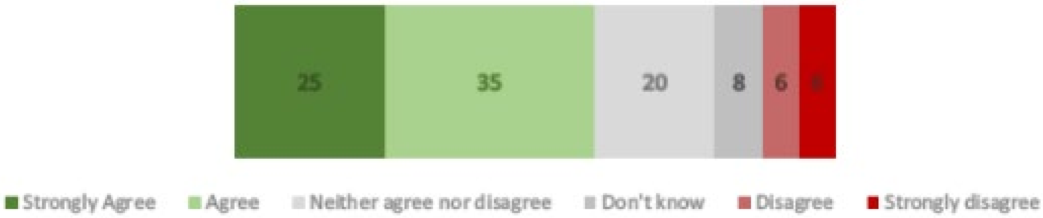

Figure 63 - Consultee response to “to what extent do you feel the water recycling alternatives would be an acceptable alternative solution should the Base Case not be delivered, to address potential future water resource challenges in Hampshire?”

When asked to provide any comments to support their view on the acceptability of water recycling alternatives, the key issues raised related to the environment and the local community. Generally, respondents were supportive of water recycling due to the perceived likelihood of lower environmental damage. However, it is important to note that the consultation materials did not include any assessment work to confirm that this is the case.

When asked to provide any comments in relation to the potential impacts of any of the water recycling alternatives listed, the key issues raised related to the environment, including with regards to disruption to the environment and the local community. Generally, respondents were supportive of water recycling due to the perceived likelihood of lower environmental damage. However, it is important to note that the consultation materials did not include any assessment work to confirm that this is the case.

Generally, some respondents, noted that the limited information provided in the consultation brochure made it difficult to provide a detailed response on the queries asked and requested additional design information and environmental impact information. There was concern raised about the alternative proposal to release recycled water into the Upper Itchen, and abstraction impact on the chalk rivers.

SW is having regard to this feedback and will address it as part of its next consultation event, where more detailed information on the Preferred Option and its updated understanding of the potential issues and impacts will be shared with consultees.

2.8.2.5. Direct responses to consultation

As well as the responses to the consultation via the Feedback Form, some consultees (individuals and stakeholder organisations) responded with feedback via direct communication (letter and email). Due to the nature of the consultation, most responses primarily related to the Base Case; however, in some direct responses from individuals, concerns were raised around the scheme selection process undertaken to identify the Base Case as the preferred solution. SW will share details of its recent OAP to select the new Preferred Option at its next consultation so that consultees can be informed on the process.

Responses were received from Local Planning Authorities in the Hampshire area. This included authorities close to the Base Case and the water recycling and Havant Thicket options. Consultation responses received from local planning authorities included both supportive comments and objections in principle to the Base Case. In general, the Local Planning Authorities requested that SW work closely with them as the Water for Life - Hampshire programme progresses. Since the consultation, SW has been engaging with the Local Planning Authorities, including those relevant to the Water Recycling options, on an ongoing basis and will continue to do so as it enters the consenting process.

Some consultation responses from Local Planning Authorities stated a preference for the alternative solutions due to the likely negative environmental impacts created by the Base Case. This included concerns about the anticipated negative impact on biodiversity, climate change, landscape and water environments, along with the high energy usage required. Reference was made to the climate emergency and national and local targets for net zero. Alternative solutions included water recycling schemes and alternative locations for the desalination plant.

Consultation responses were also received from regulators and other statutory bodies who are engaged on the WfLH Programme, including the EA, Historic England and Natural England. This feedback primarily related to the Base Case, but the following feedback was provided in relation to water recycling:

1. The EA in principle support SW in its investigations into all water recycling options, other than Option B1 which was removed at Gate 1, and it emphasised the need to progress options assessment at pace so that the company can reduce reliance on drought orders. The EA would welcome further information on the water recycling options and to engage with SW in advance of Gate 2.
2. Natural England requested more information on the comparison of impacts between the Base Case and the alternatives and the difference in the scale and likelihood of achieving mitigation of impacts between the options. NE raised a concern that there is significant uncertainty as to whether key environmental legal tests can be met for some of the water recycling options, and it also commented that the difference in cost to customers of the different options is not fully clear.
3. Historic England raised a concern that some of the pipeline routes had not yet been fully assessed to understand the impacts on heritage assets

We have analysed and are having regard to consultation feedback and consider that it largely reflects the limited information that was shared on the water recycling options at the non-statutory consultation (February 2021) due to it being at the early stage of development. Since then, SW has completed its MCDA economic appraisal comparing the options and it has also undertaken its site selection process and Consenting Evaluation, where the likely consenting and environmental impacts of each option were considered against each other. Both the MCDA and Consenting Evaluation directly fed into the overall OAP and decision making process to identify the Preferred Option. SW will continue to progress the pipeline route scheme development process after Gate 2, where impacts, such as those on heritage assets, will be further considered as part of the scheme development process for the Preferred Option.

As SW's progresses its Preferred Option past Gate 2 into the consenting process, there will be further consultations on the emerging proposals where consultees (including stakeholders, customers, regulators and landowners) will be invited to feedback on the scheme and route development process and eventually on the final proposal for the Preferred Option. This includes SW's engagement with PW in relation to the interface with the HTR where joint engagement plans are underway to inform the ongoing scheme development work for Gate 3 activities. Section 4 of Annex 9, Customer and Stakeholder Methodology provides further detail on Gate 3 engagement plans. SW will deliver the engagement that is relevant to the final option.

2.8.3. Customer Insight Engagement Findings

Following CCW best practice and SW Customer Participation Strategy, SW's focus has been on high quality and meaningful engagement – with the objective to ensure it had the insight it needed for any of the potential resource Options to succeed. For Gate 2 it engaged with more than 240 informed customers through deliberative approaches and over 1,950 in quantitative surveys. This built on the insight from Gate 1 with more than 250 informed customers, 2,300 Households and 350 Businesses through joint work with WRSE and the thousands of interviews from WRMP19 (more than 5,000) and PR19 (more than 42,000).

Conducting targeted customer insight engagement and understanding the key issues and concerns that these customers identify is critical for helping us tailor our proactive engagement with the wider customer and consultee base on the Preferred Option following Gate 2. This section provides a summary of feedback from SW's insight projects run as part of Gate 2 for the WfLH programme. The summary has taken the key insights as identified by research reports[6] and has been assured by the independent research team who led SW's CAG. For more detailed information on the methods, approaches and sample used to gather the insight, please see Annex 9, Stakeholder and Customer Methodology.

2.8.3.1. Initial Reactions to Water Recycling

Customers told SW through CAG that the term 'water recycling' feels familiar and is the preferred term (versus water reuse or other options) - as it's seen to be more a straightforward and positive descriptor. Customers see water recycling as a natural way of maximising what we already have and protecting resources, so it feels like a logical solution. Water recycling is seen to address the problem of wastage, helping to tackle the problem rather than just creating more water and could also help change the way customers think about their consumption. It's also seen as a local solution by recycling our regional resources rather than taking from the sea which may be far away.

There was a consistent concern across the insight work that emerged was around water quality both in the short and long term and potential negative associations around wastewater / effluent in the terminology used. Upon exploration, views varied depending on the type of recycling (direct vs indirect) and the storage or pipeline solutions required to support. SW also heard that as a process, customers are less familiar with water recycling, although there is a keen appetite to know more - especially for reassurances around water quality and the long-term impact of this potential solution as a new source.

2.8.3.2. Customer Benefits and Concerns of Water Recycling[7]

Primary Customer Benefits:

✓ Efficient, reliable and resilient by making use of a ready-made supply
✓ Feels like a responsible solution
✓ Innovative
✓ More environmental and sustainable
✓ Proven globally
✓ Good value for money
✓ Protect river and ground water supply

Primary Customer Concerns:

X Concept and terminology
X Cost of the pipe and treatment works - impact to customer bills
X Water quality – the taste, the long term impacts of recycling
X The use of chemicals and can feel as an industrial process
X Environmental impact: impact on rivers, pipework and carbon footprint
X Uncertain effectiveness
X Complexity

Figure 64 - Primary customer benefits and concerns (general themes)

During Gate 1 WRSE ran a joint project which analysed all previous and existing insights on water transfers. They then ran a new qualitative and quantitative approach across the ensure WRSE region, the outputs of which are summarised by Figure 64.

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[6] **Annex 9: Customer and Stakeholder Methodology**, Figure 3 – Overview of Customer Insight Projects for Gate 2, References 1 to 8

[7] From Gate 1 Submission, (Annex 15 – Stakeholder and Customer Report, sections 4.1, 4.2 and 4.3WRSE_Supply-side solutions workshop note_190820

2.8.3.3. Key questions to find out more - from Customer Action Group Members[8]

After reviewing the information available and doing their own research, there are areas where customers wish to know more about the solution. CAG Members raised the following questions where future engagement would need to ensure SW is able to provide the relevant answers:

- Clarity around the specifics of the Options – such as whether it will be direct vs indirect, or into an environmental buffer?
- If indirect, what impact will it have when treated water re-enters the river?
- What will the impact be on customer bills?
- What would be the local disruption and rewilding efforts for displaced habitats during build?

2.8.3.4. Comparison of Water Recycling vs Alternative Solutions

SW's customers (represented on the CAG and Water Futures 2050 groups) insight demonstrates that customers understand that the WfLH Programme is not about one overall solution, but a combination that work together, with everyone playing a part. When looking at the options of water recycling, desalination and transfers – water recycling is rated as the most Preferred Option. Desalination is seen as less sustainable by having greater cost and environmental impacts. Customers told SW that transfers are seen as a support role for Hampshire, but customers are not confident that transfers can provide a long term resilient supply as it is perceived to be simply about moving water between areas rather than providing a new supply.

The outputs from the customer groups SW engaged with through research have suggested there is a preference for direct vs indirect water recycling because it appears to offer the greatest benefits in terms of efficiency and sustainability. However, the benefit of using environmental buffers is recognised, as well as the positive impact this could have in other areas, such as helping to reduce nitrates. It is important to note that these outputs are from targeted customer engagement with informed customers, and so may not directly apply to the views of customers who are not yet familiar with the detail of direct vs indirect recycling.

Customers told SW that direct recycling has greater concern over water quality whereas with indirect recycling customers worry about environmental interference, especially when releasing into rivers. This is because customers feel that re-introducing water to rivers could actually do more harm, altering the water profile, exacerbated by greater abstraction distance. With reservoirs, there are concerns around cost and impact on wildlife during the build. Direct recycling feels like it has benefits over indirect - less 'tampering' with the ecosystem and less infrastructure required. Customers also think it cuts out an unnecessary extra step. Whilst SW did see a preference for direct recycling, the introduction of HT as a storage and dilution Option holds stronger appeal for the perceived additional benefits this brings:

- Stabilising supply;
- Provides greater control;
- Reduces workload on treatment plants; and
- Provides an element of natural dilution.

Some respondents did note concerns around water quality, with customers wanting more reassurances around how contaminants are removed. When recycling is discussed as part of natural process (e.g. speeding up the natural process and using UV light) it can mitigate some of those concerns and is more likely to mitigate immediate perception challenges. The inclusion of a buffer that brings added environmental and social benefits, as well as dilution of the water to a more perceived natural source, further enhances

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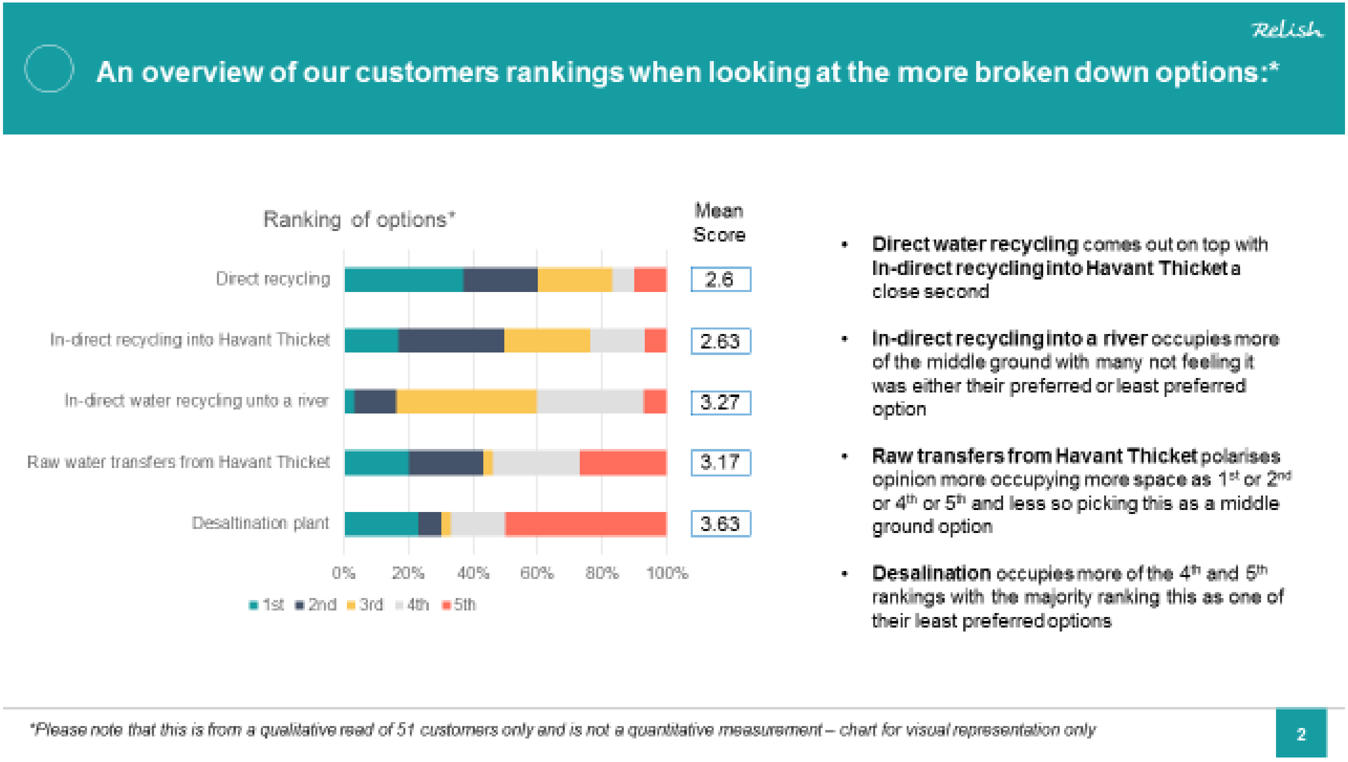
[8] **Annex 9: Customer and Stakeholder Methodology**, Figure 3 – Overview of Customer Insight Projects for Gate 2, Burst Reports: *Water for Life Hampshire Burst 11 Oct '20 up to Burst 18 Jun '21*

support. Figure 65 provides summary charts taken from SW's CAG, young person's research[9] (Water Futures 2050) and household quantitative preference survey[10] for Gate 2.



An overview of our customers rankings when looking at the more broken down options:*

- **Direct water recycling** comes out on top with **In-direct recycling into Havant Thicket** a close second
- **In-direct recycling into a river** occupies more of the middle ground with many not feeling it was either their preferred or least preferred option
- **Raw transfers from Havant Thicket** polarises opinion more occupying more space as 1st or 2nd or 4th or 5th and less so picking this as a middle ground option
- **Desalination** occupies more of the 4th and 5th rankings with the majority ranking this as one of their least preferred options

**Please note that this is from a qualitative read of 51 customers only and is not a quantitative measurement – chart for visual representation only*

Figure 65 - CAG members voted on their preferred solutions[11]

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[9] **Annex 9: Customer and Stakeholder Methodology**, Figure 3 – Overview of Customer Insight Projects for Gate 2, Ref 8: Water Futures 2050 – Wave 2, Apr '21

[10] **Annex 9: Customer and Stakeholder Methodology, Figure 3 – Overview of Customer Insight Projects for Gate 2, Ref 7 Quantitative Option Preferences – Debrief March 2021**

[11] **Annex 9: Customer and Stakeholder Methodology**, Figure 3 – Overview of Customer Insight Projects for Gate 2 Ref 1: Water for Life Hampshire Burst 18 Jun '21

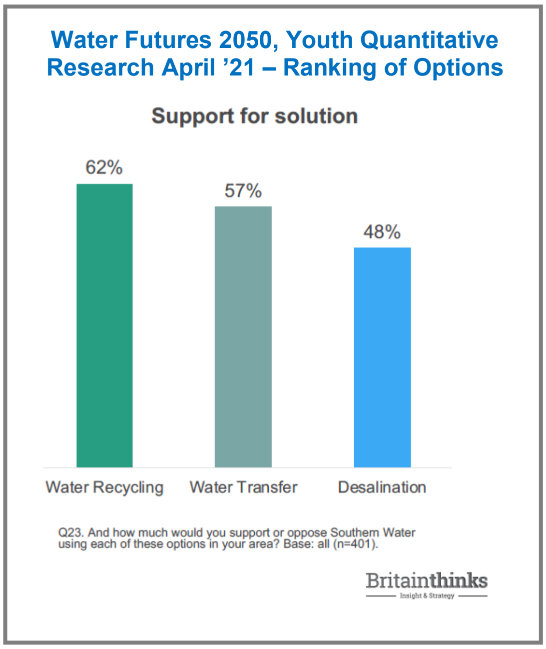

Figure 66 - Water Futures 2050, Youth Quantitative Research April '21 – Ranking of Options

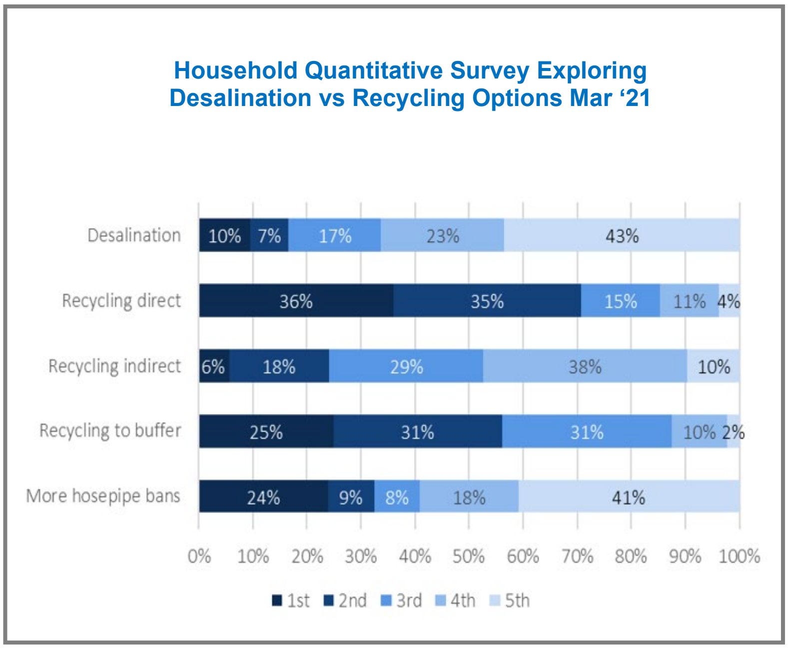

Figure 67 - Household Quantitative Survey Exploring Desalination vs Recycling Options Mar '21

2.8.3.5. Differing Views of Water Recycling across Customer Groups

For water recycling the overall preference and concerns were consistent across customer groups. However, how engagement would be needed in the development and launch of water recycling schemes did differ, such as with businesses who would be reliant on water for their end product needing information on the chemical makeup of the water. Some of the primary differences which related to that future engagement included:

- **Future customers**[12] particularly favoured water recycling as it was seen as a highly effective solution (as illustrated by Figure 66). Similar to other customers, their preference was for direct recycling although they were particularly positive about the reservoir plans and to support the environment through this. Their focus is on minimising carbon emissions, a reliable source of water and protecting local ecology;
- **Customers with affordability concerns**[13] were slightly more polarised than other groups. Some thought it was already being used as a source and others had a perceived concerned that it used sewage. However, they did think water recycling was the most effective solution versus the other Options and were also reassured by quality standards;
- **Customers from more diverse cultures**[14] shared similar views to the overall feedback, although there was greater concern over the perceived use of sewage as a water source, so further reassurances on the process to explain the treatment process and water quality issues is needed here; and
- **Businesses**[15] saw water recycling as a more natural and 'green' solution, although water safety and cleanliness is an issue, particularly to those where water is central to the business. As such, these businesses would require detailed information on some of the more technical aspects of the process and chemicals, to be reassured on standards.

2.8.4. Primary Actions to Mitigate Customer Concerns

As with the other solution Options, SW needs to develop a stronger understanding of the rationale for water recycling through engagement on water scarcity, and in particular the protection of chalk streams and the environment. Beyond the context, the primary actions to mitigate concerns are all focused on engagement – either through how we talk about water recycling or providing the reassurances customers would want.

From SW insight there are 9 primary actions (detailed in Table 71) identified by customers that would be mitigated from or developed for SW engagement planning should this solution be selected at Gate 2. If this solution is chosen these would then be developed into SW engagement plans. These include:

Table 71 – Primary Actions identified by customers requiring mitigation from or developed for SW engagement planning

S. #.	Water Recycling: Primary Actions to Mitigate Concerns - as *identified by customers through SW insight programme*	Key Actions Planned following Gate 2 to Mitigate Each Concern	Ownership
1	Customers would need reassurance on the quality and specifically any health risks when drinking recycled water. Fairly simple reassurances around the purity and high standard of treated water can go a long way to	From SW pilot trials, it was seen that the comparative data is showing that the indirect water extracted for supply is above the minimum standard required and, in many cases, higher quality when compared to current river water. This could mean SW can actually improve the river water quality. Therefore, the key mitigation action requires customer engagement, which would be developed for Gate 3 should a water recycling from part of the Preferred Option.	[redacted]

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[12] **Annex 9: Customer and Stakeholder Methodology**, Figure 3 – Overview of Customer Insight Projects for Gate 2 Ref 8, *Water Futures 2050 – Wave 1 Report, Dec '20 and Water Futures 2050 – Wave 2, Apr '21*

[13] **Annex 9: Customer and Stakeholder Methodology**, Figure 3 – Overview of Customer Insight Projects for Gate 2 Ref 4, Affordability Concerns and Diverse Cultures - April 2021

[14] **Annex 9: Customer and Stakeholder Methodology**, Figure 3 – Overview of Customer Insight Projects for Gate 2 Ref 5, Affordability Concerns and Diverse Cultures - April 2021

[15] **Annex 9: Customer and Stakeholder Methodology**, Figure 3 – Overview of Customer Insight Projects for Gate 2 Ref 6, Hampshire Water Resource Business Challenge Report 21.04.2021

S. #.	Water Recycling: Primary Actions to Mitigate Concerns - as *identified by customers through SW insight programme*	Key Actions Planned following Gate 2 to Mitigate Each Concern	Ownership
	mitigating some concerns.		
2	The use of positive language and consistency across the industry would minimise potential objectors.	SW has been working with other water companies across the South East in regional resource planning and in sharing the key insights for other SROs. Key insight has all also been shared with RAPID at a bespoke sharing session, and SW is developing the tools (such as summaries and recorded webinars) to be easily accessible for others to ensure all have access for future engagement planning.	[redacted]
3	Reassurances on proven technology by showing use of technology from culturally similar countries (e.g. USA).	SW has been working with global experts and have looked at all other facilities around the world. This use of a global approach helps develop the relationships, insight and ability to develop the reassurances for future engagement.	[redacted]
4	The process of water recycling should be explained in a way that demonstrates the natural components so as not to alarm customers that the water would be artificial – in particular, presenting the process as speeding up the 'natural cycle' (such as the use of UV rays) resonates with customers.	SW's semiotics insight output provides practical frameworks and tools to enable the water recycling process to be explained through highlighting links to the natural process. SW's pilot trials have also been demonstrating that it is able to accelerate the natural process and identify the key parts of the treatment to highlight in future engagement.	[redacted]
5	In advance of any change in water source to the home, proactive engagement would be needed to help customers to understand any differences.	Proactive engagement through a range of channels is planned for the WfLH programme. Channels would include advertorials through the press, social media, website and direct communications - however, the exact scope is dependent on the Preferred Option, timing and outputs from pilots / trials, which will provide data as to the exact difference on water quality depending on the source.	[redacted]
6	Provide justification around the impacts to customer bills. Intergenerational fairness helps provide a reason for new solutions and	SW's MCDA assessment as part of the Options Appraisal Process considered a number of scenarios, including focusing on bill affordability. SW is committed to develop a solution that balances the long-term bill impact and keeps customer's bills as consistent as possible. SW's engagement materials for WfLH ensure to focus on	[redacted]

S. #.	Water Recycling: Primary Actions to Mitigate Concerns - as *identified by customers through SW insight programme*	Key Actions Planned following Gate 2 to Mitigate Each Concern	Ownership
	protecting for future generations.	explaining the need and benefit of the Preferred Option as part of protecting future generations' supply.	
7	Demonstrate flexibility, how easily can the capacity of water recycling be increased for future generations.	The limitation on supply would derive from the wastewater treatment plant and how well it's operating. The water recycling Options SW is developing look at quantity of flow and could produce up to 95 Ml/d treated recycled water if BF and PC are operating at peak flow. The Options are below this peak flow and therefore allow scope for expansion, although further to considering the ability of the options to meet 1-in-200 year drought supply requirements, high-level analysis of the ability of each option to adapt and meet increased future needs is detailed in the Outline Option Evolution Plans (Annex 12)	[redacted]
8	Use blind taste tests with real customers at community events / on the local news.	Once DWI approve the use of the membrane used in the water recycling treatment process in other sites - SW can then have a compliant source for which to enable taste testing to progress. Once available SW will review the pilot plant at PC and develop an engagement approach. Any taste tests would need to be run at the relevant time for delivery of the Preferred Option.	[redacted]
9	Demonstrate the safety of chemicals - where else have they been used for consumables, and in particular engage with businesses who are reliant on water around the specific composition of their future source.	The chemicals used are all part of the normal treatment process for drinking water. They have all been approved for drinking water, so the action taken here will relate to future engagement planning once the solution is agreed. They will require a segmented view to key customer groups - such as businesses reliant on water for their end product / service.	[redacted]

2.9. Schedule

2.9.1. Introduction

2.9.1.1. Background

SW has an obligation under a s20 Agreement[16] to implement, 'using All Best Endeavours (ABE)', a 75 Ml/d plant, in the Fawley area, in accordance with the preferred strategy in WRMP19.

In addition, Ofwat has requested that, as part of the RAPID gated process, SW also considers a number of alternatives to the Base Case. The assessment of alternatives in this way also represents prudent risk management and business planning, to ensure that, should it be required, there is an alternative available to meet SW's supply obligation, in the event that for any reason it is not possible to implement the Base Case, despite SW using all best endeavours to do so. Essentially, the alternative solutions act as back-up Options, in case the Base Case cannot be implemented. In addition, the consideration of alternatives is required in order to support important assessments such as SEA, HRA and Water Framework Directive Assessment (WFDA) as part of the gated process, and EIA, HRA and WFDA in the context of the subsequent planning and consenting process for the Base Case.

At RAPID Gate 2, SW has developed and is evaluating multiple Options. The Options discussed within this section are:

B - a new **WRP,** supplied with treated water from Budds Farm WTW and PC WTW, supplying **Recycled Water** to Otterbourne WSW via:

- **Option B.2**: 61 Ml/d Recycled water sent to an EB - treated at Otterbourne WSW. The raw water, which is recycled, is sourced from Budds Farm WTW FE; and
- **Option B.5**: 75 Ml/d Recycled water sent to EB – treated at Otterbourne WSW. The raw water, which is recycled, is sourced from both Budds Farm WTW and PC WTW FE.

Each Option, outlined above, supply raw water to be treated at an existing SW WSW, before entering its potable water supply network. These Options are required by SW on an intermittent basis and are coincidental with a 1-in-200-year drought event.

2.9.1.2. Purpose of this Document

This is the supporting document to the delivery schedules for delivering the Recycling solution types.

The developed delivery schedules are comprehensive schedules that detail the full suite of activities, dependencies and interfaces required to deliver this highly complex project. This document is to be read in parallel as it details the supporting narrative, highlights key features and aspects of the schedule and documents key assumptions and dependencies.

2.9.1.3. Section 20 Agreement

SW has an obligation under a s20 Agreement to implement, using ABE, a 75 Ml/d plant, in the Fawley area, in accordance with the Preferred Strategy in WRMP19.

The recycling schedule assumes that the SRO taken forward to consenting will not be a 75 Ml/d plant located in the Fawley area (named in the WRMP19 Strategy A schemes referred to in the s20 Agreement).

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[16] Section 20 Agreement of the Water Resources Act with the Environment Agency (EA) and the Secretary of State for the Department of Food & Rural Affairs (DEFRA), which references the Strategy A in the SW Water Resources Management Plan for 2019 (WRMP19)

A key assumption is that in accordance with the dNPS for Water Resources Infrastructure, the WRMP provides the robust 'need' case for the DCO application and that the Option taken to planning should align with what is in the current WRMP. If the Option in the DCO application is materially different from the WRMP, it would be preferable to have the WRMP revised before the DCO application is submitted, which could be assumed a 'reasonable endeavours' delivery approach. However, if the WRMP revision is in preparation only, it will still be capable of being an important and relevant matter, and SW will need to provide the project need and justification material at the application level and not be able to rely on this in the WRMP document alone. This would add material risk to the planning process and likely require additional time within the pre-application stage of the project.

If, during the 'ABE' delivery of the Option, it is found that the Option has insurmountable obstacles to delivery or is significantly different from the option listed in Strategy A of WRMP19, a material change to the Option within the WRMP may need to be sought.

For the recycling options, it is likely that a material change would be required to WRMP19. Accordingly, SW has included activities associated with the management of a material change to WRMP19, including likely consultation and engagement activities. The schedules developed have been developed with the 'ABE' level of effort, as this references the approved WRMP, rather than specific solutions. The schedules developed for the project are accordingly designed to expedite the project in the fastest overall sequencing possible. As a result, there are significant parallel running activities that must be managed and interfaced to facilitate the effective delivery of the project. Key dependencies and assumptions are detailed later within this document.

2.9.2. Delivery Schedule Development

2.9.2.1. Methodology

During the period between Gate 1 and Gate 2 the schedule has been further developed and refined in parallel with the wider project development. The project has evolved significantly since Gate 1 as SW has further developed the design, undertaken significant investigatory activities, formulated likely construction techniques, integrated specialist suppliers and engaged with key stakeholders.

SW's schedules are owned by its Project Leadership team and present a fully integrated plan for the delivery of a highly complex project. SW maintains and updates project schedules in real time throughout the month and has formal reviews every two weeks to maintain focus on quality and progress.

As part of the schedule development process, a series of deep dive workshops were held on key interface areas such as:

- Environmental and planning consent;
- Procurement and commercial and; and
- Engineering and process design.

Where activities were common to the Base Case and strategic alternatives, workshops were combined for all the projects, with separate sessions held to develop project specific detail.

To inform the workshops, several project delivery assumptions were developed in advance, as is discussed later in this chapter. Specialist suppliers were engaged to provide key information, aligned with industry benchmarks, for the activities proposed. In particular, these were associated with ecological surveys, tunnelling and pipeline construction. The objective of the workshops was to develop the detail of activities further from Gate 1, to test the logic between the activities identified and ensure that a robust plan was developed through to completion, incorporating all development and learning from our Gate 1 activities.

Following the initial deep-dive workshops, the draft output schedules were then tested through a high-level risk analysis to ensure a realistic output. The schedule was then passed through another phase to scrutinise the logic and timeframes; this was done through identification of activities longer than nine months, without a fixed start date and introducing parallel workstreams where possible (rather than sequential).

Throughout the process, a number of scenarios were identified which will be further explored in Gate 3 with the objective to continue to optimise the schedule and explore opportunities as the project scope and design further develops. To fully develop and exploit these opportunities, SW generally needs to engage extensively with the market, stakeholders and suppliers. The opportunity to explore these opportunities is significantly improved as Options are rationalised and it moves into the next phase of the DPC delivery process.

For further information on the Gate 2 assurance process please see Annex 7, Assurance Process.

2.9.2.2. Schedule Work Breakdown Structure

The schedule has been developed to 7 Levels at present, with Level 1 to 4 of the Work Breakdown Structure (WBS) being identical all across all SROs.

Table 72 details SW's high-level WBS and the contents within lower levels within each section.

Table 72 – Southern Waters high-level WBS

WBS Level	Item	Details of Level 3 and Beyond
L2	Key Milestones	High level milestones to include: • DPC milestones • RAPID gateway dates • OFWAT Control Points • DCO process milestones • Construction start, complete, commissioning complete, plant / facility operational milestones
L2	Gates (RAPID)	Project level capturing the governance and assurance of tasks associated with the RAPID process
L2	Ofwat	Activities associated with DPC Control Points and any interface points that require information from other functional teams within the project
L2	Consent & Permit & Licencing	Required activities and processes informing DCO supported by statutory permitting, statutory and non-statutory consultation, DCO documentation application and submission
L2	Procurement & Commercial	Service routes for DCO sourcing teams, contract and equipment package awards including land acquisition and appointment of consultants, early contractor involvement and the procurement of Competitively Appointed Provider (CAP)
L2	Design	Conceptual design, feasibility designs informing non-statutory and statutory consultations for non-infrastructure and infrastructure scope
L2	Surveys	Execution of surveys pertaining to land access, environment and engineering design works
L2	Post Contract Award	Site establishment, clearance and remediation and ground works, detailed designs, site investigation, procurement and site works undertaken by the CAP
L2	Test & Commission & Handover	Testing and commissioning of assets, handover followed by benefits realisation period
L2	Operational Readiness and Training (ORAT)	This section of the schedule is yet to be fully developed as it is dependent upon activities to be undertaken if future stages. This area will detail all activities to ensure that people, processes and systems are in place to ensure an effective asset commissioning and operation.

The schedule submitted at the time of Gate 2 is progressed up to July 2021.

2.9.2.3. Schedule Gantt Charts

SW has developed a comprehensive series of P6 schedules for each of the solutions being progressed to RAPID Gate 2.

The full schedules for Recycling Options B.2 and B.5 can be found in Appendix B. The schedules submitted at the time of Gate 2 are progressed up to July 2021, as this was the cut-off date for the development of the Gate 2 submission.

The Option, B.5 and alternative B.2, differ in DO capacities. Therefore, Option B.2 shares the same approach and logic to B.5 to procurement, regulatory approval and Design and Build under a DPC route. The post contract activities do differ as B.5 includes additional scope to incorporate additional flow from the PC WTW site.

The level of schedule detail is sufficient to enable the agreed execution plan to be modelled and analysed. Activities are measurable, quantifiable and (where practical) linked to deliverables. Activities are not less than one month in duration unless absolutely necessary. Attention has been paid to incorporate a realistic logic chain for DCO submission and parallel procurement activities, enabling timely appointment of a CAP.

Engineering activity durations consider expediting requirements, review and approval cycles and regulatory requirements. Logic for the key activities identify where interfaces between SW and consultants / contractors are required. Permits are aligned to relevant design and construction type activities where applicable.

Each construction schedule is ‘physical area’ using discrete identified areas. Each area contains a number of work packages and units which are defined scope of construction work consisting of logical units and subdivisions based on geographical area. Phasing of the early and site preparation and main construction methodology and durations derive from multiple sources and are recorded within the Assumptions and Dependencies section.

Commissioning systems is based on a plan that has been produced by SW’s key Water Recycling experts, to ensure adequate time has been apportioned to the schedule.

Benefits realisation is currently estimated at one year. SW will keep this under review and update as it further develops the benefits realisation processes and key benefits realisation measures are agreed.

2.9.2.4. Risk Alignment

SW has a comprehensive risk management process that is complementary to its schedule development processes. This process, and the outcomes of it is detailed within Section 2.7.

Overall, SW has followed a similar process to that at Gate 1, in line with the development of the Strategic Outline Case. From a schedule perspective, SW has articulated a delivery date range that is cognisant of the project’s key opportunities and threats. This is detailed within Section 2.9.4. It should be noted that the ‘ABE obligation means that most schedule opportunities, particularly those associated with client led activities, are embedded within the schedule. SW has a limited number of opportunities that still require further engagement with external parties to understand the full costs and benefits. These will be explored with key stakeholders, partners, and the market within the next phase of activity.

The threat range is articulated through the use of the Green Book methodology to establish ranges of out-turn delivery dates. This aligns with UK best practice in complex project development and dovetails with the approach that SW has taken for cost estimating for consistency.

2.9.3. RAPID Gate 2 Delivery Schedules

The full delivery schedules can be found in Appendix B. These detail all relevant milestones, activities, durations, dependencies and governance gates. Each SRO project is highly complex in nature and must follow clearly identified development and governance paths for procurement, consenting, environmental and engineering development and funding.

These are fully articulated in the master schedules. SW has however created a simplified version of this plan to articulate the key features of the overarching project delivery schedule.

2.9.3.1. Plan on a Page

The ‘Plan on a Page’ gives a simplified, visual overview of the key governance points, overarching consenting and procurement activities and key design, construction and commissioning durations. It does not detail the full suite of interfaces and dependencies. Further detail of these can be found within this document and the full delivery schedules located within Appendix B.

Below Figure 68 and Figure 69 illustrates the Plan on a Page for the B.2 and the B.5 solutions.

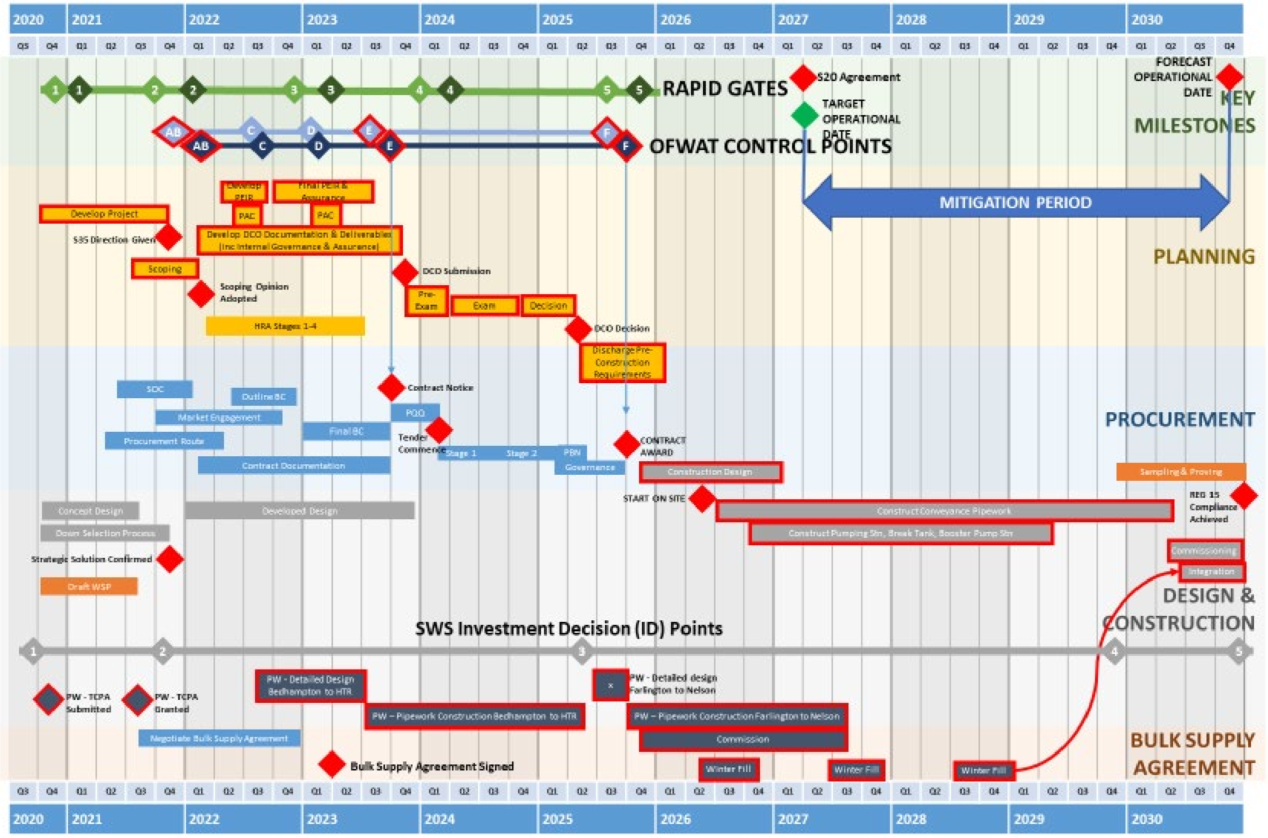

Figure 68 - WfLH - Strategic solution delivery - Water recycling (B.2)

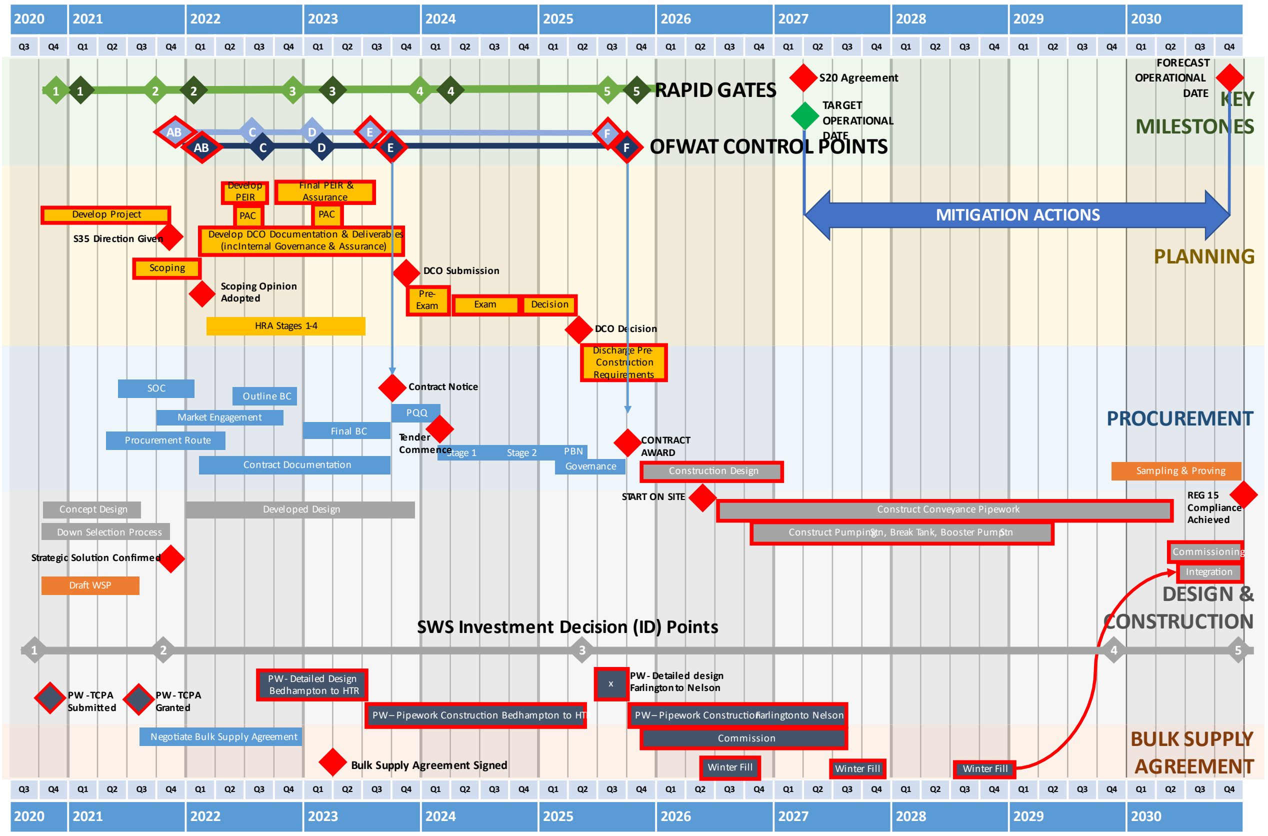

Figure 69 - WfLH - Strategic solution delivery - Water recycling (B.5)

The Plan on a Page details the proposed RAPID gates and Ofwat CPs.

The key block of activity required to develop a DCO submission and undertake examination are detailed including the timing of these critical activities.

SW's procurement process and timeframes are based upon executing the project under the DPC delivery model. A two-stage tender process is currently proposed to be utilised to facilitate the CAP competition.

Design activities are detailed, including those activities that are undertaken by SW and those that will be undertaken by the successful CAP. Construction and Commissioning durations are also detailed. These have been significantly updated in line with the project evolution between Gate 1 and Gate 2 and are now based on bottom-up estimates and comparative durations.

2.9.3.2. Key Interdependencies and Critical Path

Given the number of parallel processes that are being undertaken simultaneously, there a number of critical path and sub-critical path activities that are incredibly sensitive to being critical should there be relatively small movements within the overall delivery schedule. The below narrative highlights areas on the primary critical path along with key areas that are very close to the primary critical path.

A full copy of the critical path schedule is appended in Appendix C.

The Key Critical Path starts from Gate 2 as that currently drives the submission of the s35 request. Following submission of the draft s35, SW was informed that Defra were not willing to pass comment on the draft s35 while Optionality was still present within the process. As Gate 2 is the end of this Optionality it has been utilised as the commencement of this process, although delays to the schedule have been mitigated by the undertaking of substantial preparatory work associated with the s35 request.

The Key Critical Path then flows through the surveys, and then through into the main DCO Application process. Concurrently the DPC procurement process is also on the Key Critical Path due to the introduction of a SW and CAP financial close period of 60 days post DCO Judicial Review. This also ensures that any final consent conditions are known, can be assessed and the risk associated quantified and apportioned resulting in the Contract Award to the successful CAP.

Control Point E and F are shown on the Key Critical Path due to the link to the submission of the Tender Documentation for attaining the approval from Ofwat to allow commencement of the Pre-Qualification Questionnaire (PQQ) process.

Control Point F is a governance milestone to allow Contract Award post DCO consent being granted, and judicial review being completed.

Post Contract Award B.2 / B.5 flows through the detailed design, intrusive investigations needed to feed the design which then leads into the construction of the conveyance pipework. The final critical activities then flow into the commissioning and handover element.

2.9.3.3. Key Milestones

At RAPID Gate 1 SW suggested key milestones associated with the delivery of the project. The below Table 73 details those milestones and the current forecasted dates associated with the milestones.

Table 73 – Key milestones

Key Milestone	Gate 2 Forecast Date
RAPID Gate 2	Q3 2021
DCO: Section 35 Request	Q4 2021
DCO: Section 35 Direction given by Secretary of State (SoS)	Q4 2021
DCO: Redline for Preferred Route Announcement (PRA) confirmed	Q2 2022
DCO: Masterplan published	N/A
DPC: Ofwat Control Point E	Q3 2023
DPC: Official Journal of the European Union (OJEU) Contract Notice to be issued	Q3 2023
DCO: Submission of the DCO application	Q4 2023
DPC: Ofwat Control Point F	Q3 2025
DCO: DCO decision (end of DCO Stage 5)	Q2 2025
Construction: end of DCO requirements discharged allowing plant construction to commence	Q4 2025
Construction: Commissioned asset in use	Q4 2030

2.9.3.4. Key Assumptions and Dependencies

Given the stage of development of the schedule, there are a number of assumptions that have been made in order to develop the schedule. There are also significant dependencies within the schedule where activities have a knock-on impact upon subsequent activities. SW details some of the key assumptions and dependencies in the following Tables.

Table 74 – Consenting

Assumption / Dependency	Description	Rationale and impacts of change
Assumption	Planning approval is sought and obtained at the first attempt via DCO consenting route rather than Town and Country Planning. The critical path mostly comprises activities required for the DCO submission.	Should S35 direction not be given then the impact of following the TCPA consenting route likely involves delay due to the more fragmented approach that needs to be followed for a project of this complexity.
Assumption / Dependency	DCO follows a post Gate 2 2-stage consultation process with additional non-statutory and statutory consultations and is currently assumed to be dependent on the submission of the s35 which is therefore on the critical path.	Two additional stages of consultation will enable SW to adequately address the rigorous consultation requirements associated with the DCO consenting process, ensuring that interested and affected stakeholders are given meaningful opportunities to influence its proposals as they are developed. This mitigates the risk of non-acceptance of the DCO application due to the inadequacy of consultation.
Dependency	DCO consent is required before Contract Award.	DCO consent drives Ofwat Control Point F which allows SW to award contract to the final preferred CAP bidder.
Assumption	All stakeholders and regulators, can resource adequately to meet the schedule.	Stakeholder Engagement strategy is being developed to support the establishment of resourcing levels for key stakeholders to ensure the schedule can be met.
Dependency	ECI is a key predecessor for multiple activities.	Delay to the mobilisation of the ECI could impact DCO application submission.

Table 75 – Procurement and Commercial

Assumption / Dependency	Description	Rationale and impacts of change
Assumption	One DPC contract is being issued containing all of the elements of the SRO activities up to the Otterbourne boundary.	Multiple contracts may result in potential for delay via resourcing implications and interfaces required to award. Further packaging assessment will be undertaken in the next phase of activity.
Assumption / Dependency	Otterbourne upgrades will be delivered outside the scope of the CAP agreement.	The Otterbourne upgrade is related to existing scope agreed with regulators and is on an earlier timeline to the SRO delivery.
Assumption / Dependency	Procurement of DCO sourcing team in support of the Planning & Consents Manager concludes end 2021 / Jan 2022.	Specialist resources will be required to support these activities and ensure that the DCO consenting process is delivered successfully.
Dependency	Judicial Review application period completion for the DCO consent drives the financial closure period.	Market engagement has informed SW that potential bidders may struggle to the contract until such time that DCO consent has been achieved and any conditions reviewed, and risks associated with those conditions have been quantified and apportioned. This linkage between DCO Consent and the procurement process is highly critical and will be a key area of focus for the next stage of market engagement.
Assumption	CAP award initiates CAP site investigations, designs (procurement) and construction sequentially.	These may require confirmatory investigations by the CAP to finalise construction and tunnelling methodologies at crossings (as required).

Table 76 – Design

Assumption / Dependency	Description	Rationale and impacts of change
Assumption	Feasibility design for statutory consultation is sufficient quality to enable meaningful stakeholder engagement.	Inadequate feasibility design would impact on high quality consultation, potential risking the success of the engagement strategy.
Assumption	Feasibility design continues after Statutory consultation period for a period of 2 months.	Failure of feasibility design continuing post Statutory Consultation would result in feasibility design not being developed in line with feedback received from interested and affected stakeholders resulting in risk to DCO Consent.

Table 77 – Surveys

Assumption / Dependency	Description	Rationale and impacts of change
Assumption	SW agrees negotiated access with the majority of landowners ahead of undertaking surveys.	Use of statutory powers for access may result in negative opinion of affected stakeholders.
Dependency	SW performs all relevant surveys within feasibility design periods.	Feasibility design not sufficiently developed for DCO and DPC processes and survey data not available.

Table 78 – Early Enabling Works

Assumption / Dependency	Description	Rationale and impacts of change
Assumption	No site works commenced until site clearance and compound set up available.	Need to promote and safe and efficient work environment for the site team.

Table 79 – Main Construction Works

Assumption / Dependency	Description	Rationale and impacts of change
Assumption / Dependency	Sequencing and durations of construction is reflective of design maturity at the time of this submission, and which has been used for all other aspects of this submission. It will require further development as the design matures to validate.	Changes and evolution to the design will inevitably impact on the construction durations. This could be in a positive or negative direction.
Assumption	Pipeline construction is based on 50 m lay, per seven-day week, per gang. B.5 assumes a maximum of 7 gangs whereas B.2 assumes 5 gangs.	Given local resource and logistical constraints 7 gangs is considered a realistic maximum at this stage.

Table 80 – Testing & Commissioning & Handover

	Assumption	Rationale and impacts of change
Assumption	Commissioning apportioned as fixed period of 6 Months.	This is based on information provided from SW's key Water Recycling consultant and other examples that have been implemented worldwide.

2.9.3.5. Schedule Evolution since Gate 1

Some of the key changes and evolutions to the Gate 2 schedules to those presented at Gate 1 are:

- It was assumed at Gate 1 that SW could progress more quickly into the DCO development process for the Base Case. Engagement with key stakeholders meant that SW has agreed to delay the Request for S35 Direction until a single solution was confirmed. This has held back elements of activity that were planned in the current time period;
- At Gate 1, the assumption was that there would need to be 2 consultations associated with the consenting aspect of the project. These would be in the form of a non-statutory consultation ahead of Gate 2 and a Statutory consultation ahead of DCO submission. Following feedback from its non-statutory consultation, SW believes that a further non-statutory consultation will be required in order to generate necessary stakeholder support for the project;
- At Gate 1, the design element of work had little impact on the overall critical path. Following SW's project evolution, the design and development activities are far more intwined with each aspect of the project. Design, Consenting, Procurement and Stakeholder Management interfaces are now much more clearly defined, understood and documented;
- Following SW's post Gate 1 market engagement activities, it became clear that it needs to make an allowance for a Financial Close period for the successful DPC CAP. This had not been accounted for at Gate 1; and
- Ofwat Control Point C includes key activities such as market engagement and testing appetite of DPC procurement route from potential suppliers. It is a critical CP as it is the first point that Ofwat

can designate the scope for a DPC delivered project. Following SW's Gate 1 activities, engagement with Ofwat and wider lessons learnt, it has a stronger understanding around the level of activity and coordination with the market and stakeholders that this will entail. SW has allowed more time as a result within Gate 3 / DPC Stage 3 activities.

Significant work has taken place between Gate 1 to Gate 2 to evolve designs, construction techniques, related-site investigations and main construction site works durations. This involved activity from SW team members and specialist suppliers where applicable. This has resulted in much greater granularity in bottom-up plans whilst improving confidence in delivery plans.

The following tables, shown in Section 2.9.5 Key Solution Specific Milestones give a detailed narrative of movements between the Gate 1 schedule milestones and the Gate 2 schedule milestones.

2.9.3.6. Solution Required Date

Q1 2027 is the target delivery date for the project. Following SW's extensive schedule development, engagement and optimisation activities, the completion dates for B.2 and B.5 are forecast at Q4 2030. Please see the Section 2.9.5 for information on the movement of key milestones.

SW has been working very closely with regulators and stakeholders to communicate and understand the impacts associated with late delivery against the target dates. SW proposes to deploy an agreed and extensive mitigation strategy to ensure that the gap between the target date and the current forecast completion date can be effectively managed from a Supply / Demand balance perspective.

2.9.3.7. Timeframes for Future RAPID Gated Process

The schedule details indicative schedule dates for subsequent RAPID Gates (see Section 2.9.3.1).

The milestones are fully detailed in Section 2.9.5. It should be noted that the proposed dates for RAPID Gate 4 and 5 are indicative only at this stage and will flex as the project continues to evolve and continue through the project delivery lifecycle.

RAPID Gate 3 is now positioned at a point where SW can demonstrate technical and commercial feasibility for the solution, ensure that it is embedded within its approved WRMP and carries stakeholder and customer support. To meet these objectives, the gate is now positioned following CP C, SW's non-statutory consultation and following any update to WRMP19. The forecast date for Gate 3 is November 2022.

RAPID Gate 4 is broadly positioned to align with the start of the DPC procurement process and the DPC application. SW will continue to work closely with RAPID to determine the precise timings of this gate, and where in the project lifecycle best fits to align with the procurement and consenting process. It is currently forecast to be Q4 2023.

RAPID Gate 5 is positioned to align with the completion of the DCO consenting process, the determination of CP F and the award of the DPC delivery contract. It is currently forecast to be Q3 2025.

2.9.3.8. Missing Information

At this stage SW does not believe that there is significant outstanding information that would be expected at the Strategic Outline Case stage of major project development.

SW will continue to develop further granularity, engage specialist suppliers and secure further detail input as it moves into the next phase of activity. ECI will be secured to test and challenge construction and commissioning schedules to ensure that these are robust and optimised.

The Gate 3 activities will include significant engagement with the market, stakeholders and regulators which will continually feed into and update the delivery plans.

2.9.4. Delivery Range of Earliest Deployable Output

2.9.4.1. Future Opportunities

There are a number of areas of opportunity that are not currently incorporated into SW's base delivery schedule. These areas relate to the post-DPC Contract timeframe and are mainly related to construction activities. At this stage SW has not included them within the base schedule because they either:

- Conflict with one of its regulatory obligations (such as delivering Value for Money (VfM) for Customers); or
- SW needs additional information from the market to make an objective assessment.

Full details of the opportunities are in Appendix D.

In summary, SW believes that there may be up to 7 months of time opportunity associated with the most viable opportunities that have been identified. This 7-month period will be fully validated and examined in the next phase of activity, including through SW's ECI engagement and market engagement activities associated with the CP C submission.

2.9.4.2. Optimism Bias

To calculate the threat range, SW has utilised the same Optimism Bias (OB) approach that it utilised at Gate 1. This is consistent with the development of the Strategic Outline Case.

There are a series of statements that have been developed to substantiate the OB assessment. Please see Section 2.7 for details. These statements apply to both cost and schedule and are consistent for both areas.

Table 81 details the current Original and Adjusted OB percentage of the works duration.

Table 81 – Current Original and Adjusted OB percentage of works duration

Option	Non-Standard Split	Standard Split	Original OB Percentage (%)	Adjusted OB Percentage (%)
B.2	100	0	25%	15.36%
B.5	100	0	25%	15.16%

Option B.2 and B.5 have the same works duration of 63 months. Table 82 below details the Original OB Works durations.

Table 82 – Original OB Works durations for B.2 and B.5

Option	Works Duration (months)	Original OB Percentage (%)	Original OB Threat allowance (months)	Total Works Duration inc. Original OB (months)
B.2	63	25	16	79
B.5	63	25	16	79

Table 83 below details the Adjusted OB Works Durations.

Table 83 - Adjusted OB Works Durations for B.2 and B.5

Option	Works Duration (months)	Adjusted OB Percentage (%)	Adjusted OB Threat allowance (months)	Total Works Duration inc. Adjusted OB (months)
B.2	63	15.36	10	73
B.5	63	15.16	10	73

2.9.4.3. Overall Delivery Range

Incorporating the above factors, the delivery range for the Water Recycling SRO is detailed in Table 84 as below.

Table 84 – Delivery range for the Water Recycling SRO

Option	Earliest Opportunity Date	ABE Delivery Date	Adjusted OB Delivery Date	Original OB Delivery Date
B.2 / B.5	Q2 2030	**Q4 2030**	Q4 2031	Q2 2032

2.9.5. Extended Milestone Dates with Comparison to Gate 1 Dates

Since the Interim Update, further development and refinement of the schedule has been limited to the Emerging Preferred Option from the Interim Update – and now the Preferred Option, Option B.4. As a result the schedules presented for the other Options were developed prior to the Interim Update. This is reflected through the following Section.

There are eight sets of milestones, they are categorized based on the WBS breakdown structure from the previous section of this report.

The below Tables detail the key milestones, movements since Gate 1, the narrative around those movements and relevant assumptions.

Table 85 - Gate Dates – All Water Recycling Options

Activity ID	Description	Date at Gate 1	Option B.2/B.5	Narrative	Assumptions
RYWR.KEY.00110	Gate 2 Submission	Q3 2021	Q3 2021	Gate 3 has been moved back following the development of key areas of the schedule such as non-statutory consultations and the Ofwat Control process.	
RYWR.KEY.00120	Gate 2 Decision	Q1 2022	Q1 2022		
RYWR.KEY.00130	Gate 3 Submission	Q2 2022	Q4 2022		
RYWR.KEY.00140	Gate 3 Decision	Q3 2022	Q1 2023		
RYWR.KEY.00150	Gate 4 Submission	Q1 2023	Q4 2023		
RYWR.KEY.00160	Gate 4 Decision	Q3 2023	Q1 2024		
RYWR.KEY.00170	Gate 5 Submission	Q3 2024	Q3 2025		
RYWR.KEY.00180	Gate 5 Decision	Q4 2024	Q4 2025		

Table 86 - Ofwat Control Point Dates – All Water Recycling Options

Activity ID	Description	Date at Gate 1	Option B.2 / B.5	Narrative	Assumptions
RYWR.KEY.00210	Ofwat CP A Submission	Q4 2020	Agreed with Ofwat to combine with B	SW has held a series of informal, exploratory meetings with Ofwat to discuss how best to schedule the control points. RAPID has joined some of the meetings. These discussions are ongoing and will include the examination of any assumptions being made by SW, as well as the format and content of each report.	At Gate 1, SW's initial thinking was that each CP had to be submitted separately. However, following further consideration and discussion with Ofwat, it has combined CP A and B. This is because most of the content for CP A would also be produced for CP B. By combining the two, SW would thus increase efficiency whilst also achieving CP B Determination much sooner in new schedule.
RYWR.KEY.00220	Ofwat CP A Decision	Q1 2021	Agreed with Ofwat to combine with B		
RYWR.KEY.00230	Ofwat CP B Submission	Q2 2021	Q4 2021		
RYWR.KEY.00240	Ofwat CP B Decision (Strategic Outline Case (SCO) Approved	Q3 2021	Q1 2022		
RYWR.KEY.00250	Ofwat CP C Submission	Q4 2021	Q3 2022		It is currently felt that the optimum submission time has to coincide with Gate 3 in terms of maturity of SRO Scope and associated activities.
RYWR.KEY.00260	Ofwat CP C Decision	Q4 2021	Q3 2022		
RYWR.KEY.00270	Ofwat CP D Submission	Q1 2022	Q1 2023		Combining CP D with CP C was considered, given the apparent closeness in submission dates. However, this is currently deemed to be impractical given the amount of information required for CP D. CP D's submission scheduling will thus need to take into account the need to await CP C determination and feedback. It will now be more closely aligned with CP E
RYWR.KEY.00280	Ofwat CP D Decision	Q2 2022	Q1 2023		
RYWR.KEY.00290	Ofwat CP E Submission	Q2 2022	Q3 2023		As part of CP E, SW intends to undertake a further VfM analysis, in addition to gathering all relevant information required for an Outline Business Case.
RYWR.KEY.00300	Ofwat CP E Decision	Q3 2022	Q3 2023		

Activity ID	Description	Date at Gate 1	Option B.2 / B.5	Narrative	Assumptions
	(Commence Procurement)				
RYWR.KEY.00310	Ofwat CP F Submission	Q2 2024	Q3 2025		CP F is dependent on the point at which SW internally identifies a Preferred Bidder. The Preferred Bidder's proposal will in turn enable the Full Business Case to be completed as well as enabling SW to undertake all relevant governance prior to submission of CP F to Ofwat.
RYWR.KEY.00320	Ofwat CP F Decision (Contract Award Enabler)	Q3 2024	Q3 2025		

Table 87 - Consent and Licencing – All Water Recycling Options

Activity ID	Description	Date at Gate 1	Option B.2 / B.5	Narrative	Assumptions
RYWR.KEY.00910	SRO Consolidation (MCDA-3no SROs become 1) (c.Oct 2021)	N/A	Q4 2021	New addition	
RYWR.KEY.01000	WRSE Outcome (Final Result Early 2022. Assume Mar 2022)	Q3 2022	Q1 2022	Amended following updates in the WRSE process	
RYWR.KEY.00060	Pilot PC Commissioning Complete	N/A	Q4 2025	New addition	WRP will run for at least 5 years in line with SW asset strategy
RYWR.KEY.00050	61 / 75 Ml/d WRP - READY FOR WET COMMISSIONING	N/A	Q2 2030	Delayed due to developed understanding of the critical path (including design and construction activities) and the key activities such as DCO process.	
RYWR.KEY.00040	61 / 75 Ml/d WRP - OPERATIONAL	N/A	Q4 2030		

Table 88 - DCO

Activity ID	Description	Date at Gate 1	Option B.2 / B.5	Narrative	Assumptions
RYWR.CON.08080	REQUEST for a SCOPING OPINION - SUBMITTED to PINS	Q3 2021	Q4 2021	The movement in the Scoping Opinion being submitted to PINS is directly related to the movement in the S35 date.	The Scoping Opinion cannot be submitted to PINS until the S35 direction has been given. The schedule logic has been amended so that the submission of the Scoping Opinion is driven by the S35 Direction. Significant preparatory work on the Scoping documentation being undertaken at risk prior to S35 direction to mitigate the movement as much as possible.
RYWR.CON.08120	SCOPING OPINION - ADOPTED by PINS	Q4 2021	Q1 2022	The movement in the Scoping Opinion being submitted to PINS is directly related to the movement in the S35 date.	
RYWR.CON.06090	DCO APPLICATION SUBMITTED	Q2 2023	Q4 2023	DCO Application submitted date movement is a result of earlier delays to the S35 Direction and the key decision to undertake a two-stage consultation process post Gate 2.	SW's approach to public consultation is proposing two further stages of consultation, including both a non-statutory and statutory consultation. Two additional stages of consultation will enable SW to adequately address the rigorous consultation requirements associated with the DCO consenting process, ensuring that interested and affected stakeholders are given meaningful opportunities to influence its proposals as they are developed. This mitigates the risk of non-acceptance of the DCO application due to the inadequacy of consultation.
RYWR.CON.06140	DCO ACCEPTED	Q1 2023	Q4 2023	The movement in all of these activity dates are	The statutory process, logic and stated durations have remained. The internal durations for development of design maturity post consultation phases and internal governance periods have undergone rigorous challenge both internally

Activity ID	Description	Date at Gate 1	Option B.2 / B.5	Narrative	Assumptions
				aligned with the above reasoning.	during deep dive session with Subject Matter Experts (SMEs) and externally via legal review.
RYWR.CON.06160	EXAMINATION STARTED	Q2 2023	Q2 2024		
RYWR.CON.06180	EXAMINATION ENDED	Q4 2023	Q4 2024		
RYWR.CON.06230	DECISION ISSUED	Q2 2024	Q2 2025		
RYWR.CON.06270	JUDICIAL REVIEW PERIOD COMPLETED	Q3 2024	Q2 2025		
RYWR.CON.00640	Non-Statutory Consultation Complete	Q1 2021	Q3 2022	Non-Statutory Consultation was undertaken in Q1 2021 as per the Gate 1 schedule. The date now presented in the Gate 2 schedule represents the key decision to undertake a two-stage consultation process post Gate 2. The date presented here is the additional non-statutory consultation.	
RYWR.CON.00540	Statutory Consultation Complete	Q3 2022	Q2 2023		

Table 89 - Procurement

Activity ID	Description	Date at Gate 1	Option B.2 / B.5	Narrative	Assumptions
RYWR.PRO.02150	ECI CONSULTANT START DATE	N/A	Q4 2021	These new additional activities are representative of the increased granularity within the schedule presented at Gate 2	SW has identified key areas where the programme would benefit from commissioning external parties to apply their expertise. This is the proposed timeline for the procurement of specialist support expertise.
RYWR.PRO.02570	DCO CONSENT CONSULTANT START DATE	N/A	Q4 2021		
RYWR.PRO.02570	DCO CONSULTATION CONSULTANT START DATE	N/A	Q4 2021		
RYWR.PRO.00100	DPC - ISSUE CONTRACT NOTICE (Ofwat E dependent)	N/A	Q3 2023		
RYWR.PRO.00120	DPC - TENDER COMMENCED	N/A	Q1 2024		
RYWR.PRO.00140	DPC - Inform Bidders of Tender Shortlist	N/A	Q2 2024	Due to the changes in the DCO consultation strategy and the Control Points detailed above, there is a subsequent impact on the dates associated with these activities.	
RYWR.PRO.00160	DPC - PREFERRED BIDDER NEGOTIATIONS	N/A	Q1 2025		Following market engagement with potential CAP participants a logic link has had to be incorporated into the schedule resulting in a SW and CAP financial close period of 60 days post DCO Judicial Review. This also ensures that any final consent conditions are known, can be assessed and the risk associated quantified and apportioned.
RYWR.PRO.00190	DPC - Contract Award (KEY)	N/A	Q3 2025		
RYWR.PRO.00220	DPC - CONSTRUCTION DESIGN COMMENCE (KEY)	N/A	Q4 2025		

Table 90 - Designs

Activity ID	Description	Date at Gate 1	Option B.2 / B.5	Narrative	Assumptions
RYWR.DGN.00830	(GIVE) - SUFFICIENT DESIGN COMPLETE for PRE-APPLICATION CONSULTATION	N/A	Q4 2022	SW has worked through the interfaces in detail and is now allowing additional design effort to support throughout the consenting and procurement phases of activity. Following the key decision to undertake a two-stage consultation process post Gate 2 there has been further	

Activity ID	Description	Date at Gate 1	Option B.2 / B.5	Narrative	Assumptions
				movement within this date.	
RYWR.DGN.00820	(GIVE) - DESIGNS INFORMATION COMPLETE for PROCUREMENT TENDER DOCUMENTATION	N/A	Q4 2022	This is a new key activity that has been included during the development of the schedule.	This activity has been linked to the Statutory Consultation process to mitigate the risks associated with having SRO information in the public domain that is not representative of what is being presented at Statutory Consultation and to limit the potential for change to the documentation during the tender process due to the incorporation of commentary from interested and affected stakeholders.

Table 91 - Surveys

Activity ID	Description	Date at Gate 1	Option B.2 / B.5	Narrative	Assumptions
RYWR.PRO.04080	INFRA SURVEYS & DESIGNS SUPPLIERS START DATE	N/A	Q1 2022	These new additional activities are representative of the increased granularity within the schedule presented at Gate 2.	
RYWR.SVY.01030	Ecological Surveys - THE START DATE	N/A	Q1 2022		
RYWR.SVY.00100	Infra Surveys & Designs Contractor START ON SITE FOR SURVEY	N/A	Q2 2022		

Table 92 - Post Contract Award – Option B.2

Activity ID	Description	Date at Gate 1	Option B.2	Narrative	Assumptions
5	EARLIEST START ON SITE	N/A	Q4 2025		Documentation utilised for construction schedule build: 629451-SW-WO-BF-BQ-Z-00001 629451-SW-WO-OT-BQ-Z-0001 629451-SW-WO-PC-BQ-Z-00001 Peel 629451-SW-WO-WR-BQ-Z-00001 629451-SW-WO-WR-BQ-Z-00002 629451-SW-WO-WR-BQ-Z-00003 629451-SW-WO-WR-BQ-Z-00004 629451-SW-WO-WR-BQ-Z-00005 629451-SW-WO-WR-BQ-Z-00006
WBS SUMMARY	BF to WRP - Construction Complete	N/A	Q2 2028		
WBS SUMMARY	EBL at Otterbourne - Construction Complete	N/A	Q2 2027		
WBS SUMMARY	WRP - Construction Complete	N/A	Q4 2028		
WBS SUMMARY	Conveyance Pipework WRP to EBL - Construction Complete	N/A	Q2 2030		

Activity ID	Description	Date at Gate 1	Option B.2	Narrative	Assumptions
WBS SUMMARY	BPT WRP and Otterbourne Pre-Disinfection Plant - Construction	N/A	Q4 2026	Additional information provided as per design development	629451-SW-WO-WR-BQ-Z-00007 629451-SW-WO-WR-BQ-Z-00008 629451-SW-WO-WR-DR-C-00121 629451-SW-WO-WR-DR-C-00131 SW - WG - W4L - Tunnels Programme 629451-SW-DS-ZZ-RP-W-00001 Commissioning Plan Water WRP 629451-SW-HO-HT-DR-C-05101 A4 HTPS Connection WfLH – INFRASTRUCTURE FOR PIPELINE ROUTES – Location Flexibility Raw data used for SW AMP7 programme algorithm has been used to inform durations for individual process units. Historical project experience has been used where comparable projects could not be identified in the algorithm raw data. The main terrestrial layout has been split up based on available space, utilising multiple work fronts where applicable. Expert supply chain has been used for discrete schedule area development such as the conveyance pipework and tunnelling and associated marine works. Planning planet durations have been used for civil and construction enabling works Pipeline assumed 50 m/ Per 7-day week/ Per Gang @ 5 Gangs
RYWR.KEY.00040	61 Ml/d WRP - OPERATIONAL	N/A	Q4 2030		

Table 93 - Post Contract Award – Option B.5

Activity ID	Description	Date at Gate 1	Option B.5	Narrative	Assumptions
5	EARLIEST START ON SITE	N/A	Q4 2025		Documentation utilised for construction schedule build: 629451-SW-WO-BF-BQ-Z-00001 629451-SW-WO-OT-BQ-Z-0001 629451-SW-WO-PC-BQ-Z-00001 Peel 629451-SW-WO-WR-BQ-Z-00001 629451-SW-WO-WR-BQ-Z-00002 629451-SW-WO-WR-BQ-Z-00003
WBS SUMMARY	BF to WRP - Construction Complete	N/A	Q2 2028		
WBS SUMMARY	EBL at Otterbourne - Construction Complete	N/A	Q2 2027		
WBS SUMMARY	PC Pump Station - Construction Complete	N/A	Q3 2027		

Activity ID	Description	Date at Gate 1	Option B.5	Narrative	Assumptions
WBS SUMMARY	WRP - Construction Complete	N/A	Q3 2028		629451-SW-WO-WR-BQ-Z-00004 629451-SW-WO-WR-BQ-Z-00005 629451-SW-WO-WR-BQ-Z-00006 629451-SW-WO-WR-BQ-Z-00007 629451-SW-WO-WR-BQ-Z-00008 629451-SW-WO-WR-DR-C-00121 629451-SW-WO-WR-DR-C-00131 SW - WG - W4L - Tunnels Programme 629451-SW-DS-ZZ-RP-W-00001 AWT Sizing_Gate 2_v0.92_75Ml/d Commissioning Plan_sth Water WRP 629451-SW-HO-HT-DR-C-05101 A4 HTPS Connection WfLH – INFRASTRUCTURE FOR PIPELINE ROUTES – Location Flexibility 629451-SW-WO-OT-DR-C-00103 629451-1_C_CORRES_ENV BUFFER LAKE PREFEAS 629451-SW-BF-WR-SH-M-00002 Raw data used for SW AMP7 programme algorithm has been used to inform durations for individual process units. Historical project experience has been used where comparable projects could not be identified in the algorithm raw data. The main terrestrial layout has been split up based on available space, utilising multiple work fronts where applicable. Expert supply chain has been used for discrete schedule area development such as the conveyance pipework and tunnelling and associated marine works. Planning planet durations have been used for civil and construction enabling works. Pipeline assumed 50 m/ Per 7-day week/ Per Gang @ 7 Gangs
WBS SUMMARY	Conveyance Pipework WRP to EBL - Construction Complete	N/A	Q2 2030		
WBS SUMMARY	Conveyance Pipework PC to WRP - Construction Complete	N/A	Q2 2030		
WBS SUMMARY	BPT WRP and Otterbourne Pre-Disinfection Plant - Construction	N/A	Q4 2026		
RYWR.KEY.00040	75 Ml/d WRP - OPERATIONAL	N/A	Q4 2030		

2.9.6. Gate 3 Schedule Development

Further schedule development work will take place between Gate 2 to Gate 3 as SW moves into the development of the Outline Business Case. SW will be further developing design, consenting and procurement activities to strengthen the underlying data.

SW will also be engaging extensively with stakeholders and the market as it moves into the next phase of activity. This will also shape its delivery plans and schedules as the project evolves.

2.10. Cost Modelling

2.10.1. Introduction to the Cost Chapter

Following on from the Gate 1 submission to RAPID in September 2020, SW has undertaken additional work analysing the feasibility and viability of multiple SRO options as part of the wider WfLH programme. This section focuses on the cost estimate based upon the current design and analysis completed to date, with water recycling options, Options B.2 and B.5 considered in this section.

The following estimates (cost and carbon) have been produced:

- CAPEX;
- Risk;
- OB;
- OPEX;
- Capital Carbon;
- Operational Carbon;
- NPV; and
- AIC.

A summary of the CAPEX for each of the water recycling Options (B.2 & B.5) is detailed in Table 94.

Table 94 - Gate 2 Solution Comparison and Gate 1 to Gate 2 Journey

Options		A1	A2	B.2	B.5	B.4	D.2	CeraMac
Gate 1	CAPEX (£m)	802	759	461	587	458	176	0
Gate 2	CAPEX (£m)	745	745	480	562	451	261	157
Gate 2	CAPEX Inc 50% CeraMac (£m)	745	745	559	641	530	340	

A CeraMac plant is required at Otterbourne WSW, which treats water from multiple sources prior to distribution to customers, in parallel to the delivery of either of the water recycling Options. At this stage, modelling has not been completed to confidently determine the ratio of source water being treated by the CeraMac plant, and i.e. inform where costs for funding this plant should be allocated to. As a result, cost for this has been expressed above at 50% of CAPEX as the assumed percentage of this proposed asset which will treat flows produced by these Options, with more detailed modelling to be completed post Gate 2, which will support a more detailed calculation in the allocation of CeraMac costs for each Option.

2.10.2. Key Solution Cost Information, Building on Gate 1 with Reduced Uncertainty in Costs and Benefits

The solutions considered for the strategic Option of Water Recycling are Options B.2 and B.5, as detailed in Section 2.2.

Option B.2 which includes a WRP at Site 72 is comprised of a connection to the FE channel at Budds Farm WTW with a tunnel constructed under Langstone harbour to the WRP at site 72. Flows are then passed onto Otterbourne WSW via a pipeline culminating in a 75Ml environmental buffer lake structure before entering the process flow at Otterbourne.

Option B.5 mirrors the B.2 infrastructure with an additional feed from the PC WTW located in Fareham.

Both Options have as part of the scope a CeraMac located at the Otterbourne site. As this asset will cater for more than just the flows produced by this project it has been isolated in terms of cost modelling. Thus, for both recycling Options the costs are shown as:

1. Solution without inclusion of CeraMac
2. CeraMac asset only

In moving from Gate 1 to Gate 2 exercises were undertaken to reduce uncertainty in both costs and benefits of the solutions being considered.

In order to achieve this for the Recycling Options, the following activities have been undertaken:

- Improved design definition for both the proposed works at BF and PC WTWs. This enabled estimates to be produced on a more granular process level rather than overall solution models;
- A more detailed design was produced by [redacted] and SW's Engineering Technical Services (ETS) team for both the tunnel connecting BF and the WRP at Site 72 along with the pipeline connecting PC and the WRP respectively;
- Four Options have been reviewed for the pipe routes between the proposed site 72 WRP and Otterbourne WSW each of which has been priced to understand the relative costs. Additional input was provided by SW's infrastructure delivery partner [redacted] in order to understand the practical constraints in terms of constructability and to ensure that these are represented both in the base cost and risks as necessary;
- The assessment of risk sums has been robustly undertaken in the form of costed risk registers for each individual Option rather than the SW risk percentage uplift utilised at Gate 1;
- OB has been calculated as per the ACWG guidance and applied for each individual Option rather than at the higher desalination and recycling levels utilised at Gate 1. For more detail on the OB process and values, refer to Section 2.10.7. Additional Project Costs (APC) have been revised based on inputs from SMEs such as the statutory undertakers Scottish & Southern Electricity, Land Managers Fisher German and Environmental Consultants Royal Haskoning. The following APC components have been revised:
  - Land - Independent cost benchmarking by [redacted]
  - Power - Desktop quotations provided by [redacted]
  - Pilot Project Costs - Reviewed and updated with project team
  - Planning - Reviewed and updated with project team
  - Public Consultation - Reviewed and updated with project team
  - Legal - Reviewed and updated with project team
  - Environment - Reviewed with SW environment team and [redacted]
- Construction costs have been collated using the CCS Candy Estimating platform to ensure a consistent approach with the supply chain. Infrastructure and tunnelling elements have been priced from first principles utilising current market data in conjunction with [redacted] respectively and linked back to the design information. Process and Desalination (a separate water sourcing solution type considered, refer to documents included as part of SW's Interim Update to RAPID, dated 27 September 2021) plant costs have been derived from a combination of SW and industry cost data and reviewed against market norms. As such the level of granularity of cost and scope has been improved from the information available at Gate 1, which was both at a lower level of granularity of design information and costed largely only using parametric models; and
- The reduction in uncertainty regarding the benefits associated with the project can be found in the overall submission document.

Overall costs of the solution, construction, and operation for each Option:

The overall CAPEX and OPEX, as well as NPV and AIC values over 108 years are detailed below in Table 95**Error! Reference source not found.** (to cost base 2017 / 18). The 108 year period was adopted in NPV and AIC calculations, as this is the longest expected component, or asset, lifespan within each of the options being considered at this stage. This does differ from the All Company Working Group (ACWG) guidance, but this risk was negated as at this stage this approach was applied across all Options considered. For the B.2 and B.5 Options, the CeraMac Plant costs have been removed.

Table 95 - Water Recycling CAPEX and OPEX Totals, NPV and AIC values (cost base 2017/18) - all costs excluding the CeraMac Plant

OPERATING REGIME	FLOW (Ml/d)	CAPEX (£M)	OPEX (£M/y)	NPV (£M)	AIC (p/m3)
			B.2		
MAX (DO)	61	480	10.6	741	144
MIN	15	480	5.2	616	120
AVERAGE	15.46	480	5.3	618	120
			B.5		
MAX (DO)	75	562	13.8	884	140
MIN	15	562	5.8	700	111
AVERAGE	15.6	562	5.9	703	111

The CAPEX, OPEX at max flow, NPV and AIC values for 108 years for the CeraMac Plant only are detailed in Table 96**Error! Reference source not found.**. The CeraMac is sized at 91 Ml/d which is the output needed for the required pre-disinfection at Otterbourne. The costs detailed in this table are for the whole 91 Ml/d plant. Alternatively, Table 94 details CAPEX at 50% which is the element of flow driven by this project to enable a comparison with the desalination options. The operating regime modelled is 75 Ml/d, which represents the process treating incoming flows from the WRPs / HT. While the CeraMac will also treat additional flows from the existing site up to 91 Ml/d, these are not considered here. Note only the operational maintenance costs have been included in the OPEX for the CeraMac plant as it is deemed that sufficient operations assets are available at Otterbourne to cater for the operating of the CeraMac plant.

Table 96 - Water Reuse CAPEX and OPEX Totals, NPV and AIC values (cost base 17/18) – CeraMac Plant only

OPERATING REGIME	FLOW (Ml/d)	CAPEX (£M)	OPEX (£M/y)	NPV (£M)	AIC (p/m3)
			CeraMac		
ALL REGIMES	75	157	1.1	215	34

The CAPEX, 60-year OPEX, 60-year NPV and cost/m3 values produced at Gate 1 are summarised in Table 97. **Error! Reference source not found.** Note the OPEX costs are not easily comparable against the new Gate 2 estimates for the following reasons:

- Approach for developing operational regime estimates were different between Gate 1 and Gate 2, most significantly the flow regime considered. Gate 1 attempted to model a flow regime that included a range of potential operating flows in varying years. In Gate 2 OPEX costs are reported for minimum and maximum (DO) flows, as well as an average as described above;
- For Gate 1, power and chemical use were estimated by the costing team. For Gate 2, the power and chemical consumption has been estimated and provided by SW's design team;
- Gate 1 OPEX values were reported as the total operating cost over 60 years. Gate 2 OPEX values are costs per year; and
- Gate 1 OPEX costs included OB. This is not included in Gate 2 OPEX estimates (see Section 2.10.7 for further information).

These differences in the approach to preparing OPEX estimates also hinder comparisons of the Gate 1 NPV and cost/m3 values with the new Gate 2 NPV and AIC estimates. Furthermore, the Gate 1 cost/m3 were derived by dividing the NPV by the total throughput expected over 60 years, without discounting of flows, whereas the Gate 2 AIC values divide the NPV value by the discounted whole life throughput.

Table 97 - Gate 1 CAPEX, OPEX and NPV

SOLUTION	DO (Ml/d)	CAPEX (£M)	60yr OPEX (£M)	60yr NPV (£M)	Cost /m3 (£/m3, 60year, WLC)
B.2	61	461	607	741	3.02
B.5	75	587	648	852	3.39

2.10.3. Detail of Capital Expenditure

The CAPEX breakdown for reuse recycling Options B.2 and B.5 (excluding the CeraMac plant) are illustrated in Figure 70 below. In order to understand the costs which will not be delivered through the DCO procurement path, the CeraMac plant at Otterbourne has been removed from the scope and highlighted as a standalone asset. The CeraMac plant CAPEX breakdown is illustrated in Figure 71.

[redacted]

Figure 70 - Option B.2 & B.5 Water Recycling CAPEX with CeraMac plant removed

[redacted]

Figure 71 - Option B.2 & B.5 Water Recycling CAPEX – CeraMac plant only. Please note 50% of CeraMac value will be required to deliver B.2 or B.5 through this delivery route (£78.5k). With the other 50% being funded from a separate funding stream

Summary of the process undertaken to prepare the CAPEX estimate:

The process undertaken to prepare the CAPEX estimates for the Water Recycling Options is as follows (please note that elements highlighted in Blue below forms an improved process from Gate 1):

- Appraisal of the Options by the estimating team with the design leads to obtain understanding of scope and known constraints. Discipline specific design and estimating leads appointed to enable the collaborative production of estimates covering the infrastructure, non-infrastructure and tunnelling specific elements of scope;
- Production by the design team of scope (CIT) documents aligned to SW's process drivers, to enable the scope to be represented as a CBS in order to be priced;
- Third party support procured to collaboratively review constructability of key scope [redacted] (Tunnelling) and [redacted] (Pipeline routes);
- Estimating of Direct Costs for each Option from a combination of SW and Industry data supported by first principles estimating of the pipeline and tunnels elements;
- Estimates combined into comprehensive priced schedule of works in CCS Candy;
- Estimates reviewed by design leads to ensure that the scope had been correctly interpreted;
- Risk Registers collaboratively populated and costed with relevant SMEs;
- Contractor indirect cost allowances calculated from SW's percentage uplifts (SMART targets) to align with PR19 allowances;
- Additional project costs reviewed with SMEs with external assistance from [redacted]
- Costs are based upon the same land take considered at Gate 1;
- Client costs calculated from SW's percentage uplifts (SMART targets) to align with PR19 allowances;
- OB calculation collaboratively populated with relevant SMEs in accordance with the ACWG 3 stage approach;
- Costs tested collectively to mitigate against gaps in known data or double counting between base cost, risk, and OB;
- In order for the estimates to align to the PR19 submission to Ofwat all costs have been indexed. Currently all costs are indexed to average 2017 / 18 in line with the approach taken at Gate 1;
- The price base is the average of 12 months of index, with a mid-point of End September. The factors for each year are April – March averages. Ofwat changed the basis of indexation in April 2020 to Consumer Prices Index Including Owner Occupiers' Housing Costs (CPIH). Hence, the index up to and including March 2020 is based on monthly outturn Retail Price Index (RPI), converted to April to March annual averages, changing to CPIH in April 2020, using actuals until they run out then a forecast from a recognised source (OBR). This provides an indexation from current Q2'2021 back to 2017/18 of –8.084%; and
- CAPEX costs and estimate structure provided to align with the production of OPEX, Carbon, NPV and AIC summaries for each Option.

2.10.4. Details of Operating Expenditure

The process undertaken to prepare the OPEX estimates for the water recycling Options (B.2 and B.5) is as follows:

- OPEX estimates for each Option have been prepared, divided into fixed OPEX and variable OPEX to align with WRSE requirements;
- Fixed OPEX is made up of operational maintenance (calculated as a percentage of CAPEX) and staffing costs, whereas variable OPEX is made up of abstraction charges, transmission and network pumping costs, electricity and consumables used in treatment;
- Two operating regimes were used for deriving variable OPEX for each Option (as detailed in Table 98). These operating regimes are consistent with those detailed in Section 2.2, Engineering Technical Design and are as follows:
    - The minimum operating scenario is the lowest flow the Option can operate at and is the usual base case
    - The maximum operating scenario is the flow the Option can deliver 1-in-200-year drought event (DO)
    - A third regime, Average operating scenario, was derived from the minimum and maximum assuming the maximum occurs for 1 year in 100 years and the minimum flows occur for the remaining years

Table 98 - Min, Average, Max Flows for Options B.2 & B.5

Option	Min flow (Ml/d)	Max flow (Ml/d)	Average Flow (Ml/d)
B.2	15	61	15.46
B.5	15	75	15.60

- Staff costs for treatment plants and transfer infrastructure have been based on staffing level assumptions and hourly unit costs provided by SW;
- Chemical costs have been derived using chemical volumes supplied by SW design engineers for the WRP for 15 Ml/d, 61 Ml/d and 75 Ml/d operating regimes. Unit costs for chemicals were taken from SW's OPEX tool where available or from industry data;
- Power demand estimates for the infrastructure and non-infrastructure schemes were provided by SW design teams and converted to annual power consumption;
- Operational transport costs were estimated for staff undertaking operations and maintenance activities. These estimates included vehicle leasing and fuel use and were based on unit rates provided by SW;
- The transport and disposal costs for WTW waste (grit, screenings, and sludge) have been derived using unit rates provided by SW and estimated waste quantities;
- Annual operational maintenance costs have been estimated based on a percentage of the initial capital costs at the Option level. These percentages are based on common assumptions used in the water sector for such infrastructure. Civil maintenance was calculated as 0.5% of the Infra and non-infrastructure civil costs whilst Mechanical and Electrical (M&E) maintenance was calculated as 2.5% of Infra and non-infrastructure M&E costs which aligns to the approach taken within the WRMP24 exercise; and
- The variable OPEX cost per ML was derived by dividing the total variable OPEX by the flow estimated for that Option.

The methodology used to prepare the Capital Maintenance estimates for the recycling Options is as follows:

- CAPEX estimates have been split by asset type and each asset type has been assigned an asset life from 4 to 100 years (based on the proposed standard asset life classes for water resource planning presented in the ACWG cost consistency guidance). This allocation has then been used to allocate future capital maintenance / renewal costs for each asset type over the 100-year operation duration used in the NPV and AIC analysis. Capital maintenance / renewals cycles have been taken as starting in year 9 (first operating year).

No additional risk or OB has been added to the OPEX for Gate 2. The key risk factors affecting potential OPEX costs were identified as being significant changes in unit costs of OPEX consumables such as power and chemicals, or if the scheme needs to run more regularly than currently anticipated. At this point there was not considered the need to apply potential real terms cost inflation for unit rates as this was not seen as a significant risk that could be modelled. To account for the potential for more regular operating requirement a range between the minimum and maximum operating cost has been provided as well as the estimated average operational costs, which accounts for the most likely operating costs.

2.10.5. Net Present Value (NPV) and Average Incremental Cost (AIC)

The Gate 2 NPV and AIC values are presented in Table 98 above.

The approach to calculating the NPV and AIC values has followed the process from the ACWG to ensure consistency in the calculation of NPVs and AICs across all SROs. The ACWG Cost Consistency report reviewed approaches to calculation of financing costs and recommended a consistent approach which is summarised in Section 6.3 of the Cost Consistency report.

NPV estimates have been calculated over a 108-year period[17], comprising 8 years for development and construction followed by 100 years of operation. The 100-year operation duration has been selected as this is the life of the longest lasting asset proposed in any Option (the transfer pipelines, which occur in all Options) in accordance with latest HM Treasury Green Book recommendations. CAPEX (including maintenance and replacement costs) and OPEX forecasts (both fixed and variable costs) have been profiled over the 108-year analysis period. The Option Financing costs have then been calculated as a stream of annual costs over the life of the Option, using an assumed 2.92% Weighted Average Cost of Capital (WACC), as recommended by ACWG. The NPV of all costs has then been calculated using the Treasury Test Discount rate as set out in the HM Treasury Green Book (Appraisal and Evaluation in Central Government, HM Treasury 2018). This is 3.5% for years 0-30 of the appraisal period, 3.0% for years 31-75, and 2.5% for years 76-125.

AIC values have been estimated based on DO. Three denominators are used – minimum utilisation, maximum utilisation, and average utilisation (assuming 99 years of minimum utilisation and 1 year of maximum utilisation). In all cases the denominator (discounted DO over the life of the scheme) is the same - i.e., it is a unit cost for making available a capacity. In each case the flows are discounted over the life of the scheme using the Green Book discount rates.

2.10.6. Carbon Analysis

The process undertaken to prepare the Capital Carbon emissions estimates for the water recycling Options is as follows:

- The capital carbon assessment was based on scoping information from the CIT costing sheets;
- Analogous to cost models, the capital carbon models are based on curves created from data points, relating a driver defining the size of the asset to its carbon emissions. The carbon models are not based on the same underlying information as the cost models, and not all cost models have a directly corresponding carbon model. The size drivers also do not always match. Cost models were mapped to carbon models as closely as possible, with standardised assumptions made where drivers needed converting between units or different estimates of the asset size were required; and
- Where costs were developed using a bottom-up approach or based on quotes from suppliers rather than cost models, a general approach to account for additional capital carbon was applied based on the relative proportion of the total cost. For example, if 90% of the total cost was based on cost models and 10% was bottom up, the total capital carbon was scaled up accordingly to account for

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[17] Note that the ACWG guidance recommends a total 80year NPV period.

the additional assets. This approach was taken due to the wide range of assets which had been costed without reference to standard cost models and was a time-effective estimate of the carbon associated with these assets.

The process undertaken to prepare the Operational Carbon emissions estimates for the recycling Options is as follows:

- Quantities for power use, chemical use and transport were taken from the operational cost; estimates, with power and chemical use estimates provided by the SW design team
- Power:
  - Emissions factors for grid electricity taken from BEIS Green Book projections and take into account projected grid decarbonization from 2029 to 2100, with the emissions factor assumed to be constant after 2100
  - BEIS Green Book values always appear to lag 2 years behind the Defra reported value in each year. Therefore, the values used for 2030 correspond to the 2028 value in the Green Book etc.
- Chemicals:
  - Where available, emissions factors were taken from the Carbon Accounting Workbook (CAW). Chemical quantities were taken from the OPEX calculations, converted into the amount of pure chemical used.
  - Where not accessible from the CAW, an emissions factor for CO2e was found from an alternative source. Note that no reasonable emissions factor could be located for anti-scalant, and therefore this was assumed to have the same emissions factor to orthophosphoric acid.
- Transport:
  - Emissions factors were taken from the CAW, which provides tCO2e / km travelled
  - Assumes operational journeys completed by van, large HGVs (>33 t) used for sludge trucking and smaller HGVs (3.5-3.3 t) for screening and grit transportation
- Operational maintenance:
  - Carbon emissions associated with operational maintenance were assumed to be negligible and primarily associated with labour rather than significant additional materials use

The whole life carbon estimates comprise the capital carbon emissions, annual operational emissions and additional emissions associated with capital maintenance. The estimated annual carbon emissions profile was based on the WLC profile developed for the NPV and AIC cost calculations.

- Years 1-4: planning
  - Assumed no carbon emissions associated with planning phase
- Years 5-8: construction
  - Assumes all capital carbon emissions occur in years 4-8 in proportion to the following CAPEX breakdown:
    - Year 5: Proportional to 25% of planning costs and 20% remaining CAPEX costs
    - Year 6: Proportional to 25% of planning costs and 35% remaining CAPEX costs
    - Year 7: Proportional to 25% of planning costs and 35% remaining CAPEX costs
    - Year 8: Proportional to 25% of planning costs and 10% remaining CAPEX costs
- Years 9-108: operation & capital maintenance
  - Capital maintenance emissions were assumed proportional to capital maintenance costs, e.g., if capital maintenance costs in year 13 are 1% total CAPEX, the capital maintenance carbon emissions in year 13 were estimated as 1% of total capital carbon emissions.
  - Annual operational carbon emissions were included and calculated as above. As grid decarbonisation projections are included in the analysis, year 1 is assumed to be 2021 and the first operational year is assumed to be 2029.

The monetised cost of carbon was also calculated using the traded and non-traded carbon price forecasts from the Green Book Supplementary Guidance: Valuation of energy use and GHG emissions for appraisal

(Table 3, Carbon prices and sensitivities 2010-2100 for appraisal, 2018 £/tCO2, central price). The traded carbon price was applied to power related emissions only, with the non-traded carbon price applied to all other emissions.

The current estimate of emissions provides a view of how much the Options would add to SW's existing emissions once commissioned. Under SW's net zero operational emissions by 2030 commitment these operational emissions will need to be reduced and potentially offset by 2030. The potential costs of offsets have not been included as this would be considered as part of SW's overall net zero and offsetting strategy.

Table 99 summarises the capital carbon, operational carbon (associated with chemical use, power and transport), whole life carbon (includes capital maintenance in addition to operational carbon over 100 years) and the non-discounted monetised cost of carbon.

Table 99 - Capital, operational and whole life carbon estimates and monetised cost of carbon (2018 £/tCO2)

OPERATING REGIME	FLOW (Ml/d)	CAPITAL CARBON (tCO2e)	OPERATIONAL CARBON (tCO2e)	WHOLE LIFE CARBON (tCO2e)	MONETISED WHOLE LIFE CARBON (£M)
			B.2		
MAX (DO)	61	68,000	11,200	872,000	230
MIN	15	68,000	3,400	357,000	87
AVERAGE	15.46	68,000	3,500	362,000	89
			B.5		
MAX (DO)	75	83,000	14,700	1,089,000	286
MIN	15	83,000	3,800	391,000	94
AVERAGE	15.6	83,000	3,900	398,000	96
			CeraMac		
ALL REGIMES	75	41,000	0	134,000	32

2.10.7. Estimating Uncertainty, Risk and Optimism Bias

Following the development of the base cost (direct costs) using the priced bill of quantities underpinned by the CIT sheets (quantified schedules of works) received from the relevant Design Teams, consideration must still be given to the remaining uncertainty contained within both the pricing assumptions (e.g., assumed unit rates) and the design assumptions (e.g., assumed ground conditions).

In order to do this, any significant assumptions made during the design and estimating process are interrogated in formal risk workshops to understand the level of variance that remains within these assumptions. Discussion of the assumptions between the design team, estimating team and risk team within the workshop enables each assumption to be assigned, as appropriate, to one of estimating uncertainty, risk or OB and ensures that all of these three elements of the estimate are fully integrated and considered in accordance with each other to avoid either cost duplication or cost gaps.

For clarity, and to prevent this cost duplication throughout the cost estimating process, the three elements are defined as follows:

- Estimating Uncertainty: Percentage ranges around the component costs and productivity rates of the defined scope to account for variance inherent in the input values;
- Risk: Discrete and specific events that have the potential to impact (positive or negative) on the successful achievement of the defined and agreed scope; and
- OB: A percentage uplift applied to those elements of the Project Delivery that are not sufficiently defined or understood to enable an agreed scope to be defined and therefore discrete, specific risks

to be applied. This approach is ensured through the adjustment of the Optimism Bias percentage utilising the information contained within the quantified risk register.

Estimating Uncertainty

Through these integrated discussions, those items where it is appropriate for estimating uncertainty to be applied are identified. Subsequently, on completion of the base cost for each Option estimate, Level 1 costs are generated through a summarisation of the individual costs within the Bill of Quantities. Uncertainty ranges are then applied to these Level 1 costs (summarised major headings from the Bill of Quantities). The ranges are applied in the form of percentages, with each Level 1 summary cost having a negative (e.g., -10%) and a positive (e.g., +20%) percentage applied. These specific uncertainty range percentages were selected based upon the estimating teams' level of confidence in likely level of change to component cost and productivity for the specific Option scopes with the final range reflecting the remaining level of uncertainty associated with the respective element. These estimating uncertainty values are then applied to the BASE cost for each Option to provide a Net Direct Cost. As stated above, where potential variance in an assumption is agreed to be expressed using estimating uncertainty, these specific assumptions are no longer considered as part of the subsequent risk or optimism bias assessments to prevent duplication.

Risk

Through the integrated discussions, those items that are considered specific risks (threat or opportunity) to the agreed design, and therefore scope, are captured on a quantified risk register and their current probability of occurrence and range of cost impacts are estimated and agreed. This process is undertaken for both the infrastructure elements and the non-infrastructure elements of each Option. This ensures that a comprehensive list of discrete risks is identified and allows a fully quantified risk register to be developed for each Option based on the assumptions made during the design process.

In order to estimate the probability for each risk, the probability is assessed in a quantitative manner on a scale of 1% to 99% using group consensus during the facilitated cost risk workshop, with final approval granted by the Project Manager. This approach is in accordance with the wider Risk Management Process as contained within the SW Risk Management Handbook and is explained in more detail in Section 2.7.

When estimating the range of cost impacts for each identified risk, Minimum, Most Likely and Maximum cost impacts are considered. However, it should be noted that given the level of uncertainty that remains within the Options, the starting point for each range of cost impacts was to populate only the Minimum and the Maximum costs. Only in the event that the integrated discussions agreed that a Most Likely cost could be identified (i.e., SW has sufficient knowledge to specifically suggest a Most Likely cost), enabled a Most Likely cost to be included within the Range of cost impacts. Similar to the probability, these values are estimated using group consensus during a facilitated workshop, with final approval granted by the Project Manager. All costs are aligned with those values used in the base cost build up.

The risk cost impacts captured initially within the risk register are direct costs only. However, within the cost risk model input sheet, indirect uplifts have then been applied to the individual cost impacts to reflect the application of indirect cost percentages to ensure that the modelled risk value presented within the estimate is aligned to all the other capital costs, which themselves have been uplifted by indirect costs. Following the estimation of the probability and the range of cost impacts for each risk item, and the application of the indirect cost uplifts, the cost risk inputs have been modelled using Monte Carlo simulation within the @Risk software in accordance with the ACWG methodology. This has enabled a range of risk output values to be calculated, with the P50 value being selected for inclusion within the cost estimate.

The above risk approach has been applied across all of the Options, except in the event that the integrated discussions agreed that the level of design maturity for a particular element did not support the use of a quantified risk register. For the Water Recycling Options, these elements include the BPTs and High Lift

Pumps (Option B.2 and B.5). Under these circumstances, the risk approach for these specific elements relied on a percentage uplift approach rather than a list of specific, discrete quantified risks. However, the values resulting from this percentage uplift were still incorporated within the cost risk model and therefore the total risk value for each relevant Option.

The P50 risk values for Options B.2, B.5 and the CeraMac Plant are detailed in the Table 100 below, along with the risk percentage when compared to the base cost. In addition, the Gate 1 Base Cost and Risk Values are included for comparison where available.

Table 100 - Risk Values at Gate 1 (Q3 2020 values) versus Gate 2 (Q2 2021 values)

Option	Gate 1 Base Cost	Gate 1 Risk Value*	Gate 1 Risk Percentage*	Gate 2 Base Cost	Gate 2 P50 Risk Value	Gate 2 Risk Percentage
B.2	£233 m	£150 m	64%	£304 m	£131 m	43%
B.5	£343 m	£174 m	51%	£352 m	£160 m	45%
CeraMac	-	-	-	£109 m	£30.9 m	28%

*At Gate 1, the risk value was applied against the net direct cost portion of the Gate 1 Base Cost only. However, to enable direct comparison of value with Gate 2, the Gate 1 risk value has been uplifted with indirect costs.

Table 100 therefore details that since Gate 1, the risk percentages and values associated with the cost risks for both Option B.2 and Option B.5 have decreased, as the quantified risk process has superseded the use of percentage uplifts. This shift to a quantified risk approach, resulting from a maturing design, has enabled a more realistic view of the cost risk profile at Gate 2 and in this instance has resulted in a decreasing risk profile as more information is obtained through the design process.

Within Option B.2, whilst the risk value of £131 may still appear high when assessed against the value of the base cost (43% of the base cost) and obviously shows an increase compared to Gate 1, there are a number of key driving risks that have now been identified, that are driving this elevated cost, specifically the potential for changing the design from a micro tunnel to segmental tunnel within a section of the pipe route (£30 m) and material volatility (£25 m) which comprise 42% of the overall risk value. This is consistent for Option B.5 also, as shown in the text below. In order to further reduce the risk value throughout the next stages of the Project Lifecycle, focus will be on information gathering and mitigation in order to manage these risks to an acceptable level. These and other key cost risk drivers impacting on Option B.2 are as follows:

- Change of construction technique from micro tunnel to segmental tunnel;
- Material volatility;
- Mitigation of Nitrogen levels within the discharge;
- Schedule delay; and
- Amendments to launch and reception pits to mitigate environmental constraints.

Similarly, within Option B.5, the risk value of £160 m is driven by a number of significant cost risks associated changing the assumed construction methodology from open cut / micro tunnel to micro tunnel / segmental tunnel, which have significant cost impacts when compared to the base cost. The total value of these risks is c.£47 m which accounts for approximately 30% of the risk value. The risk around material volatility also exists (£26 m). These two items therefore make up c.£73 m of the £160 m risk value (45%) and would not have been captured as part of the percentage uplifts at Gate 1, hence the increase in risk value. As for Option B.2, focus will be on managing these risk items to an acceptable level as the design advances. These and other key cost risk drivers impacting on Option B.5 are listed below:

- Change of construction technique from micro tunnel to segmental tunnel;
- Material volatility;

- Change of construction technique from micro tunnel to segmental tunnel (Highways England);
- Mitigation of Nitrogen levels within the discharge; and
- Schedule delay.

Optimism Bias

In order to undertake the OB process, the guidance contained within the HM Treasury Green Book Supplementary Guidance: Optimism Bias has been followed, ensuring that any updated guidance from the ACWG has also been incorporated (see Section 2.10.1.8). This ensured that the appropriate Project Type was applied when commencing the OB assessment and that the appropriate adjustments are made to the OB percentages throughout the assessment.

OB has been applied once to each Option, rather than being applied at a more granular level within each Option. In order to determine the level of OB to be applied to each Option, the Project Type relating to each Option is first confirmed (Stage 1). Throughout all Options, the Project Type has been selected as Non-Standard Civil Engineering, in accordance with the guidance contained within the ACWG technical note. In relation to Option B.2 and B.5, 100% Non-Standard was selected owing to a combination of the WRP being categorised as Non-Standard and the transfer route, whilst initially being selected as Standard, being adjusted to Non-Standard owing to its length, diameter, and particular spatial constraints. This provided a Combined Upper Bound OB percentage as detailed in **Error! Reference source not found.**.

Following the agreement of the Project Type split, each statement within the OB template is assessed for confidence (Stage 2). The templates used at Gate 1 were updated to ensure alignment with the ACWG guidance and then utilised as the starting point for the Gate 2 assessment, with the previous confidence levels assessed to understand whether there had been an improvement as more information has been made available, or whether there has in fact been a reduction in confidence as previous clarity has diminished. This provided an Adjusted OB percentage, again as detailed in Table 101**Error! Reference source not found.**.

Prior to this Adjusted OB percentage being applied to the Base Estimate (excluding risk), Stage 3 of the OB assessment was undertaken. This involved mapping the specific risk items from the cost risk model, where appropriate, to the relevant contributory factors within the OB template. Once completed, the confidence level associated with the contributory factor was further assessed in order that the quantified risk inputs were taken into account and to prevent duplication of costs. This generated a Risk Adjusted OB percentage and this percentage value was then applied to the estimate, excluding the previously calculated total risk value, in order to provide an overall Option Project Cost, subject to Association for the Advancement of Cost Engineering (AACE) range and Indexation adjustments.

Table 101 - Optimism Bias at Gate 1 (Q3 2020 values) versus Gate 2 (Q2 2021 values)

Option	Gate 1 OB Percentage	Gate 1 OB Value	Gate 2 Combined Upper Bound OB Percentage (Stage 1)	Gate 2 Adjusted OB Percentage (Stage 2)	Gate 2 Risk Adjusted OB Percentage (Stage 3)	Gate 2 Risk Adjusted OB Value
B.2	39.8%	£127 m	66%	39.7%	28.6%	£87 m
B.5	39.8%	£127 m	66%	39.2%	28.1%	£99 m
CeraMac	-	-	66%	44.7%	28.9%	£32 m

Similar to the risk value and percentage, the OB percentage and value have reduced from the position at Gate 1. This is owing to a shift of value from OB into the quantified risk register, as well as increasing levels of information improving confidence in delivery.

Whilst the Green Book recommends applying OB to operating costs and benefits as well as to CAPEX, the Supplementary Green Book Guidance does not provide recommended upper and lower bound adjustment factors for OPEX as there was insufficient data to do so. In the absence of other data to inform what the OB adjustments for OPEX should be the Supplementary Green Book Guidance recommends using sensitivity analysis to test the materiality of OPEX assumptions for investment decisions. Hence, the OPEX values presented in this report do not include OB.

2.10.8. Assumptions and Exclusions

2.10.8.1. Classification of Estimates

Please note that as the design which underpins this estimate remains at an early level of maturity, the estimate is deemed to be of AACE Class 4 accuracy (+30% / -5%). There is a risk that design development may identify alternatives solutions and or methodologies which may have significant cost impact both positively and negatively. As such the current accuracy envelope can only cater for fluctuations in cost of the current solution. Any changes to estimated solutions would require a reassessment of the estimate and confidence level.

2.10.8.2. Bases of Estimates

- Material prices are based on current 2021 market rates adjusted to PR19 17/18 utilising RPI data and CPIH data and while current price volitivity is included within risk allowances no allowance has been made for future fluctuations in supply costs;
- All costs are exclusive of Value Added Tax; and
- The OB percentage used for the CeraMac Plant only estimate is based on the responses provided for the Non-Standard Civil Engineering element of the B.2 Option OB assessment, with the Non-Standard Civil Engineering element adjusted to 100% (i.e. 0% Standard Civil Engineering).

2.10.8.3. Construction General

- An allowance has been included for piling, specifically for all the proposed buildings and selected process plant base slabs;
- Where ground conditions are as yet unknown, an additional allowance for piling to other structures has been incorporated into the Risk values;
- No allowance has been made for any ground stabilisation works;
- No allowance has been made for meeting any planning or environmental costs unless advised within the estimate and risk / OB sums;
- No allowance has been made for dealing with any impact that the proposed works may have on any existing or proposed assets plant or foundations;
- The SW provided costs such as the allowances for land purchase, DNO, Public Consultations etc are taken at face value and included within the relevant estimates;
- No allowance has been made for environmental mitigations for invasive or protected species of fauna and flora unless stated within the estimate and risk / OB sums;
- No information is available as to the current ground conditions of the proposed plant;
- Process plant and pipework sizing has not yet been finalised. Allowance has been made within the risk register for limited fluctuations in sizing;
- Quantum for Bulk Earthworks Allowances for dealing with Cut / Fill / Disposal have been provided by the designers and adopted by estimating. It would be beneficial for a detailed review to be undertaken in the next phase;

- CeraMac Plant at Otterbourne – the cost for this asset are now identified separately as outside the scope of the DCO mechanism;
- All works are assumed to be carried out during normal day time working hours;
- It is assumed that the working area is not impacted in any way by hazardous working conditions with the exception of the marine works;
- It is assumed that there are no restrictions to access;
- For any materials which may be sourced from abroad, no allowance has been made for any fluctuation to these rates for exchange rate or tariff obligations;
- No additional allowance has been made for any restrictions placed on the works due to adverse weather conditions other than the factors included within the risk register for prolongation as a result of bad weather;
- As the projects are currently at concept stage no quantities have yet been finalised thus all quantities assumed in the preparation of costs are indicative;
- No allowance has been made for 3rd party works such as utility upgrades or diversions & connections unless specifically stated otherwise; and
- Specialist Dewatering is excluded from the base cost. An allowance has been included within the risk values.

2.10.8.4. Open Cut Pipework

- Standard working hours are assumed as 50 hr week (apart from critical TM phases and continuous micro tunnelling);
- All crossings assumed to be 1200 diameter sleeve installed by Micro tunnel;
- All crossings assumed to be single pipe;
- All crossings assumed to have 9 m diameter launch shafts x 9 m deep to formation;
- All crossings assumed to have 4.5 m diameter reception shafts x 9 m deep to formation - All shafts to be backfilled with imported aggregate;
- 150 mm bed and haunch in fields 30% of arisings to tip replaced with imported granular material;
- Spreading surplus spoil across the easement within fields;
- 150 mm bed in roads 100% of arisings to tip replaced with imported granular material;
- 25 m easement in fields;
- Stock fencing both sides of easement Livestock crossing point every 300 m Footpath crossing every 500 m;
- Land drain crossing in fields every 20 m Clay stank in fields every 25 m;
- Allowance has been made for a bend every 167 m of route; and
- No thrust blocks required - use of anchor gaskets assumed.

2.10.8.5. OPEX assumptions

Cost of water

Cost of water is based on abstraction costs from the EA. Cost assumed to be £19.23 / ML for ground water abstraction, with factors applied to get costs for other water sources. Desalination schemes assume tidal abstraction, applying a factor of 0.2 (£3.85 / ML) and it’s assumed this is reasonable for water recycling as water from treatment works and it’s assumed this is reasonable for water recycling as water from treatment works is diverted from the treatment works to the WRP rather than discharged into the local water course, thus changing the existing flow regime and potential causing environmental impact, which has an associated cost. An allowance for EA charges has been applied at this time until the status of the effluent has been determined.

Staff costs

- WRP assumed to require 6 operators and 2 managers, 8hr / day, 365 days a year;

- Transfer infrastructure assumed to require 1 operator, 8hr / day, 365 days a year; and
- Hourly rate for operator assumed £22.10 / hr, Manager £34.00 / hr, costs from SW OPEX calculating tool.

Chemical costs

- Chemical volumes supplied by SW design engineers for desalination and WRPs, for 15 Ml/d, 61 Ml/d and 75 Ml/d operating regimes;
- Assumed that a smaller 15 Ml/d WRP would require the same chemical use as the 75 Ml/d plant operating at 15 Ml/d; and
- Costs for chemicals taken from SW OPEX tool where available and provided by Mott MacDonald where unavailable. Where chemical costs were only available for concentrations other than those specified, the price was pro-rated accordingly.

Power

- An 'all in' average electricity price of 12 p/kWh has been used (from the SW OPEX tool)

Operational transport costs

- Includes costs of van rental and fuel use for operational maintenance;
- For staff transport a trip of 15 miles to site and back each day per Full Time Equivalent (FTE) has been assumed;
- Costs of petrol were taken as 25 p per mile;
- An estimate of £1500 a year per van has been used after discussion with SW;
- The transport and disposal costs of WTW waste have been provided by SW;
- The waste disposal volumes have been estimated as 0.025% of the flow as sludge, and 0.005% as grit and screenings; and
- Includes transport and treatment of sludge produced on site assumes £5 / m3 of sludge for transport, and £140 / tonne of sludge treated.

Operational maintenance

- Civil maintenance cost per year is calculated as 0.5% of the Infra and non-infrastructure civil costs; and
- M&E maintenance cost per year is calculated as 2.5% of Infra and non-infrastructure-M&E costs which aligns to the approach taken within the WRMP24 exercise.

NPV and AIC calculations assumptions

- The WACC has been taken as 2.92% in accordance with ACWG guidance. Discount rates are as per the HM Treasury Green Book;
- Planning costs are split 25:25:25:25 for the first 4 years, and construction costs are split 20:35:35:10 over years 5-8;
- 50% of client indirect costs are treated as planning and development costs whilst the remaining client indirect costs are considered construction costs;
- Total direct costs are attributed to a range of asset categories which dictate the capital maintenance regime and WLC. The remaining capital costs (contractor indirect costs and 50% of client indirect costs) are split equally across the asset categories; and
- Capital Maintenance lifecycles - The capital maintenance cycles used in the NPV calculations are as follows as per ACWG guidance and are relative to year 9 (first operating year).

2.10.8.6. Confirmation that Solution Costs are in Line with Relevant Methodologies Agreed with Regulators and Relevant Green Book Guidance

- The estimates have been prepared in line with relevant guidance requirements and methodologies;

- The approach to calculating the NPV and AIC values has followed process from the ACWG to ensure consistency in the calculation of NPVs and AICs across all SROs. This includes process aligned with HM Treasury Green Book. The calculation covers a period of 108 years rather than 80 years as detailed above;
- OB –The OB assessment approach was aligned to the HM Treasury Green Book Supplementary Guidance: Optimism Bias and the latest guidance from the ACWG to enable consistency of OB assessments across all SROs Therefore, whilst the OB assessment process undertaken at Gate 1 was initially used, the recent process has ensured that all subsequent guidance has been appropriately incorporated prior to the values being submitted as part of the Gate 2 submission; and
- Estimates have been developed in line with WRSE guidance where appropriate.

2.10.9. Summary and Next Steps

In Summary the Gate 2 cost and carbon estimates have benefited from an enhanced detailed level of design input than was available at Gate 1. The key elements to review for the next stage gate (Gate 3) from a cost perspective is:

- Undertake further investigations to finalise details of the water recycling connections at BF and PC;
- Obtain further clarity on planning conditions and site investigation analysis at the proposed WRP facility at Site 72;
- Undertake further analysis of the pipe routes from PC WTW and to Otterbourne WSW respectively
- Work to mitigate and manage key risks
- Undertake detailed market engagement to obtain further surety on key cost and time elements
- Produced detailed construction schedule to enable mapping Quantitative Schedule Risk Analysis (QSRA) threats and opportunities;
- Review contract strategy to enable improved market confidence in terms of delivery;
- Fully understand key regulatory objectives and requirements from national statutory bodies such as the EA;
- Undertake further engagement with relevant stakeholders; and
- The [redacted] asset at Otterbourne WSW has been ringfenced as being delivered outside the DPC route. A workshop is required to identify any additional elements which may be delivered outside of DPC.

This will enable a marked improvement in cost confidence and a step change in project maturity resulting in a higher level of confidence for business planning.

2.11. Procurement, Ownership and Operation

2.11.1. Commercial and Procurement Strategy

2.11.1.1. Introduction and Context

SW has developed a procurement strategy to support the delivery of the Water Recycling (B.5) solution. This strategy reflects the conceptual design, the current cost profile, the relevant risks and required schedule for delivery. This section sets out the procurement strategy[18] along with an assessment of the solution's suitability for delivery through the DPC model. This section addresses the requirements of RAPID Gate 2[19], as well as considers the requirements of CP B within the DPC process[20]. This section includes:

- A summary of the scope of the DPC-delivered project and the CAP agreement to be tendered;
- The framework for the DPC eligibility assessment, a summary of the results and a conclusion as to the suggested delivery route for the solution;
- Details of the procurement plan, including a procurement and contract timetable;
- An explanation as to the level of design maturity and technical readiness that SW intends to reach by the point of Contract Notice;
- Confirmation of the preferred tender and commercial models;
- Evidence of internal approval for the procurement approach; and
- An outline of the anticipated contractual arrangements with the CAP, and a summary of key activities to develop the key commercial terms as the programme develops.

The key conclusions of SW's procurement strategy detailed in this section are summarised below. The development of the procurement approach has been subject to SW's internal programme governance process, and the conclusions have been reviewed by SW's external technical and legal advisers.

- The eligibility assessment carried out based on Ofwat's guidance and utilising the information available about the solution at this time indicates that the solution[21] is considered somewhat suitable for delivery under a DPC model. This assessment also depends on:
  - RAPID's guidance and principle that solutions are assumed to be suitable for DPC unless clearly demonstrated otherwise[22]
  - A VfM analysis based on Ofwat's standard assumptions and not reflective of the nature of the solution. The VfM analysis will need to be reviewed as the project evolves, and as further market engagement feedback is obtained during subsequent gates and CPs.
- The proposed procurement plan for the CAP aims to maximise competition and deliver best value for customers. The procurement plan takes the project's critical path into consideration, reflects risk and opportunity, and is designed to ensure that the process is run productively and efficiently. SW anticipates that the procurement will be launched as a Competitive Dialogue, or similar (compliant with the UCR 2016). SW anticipates running a multi-stage tender process including a pre-qualification stage, a two stage Invitation to Tender (ITT) process throughout which bidders will be required to prepare a full tender, and a preferred bidder stage leading into financial close;

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[18] SW has allocated internal resource to the production of its procurement strategy and associated documentation. This will be aligned to APM best practice and will be prepared as SW works towards Control Point C and RAPID Gate 3.

[19] RAPID (Feb 2021) Accelerated gate two submission template, page 7.

[20] Ofwat (Feb 2020) Appendix 2: Direct Procurement for Customers; Briefing Note on the Procurement Process for 2020-2025, page 24.

[21] As detailed in section 2.11.1.2, the solution contains elements that will be procured through DPC and elements that will be delivered through SW's capital deliver model. For the purpose of this section 'solution' refers to the elements of the works that are shown as 'In scope for DPC' in **Error! Reference source not found.**.

[22] RAPID (Feb 2021) Standard gate one submission template, page 6.

- By the point of contract notice, SW will have developed a level of design that is sufficient for the planning process, whilst retaining sufficient Optionality to ensure that minimal constraint is applied to bidders' designs;
- SW has identified the late model with early market engagement as the preferred tender model for the water recycling solution. Under this model the solution will be tendered out as Design, Build, Finance, Operate & Maintain (DBFOM), after SW obtains the requisite consents and the solution is ready for detailed design and construction;
- The procurement approach is consistent with SW's internal governance processes for a project of this size and nature; and
- The proposed commercial model reflects both the technical features and expected utilisation of the solution and the feedback received from the informal market engagement undertaken to date, and as such is expected to evolve further as the project develops. SW is considering offering a fixed price contract with a 20-year operational term and a bullet payment (equal to the residual asset value at the end of contract term) as part of the DPC model. SW envisages that payments to the CAP will start post commissioning and will be primarily based on an availability charge combined with a volumetric element to cover variable OPEX linked to asset utilisation with performance targets and associated incentives/penalties.

This document builds on SW's Gate 1 submission[23], continuing the development of the commercial strategy. The content presented in this document is consistent with the findings and conclusions from Gate 1 which SW has progressed further as part of its Gate 2 submission taking into account development of the project scope and further feedback from market engagement.

SW will continue to test and validate the assumptions that underlie this submission as it further develops the scope of the solution. SW will continue its analysis of the solution's suitability for DPC as part of CP C and will further document, test and validate the suggested delivery route and progress the commercial model as part of the Gate 3 submission and CPC.

2.11.2. External advisers and assurance

SW has commissioned the following external capability to support in the development of its commercial and procurement strategy as detailed in Table 102 below:

Table 102 - SW's external advisers

Position	In role
Commercial and procurement support	[redacted]
Legal and commercial support	[redacted]
External assurance	[redacted]
Technical subject matter expertise	Various providers commissioned to support SW with specifical technical and engineering aspects of the project

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[23] Southern Water (28 September 2020) Strategic Solution Gate 1 Submission: Preliminary Feasibility Assessment; Southern Water (28 September 2020) Strategic Solution Gate 1 Submission: Annex 11 Commercial Strategy.

2.11.2.1. A Summary of the Scope of the DPC Delivered Project

This section sets out the components of the B.5 solution which are within the scope of a potential DPC procurement. It also considers the results of informal market engagement and summarises the anticipated appetite for the project within the market.

B.5 is a 75 Ml/d WRP with a discharge into a new lake, near Otterbourne WSW, and then treated at the WSW. Section 2.2 Engineering Technical Design includes further detail on the technical aspects of the scope.

While there are other configurations being considered within Gate 2, given that the solution has not yet undergone detailed design, SW considers that relatively minor differences in solution design that are captured within other configurations would not change market participants' views on the relative attractions and disadvantages of the solution and hence the procurement and commercial strategy developed for solution B.5 can be extrapolated to other configurations at this stage.

Scope of the DPC Procurement

The scope set out under the DPC model is built upon a series of working assumptions regarding the nature of the solution. The scope and assumptions set out in this section remain subject to further development and change. Table 103 below details the elements of the solution that are considered in and out of scope for delivery through the DPC procurement.

Table 103 - Summary of project scope considered for DPC

Project scope	Works	Rationale
In scope for DPC	• WRP • Transfer to an EB • Abstraction from the EB • Transfer from EB to Otterbourne	These works comprise the core components of the proposed asset which will be constructed and operated by the CAP. As such, these works have been identified as part of the scope for the DPC-delivered project..
Out of scope for DPC, but required to facilitate DPC works	• Sewage connection from BF to WRP[24]	This is a gravity connection between SW's and the CAP's assets that will be constructed on SW's existing assets. SW considers that it may be inefficient and introduce a logistical challenge and additional contractual complexity between SW and the CAP, and so for this reason, SW intends that asset ownership will change at the site boundary.
Out of scope for DPC	• Transfer beyond Otterbourne • Any upgrades required at or beyond Otterbourne treatment works	Works at Otterbourne WSW are associated with a DWI notice and are also planned to be delivered as part of the WfLH programme. These works are out of scope for DPC because Otterbourne WSW is an existing asset, currently operated by SW. For a CAP to conduct the necessary works it would likely be necessary to transfer the asset to the CAP, which would likely be less

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[24] Note that the costs associated with delivering this connection are included in the solution cost estimate but are assumed to be out of scope for DPC.

Project scope	Works	Rationale
		efficient than if SW undertakes the works itself. Also, an asset transfer from SW to the CAP would significantly increase the complexity of the proposed deal.

The current assumptions that underline this scope are as follows[25]:

- It is assumed that the scope of the solution being considered for DPC includes 42 km of 800 mm diameter underground pipeline to transfer raw water from the WRP to a new lake near Otterbourne WSW. The pipeline is planned to discharge into a new EB, a lake, where the water would be combined with SW current river and ground water abstractions. The 'raw water' will be abstracted and transferred from the EB to Otterbourne WSW;
- This would not include any additional works on existing SW sites as these would be deeply embedded in SW's current operation nor does it include the connection between BF and the WRP;
- For elements of the works which are out of the DPC scope, SW anticipates that it will procure them through its capital delivery model, although the exact arrangements are yet to be agreed[26].

Key Assumptions for the Procurement Approach

The following assumptions are applicable to the analysis of the procurement approach at this stage in project development:

- The commercial analysis undertaken is based on the Gate 2 cost estimates, which will be developed further and will be revisited in future RAPID and DPC submissions;
- The asset's primary purpose is to provide drought resilience in line with established resilience criteria[27]. Due to high costs and operational complexity, the plant will typically operate at a minimum flow level (c.15 Ml/d), with output increased only where required to meet resilience requirements. Output will increase in 15 Ml/d increments up to a maximum of 75 Ml/d. In a 1-in-200-year drought scenario, the asset will be operated at maximum (75 Ml/d) capacity. Present forecasts anticipate that such a scenario would require the plant to be operated at an increased capacity for c.49 days[28];
- A full understanding of water quality will be critical to the design and operation of the plant in order to meet requirements set by DWI. The water sampling would need to take into account the comingled water quality that is abstracted from the EB which will be transferred to the WRP;
- SW's regulatory obligations require the asset to be operational by 2027; and
- SW has considered the likely impact of these assumptions in the development of its commercial and procurement strategy. For example, the proposed operating terms in the commercial model takes into account the assumed operating model for the asset, and the assumed interfaces with SW's assets. Further, the selected contract term takes account of the assumed renewal capex profile. SW continues to test its approach in all areas and will remain alive to how changes in these assumptions will affect the future development of the approach for this solution.

Market Appetite

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[25] Significant changes in solution scope may fundamentally change the recommended procurement and contractual approach. This may be for a variety of reasons, such as where there is change in the skillset required for construction, or where a different allocation of risk is implied. SW's approach will continue to be refined as the solution is further developed.
[26] See Section 2.11.1.4 for further information on the alternative procurement routes considered.
[27] See section 2.2.3 Resilience Benefits for full details.
[28] See section 2.2 Engineering design for further information on anticipated levels of operation.

Initial informal market engagement[29] was undertaken to inform the Gate 2 submission and the development of the procurement strategy. Participants were engaged on the nature of the solutions under consideration, the indicative tender timeline and tender model, in addition to key contractual terms within the commercial model. The results of this informal engagement indicate that there is significant appetite to compete for a solution of this nature within the market. Engagement with construction contractors and investors revealed that the solution would generate significant interest in the market, with 18 participants expressing interest to participate in a future tender. This is in line with the participants list with the 18 participants either having experience in water recycling or planning to collaborate with a strategic partner with experience in water recycling.

The participants in the informal market engagement were of the opinion that the complexity of the Water Recycling solution will unlock opportunities for innovation and efficiencies, allowing bidders to submit competitively priced bids. They plan to leverage their expertise to create competition in the tender with 14 participants interested to be involved in the CAP tender.

Of those interested in the solution, some cited examples of delivering and operating plants across the globe, such as in Singapore and Australia. Generally, these parties were open to assuming the CAP role or to joining a consortium, depending on the project requirements.

Ofwat DPC Process

Ofwat expects companies to identify the most appropriate route for the delivery of the project[30], considering both in-house and DPC models and selecting the Option that presents greatest benefit to customers. As part of each of the business case submissions as required by Ofwat's DPC CP process, SW is required to set out its preferred procurement approach, providing justification and reasoning for the decision. The key Ofwat Control Points for the DPC procurement are:

- CP A will be submitted as part of the CP B submission;
- CP B – the SOC, addressing the chosen strategic supply option;
- CP C – The procurement plan, setting out the detail of the procurement and contract strategy;
- CP D - The full suite of procurement documents and the form of the CAP agreement;
- CP E – The submission of the Outline Business Case, re-affirming that DPC continues to offer VfM for Customers when compared to the in-house counterfactual;
  - "Ofwat's consent is required under the Appointee's licence conditions before it can commence the procurement" (i.e. issue the Find-a-Tender service (FTS) Contract Notice); and
- CP F – The submission of the Full Business Case, setting out the nature and terms of the deal that has been achieved through the competitive procurement process;
  - "Ofwat consent is required for the Appointee to enter into the CAP Agreement" (i.e. Contract Award)

SW intends to submit its SOC shortly after its Gate 2 submission[31], which will address Ofwat's requirements as set out in the DPC Briefing Note32 and include additional detail on the developing commercial and procurement strategy.

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[29] Informal market engagement exercises have been undertaken in 2019, as part of SW's Gate 1 submission and in 2020-21 as part of SW's Gate 2 submission.

[30] Ofwat (2020) Direct Procurement for Customers: Briefing Note on the Procurement Process for 2020-2025

[31] Milestone dates for SW's DPC activities are available in section 2.9. Schedule – Direct Procurement for Customers (DPC) Control Points.

[32] Ofwat (2020) Appendix 5 – Direct Procurement for Customers – Briefing Note on the Procurement Process for 2020-2025.

2.11.2.2. DPC Eligibility Assessment

Eligibility Assessment Framework

To ascertain the project's eligibility for delivery through the DPC model, SW has applied a three-step framework based on Ofwat's DPC process guidance[33]:

1. A size test based on the £100 m threshold for WLCs
2. An assessment of the discreteness of the asset and
3. A quantitative VfM assessment

Table 104 details the objectives of each step in the framework, the basis of assessment for each test, and the impact of each test's outcome on the solution's eligibility for delivery through the DPC delivery route. SW's Gate 1 submission[34] contains further detail on the approach and methodology of the DPC eligibility assessment framework.

Table 104 - DPC eligibility assessment framework

	1. Size	2. Discreteness	3. Value for Money (VfM)
Objective	Assess the size of the solution(s) against Ofwat's threshold.	Assess the separability of the solution(s) based on Ofwat guidance published as part of its PR19 methodology.	Assess the solution's scope to deliver customer VfM through quantitative analysis.
Test	Solution costs will be considered on a nominal and real basis, including: • Development costs • Initial CAPEX • Renewal CAPEX • OPEX	Consider specific operational and technical considerations of the asset within the wider context of SW's network based on 4 key criteria: 1. Stakeholder interactions and statutory obligations 2. Interoperability considerations 3. Output type and stability 4. Asset and operational failures	To determine if a solution will have greater scope to deliver customer VfM if undertaken via DPC, solutions will undergo a Cost Benefit Analysis (CBA) comparing the NPV cost to customers of the Factual and Counterfactual: • Factual: A solution carried out by a third-party provider under DPC arrangements • Counterfactual: A solution carried out by SW under the PR19 framework A number of assumptions will be considered under both scenarios. A VfM assessment provides the impact on the costs to customers of completing the solution under different approaches.
Outcome	Solutions that are within close proximity to the Ofwat threshold, are technically suitable and could provide scope for customer VfM when considered under the qualitative assessment, will undergo a quantitative assessment for customer VfM.		Solutions that are shown to provide customer VfM through the DPC delivery route are suitable for DPC and progressed where appropriate through the RAPID gated process and Ofwat's DPC Control Points.

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[33] Ofwat (February 2020) Appendix 2: Direct Procurement for Customers; Briefing Note on the Procurement Process for 2020-2025.
[34] Southern Water (28 September 2020) Strategic Solution Gate 1 Submission; Annex 11 Commercial Strategy

The eligibility assessment indicates that the solution is considered somewhat suitable for delivery under a DPC model. More details on the findings from the size test, discreteness test and VfM analysis are provided further below in this section.

As the solution continues to develop, SW will continue to consider the impact of these changes on the suitability of DPC for project delivery. As project specific inputs are developed further (including, but not limited to, market views key financing issues such as debt terms and gearing, and a more detailed commercial model and risk allocation), the VfM test will also be refined from a high-level assessment based on Ofwat's standard assumptions to one specifically tailored to the solution.

SW is also cognisant of its s20 obligation to deliver the programme to the committed 2027 date. As such, SW will continue to consider its timetable constraints and the evolving understanding of the project's critical path will be an important factor in the selection of the appropriate delivery route for the project.

Size Test

The forecast Total Expenditure (TOTEX) over the contract life (including a construction period of 4 years and a 20-year contract period) on a real basis is £0.71-0.89 bn[35], and the TOTEX over the whole asset life (including a construction period of 4 years and a 60-year asset life) is £1.3-1.8 bn[36]. The solution therefore exceeds the £100 m threshold and passes the size test.

The cost estimate has been updated for Gate 2. It is based on a series of assumptions and includes allowances for estimating uncertainty, risk and OB (see Section 2.10 Cost Modelling for further information) that will be further refined as the solution develops.

Project Discreteness Test

SW has applied a discreteness assessment based on four key criteria, each of which has been equally weighted: stakeholder interactions and statutory obligations, interoperability considerations, output type and stability, and asset and operational failures.

The assessment set out here applies to a different solution configuration to that assessed at Gate 1 (B.5 rather than B.1). The assessment against each criterion has been updated, however the overall evaluation is consistent with that presented at Gate 1.

The assessment resulted in a balanced output, with the solution exhibiting some characteristics that may make it less suitable for DPC, which are largely offset by characteristics that make it more suitable. Overall, the solution is considered discrete based on the principle from Ofwat's guidance that solutions are assumed to be suitable for DPC unless clearly demonstrated otherwise. The solution is considered discrete, with well understood and manageable interfaces and risks associated with operational service failures. Challenges exist around stakeholder management and the level of uncertainty over the need requirement (detailed in Table 105 below), however based on the principle that solutions are considered suitable for DPC unless clearly demonstrated otherwise, the overall assessment is that the solution is somewhat more suitable for DPC:

Table 105 - Solution B.5 DPC eligibility assessment - Discreteness test - Summary

Key criteria / considerations	Assessment by criteria	Overall assessment
Stakeholder interactions and statutory obligations	Characteristics somewhat <u>less</u> suitable for DPC	Water recycling (B.5) solution exhibits some characteristics which

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[35] Minimum utilisation scenario totex estimate: £0.707bn. Average utilisation scenario totex estimate £0.710bn. Maximum utilisation scenario totex estimate: £0.881bn.

[36] Based on an asset life of 60 years. Minimum utilisation scenario totex estimate: £1.290bn. Average utilisation scenario totex estimate £1.298bn. Maximum utilisation scenario totex estimate: £1.810bn.

Key criteria / considerations	Assessment by criteria	Overall assessment
Interoperability considerations	Characteristics somewhat more suitable for DPC	make it more suitable for DPC, and some which suggest it may be less suitable. Overall, the analysis (based on Ofwat's guidance) suggests that the solution should be considered 'discrete' and somewhat suitable for DPC.
Output type and stability	Characteristics somewhat less suitable for DPC	
Asset and operational service failures	Characteristics somewhat more suitable for DPC	

a) Stakeholder interactions and statutory obligations

This criterion considers the number of stakeholders and regulators who are likely to be involved in the delivery of the solution, the frequency of that involvement and the prospect of regulatory enforcement against SW for issues in delivery.

- **Number of stakeholders** - The assessment highlighted that a variety of stakeholders (including customers, local interested parties, third-party finance providers, industry and environmental regulators and government) were likely to be involved. Each would have differing specific concerns and objectives;
- **Frequency of involvement -** Among these stakeholders are local councils and landowners, with whom continuous engagement will be required during design, construction and into the operations phase in order for the project to be delivered successfully and to schedule. Further, this solution will employ water recycling on a larger scale than has previously been seen in the UK, and due to its role in resolving wider water resilience issues, would likely draw national interest. In the event of an asset or operational failure, the need to manage and co-ordinate multiple third parties under enhanced external scrutiny has the potential to increase the cost and risk associated with the planning and implementation of a response; and
- **Prospect of regulatory enforcement** - Further, customers' and the DWI's concerns about the 'wholesomeness' of recycled water hold the potential to delay project development and negatively impact SW's reputation. SW would be obliged to produce a WSP for the DWI based on sampling data, and so would expect a high level of DWI involvement, with increased monitoring and close attention to continuing water quality standards. However, SW's ability to manage this reputational risk would be lessened under the DPC arrangement where the CAP is in control of performance, and to transfer ownership of the risk to the CAP would likely be very costly.

Stigma surrounding recycled water is likely to pose a significant challenge for the successful implementation of the solution, likely manifesting in increased stakeholder scrutiny and interaction, also raising costs. Given the 2027 deadline set by Defra / the EA for the delivery of this solution and the nascent state of the DPC market, there exists a risk of delay in the project finance process which, if not properly managed, may jeopardise SW's delivery against committed timescales. For these reasons, the stakeholder interactions and statutory obligation characteristics of the solution make it somewhat less suitable for DPC.

b) Interoperability

This criterion considers the number, type, and nature of interfaces between the asset and SW's network, the nature of the asset operation (active or passive), its separation by physical location, and the potential to generate economies of scope.

- **Number and type of interfaces** - The solution has both upstream and downstream interfaces with SW's network, receiving water from SW's WTW and sending treated water to the WSW, also returning waste to the WTW. The costs associated with these interfaces are well understood and are not complex in nature. Further, whilst the solution would be located on a newly acquired site, the interfaces to SW's network would be on SW's existing site, providing for clear integration with SW's network;

- **Nature of asset operation -** The power required for operation is significant, and so the plant would be reliant upon supply agreements with DNO / National Grid. Given its size, it would be difficult to prepare back-up power on site, and so this risk has the potential to impact on the availability of the solution;
- **Interfaces with SW's network** - In non-drought periods, there will be limited integration with the day-to-day operations of SW's wider network beyond co-ordinated and regular information flow. Information will flow primarily from the solution to SW's wider network and key regulators (EA and DWI), covering flow abstraction, return waste flows and quality. The solution will rely on SW's demand information to determine when to increase or decrease operation, and only during a drought will the operation of the solution require close co-ordination with SW's wholesale water team; and
- **Potential to generate economies of scope** - The level and nature of operational running costs suggests that there will be only a limited loss of synergies through the separation of the asset from SW's operation. There is limited experience of water recycling technology within SW's network, meaning third party management will likely show little difference in the level of operational efficiency, and whilst there may be loss of synergy where the CAP does not have established infrastructure to support its operations, the potential for efficiency gains deriving from DPC delivery are believed to outweigh any loss of synergy.

This assessment suggests that the asset can be considered discrete, as the asset's primary interfaces with SW's network are relatively well defined and should be manageable through the DPC contractual arrangements. The solution is also separable from an operational perspective with limited anticipated loss to synergy, and so its characteristics are suggestive of a discrete asset suitable for delivery through the DPC model.

c) Output type and stability

This criterion assesses the day-to-day source of supply, resilience, volatility of output and any available alternative sources of supply.

- **Day-to-day source of supply** - Sampling of input wastewater quality will be critical to calibrate the treatment required, as the concentration of undesirable elements in the water is likely to be high and may also change over time. As the CAP's design will be reliant upon the sampling data, and the membrane technology used in the recycling process can be compromised where quality worsens beyond anticipated levels, the CAP is likely to undertake additional sampling activity to support its technical design, potentially resulting in the duplication of costs which would not occur were the solution to be delivered in house;
- **Resilience -** Future developments in the WRMP / WRSE, increased sustainability obligations set by the EA and quality obligations enacted by the DWI may lead to increases in / change to the use of the asset over time. The contractual terms will need to maintain the flexibility to accommodate for prolonged periods of additional use without harming the VfM offered by delivering the solution through the DPC route;
- **Volatility of outputs** - SW has considered two potential operating regimes; an 'on / off' regime whereby the plant will operate only as required, and a 'minimum flow' regime where the asset will operate continuously at a low level. From analysis undertaken thus far, SW anticipates that the asset will initially operate at a minimum flow of 15 Ml/d, although over time the asset's continuing operation may increase to a sustained low flow, ramping up further to peak flows in drought periods as required. Under either regime, the commercial arrangements with the CAP will need to be able to effectively account for both short-term and sustained variances in output. A solution to this issue may be to adopt an output-linked payment mechanism (which generally drives for greater VfM than one purely based on availability), however care must be taken that the payment mechanism is calibrated so that it does not lead to asset over-utilisation at the expense of the wider network and use of cheaper sources of supply. The payment mechanism is detailed further in the commercial model section in 2.11.2.6; and

- **Alternative sources of supply** – The asset relies on the provision of treated wastewater from SW at a particular level of quality, and so will be unable to operate effectively without appropriate supply. In the event that the solution becomes unable to operate, SW could resort to water abstraction from the river Itchen, however this must be considered against the reputational risks of river abstraction.

Looking at the output type and stability the solution is somewhat less suitable for DPC. The asset is sensitive to the quality of water supplied to it for treatment, and there is a risk that future regulatory changes may affect the future operation and output quality of the asset, which may be more difficult to cater for under the DPC model.

d) Asset and operational service failures

This criterion considers the simplicity / complexity of the asset, the presence or absence of precedent for the technology employed, the impact of failure on customers and the maturity of the supply chain.

- **Simplicity and complexity –** Operating a WRP of this scale requires a more complex process chain (including several stages of water treatment) and uses membranes not typically employed in smaller water recycling assets;
- **Impact of failure on customers -** Operational failures at the WRP could have national significance and will likely draw greater scrutiny from stakeholders, potentially involving the EA, DWI, Hampshire Southampton East (HSE), Public Health England (PHE) and / or Ofwat depending on the nature of the incident. To address these issues SW will likely introduce step-in rights that it can exercise to ensure that incidents are mitigated quickly, however this is unlikely to fully mitigate delays to response time and will be reflected in bid prices. For SW, the consequences of asset failure during a drought period will likely include reputational damage and penalties for failure to comply with statutory water quality obligations. SW would likely look to employ contractual measures (such as performance deductions) to encourage the CAP to manage the asset properly and prevent these kinds of circumstances from arising, albeit this will need to be balanced if undue risk pricing is to be avoided; and
- **Technology precedent and maturity of supply chain -** The process envisaged for this solution (required to treat the specific type of wastewater) will be new to the UK. Stakeholders are often cautious of first-of-a-kind projects and this may be reflected in pricing, however water recycling technology is well understood globally and such fears may be allayed through greater understanding of the solution, sampling and during the production of a tailored design.

The reputational risk and stakeholder scrutiny SW would face in the case of an asset or operational service failure are no different under the DPC model. For example, where a service failure occurred during a drought, the cost to SW for abstraction from the river Itchen (as an alternative source of supply) would be no different under the DPC regime. In fact, a CAP with prior experience in operating a recycling plant of a similar nature may be able to minimise the risk of asset and operational service failures to a level above that which SW could achieve. On the basis of these characteristics, the solution can be considered somewhat more suitable for DPC.

Value for Money (VfM) Assessment

VfM analysis considers the costs to customers under the Factual (DPC) case versus delivery under the Counterfactual (In-house) case. Revenues are calculated under both cases and then discounted at the Social Time Preference Rate (STPR) to generate a Net Present Value (NPV)[37]. The difference in NPV between the two cases and the key value drivers are compared to determine the VfM of delivery via DPC. The difference between the Factual and Counterfactual is calculated based on project specific inputs (such as Gate 2 cost estimates), macroeconomic factors, and Ofwat's standard assumptions which include a mid-

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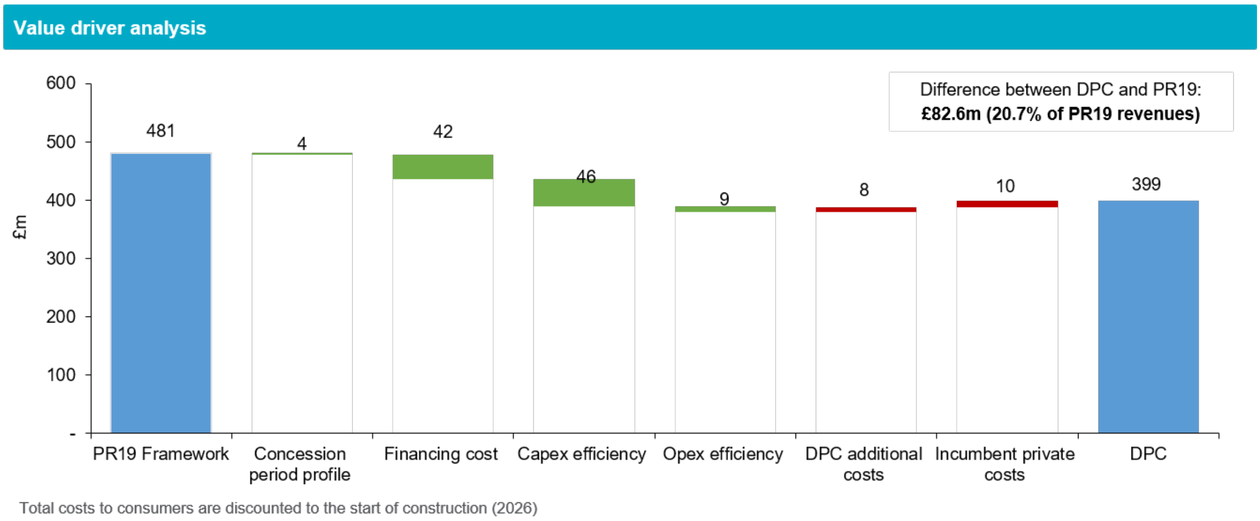
[37] More details on the approach and methodology of the VfM model are set out in the Gate 1 submission, however, note that the Gate 2 value for money analysis set out in this document reflects the updated cost estimate developed for the Gate 2 submission.

case assumption and an upper- and lower-case sensitivity (for example gearing of 85% in the mid-case, 90% in the upper and 80% in the lower-case).

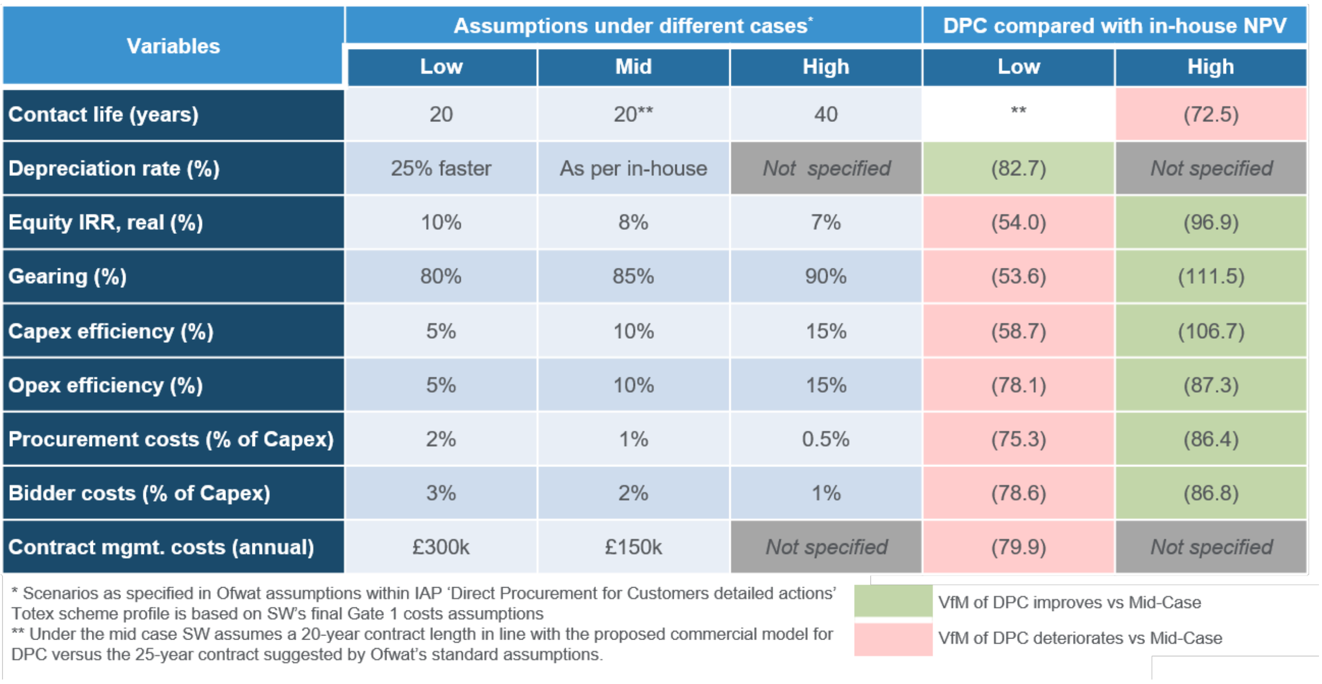
Figure 72 illustrates the results of the VfM analysis under the mid-case, showing the key value drivers between the Factual and Counterfactual cases. Under the mid case scenario, delivering the scheme under DPC would result in lower costs to customers than if the scheme was delivered by SW under the PR19 framework. The cost to customers in NPV terms of B.5 under the factual scenario (DPC) is £399 m compared with £481 m under the counterfactual (PR19). The difference in the costs to customers is £82.6 m which is equivalent to c.20.7% of the PR19 revenues. The key value drivers under the DPC model are the benefits from cheaper financing costs (£42 m) and the benefits from CAPEX efficiency (£46 m). The 20-year operations period results in a smaller scope for potential savings for OPEX versus CAPEX compared to longer term contracts. These benefits are however to some extent offset by the impact of the additional costs to the DPC and the incumbent private costs effect (made up of procurement costs and contract management costs) which would not be incurred if SW were to deliver the asset.



Total costs to consumers are discounted to the start of construction (2026)

Figure 72 – Water Recycling B.5 VfM analysis results

Figure 73 below illustrates the results of the sensitivity analysis. Under all scenarios, delivery of the water recycling plant is shown to have greater value for customers under a DPC model based on Ofwat's assumptions and framework.



Variables	Assumptions under different cases*			DPC compared with in-house NPV	
	Low	Mid	High	Low	High
Contact life (years)	20	20**	40	**	(72.5)
Depreciation rate (%)	25% faster	As per in-house	*Not specified*	(82.7)	*Not specified*
Equity IRR, real (%)	10%	8%	7%	(54.0)	(96.9)
Gearing (%)	80%	85%	90%	(53.6)	(111.5)
Capex efficiency (%)	5%	10%	15%	(58.7)	(106.7)
Opex efficiency (%)	5%	10%	15%	(78.1)	(87.3)
Procurement costs (% of Capex)	2%	1%	0.5%	(75.3)	(86.4)
Bidder costs (% of Capex)	3%	2%	1%	(78.6)	(86.8)
Contract mgmt. costs (annual)	£300k	£150k	*Not specified*	(79.9)	*Not specified*

* Scenarios as specified in Ofwat assumptions within IAP 'Direct Procurement for Customers detailed actions'
Totex scheme profile is based on SW's final Gate 1 costs assumptions
** Under the mid case SW assumes a 20-year contract length in line with the proposed commercial model for DPC versus the 25-year contract suggested by Ofwat's standard assumptions.

🟩 VfM of DPC improves vs Mid-Case
🟥 VfM of DPC deteriorates vs Mid-Case

Figure 73 - Sensitivity analysis

Overall, based on Ofwat's Initial Assessment of Plans (IAP) standard VfM assumptions, and current cost projections for B.5, delivery under a DPC framework would deliver greater value for customers from a VfM standpoint. This result, however, does not reflect project specific inputs from the market (for example, debt terms and gearing).

To enable the most accurate VfM analysis, the assumptions and inputs used to compare the Factual (DPC) and Counterfactual (In-house) cases should be tailored to reflect the nature of the solution. This should include considerations of the technical characteristics of the asset, its risk profile and the proposed contractual model. However, as the technical aspects of the solution and the commercial model are still in development, there is limited scope to establish project-specific assumptions at this stage. As such SW has not adjusted or otherwise changed any of Ofwat's standard assumptions at Gate 2. SW will revisit the VfM analysis once these aspects have been developed, specifically at Control Points C (Procurement Plan) and E (Outline Business Case).

Review of Ofwat's Standard Assumptions

At IAP stage of PR19 Ofwat recognised that there are significant differences in the assumptions used in the VfM analysis by companies to identify the NPV differential between the Factual (DPC) and Counterfactual (In-house) models. To address this, Ofwat set out a series of standard assumptions[38] which were used for the purpose of the VfM assessment set out in this document.

Whilst Appendix 9 of the PR19 final methodology[39] provides some rationale for Ofwat's assumptions and references to some data sources, many of the assumptions do not appear to be supported by sufficient evidence or are sourced from an underlying evidence base which has not been made publicly available (for example, Ofwat's estimate for contract management costs[40]). Other assumptions are underlined by datasets

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[38] Ofwat (2019) Southern Water Direct procurement for customers detailed actions
[39] Ofwat (2017) Appendix 9: Direct Procurement for Customers
[40] Ofwat states that it has assumed Appointee contract management costs based on its own assumed DPC management costs, however it does not explain how this value has been derived.

that are either small (and hence does not appear to be representative) or are focused on older precedents[41]. Ofwat has focused on the Offshore Transmission Owner (OFTO) model as a principal source of precedent for the DPC model. Whilst there are similarities between the characteristics of the OFTO and DPC models, the former appoints a provider responsible only for the operation and maintenance of assets that have already been constructed, resulting in a fundamentally different risk profile to DPC projects[42].

To better understand the position of Ofwat's standard assumptions within the observable range for applicable precedents and similar projects SW has carried out an initial benchmarking exercise, focusing primarily on Ofwat's financing cost and efficiency assumptions. This exercise has considered precedents from a selection of comparable projects across various infrastructure sectors including, but not limited to:

- Energy, such as OFTO and Interconnector projects;
- Waste, water and Energy from Waste (EfW) projects;
- Social housing, education, accommodation and other similar infrastructure projects; and
- Transport infrastructure projects, including bridges, tunnels, roads and rail transit.

The review of precedents was based on a desktop research using a combination of publicly available information and anonymised commercially sensitive data provided by SW's advisors. This review has not considered any of the qualitative or intangible benefits or costs of DPC.

Overall, SW's desktop analysis suggested that the Ofwat standard assumptions are broadly within the range observed for comparable projects and precedents (albeit in the lower end of the range in some instances) for a "typical" DPC project. Some of SW's key observations are set out below.

- **Efficiency assumptions (CAPEX and OPEX)** – The Ofwat efficiency assumptions are applied on top of the estimated cost for in-house delivery. The approach does not take into account the maturity of the cost data, SW's inhouse procurement model for these projects, and the residual risks that will need to be borne by SW. SW will continue to review the efficiency assumptions considering the above factors in subsequent stages of the gate submissions. There may be limited scope to improve upon these assumptions through market engagement, as potential bidders may be unwilling to reveal information that might harm their competitive advantage or will not be in a position to provide more meaningful data until much later in the process. This means that SW will supplement the VfM analysis with robust sensitivity analysis to address uncertainty until the actual values obtained through bid submissions can be used in the project's VfM analysis;
- **Procurement and bid costs** – Ofwat's standard assumptions or the precedents do not account for the first-of-a-kind premium that will likely be applicable for the first cohort of DPC projects. In addition, it is likely that the final choice of option will involve desalination or water recycling plants (effluent re-use for potable water). In both cases the technologies involved are largely or entirely new to the UK and will require significant input from contactors overseas. To the best of SW's knowledge there are no UK suppliers of either technology on a 'turn key' basis. The regulatory and policy frameworks for using these technologies in public water supply are also immature in the UK. For these reasons, the assumptions given by Ofwat are likely to underestimate the actual costs that incumbents and bidders will incur throughout the process. A robust bottom-up costing exercise will be undertaken to firm up initial assumptions and reduce uncertainty once there is more clarity and certainty about the structure and timings of the procurement process;
- **Cost of Equity and other financing assumptions** – For the same reasons as set out above for the procurement and bid costs, the initial DPC projects will be considered by the market to carry a higher risk and thus financing costs of these early DPC projects are likely to be subject to a first-of-a-kind

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[41] Ofwat primarily relies on CEPA 2016 (Evaluation of OFTO Tender Round 2 and 3 Benefits) for evidence of financing savings, however this document references reported secondary market returns in UK PFI between 2003 and 2011; a period covering the 2008 financial crisis and exhibiting different market conditions.

[42] Given that financing costs are typically reflective of project risk, the OFTO asset class can be used to draw comparisons with the anticipated cost of debt for DPC projects' operations period, however this may not be reflective of the financing efficiency that could be achieved by a provider responsible for arranging whole-life financing.

premium. This can be seen in several other programmes including the initial OFTO Tender Rounds (which had a higher cost of equity). This is currently not reflected in Ofwat's standard assumptions;

- **Breadth of observed ranges** – At this early stage in SW's RAPID process, the benchmarked ranges are relatively wide and reflect the level of detail currently available about key project terms. As the solution is progressed through the DPC process and more clarity is gained over scope, risk allocation and the contractual model, SW will look to identify which of the available precedents provide the most accurate comparison to the project. In particular, it may be possible to identify project deals which are comparable to the solution (including risk allocation and commercial terms) and thus provide a more suitable benchmark; and
- **Time frame** – Ofwat does not set out a timeframe for the DPC process but SW has a fixed timeframe in which it needs to commission the solution driven by the Section 20 agreement with the EA to use "ABEs" to have the WRMP strategy, including the Options being considered here as candidates for DPC, by 2027. The fixed timeframe could also influence costs, as it will compress the time available for optimising design and capital costs, the process of identifying and negotiating risk allocations satisfactory to all parties and the time available for CAP contract development. Bidders will be aware that SW has fixed timescales, and this could act against finding the provider and set of contracts that provide best value for SW's customers. As context the recently completed bulk supply contract for Portsmouth Water to build and operate the Havant Thicket reservoir on behalf of SW took c.3 years to negotiate, at a multimillion-pound cost to SW.

In summary, SW will refine the assumptions used in the VfM analysis based on project-specific detail and market feedback obtained during the later stages of the procurement process. Although the correct assumptions to be used under the Factual (DPC) model of the VfM analysis will ultimately only be available once bidders provide their final bids at ITT stage 2, SW has identified a number of activities that hold the potential to improve the VfM assumptions in future Gate submissions:

- Undertaking further sensitivity and scenario analyses that reflect project-specific risks and opportunities;
- Reviewing and updating the assumptions – especially those related to financing costs, financing assumptions, procurement costs and contract management costs - to reflect the first of a kind nature of SW's project;
- Reviewing the cost efficiency assumptions to reflect the maturity of the costs for in-house delivery, and SW's approach to inhouse procurement for this solution;
- Further benchmarking of the costs of debt and equity to reflect the risk profile of the SW's project more closely, and to reflect changes in macroeconomic factors and market conditions;
- Better reflection of the efficiencies built into the Price Review process (frontier shift and efficiency challenges) for in-house delivery route; and
- Reviewing the non-financial implications of the DPC model, including its impact on timelines and SW's licence obligations.

2.11.2.3. Procurement Plan, including Procurement and Contract Timetable

This section sets out SW's approach to the CAP procurement, including the anticipated timetable, the stages of the procurement process and the evaluation framework that will be applied to identify the CAP. It also considers the activities that SW will undertake outside of the CAP procurement to facilitate project delivery.

Procurement Routes Considered

Whilst SW's analysis has recommended that the project is suitable for delivery under the DPC model, SW has also considered the applicability of procurement routes other than DPC. Examples of current capital delivery routes under SW's capital delivery model include:

- AMP7 frameworks with SW's three delivery partners, with a specific focus on larger projects and programmes;
- A Low Complexity Delivery Route (LCDR) which sits outside of the more complex delivery partner contract route, providing additional supply chain capability and capacity to complement the existing supply chain partners and reducing the overheads on smaller-value infrastructure and non-infrastructure projects whilst also creating resilience and commercial competition;
- The Studies and Investigations (S&I) framework (see the *Key pre-DPC activities to implement the preferred tender model and commercial model* sub-section later in this section for more information); and
- The AMP7 Strategic Solutions Partner (SSP) framework, which provides project management and Project Management Office (PMO) support, in addition to engineering and technical solutions.

For large infrastructure projects such as the water recycling solution, SW's framework agreements may not be suitable, as they are not designed for works of this scale and technical complexity. This means that were the project to be delivered in-house, SW would likely conduct a new published procurement process to appoint a provider for the design and construction of the works.

SW's analysis of procurement routes has also shown that large-scale design and build procurement models typically include ECI to safeguard solution design as well as optimise risk balance, providing more cost efficient and predictable contract values and delivery timescales. The nature of risks identified for this project further assert the benefit of ECI. SW's approach to procuring ECI support is discussed in more detail below.

Timeline of Procurement under the DPC Model

In Figure 74, SW has illustrated the anticipated timeline for the procurement of the solution, including its pre-DPC activities, governance, and submissions to Ofwat as part of the DPC process. At the date of the submission of this report, the timelines (including the underlying breakdown of response periods) are still subject to further change in the future iterations of the schedule. As such, a high-level view of the plan up to CAP award is provided at this time, covering the key activities in aggregate (business case development, design and planning, CAP procurement etc.) without showing a breakdown for each individual task. For the purposes of this report, please refer section 2.9 (Schedule) for additional information on planned activities and for key dates relating to control point and Gates.

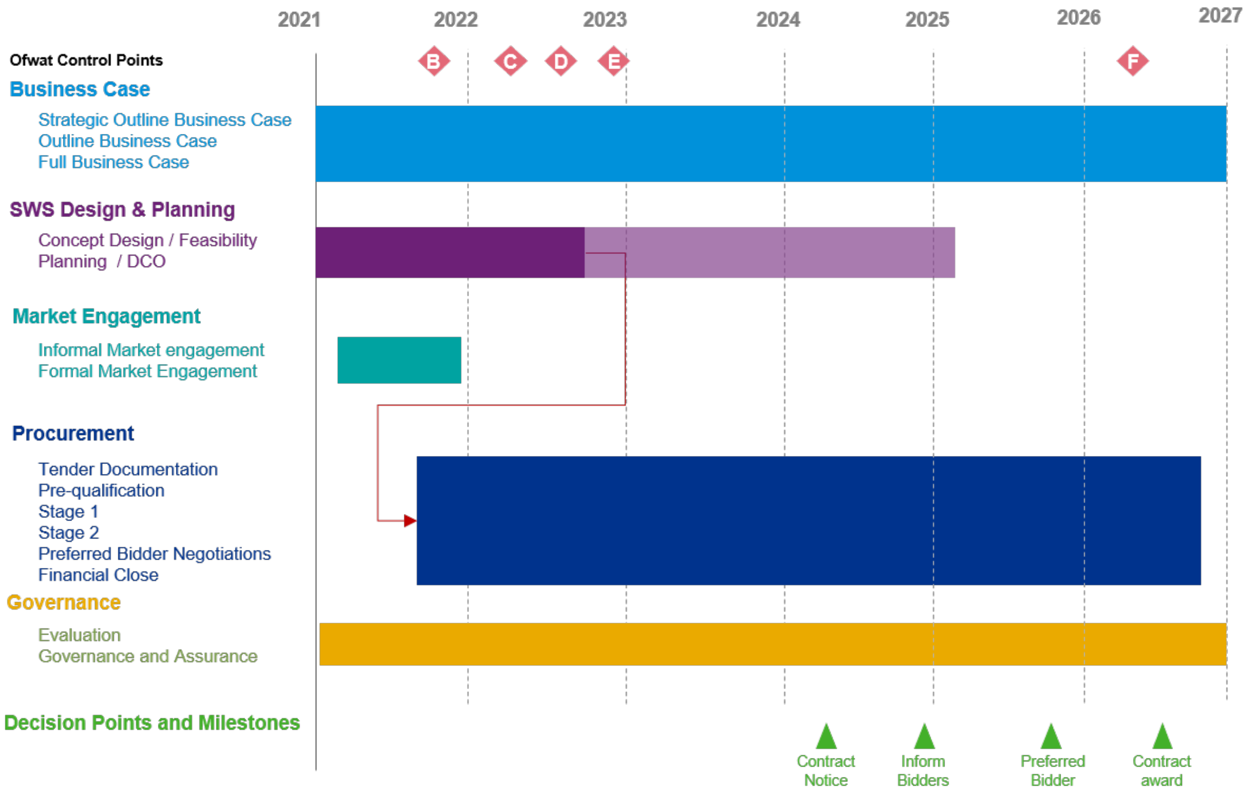

Figure 74 - DPC procurement timeline

CAP Procurement Plan

Development of the CAP procurement plan

At this stage, SW has developed initial thinking on the likely CAP procurement plan. The plan will be expanded upon as SW works towards the delivery of Control Point C (Procurement plan), which will include a greater level of detail. SW is focused on developing a CAP procurement plan that is designed to maximise competition and deliver best value for customers. The plan takes the project's critical path into consideration, reflects risk and opportunity, and is designed to ensure that the process is run productively and efficiently. It has been prepared in conjunction with SW's external procurement, commercial and legal advisers. The procurement process will be run in a fair and transparent manner, and in compliance with the requirements of the UCR 2016.

SW has considered the resourcing and governance requirements of the procurement process in the development of its approach and the timetable set out above. To achieve a fully assured and competitive process, SW will ensure that appropriate resources are available as required to ensure that SW can:

- Maintain and manage the competitive dialogue with bidders;
- Conduct the necessary evaluations at each stage of the process within the timescales set out; and
- Give effect to its programme and procurement governance and assurance processes.

Other relevant factors that have been considered in the development of the procurement plan, include (but are not limited to) the complexity of the process, the required duration at each stage and the requirements of the UCRs. The following factors are specific to procurement under DPC or to the nature of the solution, and as such have also been considered in procurement design:

- The DPC model is novel and as such the market is still forming. While there are parallels with other procurement routes, precedent for the use of concepts or approaches applied elsewhere (such as in

Public Private Partnership / Private Finance Initiative (PPP/PFI) deals) has not yet been established for DPC; and

- The plan also recognises the significant investment required by bidders to participate in the procurement competition. With these considerations, an effective and valuable procurement that confidently delivers for customers is contingent upon attracting a sufficient volume of compelling and credible prospective bidders. SW has undertaken significant market research to understand the constraints and considerations for CAP bidders to determine whether they will invest in the tender process. The plan reflects the findings.

As SW progresses beyond Gate 2, its procurement plan and documentation will be subject to extensive internal challenge and external assurance (including legal review) as they are developed and agreed prior to the formal commencement of the procurement process. This will include any submissions as required under RAPID's gates process and Ofwat's DPC control points, and as such the CAP procurement plan remains subject to further amendment as the project matures.

Market engagement in advance of the procurement process

In line with the selected tender model (late with early market engagement), SW intends to conduct structured formal and informal market engagement with the market (including contractors and finance providers) throughout SW's procurement development process and initial design phase. This is intended to enhance transparency and promote dialogue with bidders, and to prevent the unfair exclusion of any interested parties. SW's approach will continue to be informed by and may be updated to reflect the results of future market engagement exercises.

SW anticipates that through market engagement it will also be able to outline the stages and timetable of the procurement process to interested parties. This will be important as it will allow and prompt those interested in the project to form bidding parties (for example joint ventures, and other forms of consortia), ready for the formal commencement of the procurement process.

Prior to the formal launch of the competitive tender process, SW will formally notify organisations of the forthcoming opportunity through the release of a Prior Information Notice (PIN). The audience for this market engagement will be kept as wide as possible, as SW aims to reach all available suppliers, including those that may subcontract to the CAP. Bidders' ability to form and submit a competitive tender will be contingent on supplier support through the procurement process. It is therefore beneficial to promote this opportunity to both potential CAPs and the wider supply chain. From this market engagement, SW will seek voluntary responses from interested parties who wish to provide feedback on the proposed procurement plan and contract. This will not have impact on the bidder's ability to bid in the procurement. This will be followed by a briefing presentation in which SW will seek to address questions bidders may have relating to the information submission as well as the procurement process. Given this briefing interface the entire market and the key members of SW's senior leadership team will participate and deliver in this briefing. Should significant challenges to the procurement strategy be prompted in this market engagement, SW can reassess and chose to conduct further market engagement.

Procurement process

SW's procurement process is illustrated in Figure 76 and comprises a Selection Questionnaire (SQ)[43] period launched at Contract Notice, followed by a two-stage ITT process, leading into Financial Close and Contract Award. Figure 75 illustrates this process, however, the exact response and assessment periods for each procurement stage are still under development[44].

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[43] SQ stands for Selection Questionnaire under the Find-a-Tender (FTS) UK procurement process, replacing the OJEU PQQ, or pre-qualification questionnaire.

[44] Please refer to section 2.9 Schedule for current durations

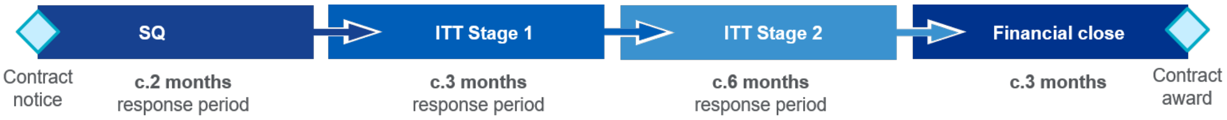

Figure 75 - Procurement stages

Upon publication of formal contract notice, and in line with its obligations under the UCR[45], SW will release all appropriate documentation. Full disclosure of procurement documentation at this initial stage will allow the market to appraise the opportunity and make an informed decision on whether to participate in the competition. The documents published will include, but are not limited to:

- All assessment documentation for each stage of the process, including the questionnaires for SQ and ITT stages 1 and 2;
- The evaluation criteria to be applied at each stage;
- The draft of the CAP agreement; and
- All applicable technical documentation and requirements.

SW plans to launch the procurement as a Competitive Dialogue, or similar (subject to regulation changes), that facilitates discussion with bidders during the procurement process[46]. This approach will allow SW to engage directly with bidders throughout the process to discuss aspects of the solution and their submitted proposals (once ITT stage 1 submissions have been made). Engagement throughout the process should lead to the submission of final tenders that are compelling, competitive, and fully satisfy the objectives of the procurement process.

SW has scheduled a c.seven-week period from Contract Notice to SQ response. This will test the capability and capacity of CAP bidders relative to project requirements. It is imperative that this process is thorough to ensure that appropriate bidders are selected to progress to the next stage. It is also important that the submission requirements are appropriately detailed to allow for a thorough assessment of bidder capability, whilst balancing the need to ensure that the costs bidders incur in preparation of their responses are not prohibitive to participation in the process. At SQ, bidders will likely be assessed on a mixture of their certification, policy compliance and previous experience of successfully delivering comparable projects.

SW will assess all responses received at SQ stage. Once complete, the results of SW’s detailed assessment will be assured and confirmed through SW’s established programme and procurement governance processes. SW anticipates inviting the four highest scoring CAP bidders to prepare a tender. However, this may be as few as three, or as high as six, depending on the quality of SQ responses and relative proximity of scoring. SW anticipates that by progressing four bidders beyond SQ stage, it will maintain effective competition during the ITT stages of the competition. Under this approach, SW also considers that effective competition could be maintained should one bidder drop out of the process once the ITT stage has commenced.

The ITT will be a multi-stage process[47]. ITT stage 1 will span a c.three-month period from invitation to the submission of responses. This submission will cover aspects of price and proposals on the technical solution, including elements relating to construction, operation and maintenance. Bidders’ proposals need not be fully complete at ITT stage 1; however, the purpose of this stage is to understand bidders’ proposed solutions so that SW can engage in meaningful dialogue with those bidders who are taken forward to ITT stage 2. SW anticipates that it will invite three of the four ITT stage 1 bidders to progress to stage 2[48]. To

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[45] Utilities Contract Regulations 2016, regulation 73 - Electronic availability of procurement documents

[46] Whichever procurement route SW follows will be compliant with the Utilities Contract Regulations 2016.

[47] SW recognises the time and cost implications of the two-stage tender process; however, it considers that the benefits of this approach (limiting bidders’ costs by focusing the competition early on those with a realistic prospect of winning and allowing sufficient time for the internal governance approval processes) are sufficient to warrant this approach. SW’s approach has been subject to external legal review.

[48] The volume of bidders progressed may increase to four, depending on the quality of submissions and relative scores of responses.

enable SW to meaningfully assess responses received at ITT stage 1 and to down select to the bidders who will progress to stage two, SW must be able to assess and fix some components of bidders' stage 1 submissions. The exact components that will be fixed are yet to be determined but will likely include some components of a bidder's pricing schedule. This approach is additionally beneficial as it allows SW to limit bidders' costs, as only those with a realistic prospect of winning the competition will be taken through to ITT stage 2.

Stage two will require bidders to prepare a full tender over a c.six-month period. While the previous c.three-month tender stage has been scheduled with consideration to the costs bidders would incur, stage two reflects a duration sufficient (for bidders that have progressed to this point in the competition) to develop a full proposal, which will include (but is not limited to) the bidders' design and final price to deliver the works. Bid costs are likely to be the most significant at this stage, as bidders produce detailed designs and finalise their responses. At this stage, competition between participants will work to drive for the best possible proposals at the lowest possible costs.

During stage two, SW may request interim non-binding draft submissions from the bidders. This will enable SW to ensure bids are developed to a high standard and ensure any necessary clarifications are addressed. It will also enable effective, transparent, and fair competitive dialogue to award and will help to secure the quality of responses. Where SW receives interim updates during ITT stage 2 this may also help to make the final assessment process more efficient as SW will have the opportunity to understand and consider developments prior to final response submission.

Key procurement dependencies

SW will progress its DCO application in tandem with the procurement process. SW's current programme timetable provides for the submission of its DCO application in late 2023, with determination anticipated to be given in early 2025. This means that:

- The full details of SW's application will be available to bidders in advance of the procurement process, and that determination would be given before the end of the procurement process, allowing bidders to reflect any changes in their submissions;
- SW will be responsible for managing the risk that changes resulting from the DCO approval cause disruption to procurement process, for example where approval is dependent upon a key change that has the potential to influence bidders' responses. Should the DCO process result in some variability of solution, this will be managed through communications with all CAP bidders and in line with procurement regulations; and
- Whilst SW anticipates that full approval will be achieved prior to award, procurement timescales may need to be adjusted to reflect any changes. It is noted that the DCO application process sits on the critical path for the project, meaning that delays to the DCO process will likely have a consequent knock-on effect on the CAP procurement process and timetable.

Key procurement risks

SW has identified a series of key risks to the procurement process, as detailed in Table 106 below. At this stage, this is a high-level non-exhaustive list of potential key risks to procurement that will be considered in more detail as the procurement plan is developed further. SW has set out its early views of potential risk mitigations, however these also remain subject to refinement as the plan development progresses.

Table 106 - Procurement risks

Procurement risk	Description	Outline view of potential mitigations
Lack of market appetite for the project	The risk that the market does not consider the project attractive, meaning no or limited responses are received to the Contract Notice. Factors that may affect market appetite could include, inter alia: • Negative perception of the commercial model (incl. outline terms of the CAP agreement) • Concern over programme timeline, including dependency with DCO process	This risk is best mitigated through engagement with prospective bidders in advance of the procurement process, allowing SW to share information on the project, including key commercial terms, and obtain feedback from the market in advance of Contract Notice. This process will help to ensure that prospective bidders are well-informed about the project and will allow SW to understand and address any concerns held by the market.
Limitation / absence of supply chain capacity	The risk that there is insufficient capacity in the market to deliver a project of this nature, likely due to engagement on other similar projects, resulting in a diminished level of competition.	SW's engagement with the market to date has indicated that there is sufficient capacity in the market for the project, however SW will continue to monitor this risk through future engagement exercises.
Delay to the procurement process	The risk that the procurement process is delayed, resulting in additional cost and affecting SW's ability to meet its S.20 obligations for the delivery of the project. Causes of delay could include, inter alia: • Bidder requests for additional time to prepare responses • Delayed or extended governance processes • Delays in parallel activities, such as the DCO application process • Legal challenge (discussed below)	Mitigations against delay include: • The development of a clear procurement timeline based on past experience of similar projects, giving due consideration to key dependencies, and allowing sufficient time for each activity • Providing bidders with as much information as possible at the outset and engaging frequently throughout to ensure clarifications are addressed • Legal input throughout the design and implementation of the procurement process
Diminished competition in the procurement process	The risk that one or more bidders exit the procurement process, resulting in a diminished level of competition between remaining participants.	Measures to ensure competition is maintained include: • Limiting the need for bidder investment in the early stages of the process, so that the prospect of 'sunk costs' does not deter participation • Holding a reserve bidder from Pre-Qualification Questionnaire (PQQ) into ITT stage 1 in case one of

Procurement risk	Description	Outline view of potential mitigations
		the successful bidders exits the process • Reducing the competition to a smaller number of bidders at ITT stage 1 so that remaining bidders have a greater chance of winning and are less likely to exit the process • Inviting 3 bidders to ITT Stage 2 so that competitive tension can be maintained even if one of the bidders exists the process
Legal procurement challenge	The risk that unsuccessful bidders challenge the conduct of the procurement process, or the application of the assessments, suggesting that the UCR 2016 have not been followed.	It is not possible to exclude bidders' right to raise a legal challenge against the procurement process, however all of SW's procurement processes are managed in compliance with the UCR 2016, and its procurement plan will be subject to continuing legal review as it is being developed.

CAP Tender Evaluation Framework and Assessment Criteria

This section presents the evaluation framework for the SQ and ITT stages. Figure 76 illustrates the evaluation process with indicative timings for each stage that will be tested and verified further.

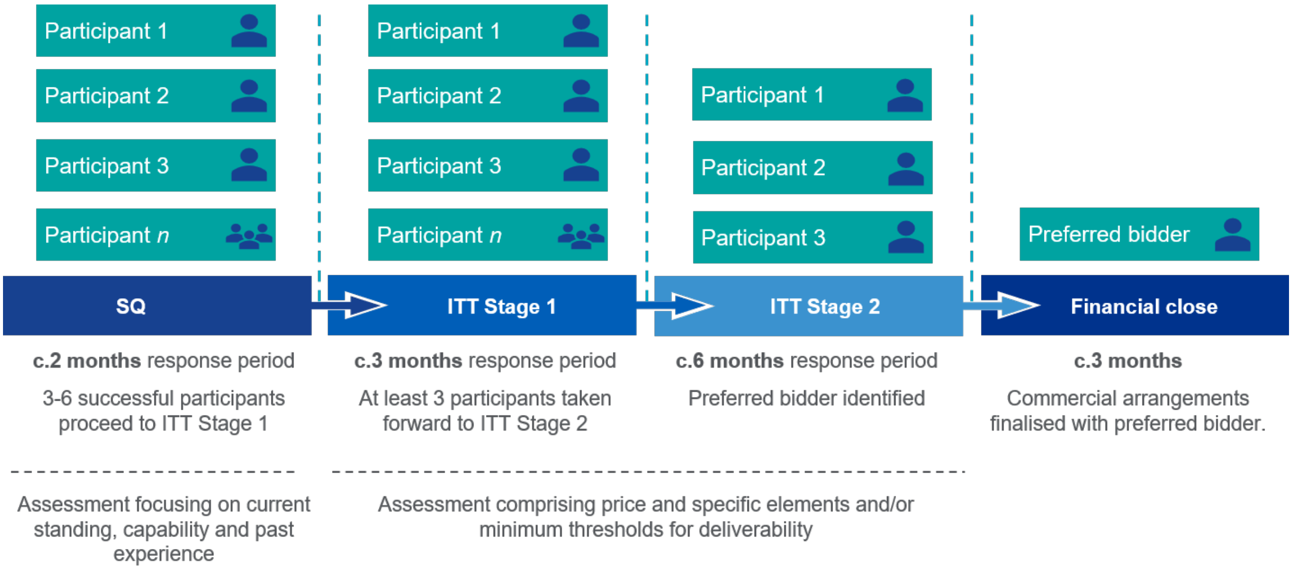

Figure 76 - Evaluation process

Each stage of the evaluation process will aim to achieve different objectives:

- **SQ** - Assesses the bidders' competence and ability to deliver the solution on a backward-looking basis; bidders that demonstrate historical competency based on a minimum threshold on a pass or fail basis are to be passed to the next stage. It is expected that the SQ will focus on the identity and financial credibility and capability of bidders and so as part of the SQ SW will likely assess bidders' structure, financial statements and performance, and experience delivering similar projects. SW will consider the depth of these assessments (i.e. light-touch review or detailed assessment of all bidder parties) as the evaluation framework is developed further. Depending on the number of bidders achieving a pass there may be further down-selection to take c.3-6 bidders through the next stage based on the best SQ responses;

- **ITT stage 1** - Assesses the bidders' project deliverability, and potentially to a smaller extent on their indicative prices, (elements of which may be fixed at this stage), to identify 3 bidders to proceed to ITT Stage 2 for detailed design; bidders that demonstrate robust financial, commercial and technical deliverability on an overall scoring basis may be passed to the next stage. SW will consider whether to set any minimum thresholds for deliverability and will seek an understanding of a bidder's delivery model, the structure of their planned activities, their approach to risk mitigation and their plan to secure and maintain the necessary skills and capabilities throughout the life of the contract. At this stage SW will look to reach a balance, requiring bidders to provide enough information to undertake a deliverability assessment without incurring unnecessary bid costs. As part of the calibration of the deliverability assessment SW will also consider the time and effort requirement of the bid evaluation; and
- **ITT stage 2** - Assesses developments in deliverability against design requirements but is likely to be focused on determining the best solution proposed at the optimal price; the Most Economically Advantageous Tender (MEAT) will win. Further deliverability assessment will focus on the design activities carried out by bidders and will test that the design proposed by bidders fits minimum requirements of various technical elements, reflecting developments in SW's consenting and permitting activity. At this late stage, SW's primary aim will be to drive VfM for customers through competitive tension whilst ensuring that the bidders' proposed solution is fit for purpose.

The detailed evaluation criteria for each stage will need to cover technical, commercial and legal aspects of the project, taking into account SW and Ofwat objectives. The evaluation framework will be designed such that it is fair, transparent and fully documented, ensuring that any potential challenges from losing bidders can be robustly defended, so that the risk of such a challenge is minimised.

Key Pre-DPC Activities to Implement the Preferred Tender Model and Commercial Model

Recognising the time-sensitive nature of some aspects of the project development, it will be necessary for SW to undertake certain pre-DPC activities to support the implementation of the preferred tender and commercial models. A variety of activities are currently under consideration including, but not limited to, early feasibility works[49], enabling works[50] and pre-DPC construction works, however, these are reflective of the level of detail currently available; and it is likely that some areas will evolve in terms of scope and priority as the project develops further.

Conflict of interest

SW has engaged a variety of suppliers to support its project development. Where frameworks have been established, due consideration has been given to conflict of interest, ensuring that appropriate safeguards are in place for frameworks suppliers who may also participate in the DPC procurement process. SW has established conflict of interest arrangements with all suppliers engaged to date. Similar arrangements will be sought with suppliers engaged in the future, and SW will continue to actively manage any potential conflicts of interest as the project develops.

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[49] Feasibility studies identify the practicality of a project, considering relevant contextual factors (economic, commercial, technical, regulatory etc.) in order to determine whether a project should be progressed.

[50] Enabling works is a generic description for the site preparation works that take place prior to work under the main CAP construction contract. The term also covers the statutory and non-statutory works required to gain Development Consent Order (DCO) and Direct Procurement for Customers (DPC) approvals.

Studies & Investigations (S&I) framework

To support its pre-DPC activities SW has established several specialist S&I frameworks. This was following an extensive programme of market and stakeholder engagement and a competitive procurement process. The majority of the enabling works packages are within the scope covered by SW's S&I Framework and can be procured through this route. Other packages will either be procured through the Catchment Management Specialist Framework, or for packages which cannot be procured using existing frameworks a procurement decision will need to be made. Call-off from these frameworks has been used to secure the majority of pre-DPC and pre-DCO workstreams. This is following a fully competitive OJEU[51]/FTS[52] procurement where 23 lots were awarded across the 5 S&I frameworks[53].

The specialist frameworks have been established with due consideration to conflict of interest, ensuring that appropriate safeguards are in place for frameworks' suppliers who may also participate in the DPC procurement process. Similar arrangements will be sought with suppliers engaged in the future, and SW will continue to actively manage any potential conflicts of interest as the project develops.

Enabling works

SW's procurement approach for its pre-DPC activity has been developed in two phases; Phase 1 focuses on meeting SW's early feasibility needs. Phase 2 comprises enabling works and pre-DPC construction works. The majority of work packages under Phase 1 have been delivered to budget and within required timescales. In the most part, these packages relate to obtaining consents (including planning, consenting, environmental constraints, permitting, and other environmental considerations) and as such include a variety of surveys in support of SW's Gate 2 submission, DCO preparation and EIAs.

For Phase 2 of its pre-DPC activity, SW will continue to utilise the established S&I frameworks. The contents of Phase 2 have been in development during Q2 and Q3 of 2021. It will include additional sub-strategies which focus on pieces of work that lie on the critical path and must be completed in order to achieve DCO approval and allow for a CAP to be appointed. This phase of activity is being prepared in consultation with key stakeholders including regulators (EA, NE, Ofwat etc.) and other members of the delivery team and will include but is not limited to:

- Environmental technical appraisals and studies;
- Modelling, including Cormix and 3D modelling;
- Support activities to further SW's Optioneering, DCO and EIA processes;
- Terrestrial ecology surveys, including bats, breeding birds, Hazel Dormouse and badgers; and
- Aquatic ecology surveys, including river habitat and corridor surveys.

SW intends to agree its procurement acquisition strategy for Phase 2 in 2021. The scope of this second phase of pre-DPC activity remains under development, once this has been agreed SW will develop a strategy for the allocation of these works between lots.

For its future enabling works packages, SW has identified the relevant suppliers within the S&I framework and is in the process of engaging suppliers on each framework to better understand their capacity relating to the different packages required. Actions related to the identification of pre-DPC suppliers will include:

- Verifying the capacity of existing framework suppliers to undertake specific packages of work;

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[51] OJEU refers to the Official Journal of the European Union, contains public sector contract tenders and notices from every EU member country.

[52] FTS refers to the Find-a-Tender service, which is a UK procurement portal launched following the UK's exit from the European Union.

[53] The 5 S&I frameworks include Catchment Management Strategy and Delivery, Wastewater investigations, Environmental monitoring, assessment & implementation, Asset investigations and flow monitoring, and Water Resourcing Management and Investigations.

- Proactively maintaining conversations with suppliers to understand their long-term capacity. This may allow SW to secure resource for a longer term and understand whether added value can be gained from awarding bulk packages to specific suppliers; and
- Identifying those packages of work that will not be awarded to framework suppliers and develop procurement routes for such packages.

DCO planning support services

To support in the development of its DCO strategy and its application and consultation process SW requires input from a variety of services and specialisms. Of these, planning and consenting support services are required urgently, and an in-house planning team does not exist. As such, SW has sought Board approval to make a direct award to [redacted] (under the S&I framework) who will provide interim support until December 2021, by which time the tender for the DCO partner will have concluded. SW will not preclude [redacted] from competing in the procurement process for the full support works but has ensured that appropriate conflict provisions (such as information barriers) are in place to prevent any unfair advantage.

DCO consultation

The activities required within the DCO consultation are also urgent and there is currently no internal resource that can fulfil the consultation resourcing requirements needed for this SRO. The activities required fit within the SSP framework service scope and can be procured under the SSP framework. The SSP is composed of [redacted] with subcontractors [redacted] are believed to have the required experience and capability to deliver DCO consultations. SW is currently preparing to engage the suppliers on this framework to test their capability and will then assess the most appropriate procurement route.

Pre-DPC engineering and design surveys

In addition to enabling works, SW will also undertake some pre-DPC construction activity. The packages of work and schedules for delivery for these construction works are currently in development, however amongst the packages identified thus far there is a focus on design support required for this solution. SW is currently reviewing which of these work packages can be undertaken by internal resource. For work packages where external resources are required a full scope of work for the packages will be developed that SW will procure using the SSP framework, S&I framework, Environmental framework (EIA), or may undertake a separate procurement (compliant with the UCR 2016) to make an award to a supplier who can support SW with these requirements.

Technical advisory service

Additionally, [redacted] are currently providing a technical advisory service to SW for this solution. At present SW's contract is with [redacted] rather than directly with [redacted] SW has identified potential value opportunities which require investigation, and so will examine the current sourcing method and put forward an optimal approach for delivery as the project develops further.

Early Contractor Involvement (ECI)

ECI denotes the introduction of a contractor's skillset in the early stages of a project to bring design 'buildability' and cost efficiency to the pre-construction phase. SW recognises the unique, large and complex nature of its WfLH programme, and therefore considers that it will benefit from contractor expertise extending across SROs and the DCO and DPC processes. It is anticipated that ECI support will be needed throughout project development, procurement and potentially beyond CAP award, however the long-term scope for the ECI is yet to be determined. At this time, SW is developing its ECI strategy and engaging with relevant suppliers. As the WfLH programme develops, a detailed schedule of activity for the ECI will be developed, however to date SW has identified the following requirements:

- Constructability reviews and construction schedule development (including the production of construction phase plans);
- Advice on the necessary mechanical and electrical systems, commissioning durations, tunnelling approach and other discrete areas as applicable;
- Support through SW's statutory consultation process;
- Tender evaluation during the assessment stages of the procurement process, focusing on technical questions; and
- Reviewing sub-contractors' Risk Assessment Method Statements (RAMS).

These requirements will be further improved or extended during negotiation / dialogue sessions SW has planned as part of the Competitive Procedure with Negotiations procurement route which will be conducted to engage a suitable ECI contractor. SW will seek ECI parties who can demonstrate an extensive background in civil and mechanical engineering, a history of experience in similar or major infrastructure projects, and experience of working with clean water assets.

To secure the support it requires, SW proposes to undertake a competitive procedure with negotiation procurement process competitive dialogue with negotiation procurement process (with a pre-qualification stage and two-stage tender) to engage two non-DPC ECI parties, with award anticipated for July 2022. SW anticipates that these ECI parties will be engaged on an New Engineering Contract (NEC) Option C (target cost) or E (cost reimbursable) basis, over a 9-12-month period, working in parallel and competing for a single award for the construction period.

The successful ECI party will be integrated into SW's WfLH team and will initially be required to undertake a review of the WfLH outline project design statements (and associated documents / plans / drawings, specifications and schedules) currently under development. The design / buildability resource is expected to deliver a number of agreed outcomes regarding the design / buildability of the WfLH project including, but not limited to:

- Providing design and constructability input, including review of key documentation, implementation of best practices and (where possible) standardisation, and the development of a constructability plan;
- Creating and maintaining a constructability lessons-learned database and cost-effective design modification database;
- Undertaking constructability workshops prior to the CAP tender process, focused on the discussion of concepts and sharing of input, developing a plan for constructability implementation during project execution and the identification of opportunities and concerns;
- Providing discrete areas of advice, for example in relation to underground works, major crossings (watercourses, road crossings, critical services etc.) and for works in specific environmental conditions; and
- Reviewing and assisting with the development of a variety of DCO design deliverables.

To address its urgent need for support in its construction and commissioning schedule development (whilst it procures formal ECI support) SW has engaged early Buildability Construction Management (BCM) support under its SSP framework.

2.11.2.4. Design Maturity

Detailed information on SW's design development can be found at the following locations in this document:

- The anticipated level of design maturity can be found in sections 2.2 Engineering Design, 2.3 Network Infrastructure and 2.4 Site and Route Selection;

- Detail on project risks and their potential to impact the development of design maturity can be found in section 2.7 Risk Management; and
- Detail on SW's planning and consenting strategy (including EIA) can be found in section 2.8 Planning and Consenting.

To facilitate the procurement process, SW will ensure that the design process balances the certainty required for the purpose of planning applications and the DCO approval process (sufficient to mitigate the risk that planning is not achieved), with the need to maintain a level of flexibility and Optionality that will allow bidders to demonstrate their knowledge and skillset, and to add value to the final solution design. A less tightly defined scope will provide bidders opportunity to develop the most efficient and cost-effective engineering solutions.

SW's current programme timetable provides for the submission of its DCO application in late 2023, with determination anticipated to be given in early 2025. This means that the details of SW's application will be available to bidders in advance of the procurement process, and that determination would be given before the end of the procurement process, allowing bidders to reflect any changes in their submissions.

Engineering documentation provided for the tender process will be split between "rely-upon information" (information that has been used to inform the DCO application, and the remaining information (provided "for information only") that will be provided to enable the bidders to submit a detailed submission that can be normalised for evaluation.

Informal Market Engagement Feedback

As part of its Gate 2 solution development, SW also collected feedback on the level of design maturity required by bidders for the CAP tender. The key points noted by strategic investors and construction contractors were as follows:

- Since the detailed design is expected to be developed by bidders, any initial design works carried out by SW should still give bidders the flexibility to innovate whilst adhering to DCO process requirements. Participants believed that an optimum pre-tender design leaves room for change and improvement;
- Participants suggested that SW should progress the design envelope enough to meet the DCO approval requirements without limiting the CAP's ability to drive innovation and cost savings;
- Participants highlighted that clarity on the level and scope of the initial design and SW's expectations for the detailed design would be key to developing bid submissions as part of the tender process;
- Participants were favourable towards SW engaging with an early design contractor to help develop the initial design especially in preparation for the DCO approval;
- A water recycling asset has more interaction and interfaces with other SW assets when compared to other solutions considered. For the tender, more information on the interfaces is required to develop a bid submission; and
- Bidders are of the view that pilot trials may be very useful due to the variability of water quality in wastewater abstracted for Water Recycling solution[54].

This feedback is consistent with the late model, under which bidders will expect SW (as incumbent) to have secured the necessary planning permissions based on a reference design. SW will work with its ECI contractors to ensure that the planning, consenting and DCO processes do not unduly restrict the ability of bidders to optimise their designs. Having considered participants feedback in respect of pilot trials, SW does not intend to undertake any such trials in advance of the procurement process.

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[54] See section 2.2 Engineering Design for information on pilot trials that SW plans to undertake. It may be that bidders elect to undertake further pilot trials to support design development.

2.11.2.5. Confirmation of Preferred Tender Model and Commercial Model

Tender Model

The late model with early market engagement has been identified as the preferred tender model for the Water Recycling solution. Under this model the solution is tendered out as a DBFOM once SW has obtained the requisite consents.

To reach this decision, SW has developed and applied an assessment framework against the four potential tender models identified at Gate 1. Internal workshops were conducted to down-select 2 models to be tested with the market as part of SW's Gate 2 informal market engagement[55]. Bringing together feedback from the informal market engagement with SW's assessment, the late tender model with early market engagement was selected as the preferred model.

Table 107 below details the stages of tender model review.

Table 107 - Preferred tender model stages of review

Review stage	Scope
Initial review of tender models	Four tender models assessed that have been identified for further progression at Gate 1: a) late with early design, b) late with early market engagement, c) late with novation of early designer or d) late with split Design and Build (D&B) from finance.
Workshops with key SW SMEs	Preference for late with early market engagement or late with split D&B from finance.
Informal market engagement feedback	Preference for late with early market engagement.

Key justifications for the selection of late model with early market engagement are:

- The late model (or a version thereof) is necessitated by SW's timetable constraints. Were SW to follow the early model, the procurement of the CAP and planning application process would typically be undertaken sequentially. Given the time required for each of these activities, SW would be unable to meet its timetable obligations. Under the late model, SW is able to pursue the necessary planning and consents in parallel with its procurement process to enable the solution to be delivered as quickly as possible once a CAP is appointed. The late model is therefore the most time-efficient of the Options considered;
- Although there are limited examples of water recycling plants on this scale in the UK, there is a wide pool of international contractors expected to drive competition from D&B perspective and therefore there is less need for SW to propose the late split model in order to keep competitive tension throughout the tender process;
- Tendering the full spectrum of DBFOM activities will lead to a more straightforward risk allocation between the CAP and SW and will minimise the number of interfaces required at the early stages of the project; and
- The late with early market engagement Option emerged as the clear preference of potential bidders. Potential bidders believe that under the proposed late model with early market engagement they would be able to offer greater VfM through the integration of all DBFOM activities into one proposal, facilitating innovation, minimising interface risks and ensuring overall alignment of risk allocation.

Under the late model with early market engagement, SW is expected to play a key role in the need identification, Option selection, design and consenting activities. The project hand over to the CAP will occur before the detailed design stage, once consent has been obtained based on the initial design developed by SW. The CAP will be responsible for the detailed design, construction, operation, maintenance and financing

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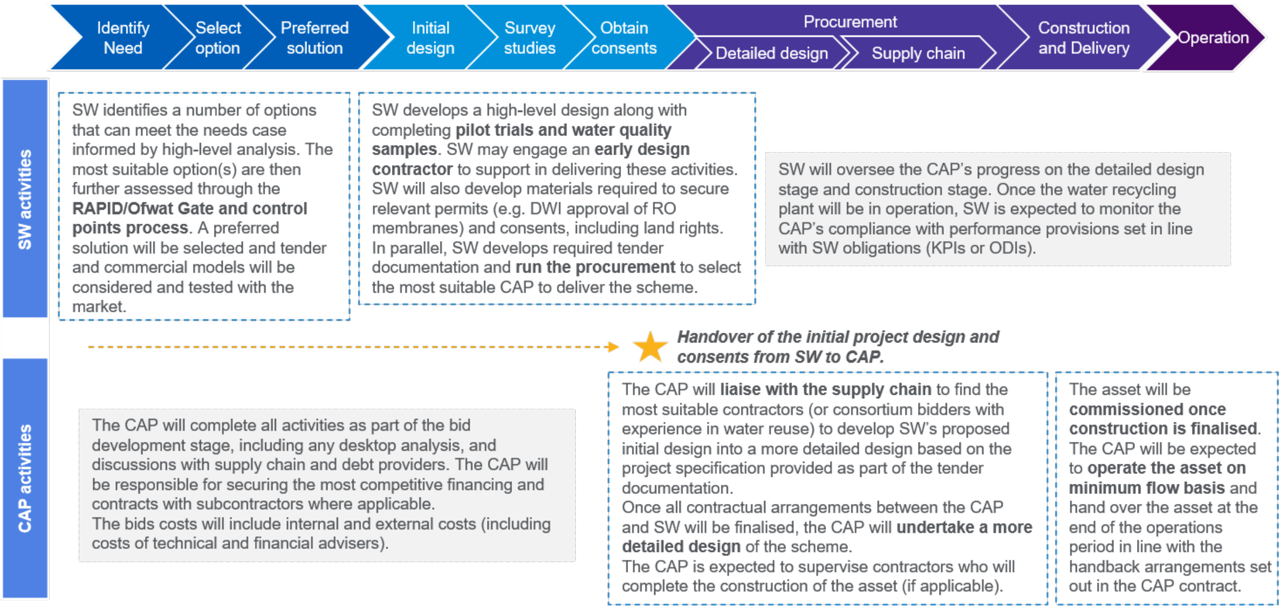
[55] The late tender model with early market engagement, and the late tender model with split D&B from finance.

of the solution. Under this model the ownership of the solution would sit with the CAP for the duration of the contract term, after which it would be transferred back to SW, or if SW chose to re-tender, transferred to a new owner. Figure 77 illustrates the key activities under the late model with early engagement for SW and CAP along the project lifecycle.



SW identifies a number of options that can meet the needs case informed by high-level analysis. The most suitable option(s) are then further assessed through the **RAPID/Ofwat Gate and control points process**. A preferred solution will be selected and tender and commercial models will be considered and tested with the market.

SW develops a high-level design along with completing **pilot trials and water quality samples**. SW may engage an **early design contractor** to support in delivering these activities. SW will also develop materials required to secure relevant permits (e.g. DWI approval of RO membranes) and consents, including land rights. In parallel, SW develops required tender documentation and **run the procurement** to select the most suitable CAP to deliver the scheme.

SW will oversee the CAP's progress on the detailed design stage and construction stage. Once the water recycling plant will be in operation, SW is expected to monitor the CAP's compliance with performance provisions set in line with SW obligations (KPIs or ODIs).

Handover of the initial project design and consents from SW to CAP.

The CAP will complete all activities as part of the bid development stage, including any desktop analysis, and discussions with supply chain and debt providers. The CAP will be responsible for securing the most competitive financing and contracts with subcontractors where applicable.
The bids costs will include internal and external costs (including costs of technical and financial advisers).

The CAP will **liaise with the supply chain** to find the most suitable contractors (or consortium bidders with experience in water reuse) to develop SW's proposed initial design into a more detailed design based on the project specification provided as part of the tender documentation.
Once all contractual arrangements between the CAP and SW will be finalised, the CAP will **undertake a more detailed design** of the scheme.
The CAP is expected to supervise contractors who will complete the construction of the asset (if applicable).

The asset will be **commissioned once construction is finalised**. The CAP will be expected to **operate the asset on minimum flow basis** and hand over the asset at the end of the operations period in line with the handback arrangements set out in the CAP contract.

Figure 77 - Indicative activities under the late model with early market engagement

Commercial model

The commercial model further develops the work carried out as part the Gate 1 submission and is built upon the basis of the late tender model with early market engagement being identified as the preferred model. The proposed commercial model reflects both the current understanding of the solution and the feedback received from the informal market engagement undertaken to date. It will evolve as the project develops. The commercial model also incorporates a variety of inputs from the wider industry, including Ofwat's DPC guidance, internal workshops with SW SMEs and analysis of precedents from PFI / PPP type projects in the water, energy, rail, and wider infrastructure sector that share similar risk profile, business model, asset type, or appointee structure to the solution.

Contract with the CAP

SW considers that a fixed price contract with the CAP, on a DBFOM basis is the most suitable Option. A fixed price contract provides the greatest protection for SW and customers from price increases. As the expertise in delivering water recycling assets is expected to come from bidders, they are considered to be best placed bear the risk of cost overruns.

Table 108 details SW's high-level proposal for how the contract with the CAP would be structured before the issues are discussed below.

Table 108 - Overview of proposed commercial model

Area	Proposed approach
Contract length	• Subject to any future changes in the projected renewal cost profile, the recommended (operational) contract length is 20 years. This is primarily driven by the renewal sum CAPEX in year 21 of operations (which would be inefficient for a CAP to finance).

Area	Proposed approach
	• The contract will also cover a design period of 1 year[56] and the construction period of 4 years
End of contract asset treatment	• A bullet payment will be made to the CAP based on the end of contract asset value • At the end of the contract, the asset will either be retendered by SW or transferred to SW's control and an amount equivalent to the end of contract asset value added to SW's RCV
Termination	• Contract terms should include termination rights, allowing SW or CAP to terminate the contact based on pre-defined scenarios or targets, such as default scenarios, force majeure, or non-payment by SW
Payment mechanism	• Payment to CAP will start post commissioning • Hybrid model primarily based on availability charge combined with a volumetric element to cover variable OPEX linked to asset utilisation • Refinancing gains to be shared 50:50 between the CAP and the customers[57] • Performance targets with associated incentives / penalties
Acceptance and late service commencement	• Liquidated damages for late service commencement May include financial incentives for timely asset delivery, e.g. early delivery bonuses • Clearly defined criteria and process for acceptance
Operational performance	• Most risks are expected to be transferred to the CAP, e.g. EA water quality risk, process risk, leakage, response time and critical spares • Some will be shared between the parties (e.g. DWI water quality risk, volume uncertainty

- An **operational term**[58] of 20 years has been selected as the term that achieves the best alignment between the nature of the solution, the asset lives of its principal components, the appetite of stakeholders (such as SW's regulators), the market, the available financing solutions, the project's VfM proposition and SW's long-term objectives;
- The solution's **renewal CAPEX profile** forecasts significant expenditure in operational year 2021[59]. If financed by a CAP this would require the maintenance of inefficient cash reserves throughout the contract term, diminishing the VfM provided by the project. Assuming a straight-line depreciation over the asset life the large renewal CAPEX in operational year 2021 significantly increases the bullet payment at the end of the contract should a term beyond 20 years be selected. Further, the selected contract length matches bidders' preference for a shorter contract[60], and aligns with the typical length for bank financing, which is considered the most likely financing route for this solution due to its first-of-a-kind nature. Shorter terms also allow bidders to fix their Operation & Maintenance

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[56] This timescale is an estimation only at this stage. SW anticipates that the CAP's design activity will be predominantly undertaken during the procurement process, and that post-award, the CAP will place the necessary orders with its supply chain and put in place arrangements for delivery. See section 2.9 Schedule for further information on the anticipated timetable for project delivery.

[57] SW anticipates that a refinancing event may take place post-commissioning. The current 50:50 assumption is in line with Ofwat's guidance but will be tested further to ensure that the CAP is appropriately incentivised to reduce financing costs.

[58] Here, operational term refers to the operational period which begins once the asset has been successfully commissioned.

[59] Based on the Gate 2 cost estimate profile, c.£109m of renewal capex will be required in OY21.

[60] In the market engagement conducted to date, bidders expressed a preference for a contract term of below 25 years or 25-30 years.

(O&M) costs[61], creating opportunity to drive additional efficiency. In all, these factors coalesce to present a 20-year operational term as the optimal length;

- Taking the above into account for the **end of contract asset treatment**, SW has elected to make a bullet payment to the CAP at the end of the contract term. This approach reflects the difference between the 60-year life of the asset and the 20-year term of the CAP agreement, ensuring that customer affordability is not compromised in favour of full repayment over the term.

  Whilst a bullet payment will be made, this may be subject to an assessment of the asset condition at hand back[62]. Once finalised, the asset depreciation profile will drive the size of the bullet payment, however this is yet to be determined and will be subject to further calibration. Market engagement has shown that bidders are open to and generally supportive of the inclusion of a bullet payment, however it will be key to understand how the potential size of the bullet payment may impact upon bidders' appetite to participate in the procurement and their submitted prices. SW may look to test the financial implications of various depreciation profiles to ascertain their impact upon customer benefit and consider questions related to intergenerational fairness (such as bill impact and affordability). At the end of the CAP contract, the asset will either be retendered to find another provider to take over the asset, or will return to SW's control, with an addition made to SW's RCV equal to the remaining value of the asset;
- **Termination rights** are typical for PPP / PFI project finance arrangements and will be expected by the market, in particular for certain no fault (e.g. force majeure), Appointee default (e.g. non-payment) and CAP default scenarios.

  Ofwat has recognised that the requirements of SW's licence and other statutory obligations cannot be transferred to the CAP, and so SW must retain the contractual right to address service failures which may result in adverse effects for customers and liability for SW. As such, SW is likely to seek automatic step-in rights where certain water quality standards are compromised[63] (for example where cryptosporidium is detected), and to introduce a "termination for convenience" clause, whereby the contract can be terminated at SW's will without the need for cause, providing a safeguard for SW in its activities as water undertaker.;
- With regard to the **payment mechanism**, a hybrid model will include an availability-based payment (likely linked to the provision of a set minimum-flow level) and a volumetric element covering variable OPEX reflecting the level of asset utilisation (e.g. an increased level of asset output). Variable costs will also be based on a schedule, that is, defined costs at different levels of operation.

  This approach reflects the solution's position as a resilience asset and will increase the VfM for customers, who will pay for asset utilisation (above an agreed minimum flow) only where it is required, for example in drought conditions. Further performance penalties and incentives (tailored to the detailed operational characteristics of the solution) may also be employed to ensure that the CAP is appropriately incentivised to maintain the asset's availability in times of need. SW will also consider additional components of the payment mechanism which may help to drive additional VfM, including a refinancing gain share[64] (expressed through a reduction in customer charges) and the potential for the indexation of revenue streams, subject to further analysis;
- **Acceptance and late service commencement** provisions will need to ensure that the CAP is financially incentivised to ensure timely delivery. It will need to avoid creating a disproportionate downside exposure that would be reflected in bid prices.

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[61] Bidders would likely seek contractual mechanisms that would allow maintenance costs to be adjusted in the event of a longer-term agreement.

[62] Asset condition at hand back could be accounted for through several different approaches, including (inter alia) a deduction from the residual value payment, a deduction from the availability charge (where asset deterioration had been identified earlier in the contract term), and/or the imposition of a requirement for the CAP to post security. The relative merits/demerits of each approach will be considered further as the commercial model continues to develop. Additionally, consideration will be given to the potential process for asset handover, and how a new provider or SW could be given confidence in the end of contract surveys and inspections undertaken by the original CAP. It will also be important to ensure that evidence exists to demonstrate that the maintenance regime has been adhered to over the life of the contract.

[63] During market engagement, one bidder suggested that termination rights should be based on performance-related penalties.

[64] The 50:50 refinancing gain currently proposed is based on existing PFI guidance and precedent.

The payment mechanism will meet this objective in part, as revenues to the CAP will not commence until the asset is commissioned, in line with Ofwat's guidance[65]. However, given SW's need to implement the solution in time for its 2027 regulatory deadline, liquidated damages and early-delivery bonuses may be implemented to ensure committed schedules are achieved. During market engagement, bidders have noted that clear acceptance criteria will be crucial to ensuring that the asset can enter operation in line with both SW's and the CAP's expectations. An independent certifier / verifier may also be engaged, providing both parties with guidance and allowing for an independent and objective view of acceptance; and

- Most **operational performance** risks will be transferred to the CAP, reflecting its assumption of responsibility for operation under the CAP agreement. As noted above, there are risks (particularly relating to statutory obligations) which SW will be unable to transfer, with the effect that both parties will need to co-operate effectively to manage these. SW will also look to ensure asset condition inspections are undertaken regularly as this will inform the asset's deterioration profile.

The contractual arrangements between the CAP and SW will be outlined in more detail as the commercial model is developed further and will be reflective of a more developed understanding of project risks.

Risk allocation

The principles bulleted below underline the high-level risk allocation exercise that has been undertaken to date:

- Ofwat's DPC principles state that risks should be allocated to those best able to manage them;
- Risk allocation impacts bidders' appetite to participate in the CAP tender and submit a bid;
- The information shared with bidders will affect their willingness to accept ownership of risk; the more information is shared with bidders during the procurement the more likely they will accept responsibility for a particular risk;
- Bid prices will be reflective of the level of information shared and the overall allocation of risks between the parties; and
- SW may consider reopeners for risks that cannot reasonably be managed by the CAP.

Table 109 below identifies some of the key risks that are applicable to the delivery of the solution within the DPC model. Risks are allocated at a high-level between customers, the CAP and SW, reflecting the party principally responsible for each risk, or whether a particular risk is expected to be shared between parties.

SW has tested its outline risk allocation with the market through an informal market engagement exercise. Participants were provided with a version of the table below that detailed a summary explanation of the risk and the rationale for its allocation. The exercise provided SW with valuable feedback on individual risks, which has been incorporated into the explanations set out below. Overall, participants agreed that the proposed risk allocation was appropriate, noting its similarity with other comparable projects.

Table 109 - High-level allocation of risk between parties

Risks and considerations	Customer	CAP	SW
Consenting			■
Planning			■
Reference design			■
Detailed design		■	

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[65] This position aligns with Ofwat's DPC principle that customers should not pay for assets until they are in receipt of the benefit they provide.

Risks and considerations	Customer	CAP	SW
Ground conditions		▨	▨
Programme		▨	
Sub-contractor performance		▨	
Asset handover		▨	
Commissioning		▨	
Land access rights		▨	▨
Construction Costs		▨	
Operating costs		▨	
Interoperability / Interface	▨	▨	▨
Finance		▨	
Regulatory (Ofwat/RAPID/DWI)		▨	▨
Availability risk		▨	
Operational performance		▨	▨
Force majeure	▨	▨	
Change in law	▨	▨	
Bad debt	▨		▨

Other risks

Other risks to be considered as part of the risk allocation include ecology risk, water conditions risk, first of a kind risk, risk related to stakeholders, power, grid capacity, DCO, archaeology, incentives, 3rd party providers, liabilities and guarantees, operating concession, asset hand back/condition, consents, uninsurable events, etc.

At a high level, the risk allocation in the table above reflects the use of the late model for the procurement of the CAP. As is typical for the late model, SW will assume responsibility for planning, consenting, reference design and other early risks associated with the activities it will undertake in advance of contract award to support the delivery of the scheme. Should any of these risks materialise SW will bear the costs associated (including once CAP appointment has occurred), for example costs associated with the granted DCO and any other consenting activities undertaken pre-award.

Once an award has been made, the CAP will take ownership for detailed design, programme and project management (including the management of sub-contractor performance), construction, financing, operation, maintenance, and other delivery risks. It will be responsible for delivering the solution in line with all DCO conditions and for managing any associated risks. Under a fixed price contract, the CAP will also assume the risk of cost overruns during both construction and operation.

Some risks will be more complex in their allocation, leading to a sharing of responsibility between parties, typically between SW and the CAP, but in some instances with costs also passed through to customers. SW has engaged with market participants about risk allocation[66] and found support for the positions adopted.

- **Ground risk -** Ground risk represents one of the most significant challenges to the delivery of large assets, particularly during the construction phase. Understanding the environment typically requires a programme of surveys, studies, and investigations to be undertaken, generating information that

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[66] During the market engagement exercise, SW showed participants a version of Table 6 – High-level allocation of risk between parties, with a selection of summary points beneath each item as a prompt for discussion.

can be used to allocate risk based on the specific characteristics of the area in question[67]. SW currently anticipates that the CAP will assume the risk of standard ground condition variations, whilst SW will retain unforeseeable ground condition risk, although it is noted that bidders are only likely to accept risk exposure for ground conditions where a sufficient level of geotechnical and topographical information is made available as part of the tender process[68];

- **Land and access rights** - Risks related to land and access rights will also be shared between SW and the CAP. SW will bear the initial risk as it acquires the necessary rights, before granting the rights to the CAP to enable them to comply with their commitments and obligations under the agreement. The CAP must ensure that it complies with the terms of any rights as set by SW, who will likely seek to ensure that it has a route to compensation where liability arises in response to the CAP's conduct or activity. SW will need to also consider any reputational issues arising through the CAP's activities, and as such will likely look to work proactively with the CAP throughout delivery and operation;
- **Interface risk** – This risk will be shared between SW and CAP, as whilst the CAP will be responsible for constructing a fit for purpose interface between the solution and SW's wider network, it will be reliant upon a clear specification from SW upon which it can base its design. Once operational, risk related to issues arising from co-ordination of the asset's operation and the flow of information between parties will be shared between SW and the CAP. When tested with informal market engagement participants, interface risk was recognised as prominent for this solution, primarily because of the input/output relationship between the CAP and SW. SW will be responsible for providing the CAP with effluent in line with pre-defined parameters in order for treatment to create output that meets SW's specifications. The key mitigant to this risk will be a clear definition of asset to network interfaces and operational input and output requirements;
- **Change in law risk** - Regulatory change and change in law will need to be monitored throughout the project and has the potential to significantly impact all facets of project delivery. At the national level, general changes in law (that is, changes to working time regulations, national minimum wage, and so on) are likely to be borne by the CAP who will be expected to consider these factors as it prepares its bid. SW's current assumption is that specific changes to the regulatory framework (including changes in Ofwat's / RAPID requirements) will likely impact both parties and will be shared between SW, the CAP and customers in some instances. The market engagement participants have challenged this position, suggesting that SW may be best placed to manage this risk. During the procurement, bidders will look to understand the regulatory requirements that currently apply to the project and the potential scope for changes. Where regulatory change is perceived to be likely or significant, this will be reflected through increases in bid prices;
- **Operational risks** - SW intends for the CAP to operate the asset throughout contract term, and as such expects the CAP to assume responsibility for most operational risks, including process, leakage and response time (in the event of a water quality incident or service interruption). Further, it is anticipated that the payment mechanism will be linked to availability, incentivising the CAP to operate the asset effectively and maintain performance levels. However, SW cannot transfer operational risk to the CAP entirely, retaining responsibility for its statutory and licence obligations as water undertaker along with the associated penalties arising from service interruptions and water quality issues. Further, the associated risk to reputation will also continue to be held by SW. As the asset's principal purpose is to provide resilience in dry weather conditions, it is likely that any service failures during a period of increased asset operation (such as during a drought) would both damage SW's reputation and render it subject to regulatory penalty. To address this exposure, SW will likely look to ensure that contractual mechanisms are in place to allow it to recoup any penalty costs from the CAP; and

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[67] It is commonplace for a Geotechnical Baseline Report to be developed and used to allocate risk between parties through a series of baselined parameters.
[68] The level of information shared with bidders during the tender process will impact the contingency built into bids.

- **Bad debt** - Under the DPC model, the Tender Revenue Stream (TRS) will be paid to the CAP by SW. In turn, SW will recover these revenues from customers through the charges regime. Ofwat has stated its preference for certainty in the TRS, and that the current regulatory (building-block) mechanism for the recovery of customer bad debt will therefore continue to apply for DPC revenues. On this basis, this risk will be shared between SW who bears the initial cost of under-recovery, and customers from whom the charges will be recovered in future years.

As stated above, SW has developed its commercial model to a level of detail necessary for its Gate 2 and Control Point B submissions. SW will continue to develop the commercial model and risk allocation as solution development progresses beyond these submissions.

2.11.2.6. Internal Approval of Procurement Approach

SW operates a defined governance process for the approval of the 'Strategy' stage of any procurement with a value over £250 k. The Strategy stage is the point at which the preferred procurement route, the process for tender evaluation and award, the supplier payment and contract management approach are all set-out.

Authority for approval of the Procurement Strategy is delegated dependant on the value of the procurement, the thresholds for delegated authority approval are set out in the Procurement Gates Approvals. All procurements valued over £5 m must be approved by both the Head of Procurement and the relevant Functional Director. Additionally, the Procurement Strategy for all Material CAPEX Agreements (such as the CAP agreement) valued over £25 m must be approved by SW's Board.

2.11.2.7. Commercial Arrangements

Outline Contractual Arrangements with the CAP

SW has considered those contractual arrangements which are essential to establishing the commercial model for the CAP. These are set out in Section 2.11.1.6 above and are summarised below in this section. As the project develops, a broader range of contractual arrangements will be considered at a greater level of depth in preparation for the procurement process.

Key Activities to Develop Commercial Arrangements with the CAP

The commercial terms outlined in this document are at the principal level and SW will further document, test and validate the suggested delivery route as part of the Gate 3 submission and Control Point C. This will include:

- *Conducting further market engagement* - including but not limited to the issuance of non-call for competition notice release requesting suppliers (including contractors and finance providers) to express interest in pre-market engagement. SW will clarify objectives to potential bidders and describe the anticipated procurement process and contract structure to receive feedback. SW will use the market engagement to inform bidders about the regulatory framework underpinning the delivery of the solution and give them confidence in the process through the representation of RAPID at the market engagement;
- *Developing the detail of the commercial DPC arrangements* - including, but not limited to;
    - *Payment mechanism terms* – Calibration of the operational incentives / penalties, review of the proposed financial gain share mechanism, establishing the approach to indexation and considering potential pass-through items
    - *Approach to commissioning* – Considering the benefits of a possible staged approach and potential revenue payment to CAP during the commissioning period

  - *Bid cost reimbursement* – Considering whether bid cost reimbursement is necessary to drive interest, and if so, what would represent the optimal level of reimbursement that would drive competition in the bidding process while minimising costs to customers
  - *Collaboration* – Looking at how ongoing improvement and efficiency can be achieved through the DPC model
  - *Termination and termination payments* – Exploring monitoring requirements, minimum performance targets and required step-in rights, as well as the associated termination payments in various termination scenarios
  - *Acceptance and late service commencement* – Assessing the right level of liquidated damages; considering the role of the Independent Technical Advisor (ITA) and an independent certifier / verifier facilitating acceptance, commissioning, maintenance, solution handover and evaluating the efficacy of a bonus payment to facilitate / incentivise timely delivery
- *Refining the risk allocation* - Refining risk allocation to reflect the details of the commercial model focusing on the risks that will be shared between the CAP and SW, such as planning risk, ground conditions, sea and marine works, land access rights and ownership, interoperability, water quality risk, 3rd party providers, regulatory risk and change in law and force majeure events. Each of these risks will be assessed individually along with potential mitigants. Sharing arrangements will be calibrated based on a tailored approach to ensure market interest for the tender process and a VfM outcome for customers. SW will explore which change control mechanisms are required for efficient risk sharing arrangements that provide adequate protection against price increases and thus safeguard the value to customers under the DPC model. Risk allocation will be informed by feedback collected from potential bidders as part of the market engagement exercise. As part of the risk allocation SW will consider the regulatory framework to ensure there is no misalignment between the CAP contract and SW's regulatory framework that could put customer value at risk.

Further Activity to Develop the Procurement Strategy

SW will also undertake the following activities to further develop and enhance its procurement strategy:

- *Continuing the VfM analysis* **-** SW will confirm the solution's suitability for DPC as part of CP C by revisiting the VfM analysis based on latest information on solution scope and cost information and considering other factors that may impact the value proposition under a DPC model;
  - SW will revisit Ofwat's standard VfM assumptions and will use the market engagement to set the key inputs in the VfM analysis to ensure the results are reflective of the nature of the solution and a possible future CAP tender outcome to the extent possible.
  - SW will develop and use a robust financial model bringing together key aspects of the solution delivery, such as cost profiles, maintenance regime, financings costs, depreciation profile, etc. to capture all key cost factors which may influence VfM under the DPC model. SW will also consider whether the solution is suitable for a DPC model in light of the current timeline. Specifically, SW will assess how the DPC model may impact the overall delivery schedule, SW's ability to meet its obligation under s20 and what mitigation can be considered to address the risk of any delay.
- *Developing the evaluation framework* - Developing a detailed tender design and evaluation framework to be applied to bidders as part of the procurement. The SQ and ITT questions and evaluation guidance will need to be prepared in line with the objectives set for the procurement process as a whole as well as for the individual stages. A financial model will need to be developed capable of comparing the DPC 'Factual' case against the SW-delivered 'Counterfactual' for the purpose of carrying out the VfM assessment. As part of the tender design development key considerations will include the level of technical detail / design expected as part of the bid submission, whether bidders will be required to provide fully committed financing, delivery plan, risk mitigants, etc. SW will also consider how collaboration can be applied throughout the tender process

to mitigate procurement risk. As part of this work, SW will prepare a negotiation plan, outlining those commercial terms that are non-negotiable as well as the process for negotiating with bidders (and Ofwat[69]) throughout the tender process;

- *Refining the critical path* - Refining the implementation plan to reflect emerging views on the outline design and DCO processes. This will include consideration of the critical path under both DPC and non-DPC delivery routes, interdependencies across DCO, outline design, procurement, the trade-offs between various configurations of the overall process and input/output relationships between activities;
    - SW will identify key risks to the delivery timeline and establish possible mitigants to keep solution's schedule in line with SW's legal and regulatory obligations. SW will assess what activities could be brought forward and what ECI work could be delivered before DCO approval to accelerate the overall solution delivery. As part of this SW will investigate the opportunity to decouple specific activities from the scope of the DPC procurement and bring forward activities either through the appointment of an ECI contractor or by reimbursing costs to facilitate the CAP's mobilisation and progress with specific aspects of the design. SW will carefully examine how accelerating certain activities will impact on the CAP's ability to innovate and drive value to customers. The recommended approach will aim to balance the timeline constraints with retaining flexibility in the process for the CAP.
    - SW will continue to consider both DPC and in-house procurement Options in the context of the project's critical path. SW will review its programme to determine at which point in time a switch from the DPC model to in-house delivery may delay the overall schedule and may put timely delivery of the solution at risk. Findings from the work on the implementation plan will be considered when establishing the solution's suitability for DPC.

In parallel to the validation of the suggested delivery route, SW's activities to secure key approvals as part of the pre-tender preparation and to prepare for the CAP tender must also continue. These will include, but are not limited to:

- Further development of SW's initial design to a level sufficient for the procurement and DCO processes;
- Procuring support for the DCO consultation and planning processes;
- Obtaining DCO approval to facilitate the CAP's delivery of the solution. The procurement documentation and project agreement will need to reflect any conditions imposed as part of the granted DCO;
- Completing the Control Points (A, B, C, D, E and F) in Ofwat's DPC process; and
- Procuring an Independent Technical Adviser (ITA) as per the requirement from Ofwat and SW's licence obligation.

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[69] SW notes Ofwat's requirement that it should be notified of changes agreed to during the procurement that materially impact customer charges. The nature of SW's engagement with Ofwat during the procurement process is yet to be determined.

Appendix A – Option B.3

Option	Description
Option B.3	61 Ml/d Recycled water sent direct to Otterbourne Water Supply Works (WSW) Budds Farm WTW transfer to new Water Recycling Plant (61 Ml/d), transfer direct to Otterbourne WSW for treatment

Option B.3 ranked fourth at Gate 1 of the ten Options put forward under the three SRO Solution categories. Following further technical investigation after Gate 1, risks and uncertainties around the feasibility and deliverability of this Option were identified. As a result, Option B.3 is considered too unreliable for it to be a genuine alternative to the Selected Option, particularly in the context of the urgent need to meet the duty to supply through the WfLH Programme.

Work was therefore stopped on this option and it was not progressed through the OAP. This was confirmed through the WfLH programme governance and by the Executive Programme Board.

Description of Option B.3

- Budds Farm WTW transfer to new Water Recycling Plant (61 Ml/d), recycled water transfer direct to Otterbourne WSW for treatment and supply into the network.
- 61 Ml/d Recycled water sent direct to Otterbourne Water Supply Works (WSW). Global water industry terminology defines the solution as either direct potable or, in the UK, direct water recycling.

Background to decision

Option B.3 is a direct water recycling solution. Direct water recycling is current not in use in the UK, and is a relatively novel approach internationally, as there are only circa four operational plants globally. From a UK legislative and regulatory perspective, successfully implementing direct water recycling is complex as there is no specific integrated policy or regulatory framework in place regarding the implementation of direct water recycling. As it is a new process in the UK, there are greater unknowns than associated with other water recycling technologies, which would necessitate additional data and piloting to provide confidence under the drinking water safety plan process. A technical consultant [redacted] was commissioned to provide an expert opinion and recommended that SW should implement water recycling using a phased approach, beginning with implementation of indirect water recycling. When considering these points in combination with the context of the urgent need to deliver a long term water resources solution to meet its duty to supply, and potential for delays due to the lack of integrated policy or regulatory framework, SW concluded that this option is currently too unreliable to be appropriate for further consideration as an SRO for Hampshire at this point in time.

Globally there are only four currently operational direct water recycling schemes USEPA[70] (2017), see following table.

Name of Direct Potable Reuse Scheme[71]	Location	Status
Colorado River Municipal Water District Raw Water Production Facility Big Spring Plant	Texas, USA	Operational
Goreangab Water Reclamation Plant	Windhoek, Namibia	Operational
Beaufort West	South Africa	Operational

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[70] USEPA, United States Environmental Protection Agency (2017) Potable Reuse Compendium.

71 For the purposes of this Appendix, reference to 'direct potable reuse' is from [redacted] and means direct water recycling.

Name of Direct Potable Reuse Scheme[71]	Location	Status
eMalahleni Municipality	South Africa	Operational
Cypress WTP Emergency DPR projects	Wichita Falls, Texas, USA	Decommissioned
Village of Cloudcroft (blended spring water)	New Mexico, USA	Built but delayed
El Paso – Advanced Water Purification Facility	Texas, USA	Undergoing regulatory approval

All of the schemes are located in hot, dry areas (Texas USA, Namibia & South Africa) and are therefore required as permanent sources of potable supply. Currently, there are no direct water recycling schemes in Europe or the UK. From a UK regulatory perspective, there is no specific integrated policy framework for the successful implementation of direct water recycling. Also, there is no publically available policy documentation from the water industry regulators that provides specific views and guidance on the implementation of this technology.

The UK does not have mature water recycling-specific regulation, and greater clarity is needed before it can be genuinely considered (UKWIR, 2014 Executive Summary)[72]. Technological, governance and management competencies need to be cultivated within the water sector to enable direct water recycling as a viable option (UKWIR, 2014 Executive Summary). The “cultivation” suggested by UKWIR requires additional time, which is at odds with delivery of the WfLH SRO to meet the urgent need in Hampshire, in accordance with the All Best Endeavours obligation under the s20 Agreement.

UKWIR highlights uncertainties in non-regulatory legal and regulatory positions as key areas that act as obstacles to the development of direct water recycling schemes (UKWIR p 76, 2014). The EA, DWI and Government do not have clear public positions on direct water recycling. The UK Government can influence the introduction of effluent recycling schemes through publication of policy documents and guidance, such as the 2011 Water for Life White Paper which did not refer to direct water recycling. In July 2021, the Government recently issued its new Strategic Policy Statement for Ofwat for consultation; however, this more recent publication does not specifically refer to direct water recycling. The EA has previously issued a Position Statement where it supported indirect water recycling, but this was silent on direct water recycling as an option (EA, 2011)[73] and in any event, the Position Statement was later withdrawn in June 2016. This further adds to the lack of clear policy support for and specific regulatory framework on implementing direct water recycling as a long term water resources solution and the uncertainties associated with this as a reliable water resource solution that can be successfully delivered and operational in a timely way.

Following our Gate 1 submission, the DWI provided feedback on direct water recycling advising that it will not determine whether direct water recycling is appropriate or not. SW would be required to provide the DWI with sufficient evidence on a number of points to enable a direct water recycling scheme, including:

- Technical data to back up and support the use of the scheme (given there are currently no operational site in the UK, and very few worldwide);
- Proof that the process challenges can be safely and robustly managed;
- Sufficient design redundancy and safety factors;
- Evidence to demonstrate that this option is supported by our customers and stakeholders (as there is a high degree of risk surrounding public and customer acceptance) and that SW can meet Regulation 4, Wholesomeness with such a technology.

Another key point highlighted by the DWI was that there needs to be a Regulation 31 approved Reverse Osmosis membrane, which is something that does not currently exist. This does not apply to any of the

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[72] UKWIR, (UK Water Industry Research) (2014) ESTABLISHING A ROBUST CASE FOR FINAL EFFLUENT REUSE - AN EVIDENCE BASE – Report Ref. No 14/WR/29/3

[73] Environment Agency “Position Paper - Effluent re-use for potable water supply” (2011), withdrawn 21/10/2016. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/561829/geho0811btvt-e-e.pdf

other recycling options considered as they are all indirect (i.e. they use an environmental buffer) so the membranes are not in contact with the clean water supply. This further compounds the uncertainties around the approvals required for direct water recycling, including the amount of time that is needed to get a Regulation 31 membrane for the timely delivery and operation of direct water recycling as an SRO for Hampshire, and the information and evidence required to support it.

[redacted] our technical advisers on water recycling technology, were commissioned to summarise the successful approaches to water reuse in the US and make recommendations on the various configurations of water reuse that could be taken in Hampshire, UK (B&C, 2021)[74]. In particular, B&C highlighted concerns that:

- Regulation 31 approval for the Reverse Osmosis membrane does not exist: and
- The integration of water recycling as a drinking water supply is not specifically defined in existing UK policy or regulatory frameworks.

The B&C report recommends that SW implement direct potable water reuse using a phased approach, beginning with implementation of indirect water recycling to build regulatory acceptance, public support, and operational experience of water recycling in England to help with the successful approvals, delivery, and operation of water recycling as a water resources scheme. SW is following this recommendation via its new Selected Option. The B&C report also identifies that considerable time is required to address policy and customer acceptance concerns, which would have a knock-on impact on the overall delivery schedule for Option B.3, if it were progressed. B&C's recommendation also aligns with the UKWIR recommendation to undertake consultation between the industry and regulators, prioritising the most likely water recycling scenarios, and make it a more attractive option (UKWIR, 2015)[75]

Conclusion

- As detailed above, Option B.3 was considered too unreliable for it to be a genuine alternative to the Base Case, therefore work on this Option ceased in in July 2021 and it was not progressed through the OAP.
- Delivering the Selected Option will act as an evolutionary step in water recycling. This will support the implementation of a future water recycling schemes by SW and the wider UK water industry.

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[74] Brown and Caudwell (2021) Option B3, Expert Opinion.

[75] UKWIR, (UK Water Industry Research) (2015) ESTABLISHING A ROBUST CASE FOR FINAL EFFLUENT REUSE PHASE 2: TESTING THE UK REGULATORY FRAMEWORK– Report Ref. No 15/WR/29/4

Appendix B – Full Gantt Charts for B.2 and B.5

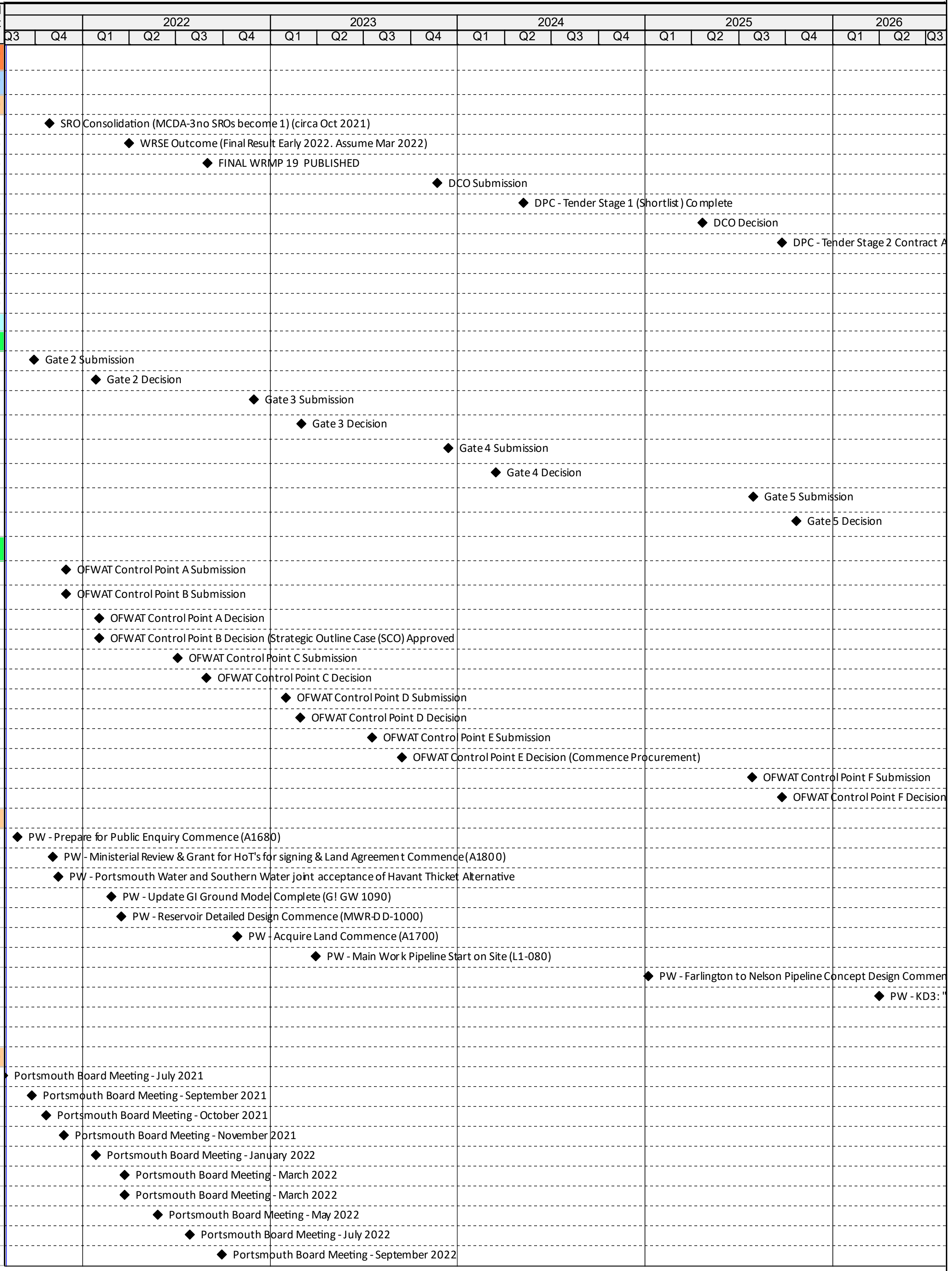
Option B.2 Full Gant Chart

Print: 26-Aug-21

WATER RECYCLING PLANT - OPTION B2 (BASED ON DPC PROCUREMENT ROUTE)

Progressed to 06-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
WATER RECYCLING PLANT - OPTION B2 (BASED ON DPC PROCUREMENT ROUTE)		2338		28-Sep-20 A	17-Dec-30	0
KEY MILESTONES		2324		29-Jul-21 A	16-Dec-30	0
LEVEL 2 PROJECT MILESTONES		2302		27-Sep-21	16-Dec-30	0
RYWR.KEY.00910	SRO Consolidation (MCDA-3no SROs become 1) (circa Oct 2021)	0	0%		29-Oct-21*	0
RYWR.KEY.01000	WRSE Outcome (Final Result Early 2022. Assume Mar 2022)	0	0%		31-Mar-22*	0
RYWR.KEY.00510	FINAL WRMP 19 PUBLISHED	0	0%		31-Aug-22	320
RYWR.KEY.00710	DCO Submission	0	0%		21-Nov-23	11
RYWR.KEY.00810	DPC - Tender Stage 1 (Shortlist) Complete	0	0%		08-May-24	0
RYWR.KEY.00720	DCO Decision	0	0%		22-Apr-25	19
RYWR.KEY.00820	DPC - Tender Stage 2 Contract Award	0	0%		23-Sep-25	0
RYWR.KEY.00010	SECTION 20 AGREEMENT - SRO Operational	0	0%		31-Mar-27*	0
RYWR.KEY.00050	WATER RECYCLING PLANT - READY FOR WET COMMISSIONING	0	0%		15-Apr-30	170
RYWR.KEY.00040	WATER RECYCLING PLANT - OPERATIONAL	0	0%		16-Dec-30	0
GOVERNANCE		1015		27-Sep-21	22-Oct-25	1287
RAPID		1015		27-Sep-21	22-Oct-25	1287
RYWR.KEY.00110	Gate 2 Submission	0	0%		27-Sep-21	121
RYWR.KEY.00120	Gate 2 Decision	0	0%		27-Jan-22	1703
RYWR.KEY.00130	Gate 3 Submission	0	0%		30-Nov-22	1657
RYWR.KEY.00140	Gate 3 Decision	0	0%		02-Mar-23	1607
RYWR.KEY.00150	Gate 4 Submission	0	0%		14-Dec-23	1569
RYWR.KEY.00160	Gate 4 Decision	0	0%		15-Mar-24	1519
RYWR.KEY.00170	Gate 5 Submission	0	0%		29-Jul-25	1327
RYWR.KEY.00180	Gate 5 Decision	0	0%		22-Oct-25	1287
OFWAT		949		29-Nov-21	23-Sep-25	1308
RYWR.KEY.00210	OFWAT Control Point A Submission	0	0%		29-Nov-21	2257
RYWR.KEY.00230	OFWAT Control Point B Submission	0	0%		29-Nov-21	191
RYWR.KEY.00220	OFWAT Control Point A Decision	0	0%		01-Feb-22	2217
RYWR.KEY.00240	OFWAT Control Point B Decision (Strategic Outline Case (SCO) Approved	0	0%		01-Feb-22	151
RYWR.KEY.00250	OFWAT Control Point C Submission	0	0%		04-Jul-22	128
RYWR.KEY.00260	OFWAT Control Point C Decision	0	0%		30-Aug-22	88
RYWR.KEY.00270	OFWAT Control Point D Submission	0	0%		30-Jan-23	101
RYWR.KEY.00280	OFWAT Control Point D Decision	0	0%		27-Feb-23	81
RYWR.KEY.00290	OFWAT Control Point E Submission	0	0%		18-Jul-23	40
RYWR.KEY.00300	OFWAT Control Point E Decision (Commence Procurement)	0	0%		13-Sep-23	0
RYWR.KEY.00310	OFWAT Control Point F Submission	0	0%		28-Jul-25	40
RYWR.KEY.00320	OFWAT Control Point F Decision (Contract Award Enabler)	0	0%		23-Sep-25	0
HAVANT THICKET RESERVOIR INTERFACE MILESTONES		1955		26-Aug-21	02-Jul-29	369
RYWR.KEY.01010	PW - Prepare for Public Enquiry Commence (A1680)	0	0%	26-Aug-21*		0
RYWR.KEY.01030	PW - Ministerial Review & Grant for HoT's for signing & Land Agreement Commence (A1800)	0	0%	04-Nov-21*		0
RYWR.KEY.01020	PW - Portsmouth Water and Southern Water joint acceptance of Havant Thicket Alternative	0	0%	15-Nov-21		2268
RYWR.KEY.01040	PW - Update GI Ground Model Complete (G! GW 1090)	0	0%		25-Feb-22*	0
RYWR.KEY.01050	PW - Reservoir Detailed Design Commence (MWR-DD-1000)	0	0%	16-Mar-22*		0
RYWR.KEY.01060	PW - Acquire Land Commence (A1700)	0	0%	28-Oct-22*		0
RYWR.KEY.01070	PW - Main Work Pipeline Start on Site (L1-080)	0	0%	30-Mar-23*		0
RYWR.KEY.01080	PW - Farlington to Nelson Pipeline Concept Design Commence (HT-FNP-De1020)	0	0%	06-Jan-25*		0
RYWR.KEY.01090	PW - KD3: "Sub System B" System Test (DAF +Pumps (Bed -Far) Complete (L1-KD3)	0	0%		31-Mar-26*	0
RYWR.KEY.01100	PW - ODI (OFWAT) Dry Commissioning Date (Reservoir and Bedhampton HT Pipeline) (L0-050)	0	0%		30-Sep-26*	0
RYWR.KEY.01110	PW - ODI (OFWAT) Wet Commissioning Date (Reservoir and Bedhampton HT Pipeline) (L0-920)	0	0%		02-Jul-29*	0
PORTSMOUTH WATER BOARD MEETINGS		293		29-Jul-21 A	24-Nov-22	0
RYWR.KEY.02010	Portsmouth Board Meeting - July 2021	0	100%		29-Jul-21 A	
RYWR.KEY.02020	Portsmouth Board Meeting - September 2021	0	0%		23-Sep-21*	0
RYWR.KEY.02030	Portsmouth Board Meeting - October 2021	0	0%		21-Oct-21*	0
RYWR.KEY.02040	Portsmouth Board Meeting - November 2021	0	0%		25-Nov-21*	0
RYWR.KEY.02050	Portsmouth Board Meeting - January 2022	0	0%		27-Jan-22*	0
RYWR.KEY.02070	Portsmouth Board Meeting - March 2022	0	0%		24-Mar-22*	0
RYWR.KEY.02060	Portsmouth Board Meeting - March 2022	0	0%		24-Mar-22*	0
RYWR.KEY.02080	Portsmouth Board Meeting - May 2022	0	0%		26-May-22 *	0
RYWR.KEY.02090	Portsmouth Board Meeting - July 2022	0	0%		28-Jul-22*	0
RYWR.KEY.02130	Portsmouth Board Meeting - September 2022	0	0%		29-Sep-22*	0



🟩 Remaining Work
🟥 Critical Remaining Work
◆ Milestone

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Project ID: 710060-B2-1 CURR Standard Layout for Distribution

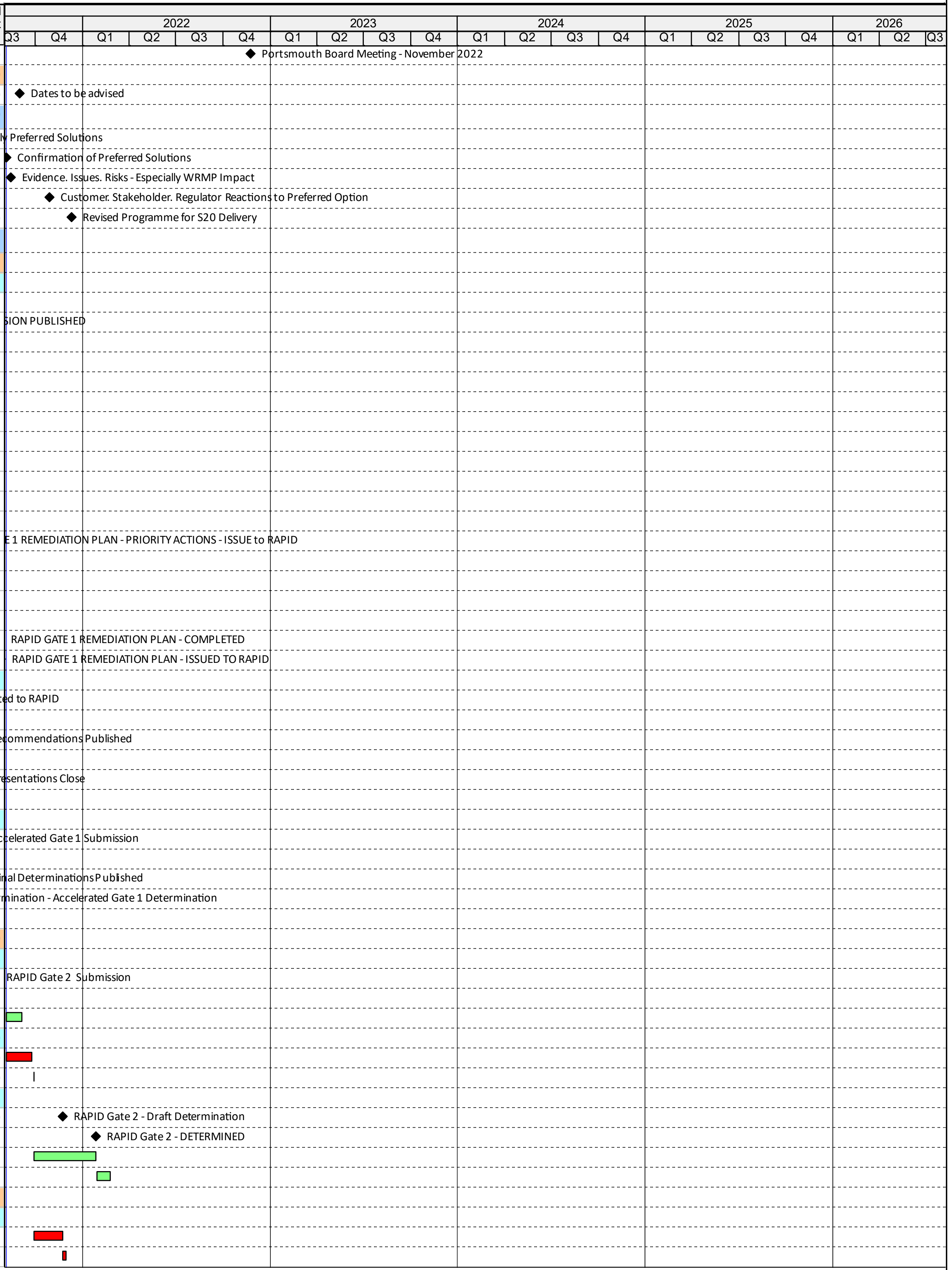
Date	Revision	Checked	Approved
26-Aug-21	WR (B2) Schedule for G1.5 Submission	DC	BM

WATER RECYCLING PLANT - OPTION B2 (BASED ON DPC PROCUREMENT ROUTE)

Progressed to 06-Aug-21

Print: 26-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
RYWR.KEY.02140	Portsmouth Board Meeting - November 2022	0	0%		24-Nov-22*	0
PORTSMOUTH / SW COLLABORATIVE EXEC MEETINGS (dates to be confirmed)		0		31-Aug-21	31-Aug-21	0
RYWR.KEY.03010	Dates to be advised	0	0%		31-Aug-21*	0
SENIOR STAKEHOLDER MEETINGS		88		01-Jun-21 A	09-Dec-21	0
RYWR.CON.00710	Early Preferred Solutions	0	100%		01-Jun-21 A	
RYWR.CON.00720	Confirmation of Preferred Solutions	0	0%		06-Aug-21*	-22
RYWR.CON.00730	Evidence. Issues. Risks - Especially WRMP Impact	0	0%		13-Aug-21*	0
RYWR.CON.00740	Customer. Stakeholder. Regulator Reactions to Preferred Option	0	0%		28-Oct-21*	0
RYWR.CON.00750	Revised Programme for S20 Delivery	0	0%		09-Dec-21*	0
GATEWAYS (RAPID)		1071		28-Sep-20 A	19-Nov-25	1267
GATEWAY 1		0		28-Sep-20 A	26-Jul-21 A	
DELIVERABLES		0		29-Sep-20 A	26-Jul-21 A	
NWSR.GWY.02180	RAPID Gate 1 - Adapt Submission for Publication	0	100%	29-Sep-20 A	01-Oct-20 A	
NWSR.GWY.02190	(GIVE) RAPID Gate 1 - SUBMISSION PUBLISHED	0	100%		01-Oct-20 A	
NWSR.GWY.02200	RAPID Gate 1 - Queries Process	0	100%	29-Sep-20 A	19-Oct-20 A	
NWSR.GWY.02010	RAPID GATE 1 REMEDIATION PLAN - Identify Priority Action Owners	0	100%	04-Jan-21 A	15-Jan-21 A	
NWSR.GWY.02020	RAPID GATE 1 REMEDIATION PLAN - Confirm Priority Actions with Designated Owners	0	100%	11-Jan-21 A	15-Jan-21 A	
NWSR.GWY.02030	RAPID GATE 1 REMEDIATION PLAN - Priority Actions - Workshops - Round 1	0	100%	18-Jan-21 A	22-Jan-21 A	
NWSR.GWY.02040	RAPID GATE 1 REMEDIATION PLAN - Priority Actions - Workshops - Round 2	0	100%	25-Jan-21 A	29-Jan-21 A	
NWSR.GWY.02050	RAPID GATE 1 REMEDIATION PLAN - Develop Draft Schedule for all Priority Actions	0	100%	08-Feb-21 A	12-Feb-21 A	
NWSR.GWY.02060	RAPID GATE 1 REMEDIATION PLAN - Desalination - Prepare Priority Actions Detailed Response	0	100%	15-Feb-21 A	18-Mar-21 A	
NWSR.GWY.02070	RAPID GATE 1 REMEDIATION PLAN - Desalination - Peer SME Legal Review	0	100%	05-Mar-21 A	18-Mar-21 A	
NWSR.GWY.02090	RAPID GATE 1 REMEDIATION PLAN - MARCH UPDATE	0	100%	22-Mar-21 A	26-Mar-21 A	
NWSR.GWY.02080	RAPID GATE 1 REMEDIATION PLAN - SWS Review, Governance & Sign Off	0	100%	19-Mar-21 A	31-Mar-21 A	
NWSR.GWY.02110	RAPID GATE 1 REMEDIATION PLAN - PRIORITY ACTIONS - ISSUE to RAPID	0	100%		31-Mar-21 A	
NWSR.GWY.02120	RAPID GATE 1 REMEDIATION PLAN - APRIL UPDATE	0	100%	26-Apr-21 A	30-Apr-21 A	
NWSR.GWY.02130	RAPID GATE 1 REMEDIATION PLAN - MAY UPDATE	0	100%	24-May-21 A	28-May-21 A	
NWSR.GWY.02140	RAPID GATE 1 REMEDIATION PLAN - JUNE UPDATE	0	100%	26-May-21 A	02-Jun-21 A	
NWSR.GWY.02150	RAPID GATE 1 REMEDIATION PLAN - JULY UPDATE	0	100%	19-Jul-21 A	23-Jul-21 A	
NWSR.GWY.02160	RAPID GATE 1 REMEDIATION PLAN - COMPLETED	0	100%		23-Jul-21 A	
NWSR.GWY.02170	RAPID GATE 1 REMEDIATION PLAN - ISSUED TO RAPID	0	100%		26-Jul-21 A	
ASSURANCE & GOVERNANCE		0		28-Sep-20 A	19-Feb-21 A	
NWSR.GWY.02310	(GIVE) RAPID Gate 1 - Submitted to RAPID	0	100%		28-Sep-20 A	
NWSR.GWY.02250	RAPID Gate 1 - Draft Recommendations	0	100%	20-Oct-20 A	01-Dec-20 A	
NWSR.GWY.02270	RAPID Gate 1 - Draft Recommendations Published	0	100%		01-Dec-20 A	
NWSR.GWY.02290	RAPID Gate 1 - Representations	0	100%	01-Dec-20 A	31-Dec-20 A	
NWSR.GWY.02280	RAPID Gate 1 - Representations Close	0	100%		31-Dec-20 A	
NWSR.GWY.02260	RAPID Gate 1 - Review RAPID Determination & Lessons Learned	0	100%	28-Jan-21 A	19-Feb-21 A	
DETERMINATION		0		28-Sep-20 A	28-Jan-21 A	
NWSR.GWY.02420	PR19 Final Determination - Accelerated Gate 1 Submission	0	100%		28-Sep-20 A	
NWSR.GWY.02430	LoE - RAPID Gate 1 - Determination Period	0	100%	28-Sep-20 A	28-Jan-21 A	
NWSR.GWY.02470	RAPID Gate 1 - Final Determinations Published	0	100%		28-Jan-21 A	
NWSR.GWY.02440	PR19 Final Determination - Accelerated Gate 1 Determination	0	100%		28-Jan-21 A	
NWSR.GWY.02450	RAPID Gate 1 - Draft Determinations	0	100%	04-Jan-21 A	28-Jan-21 A	
GATEWAY 2		138		05-May-21 A	24-Feb-22	2200
DELIVERABLES		20		05-May-21 A	03-Sep-21	2318
NWSR.KEY.00010	START - RAPID Gate 2 Submission	0	100%	05-May-21 A		
NWSR.GWY.00010	RAPID Gate 2 - Authors Briefing	0	100%	05-May-21 A	05-May-21 A	
NWSR.GWY.00020	RAPID Gate 2 - Document Freeze - Collation & Printing - Allowance 1 Calendar Week	29	0%	31-May-21 A	03-Sep-21	3391
ASSURANCE & GOVERNANCE		36		07-Jun-21 A	27-Sep-21	-10
NWSR.GWY.00030	RAPID Gate 2 - SW Governance Approvals	35	0%	07-Jun-21 A	24-Sep-21	-10
NWSR.GWY.00040	RAPID Gate 2 - SUBMISSION TO RAPID	1	0%	27-Sep-21	27-Sep-21	-10
DETERMINATION		102		28-Sep-21	24-Feb-22	1693
NWSR.GWY.00055	RAPID Gate 2 - Draft Determination	0	0%		22-Nov-21	-10
NWSR.KEY.00020	RAPID Gate 2 - DETERMINED	0	0%		27-Jan-22	1693
NWSR.GWY.00050	RAPID Gate 2 - Determination Period (27th January 2022)	82	0%	28-Sep-21	27-Jan-22	1693
NWSR.GWY.00056	RAPID Gate 2 - Lesson Learnt	20	0%	28-Jan-22	24-Feb-22	1693
GATEWAY 3		375		28-Sep-21	30-Mar-23	1597
DELIVERABLES		229		28-Sep-21	30-Aug-22	1576
NWSR.GWY.03010	RAPID Gate 3 - Create Submission Structure	40	0%	28-Sep-21	22-Nov-21	-5
NWSR.GWY.03020	RAPID Gate 3 - Review & Incorporate Feedback from RAPID Gate2 Draft Determination	5	0%	23-Nov-21	29-Nov-21	-10



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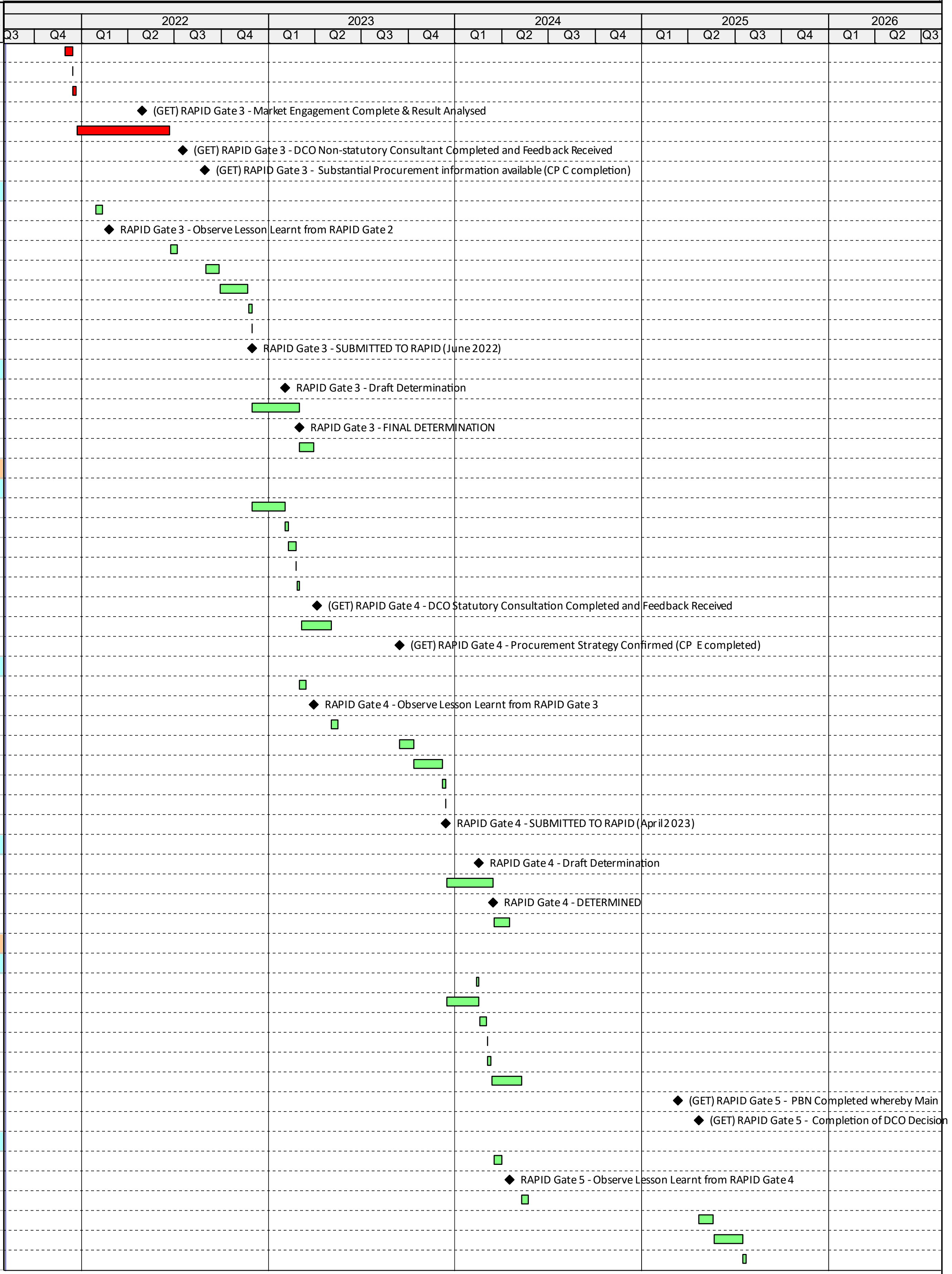
WATER RECYCLING PLANT - OPTION B2 (BASED ON DPC PROCUREMENT ROUTE)

Progressed to 06-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
NWSR.GWY.0303 0	RAPID Gate 3 - Sign Off by Director. Legal	10	0%	30-Nov-21	13-Dec-21	-10
NWSR.GWY.0304 0	RAPID Gate 3 - Confirm by RAPID	1	0%	14-Dec-21	14-Dec-21	-10
NWSR.GWY.0308 0	RAPID Gate 3 - Brief Authors	5	0%	15-Dec-21	21-Dec-21	-10
NWSR.GWY.0310 2	(GET) RAPID Gate 3 - Market Engagement Complete & Result Analysed	0	0%		29-Apr-22	1659
NWSR.GWY.0309 0	RAPID Gate 3 - Create Gateway Deliverables	120	0%	22-Dec-21	22-Jun-22	-10
NWSR.GWY.0310 3	(GET) RAPID Gate 3 - DCO Non-statutory Consultant Completed and Feedback Received	0	0%		18-Jul-22	1606
NWSR.GWY.0310 1	(GET) RAPID Gate 3 - Substantial Procurement information available (CP C completion)	0	0%		30-Aug-22	1576
ASSURANCE & GOVERNANCE		213		28-Jan-22	30-Nov-22	1576
NWSR.GWY.0311 0	RAPID Gate 3 - Review & Incorporate Feedback from RAPID Gate2 FinalDetermination	10	0%	28-Jan-22	10-Feb-22	1703
NWSR.GWY.0312 0	RAPID Gate 3 - Observe Lesson Learnt from RAPID Gate 2	0	0%		24-Feb-22	1693
NWSR.GWY.0313 0	RAPID Gate 3 - Amend Deliverables based on RAPID Gate 2 & Lesson Learnt	10	0%	23-Jun-22	06-Jul-22	1614
NWSR.GWY.0315 0	RAPID Gate 3 - Internal Assurance	20	0%	31-Aug-22	27-Sep-22	1576
NWSR.GWY.0319 0	RAPID Gate 3 - External Assurance	40	0%	28-Sep-22	22-Nov-22	1576
NWSR.GWY.0321 0	RAPID Gate 3 - Legal Review	5	0%	23-Nov-22	29-Nov-22	1576
NWSR.GWY.0323 0	RAPID Gate 3 - Sign off by Board	1	0%	30-Nov-22	30-Nov-22	1576
NWSR.GWY.0325 0	RAPID Gate 3 - SUBMITTED TO RAPID (June 2022)	0	0%		30-Nov-22	1576
DETERMINATION		80		01-Dec-22	30-Mar-23	1597
NWSR.GWY.0332 0	RAPID Gate 3 - Draft Determination	0	0%		02-Feb-23	1576
NWSR.GWY.0331 0	RAPID Gate 3 - RAPID Determination Period (incl Q&A)	60	0%	01-Dec-22	02-Mar-23	1576
NWSR.GWY.0333 0	RAPID Gate 3 - FINAL DETERMINATION	0	0%		02-Mar-23	1597
NWSR.GWY.0334 0	RAPID Gate 3 - Lesson Learnt	20	0%	03-Mar-23	30-Mar-23	1597
GATEWAY 4		340		01-Dec-22	16-Apr-24	1509
DELIVERABLES		194		01-Dec-22	13-Sep-23	1493
NWSR.GWY.0411 0	RAPID Gate 4 - Create Submission Structure	40	0%	01-Dec-22	02-Feb-23	1581
NWSR.GWY.0412 0	RAPID Gate 4 - Review & Incorporate Feedback from RAPID Gate3 Draft Determination	5	0%	03-Feb-23	09-Feb-23	1576
NWSR.GWY.0413 0	RAPID Gate 4 - Sign Off by Director. Legal	10	0%	10-Feb-23	23-Feb-23	1576
NWSR.GWY.0414 0	RAPID Gate 4 - Confirm by RAPID	1	0%	24-Feb-23	24-Feb-23	1576
NWSR.GWY.0415 0	RAPID Gate 4 - Brief Authors	5	0%	27-Feb-23	03-Mar-23	1576
NWSR.GWY.0417 0	(GET) RAPID Gate 4 - DCO Statutory Consultation Completed and Feedback Received	0	0%		05-Apr-23	1603
NWSR.GWY.0416 0	RAPID Gate 4 - Create Gateway Deliverables	40	0%	06-Mar-23	03-May-23	1576
NWSR.GWY.0418 0	(GET) RAPID Gate 4 - Procurement Strategy Confirmed (CP E completed)	0	0%		13-Sep-23	1493
ASSURANCE & GOVERNANCE		200		03-Mar-23	14-Dec-23	1493
NWSR.GWY.0421 0	RAPID Gate 4 - Review & Incorporate Feedback from RAPID Gate3 FinalDetermination	10	0%	03-Mar-23	16-Mar-23	1607
NWSR.GWY.0422 0	RAPID Gate 4 - Observe Lesson Learnt from RAPID Gate 3	0	0%		30-Mar-23	1597
NWSR.GWY.0423 0	RAPID Gate 4 - Amend Deliverables based on RAPID Gate 3 & Lesson Learnt	10	0%	04-May-23	17-May-23	1576
NWSR.GWY.0427 0	RAPID Gate 4 - Internal Assurance	20	0%	14-Sep-23	11-Oct-23	1493
NWSR.GWY.0428 0	RAPID Gate 4 - External Assurance	40	0%	12-Oct-23	06-Dec-23	1493
NWSR.GWY.0431 0	RAPID Gate 4 - Legal Review	5	0%	07-Dec-23	13-Dec-23	1493
NWSR.GWY.0433 0	RAPID Gate 4 - Sign off by Board	1	0%	14-Dec-23	14-Dec-23	1493
NWSR.GWY.0435 0	RAPID Gate 4 - SUBMITTED TO RAPID (April2023)	0	0%		14-Dec-23	1493
DETERMINATION		80		15-Dec-23	16-Apr-24	1509
NWSR.GWY.0452 0	RAPID Gate 4 - Draft Determination	0	0%		16-Feb-24	1493
NWSR.GWY.0451 0	RAPID Gate 4 - RAPID Determination Period (incl Q&A)	60	0%	15-Dec-23	15-Mar-24	1493
NWSR.GWY.0455 0	RAPID Gate 4 - DETERMINED	0	0%		15-Mar-24	1509
NWSR.GWY.0458 0	RAPID Gate 4 - Lesson Learnt	20	0%	18-Mar-24	16-Apr-24	1509
GATEWAY 5		480		15-Dec-23	19-Nov-25	1267
DELIVERABLES		331		15-Dec-23	22-Apr-25	1268
NWSR.GWY.0512 0	RAPID Gate 5 - Review & Incorporate Feedback from RAPID Gate 4 Draft Determination	5	0%	12-Feb-24	16-Feb-24	1493
NWSR.GWY.0511 0	RAPID Gate 5 - Create Submission Structure	40	0%	15-Dec-23	16-Feb-24	1528
NWSR.GWY.0513 0	RAPID Gate 5 - Sign Off by Director. Legal	10	0%	19-Feb-24	01-Mar-24	1493
NWSR.GWY.0515 0	RAPID Gate 5 - Confirm by RAPID	1	0%	04-Mar-24	04-Mar-24	1493
NWSR.GWY.0516 0	RAPID Gate 5 - Brief Authors	5	0%	05-Mar-24	11-Mar-24	1493
NWSR.GWY.0517 0	RAPID Gate 5 - Create Gateway Deliverables	40	0%	12-Mar-24	09-May-24	1493
NWSR.GWY.0519 0	(GET) RAPID Gate 5 - PBN Completed whereby Main Contract ready to be Awarded	0	0%		12-Mar-25	1294
NWSR.GWY.0518 0	(GET) RAPID Gate 5 - Completion of DCO Decision	0	0%		22-Apr-25	1268
ASSURANCE & GOVERNANCE		340		18-Mar-24	29-Jul-25	1267
NWSR.GWY.0541 0	RAPID Gate 5 - Review & Incorporate Feedback from RAPID Gate4 FinalDetermination	10	0%	18-Mar-24	02-Apr-24	1519
NWSR.GWY.0542 0	RAPID Gate 5 - Observe Lesson Learnt from RAPID Gate 4	0	0%		16-Apr-24	1509
NWSR.GWY.0543 0	RAPID Gate 5 - Amend Deliverables based on RAPID Gate 4 & Lesson Learnt	10	0%	10-May-24	23-May-24	1493
NWSR.GWY.0549 0	RAPID Gate 5 - Internal Assurance	20	0%	22-Apr-25	20-May-25	1268
NWSR.GWY.0551 0	RAPID Gate 5 - External Assurance	40	0%	21-May-25	16-Jul-25	1268
NWSR.GWY.0552 0	RAPID Gate 5 - Legal Review	5	0%	17-Jul-25	23-Jul-25	1268



🟩	Remaining Work
🟥	Critical Remaining Work
◆ ◆	Milestone

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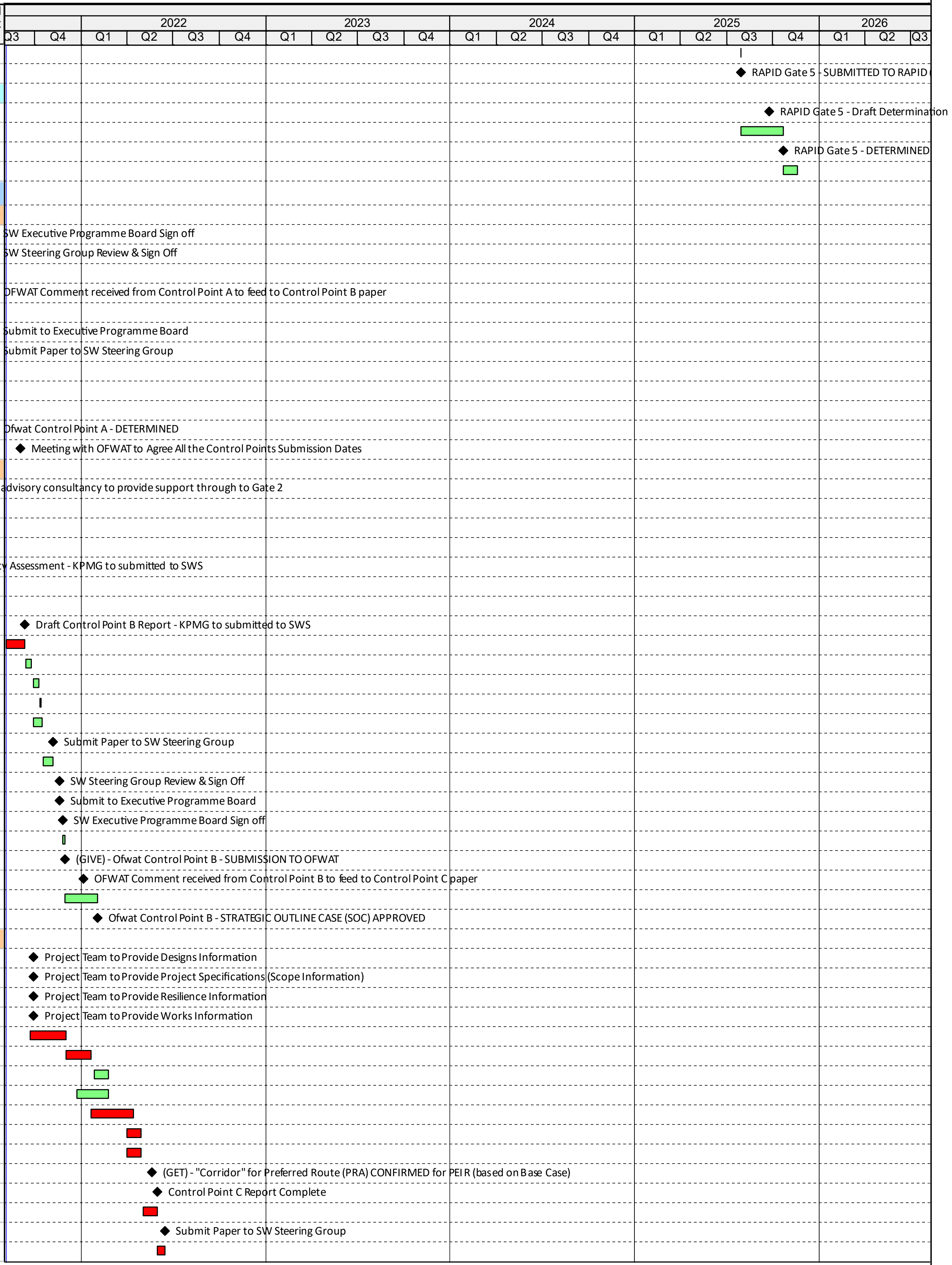
WATER RECYCLING PLANT - OPTION B2 (BASED ON DPC PROCUREMENT ROUTE)
Progressed to 06-Aug-21

Print: 26-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
NWSR.GWY.05540	RAPID Gate 5 - Sign off by Board	1	0%	29-Jul-25	29-Jul-25	529
NWSR.GWY.05560	RAPID Gate 5 - SUBMITTED TO RAPID (Autumn 2024)	0	0%		29-Jul-25	1267
DETERMINATION		80		29-Jul-25	19-Nov-25	1267
NWSR.GWY.05820	RAPID Gate 5 - Draft Determination	0	0%		24-Sep-25	1287
NWSR.GWY.05810	RAPID Gate 5 - RAPID Determination Period (incl Q&A)	60	0%	29-Jul-25	22-Oct-25	1267
NWSR.GWY.05860	RAPID Gate 5 - DETERMINED	0	0%		22-Oct-25	1267
NWSR.GWY.05880	RAPID Gate 5 - Lesson Learnt	20	0%	22-Oct-25	19-Nov-25	1267
OFWAT		1030		15-Jan-21 A	23-Sep-25	1308
CONTROL POINT A (TO COMBINE WITH CONTROL POINT B)		0		08-Jul-21 A	01-Sep-21	0
NWSR.GWY.11060	SW Executive Programme Board Sign off	0	100%		08-Jul-21 A	
NWSR.GWY.11040	SW Steering Group Review & Sign Off	0	100%		08-Jul-21 A	
NWSR.GWY.11010	Southern Water to ask OFWAT if Control Point A if required	0	100%	08-Jul-21 A	08-Jul-21 A	
NWSR.GWY.11110	OFWAT Comment received from Control Point A to feed to Control Point B paper	0	100%		08-Jul-21 A	
NWSR.GWY.11080	Amend Paper incorporating comments from Programme Board	0	100%	08-Jul-21 A	08-Jul-21 A	
NWSR.GWY.11050	Submit to Executive Programme Board	0	100%		08-Jul-21 A	
NWSR.GWY.11030	Submit Paper to SW Steering Group	0	100%		08-Jul-21 A	
NWSR.GWY.11020	Produce Control Point A Paper (1no SRO decided)	0	100%	08-Jul-21 A	08-Jul-21 A	
NWSR.GWY.11090	Ofwat Control Point A - SUBMISSION TO OFWAT	0	100%	08-Jul-21 A	08-Jul-21 A	
NWSR.GWY.11100	Ofwat Control Point A - Review Period	0	100%	08-Jul-21 A	08-Jul-21 A	
NWSR.GWY.11130	Ofwat Control Point A - DETERMINED	0	100%		08-Jul-21 A	
NWSR.GWY.10000	Meeting with OFWAT to Agree All the Control Points Submission Dates	0	0%		01-Sep-21*	0
CONTROL POINT B (COMBINE WITH CONTROL POINT A)		121		15-Jan-21 A	01-Feb-22	77
NWSR.GWY.12010	(GET) - Identify an advisory consultancy to provide support through to Gate 2	0	100%		15-Jan-21 A	
NWSR.GWY.12020	DPC Eligibility Assessment input collection	0	100%	01-Feb-21 A	19-Feb-21 A	
NWSR.GWY.12030	DPC Eligibility Assessment (40% complete)	0	100%	08-Feb-21 A	01-Mar-21 A	
NWSR.GWY.12040	DPC Eligibility Assessment (100% complete)	0	100%	01-Mar-21 A	12-Mar-21 A	
NWSR.GWY.12050	DPC Eligibility Assessment - KPMG to submitted to SWS	0	100%		15-Mar-21 A	
NWSR.GWY.12060	Produce Draft Control Point B Report (30% complete)	0	100%	15-Mar-21 A	02-Apr-21 A	
NWSR.GWY.12080	Produce Draft Control Point B Report (70% complete)	0	100%	05-Apr-21 A	16-May-21 A	
NWSR.GWY.12210	Draft Control Point B Report - KPMG to submitted to SWS	0	0%		10-Sep-21	6
NWSR.GWY.12090	Produce Draft Control Point B Report (100% complete)	25	0%	27-May-21 A	10-Sep-21	6
NWSR.GWY.12220	SWS to review and comment on Draft Control Point B Report	10	0%	13-Sep-21	24-Sep-21	34
NWSR.GWY.12230	Produce Final Control Point B Report	10	0%	27-Sep-21	08-Oct-21	37
NWSR.GWY.12240	Final Control Point B Report - SWS Incorporating Control Point A Comments	2	0%	11-Oct-21	12-Oct-21	37
NWSR.GWY.12250	Procurement Team to Submit Report for Internal assurance	15	0%	27-Sep-21	15-Oct-21	34
NWSR.GWY.12260	Submit Paper to SW Steering Group	0	0%		05-Nov-21	34
NWSR.GWY.12255	Procurement Team to Submit Report for External assurance	15	0%	18-Oct-21	05-Nov-21	34
NWSR.GWY.12270	SW Steering Group Review & Sign Off	0	0%		18-Nov-21	2
NWSR.GWY.12280	Submit to Executive Programme Board	0	0%		18-Nov-21	62
NWSR.GWY.12290	SW Executive Programme Board Sign off	0	0%		24-Nov-21	3
NWSR.GWY.12300	Amend Paper incorporating comments from Programme Board	4	0%	24-Nov-21	29-Nov-21	77
NWSR.GWY.12340	(GIVE) - Ofwat Control Point B - SUBMISSION TO OFWAT	0	0%		29-Nov-21	77
NWSR.GWY.12360	OFWAT Comment received from Control Point B to feed to Control Point C paper	0	0%		04-Jan-22	97
NWSR.GWY.12350	Ofwat Control Point B - Review Period	40	0%	30-Nov-21	01-Feb-22	77
NWSR.GWY.12370	Ofwat Control Point B - STRATEGIC OUTLINE CASE (SOC) APPROVED	0	0%		01-Feb-22	77
CONTROL POINT C		233		22-Sep-21	30-Aug-22	2073
NWSR.GWY.13240	Project Team to Provide Designs Information	0	0%		27-Sep-21	82
NWSR.GWY.13230	Project Team to Provide Project Specifications (Scope Information)	0	0%		27-Sep-21	82
NWSR.GWY.13220	Project Team to Provide Resilience Information	0	0%		27-Sep-21	82
NWSR.GWY.13210	Project Team to Provide Works Information	0	0%		27-Sep-21	82
NWSR.GWY.13140	Prepare for Market Engagement (attendees, invites, objectives)	50	0%	22-Sep-21	30-Nov-21	6
NWSR.GWY.13160	Market Engagement Material Sign off	30	0%	01-Dec-21	19-Jan-22	6
NWSR.GWY.13270	Produce Control Point C Report (30% complete) (Inc Eligibility Assessment)	20	0%	27-Jan-22	23-Feb-22	31
NWSR.GWY.13250	Received Cost Intelligence data	40	0%	22-Dec-21	23-Feb-22	31
NWSR.GWY.13170	Market Engagement Activities (based on RAPID G3 Draft Deliverables)	60	0%	20-Jan-22	13-Apr-22	6
NWSR.GWY.13180	Gather Market Engagement Feedback	20	0%	31-Mar-22	29-Apr-22	6
NWSR.GWY.13280	Produce Control Point C Report (70% complete)	20	0%	31-Mar-22	29-Apr-22	6
NWSR.GWY.13110	(GET) - "Corridor" for Preferred Route (PRA) CONFIRMED for PEIR (based on Base Case)	0	0%		20-May-22	2142
NWSR.GWY.13310	Control Point C Report Complete	0	0%		30-May-22	6
NWSR.GWY.13290	Produce Control Point C Report (100% complete) Incorporate OFWAT Comment from Control Point B	20	0%	03-May-22	30-May-22	6
NWSR.GWY.13350	Submit Paper to SW Steering Group	0	0%		15-Jun-22	6
NWSR.GWY.13340	Procurement Team to Submit Report for Internal assurance	10	0%	31-May-22	15-Jun-22	6



🟩 Remaining Work
🟥 Critical Remaining Work
◆ ◆ Milestone

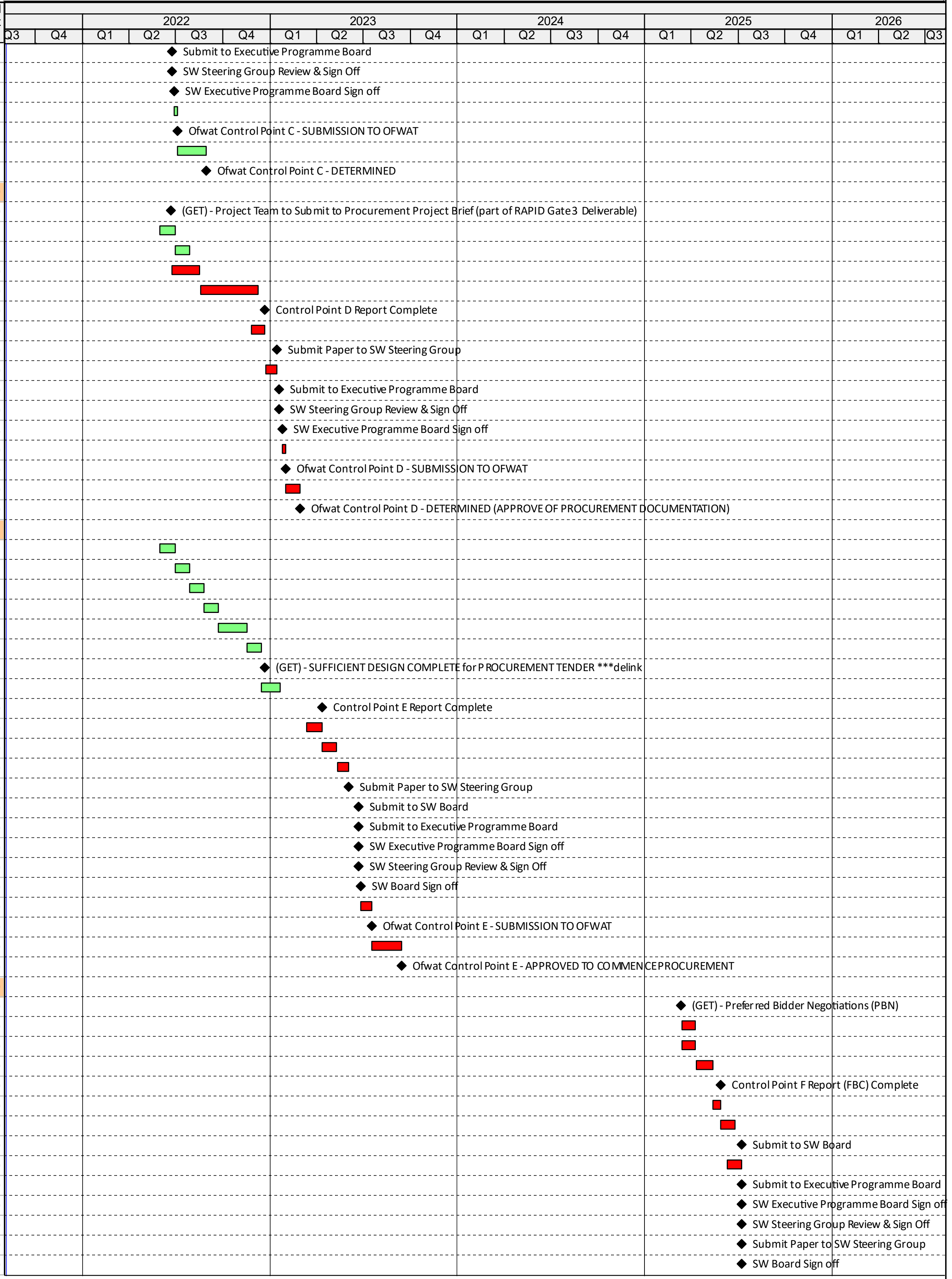
Project ID: 710060-B2-1 CURR Standard Layout for Distribution

Date	Revision	Checked	Approved
26-Aug-21	WR (B2) Schedule for G1.5 Submission	DC	BM

WATER RECYCLING PLANT - OPTION B2 (BASED ON DPC PROCUREMENT ROUTE)

Progressed to 06-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
NWSR.GWY.13370	Submit to Executive Programme Board	0	0%		23-Jun-22	4
NWSR.GWY.13360	SW Steering Group Review & Sign Off	0	0%		23-Jun-22	1
NWSR.GWY.13380	SW Executive Programme Board Sign off	0	0%		28-Jun-22	1
NWSR.GWY.13390	Amend Paper incorporating comments from Programme Board	5	0%	28-Jun-22	04-Jul-22	52
NWSR.GWY.13450	Ofwat Control Point C - SUBMISSION TO OFWAT	0	0%		04-Jul-22	52
NWSR.GWY.13460	Ofwat Control Point C - Review Period	40	0%	05-Jul-22	30-Aug-22	52
NWSR.GWY.13470	Ofwat Control Point C - DETERMINED	0	0%		30-Aug-22	52
CONTROL POINT D		186		31-May-22	27-Feb-23	-10
NWSR.GWY.14150	(GET) - Project Team to Submit to Procurement Project Brief (part of RAPID Gate3 Deliverable)	0	0%		22-Jun-22	-10
NWSR.GWY.14190	Produce Control Point D Report (30% complete)	20	0%	31-May-22	29-Jun-22	75
NWSR.GWY.14200	Produce Control Point D Report (70% complete)	20	0%	30-Jun-22	27-Jul-22	75
NWSR.GWY.14230	Prepare & Run for Market Engagement (attendees, invites, objectives)	40	0%	23-Jun-22	17-Aug-22	-10
NWSR.GWY.14240	Produce Contractual Requirements (to revisit this activity once Option Selection is completed)	80	0%	18-Aug-22	08-Dec-22	-10
NWSR.GWY.14260	Control Point D Report Complete	0	0%		22-Dec-22	-10
NWSR.GWY.14250	Produce Control Point D Report (100% complete) Incorporate OFWAT Comment from Control Point C	20	0%	25-Nov-22	22-Dec-22	-10
NWSR.GWY.14280	Submit Paper to SW Steering Group	0	0%		13-Jan-23	-10
NWSR.GWY.14270	Procurement Team to Submit Report for Internal assurance	10	0%	23-Dec-22	13-Jan-23	-10
NWSR.GWY.14310	Submit to Executive Programme Board	0	0%		19-Jan-23	-10
NWSR.GWY.14290	SW Steering Group Review & Sign Off	0	0%		19-Jan-23	0
NWSR.GWY.14330	SW Executive Programme Board Sign off	0	0%		24-Jan-23	-4
NWSR.GWY.14340	Amend Paper incorporating comments from Programme Board	5	0%	24-Jan-23	30-Jan-23	-10
NWSR.GWY.14350	Ofwat Control Point D - SUBMISSION TO OFWAT	0	0%		30-Jan-23	-10
NWSR.GWY.14360	Ofwat Control Point D - Review Period	20	0%	31-Jan-23	27-Feb-23	-10
NWSR.GWY.14370	Ofwat Control Point D - DETERMINED (APPROVE OF PROCUREMENT DOCUMENTATION)	0	0%		27-Feb-23	-10
CONTROL POINT E		323		31-May-22	13-Sep-23	1813
NWSR.GWY.15040	Prepare for Market Engagement (attendees, invites, objectives)	20	0%	31-May-22	29-Jun-22	26
NWSR.GWY.15050	Prepare for Market Engagement (material)	20	0%	30-Jun-22	27-Jul-22	26
NWSR.GWY.15060	Market Engagement Material Sign off	20	0%	28-Jul-22	24-Aug-22	26
NWSR.GWY.15120	Market Engagement Activities	20	0%	25-Aug-22	22-Sep-22	26
NWSR.GWY.15170	Received Cost Intelligence data	40	0%	23-Sep-22	17-Nov-22	26
NWSR.GWY.15180	Produce Control Point E Report (30% complete) (Inc Eligibility Assessment)	20	0%	18-Nov-22	15-Dec-22	26
NWSR.GWY.15150	(GET) - SUFFICIENT DESIGN COMPLETE for PROCUREMENT TENDER ***delink	0	0%		21-Dec-22	1992
NWSR.GWY.15210	Produce Control Point E Report (70% complete)	20	0%	16-Dec-22	20-Jan-23	26
NWSR.GWY.15230	Control Point E Report Complete	0	0%		12-Apr-23	-10
NWSR.GWY.15220	Produce Control Point E Report (100% complete) Incorporate OFWAT Comment from Control Point D	20	0%	14-Mar-23	12-Apr-23	-10
NWSR.GWY.15240	Procurement Team to Submit Report for Internal assurance	20	0%	13-Apr-23	11-May-23	-10
NWSR.GWY.15250	External Assurance Period	15	0%	12-May-23	02-Jun-23	-10
NWSR.GWY.15260	Submit Paper to SW Steering Group	0	0%		02-Jun-23	-10
NWSR.GWY.15300	Submit to SW Board	0	0%		22-Jun-23	0
NWSR.GWY.15280	Submit to Executive Programme Board	0	0%		22-Jun-23	0
NWSR.GWY.15290	SW Executive Programme Board Sign off	0	0%		22-Jun-23	0
NWSR.GWY.15270	SW Steering Group Review & Sign Off	0	0%		22-Jun-23	0
NWSR.GWY.15310	SW Board Sign off	0	0%		27-Jun-23	0
NWSR.GWY.15320	Amend Paper incorporating comments from SW Board	16	0%	27-Jun-23	18-Jul-23	0
NWSR.GWY.15330	Ofwat Control Point E - SUBMISSION TO OFWAT	0	0%		18-Jul-23	0
NWSR.GWY.15340	Ofwat Control Point E - Review Period	40	0%	19-Jul-23	13-Sep-23	0
NWSR.GWY.15350	Ofwat Control Point E - APPROVED TO COMMENCE PROCUREMENT	0	0%		13-Sep-23	0
CONTROL POINT F		134		12-Mar-25	23-Sep-25	0
NWSR.GWY.16090	(GET) - Preferred Bidder Negotiations (PBN)	0	0%		12-Mar-25	0
NWSR.GWY.16110	Produce Control Point F Report (FBC) (30% complete) (Inc Eligibility Assessment)	20	0%	13-Mar-25	09-Apr-25	0
NWSR.GWY.16100	Received Cost Intelligence data	20	0%	13-Mar-25	09-Apr-25	0
NWSR.GWY.16120	Produce Control Point F Report (FBC) (70% complete)	20	0%	10-Apr-25	12-May-25	0
NWSR.GWY.16140	Control Point F Report (FBC) Complete	0	0%		27-May-25	0
NWSR.GWY.16130	Produce Control Point F Report (FBC) (100% complete) Incorporate OFWAT Comment from Control Poi	10	0%	13-May-25	27-May-25	0
NWSR.GWY.16180	Procurement Team to Submit Report for Internal assurance	20	0%	28-May-25	24-Jun-25	0
NWSR.GWY.16270	Submit to SW Board	0	0%		08-Jul-25	0
NWSR.GWY.16190	External Assurance Period	20	0%	11-Jun-25	08-Jul-25	0
NWSR.GWY.16250	Submit to Executive Programme Board	0	0%		08-Jul-25	0
NWSR.GWY.16260	SW Executive Programme Board Sign off	0	0%		08-Jul-25	0
NWSR.GWY.16240	SW Steering Group Review & Sign Off	0	0%		08-Jul-25	0
NWSR.GWY.16230	Submit Paper to SW Steering Group	0	0%		08-Jul-25	0
NWSR.GWY.16280	SW Board Sign off	0	0%		09-Jul-25	0



🟩 Remaining Work
🟥 Critical Remaining Work
◆ ◆ Milestone

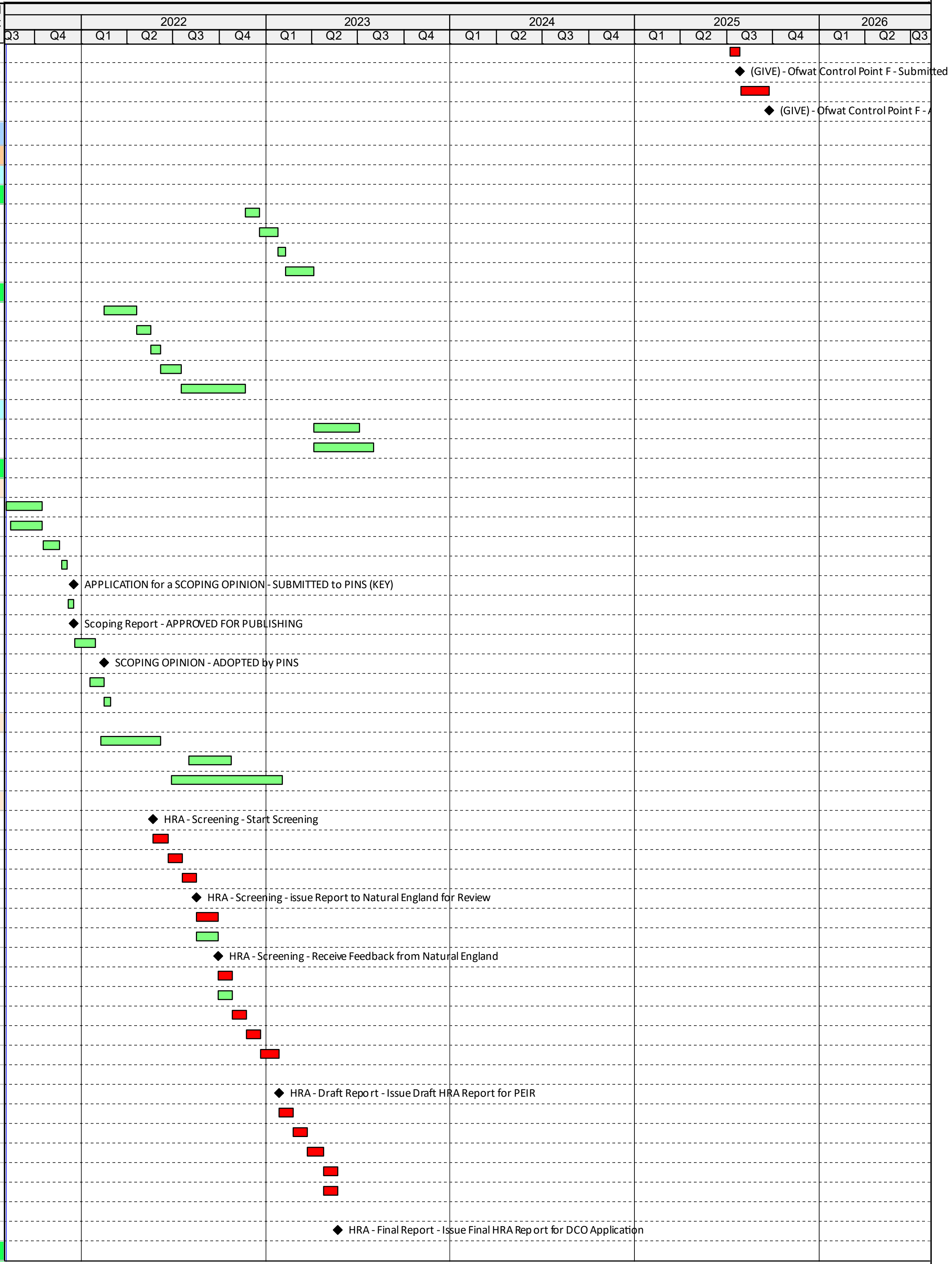
Project ID: 710060-B2-1 CURR Standard Layout for Distribution

Date	Revision	Checked	Approved
26-Aug-21	WR (B2) Schedule for G1.5 Submission	DC	BM

WATER RECYCLING PLANT - OPTION B2 (BASED ON DPC PROCUREMENT ROUTE)

Progressed to 06-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
NWSR.GWY.16300	Amend Paper incorporating comments from Programme Board	14	0%	09-Jul-25	28-Jul-25	0
NWSR.GWY.16320	(GIVE) - Ofwat Control Point F - Submitted	0	0%		28-Jul-25	0
NWSR.GWY.16330	Ofwat Control Point F - Review Period	40	0%	29-Jul-25	23-Sep-25	0
NWSR.GWY.16360	(GIVE) - Ofwat Control Point F - APPROVED TO CAP AGREEMENT	0	0%		23-Sep-25	0
CONSENT & PERMIT & LICENCING		1052		04-Jan-21 A	23-Oct-25	1286
CONSENT - DCO (Development Consent Order)		1052		04-Jan-21 A	23-Oct-25	1286
STAKEHOLDER ENGAGEMENT		285		14-Feb-22	05-Apr-23	86
STATUTORY CONSULTATION		90		22-Nov-22	05-Apr-23	86
RYWR.CON.00510	Statutory Consultation - Literature Generation	20	0%	22-Nov-22	20-Dec-22	86
RYWR.CON.00520	Statutory Consultation - Legal Review & SWS Governance & Assurance	20	0%	20-Dec-22	25-Jan-23	86
RYWR.CON.00530	Statutory Consultation - Publishing (Hard/Virtual)	10	0%	25-Jan-23	08-Feb-23	86
RYWR.CON.00540	Statutory Consultation - Period for Consultation	40	0%	08-Feb-23	05-Apr-23	86
NON-STATUTORY CONSULTATION		195		14-Feb-22	22-Nov-22	86
RYWR.CON.00610	Non Statutory Consultation - Literature Generation	45	0%	14-Feb-22	20-Apr-22	86
RYWR.CON.00620	Non Statutory Consultation - Legal Review & SWS Governance & Assurance	20	0%	20-Apr-22	19-May-22	86
RYWR.CON.00630	Non Statutory Consultation - Publishing (Hard/Virtual)	10	0%	19-May-22	06-Jun-22	86
RYWR.CON.00640	Non Statutory Consultation - Period for Consultation	30	0%	06-Jun-22	18-Jul-22	86
RYWR.CON.00650	Non Statutory Consultation - TIME BAR (4MO + 2wks)	90	0%	18-Jul-22	22-Nov-22	86
DCO APPLICATION DOCUMENTS		586		04-Jan-21 A	07-Dec-23	1752
RYWR.CON.00550	Statutory Consultation - Finalised DCO Dcoumenta􏰀on Prepara􏰀on	60	0%	05-Apr-23	04-Jul-23	1863
RYWR.CON.00560	Statutory Consultation - 4MO - DCO Dcoumentation Preparation Complete	80	0%	05-Apr-23	01-Aug-23	86
Environmental Reports		446		04-Jan-21 A	23-May-23	1892
Scoping		140		04-Jan-21 A	28-Feb-22	2138
RYWR.CON.08020	Scoping Report - Draft Scoping Report	50	0%	01-Jun-21 A	15-Oct-21	92
RYWR.CON.08010	Scoping Report - Stakeholder Engagement	45	0%	04-Jan-21 A	15-Oct-21	92
RYWR.CON.08030	Scoping Report - Finalise Draft Report	25	0%	18-Oct-21	19-Nov-21	92
RYWR.CON.08040	Scoping Report - Assurance Review & Update (incl Legal Input)	10	0%	22-Nov-21	03-Dec-21	92
RYWR.CON.08080	APPLICATION for a SCOPING OPINION - SUBMITTED to PINS (KEY)	0	0%		17-Dec-21	82
RYWR.CON.08050	Scoping Report - Southern Water Governance Period (incl LegalReview)	9	0%	06-Dec-21	17-Dec-21	82
RYWR.CON.08060	Scoping Report - APPROVED FOR PUBLISHING	0	0%		17-Dec-21	82
RYWR.CON.08090	Scoping Opinion - Adoption Period	42	0%	18-Dec-21	28-Jan-22	127
RYWR.CON.08120	SCOPING OPINION - ADOPTED by PINS	0	0%		14-Feb-22	86
RYWR.CON.08100	Scoping Opinion - Statutory Consultation Period	28	0%	18-Jan-22	14-Feb-22	127
RYWR.CON.08110	Scoping Opinion - Review & Feedback	10	0%	14-Feb-22	28-Feb-22	2138
PEIR		246		08-Feb-22	02-Feb-23	1967
RYWR.CON.08410	PEIR - Draft PEIR for Non Statutory Consultation	80	0%	08-Feb-22	06-Jun-22	2073
RYWR.CON.08450	PEIR - Amend with Non Statutory Consultation Feedback	60	0%	01-Aug-22	25-Oct-22	2033
RYWR.CON.08460	PEIR - Finalise PEIR for Statutory Consultation	150	0%	29-Jun-22	02-Feb-23	1967
HRA Report		250		23-May-22	23-May-23	11
RYWR.CON.08820	HRA - Screening - Start Screening	0	0%	23-May-22		11
RYWR.CON.08810	HRA - Screening - Collate information on Natura 2000 sites	20	0%	23-May-22	21-Jun-22	11
RYWR.CON.08830	HRA - Screening - Prepare HRA Screening Report	20	0%	22-Jun-22	19-Jul-22	11
RYWR.CON.08840	HRA - Screening - Assurance Review & Update Report	20	0%	20-Jul-22	16-Aug-22	11
RYWR.CON.08850	HRA - Screening - issue Report to Natural England for Review	0	0%		16-Aug-22	11
RYWR.CON.08880	HRA - Draft Report - Stage 2 - Undertake Draft Appropriate Assessment	30	0%	17-Aug-22	28-Sep-22	11
RYWR.CON.08870	HRA - Screening - Natural England Consultation Period	30	0%	17-Aug-22	28-Sep-22	31
RYWR.CON.08890	HRA - Screening - Receive Feedback from Natural England	0	0%		28-Sep-22	31
RYWR.CON.08920	HRA - Draft Report - Stage 3 - Review Draft Alternatives	20	0%	29-Sep-22	26-Oct-22	11
RYWR.CON.08910	HRA - Screening - Assess Feedback and Respond	20	0%	29-Sep-22	26-Oct-22	31
RYWR.CON.08930	HRA - Draft Report - Stage 4 - Assess Draft IROPI Implications	20	0%	27-Oct-22	23-Nov-22	11
RYWR.CON.08940	HRA - Draft Report - Assess Compensatory Measures	20	0%	24-Nov-22	21-Dec-22	11
RYWR.CON.08950	HRA - Draft Report - Complete Draft Report for PEIR	20	0%	22-Dec-22	26-Jan-23	11
RYWR.CON.08860	HRA - Draft Report - Maintain & Update SoCG	110	0%	17-Aug-22	26-Jan-23	11
RYWR.CON.08960	HRA - Draft Report - Issue Draft HRA Report for PEIR	0	0%		26-Jan-23	11
RYWR.CON.08980	HRA - Final Report - Stage 2 - Update Appropriate Assessment	20	0%	27-Jan-23	23-Feb-23	11
RYWR.CON.08990	HRA - Final Report - Stage 3 - Update Alternatives	20	0%	24-Feb-23	23-Mar-23	11
RYWR.CON.09010	HRA - Final Report - Stage 4 - Update IROPI Implications	20	0%	24-Mar-23	24-Apr-23	11
RYWR.CON.09020	HRA - Final Report - Update Compensatory Measures	20	0%	25-Apr-23	23-May-23	11
RYWR.CON.09030	HRA - Final Report - Complete Final Report for DCO Application	20	0%	25-Apr-23	23-May-23	11
RYWR.CON.08970	HRA - Final Report - Maintain & Update SoCG	80	0%	27-Jan-23	23-May-23	11
RYWR.CON.09040	HRA - Final Report - Issue Final HRA Report for DCO Application	0	0%		23-May-23	11
DCO Design Deliverables (to be validated with ECI)		494		15-Dec-21	07-Dec-23	1752



🟩	Remaining Work
🟥	Critical Remaining Work
◆ ◆	Milestone

Date	Revision	Checked	Approved
26-Aug-21	WR (B2) Schedule for G1.5 Submission	DC	BM

Print: 26-Aug-21

WATER RECYCLING PLANT - OPTION B2 (BASED ON DPC PROCUREMENT ROUTE)

Progressed to 06-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
RYWR.CON.04340	Draft TA Appendices	120	0%	15-Dec-21	15-Jun-22	2126
RYWR.CON.04330	WebTag Options Assessment	120	0%	15-Dec-21	15-Jun-22	2126
RYWR.CON.04320	Draft Energy Strategy	120	0%	15-Dec-21	15-Jun-22	2126
RYWR.CON.04290	Draft Major Accidents & Disasters	120	0%	15-Dec-21	15-Jun-22	2126
RYWR.CON.04450	Construction Noise Modelling	120	0%	15-Dec-21	15-Jun-22	2126
RYWR.CON.04230	Identify & Agree Mitigation Proposals	120	0%	15-Dec-21	15-Jun-22	2126
RYWR.CON.04370	Draft Buildability Report	120	0%	15-Dec-21	15-Jun-22	1986
RYWR.CON.04220	Draft Economic Impact Assessment	120	0%	15-Dec-21	15-Jun-22	2126
RYWR.CON.04210	Draft Commercial Development Strategy	120	0%	15-Dec-21	15-Jun-22	2126
RYWR.CON.04190	Draft Population & Housing Analysis	120	0%	15-Dec-21	15-Jun-22	2126
RYWR.CON.04180	Draft SWS Related Employment Land Study	120	0%	15-Dec-21	15-Jun-22	2126
RYWR.CON.04170	Draft Sustainability Strategy	120	0%	15-Dec-21	15-Jun-22	2126
RYWR.CON.04160	Draft Biodiversity Management Plan	120	0%	15-Dec-21	15-Jun-22	2126
RYWR.CON.04140	Draft Property Hardship / Mitigation Scheme	120	0%	15-Dec-21	15-Jun-22	2126
RYWR.CON.04130	Draft Lighting Strategy	120	0%	15-Dec-21	15-Jun-22	2126
RYWR.CON.04110	PAC Quantities Issued for Modelling	0	0%	14-Sep-22		1823
RYWR.CON.04420	Ground Noise Modelling	120	0%	16-Jun-22	01-Dec-22	1986
RYWR.CON.04470	Draft Ground Noise	120	0%	14-Jul-22	06-Jan-23	1986
RYWR.CON.04480	Ground Noise Mitigation	120	0%	14-Jul-22	06-Jan-23	1986
RYWR.CON.04120	Construction Traffic Modelling	120	0%	14-Sep-22	08-Mar-23	1823
RYWR.CON.04270	Strategic Traffic Modelling	120	0%	22-Dec-22	21-Jun-23	1772
RYWR.CON.04260	VISSIM Traffic Modelling	120	0%	22-Dec-22	21-Jun-23	1772
RYWR.CON.04250	Fluvial Water Flood Modelling	120	0%	22-Dec-22	21-Jun-23	1752
RYWR.CON.04240	Pluvial Water Flood Modelling	120	0%	22-Dec-22	21-Jun-23	1752
RYWR.CON.04150	Draft Landscaping Strategy	120	0%	22-Dec-22	21-Jun-23	1872
RYWR.CON.04530	Draft Waste Strategy	120	0%	09-Mar-23	30-Aug-23	1823
RYWR.CON.04280	Draft Construction Traffic Management Plan	120	0%	09-Mar-23	30-Aug-23	1823
RYWR.CON.04460	Draft Construction Environmental Management Plan (CEMP)	120	0%	09-Mar-23	30-Aug-23	1823
RYWR.CON.04430	Draft Materials Management Plan	120	0%	09-Mar-23	30-Aug-23	1823
RYWR.CON.04440	Draft Transport Assessment (TA)	100	0%	22-Jun-23	09-Nov-23	1772
RYWR.CON.04540	Draft Noise Mitigation Strategy	100	0%	22-Jun-23	09-Nov-23	1772
RYWR.CON.04520	Traffic Noise Modelling	100	0%	22-Jun-23	09-Nov-23	1772
RYWR.CON.04490	Traffic Noise Mitigation	100	0%	22-Jun-23	09-Nov-23	1772
RYWR.CON.04410	Draft Surface Water Management Strategy	120	0%	22-Jun-23	07-Dec-23	1752
RYWR.CON.04380	Draft Flood Risk Assessment (FRA)	120	0%	22-Jun-23	07-Dec-23	1752
DCO CONSENT PROCESS		922		14-Feb-22	23-Oct-25	6
Submission & Determination		820		14-Feb-22	02-Jun-25	20
RYWR.CON.06010	DCO Application - Produce Application Document	160	0%	14-Feb-22	04-Oct-22	227
RYWR.CON.06020	DCO Application - Complete Environmental Statement	40	0%	22-Jun-23	16-Aug-23	11
RYWR.CON.06060	DCO Application - Southern Water Assurance & Governance Period	68	0%	17-Aug-23	21-Nov-23	11
RYWR.CON.06090	DCO APPLICATION SUBMITTED (KEY)	0	0%		21-Nov-23	9
RYWR.CON.06130	DCO ACCEPTANCE PERIOD (Stated Duration No Greater than 4 calendar weeks)	28	0%	22-Nov-23	19-Dec-23	15
RYWR.CON.06140	DCO ACCEPTED	0	0%		19-Dec-23	5
RYWR.CON.06150	PRE-EXAMINATION PERIOD (Assumed to be no more than 65 working days)	80	0%	19-Dec-23	19-Apr-24	5
RYWR.CON.06160	EXAMINATION STARTED (KEY)	0	0%		19-Apr-24	8
RYWR.CON.06170	EXAMINATION PERIOD (Stated Duration No Greater than 6 calendar months)	185	0%	20-Apr-24	21-Oct-24	8
RYWR.CON.06180	EXAMINATION ENDED (KEY)	0	0%		21-Oct-24	8
RYWR.CON.06190	PINS RECOMMENDATION REPORT PERIOD (Stated Duration No Greater than 3 calendar months)	91	0%	22-Oct-24	20-Jan-25	8
RYWR.CON.06210	PINS ISSUE RECOMMENDATION TO SoS	0	0%		20-Jan-25	8
RYWR.CON.06220	SoS DECISION PERIOD (Stated Duration No Greater than 3 calendar months)	91	0%	21-Jan-25	21-Apr-25	8
RYWR.CON.06230	DECISION ISSUED (KEY)	0	0%		21-Apr-25	8
RYWR.CON.06250	JUDICIAL REVIEW PERIOD (Stated Duration No Greater than 6 calendar weeks)	42	0%	22-Apr-25	02-Jun-25	28
RYWR.CON.06270	JUDICIAL REVIEW PERIOD COMPLETED (KEY)	0	0%		02-Jun-25	28
Discharge DCO Requirement		130		22-Apr-25	23-Oct-25	6
RYWR.CON.07110	Conveyance Pipework - Discharge DCO Requirements	130	0%	22-Apr-25	23-Oct-25	6
RYWR.CON.07120	Pumping Facilities - Discharge DCO Requirements	130	0%	22-Apr-25	23-Oct-25	6
CONSENT - DWI (Driving Water Inspectorate)		0		08-Feb-21 A	29-Mar-21 A	
D2 CD G2 02050	Concept Draft Water Safety Plans Water Recycling & Havant Thicket	0	100%	08-Feb-21 A	29-Mar-21 A	
STATUTORY PERMIT		300		29-Mar-21 A	18-Oct-22	2038
S35		93		29-Mar-21 A	15-Dec-21	82
RYWR.CON.10010	Section 35 Direction - Draft Project Description	0	100%	29-Mar-21 A	20-Apr-21 A	
RYWR.CON.10040	Section 35 Direction - Issue Draft to DEFRA for Review	0	0%		03-Sep-21	84

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WATER RECYCLING PLANT - OPTION B2 (BASED ON DPC PROCUREMENT ROUTE)

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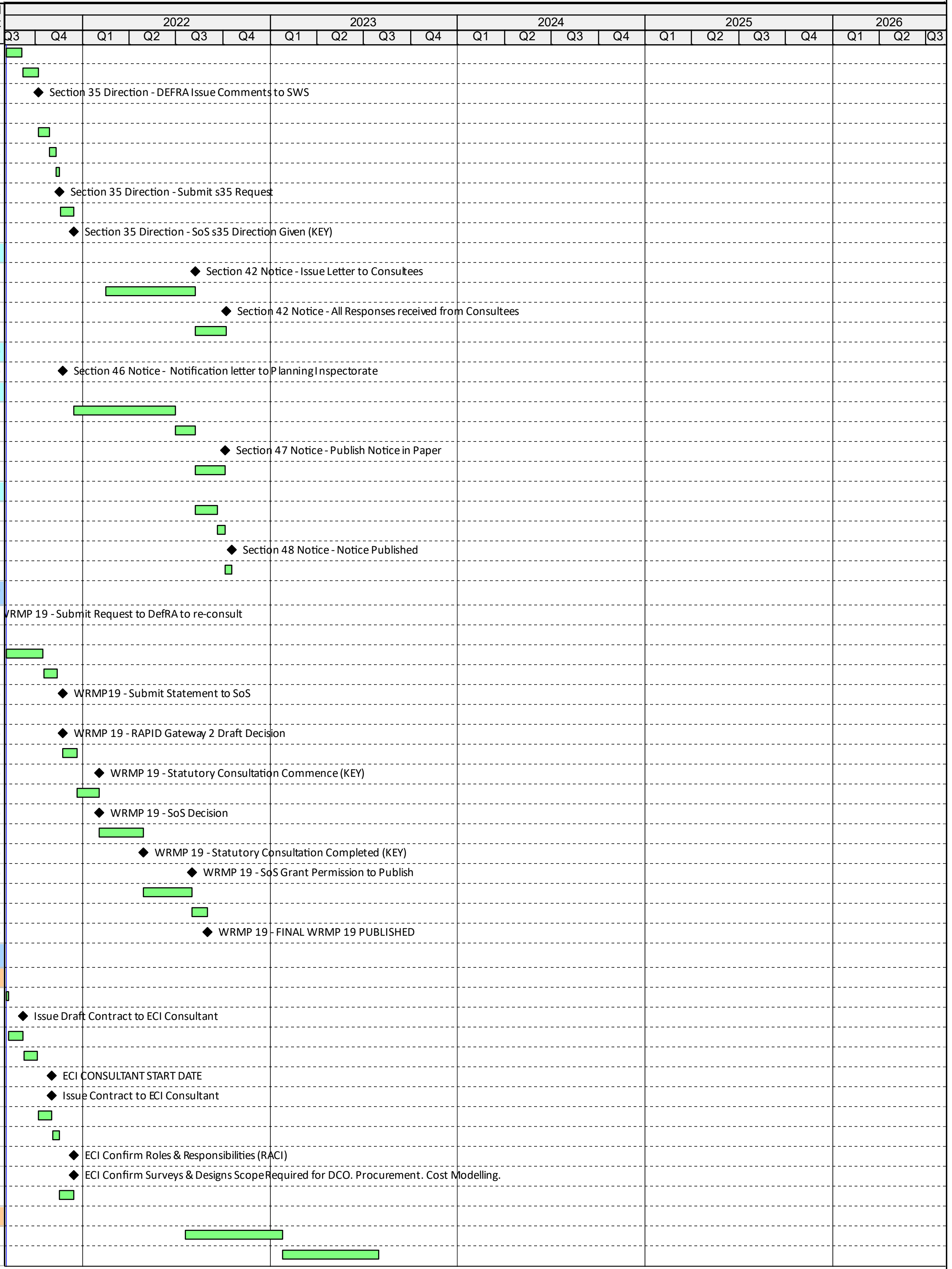
Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
RYWR.CON.10030	Section 35 Direction - Draft s35 Request	20	0%	06-Aug-21	03-Sep-21	84
RYWR.CON.10050	Section 35 Direction - DEFRA Review of Draft s35 Request	23	0%	06-Sep-21	06-Oct-21	84
RYWR.CON.10060	Section 35 Direction - DEFRA Issue Comments to SWS	0	0%		06-Oct-21	84
RYWR.CON.10020	Section 35 Direction - Engagement with PINS on Draft Request	58	0%	29-Mar-21 A	27-Oct-21	84
RYWR.CON.10070	Section 35 Direction - Finalise s35 Request	15	0%	07-Oct-21	27-Oct-21	84
RYWR.CON.10080	Section 35 Direction - Assurance Review & Update	10	0%	28-Oct-21	10-Nov-21	84
RYWR.CON.10090	Section 35 Direction - SWS Governance	5	0%	11-Nov-21	17-Nov-21	84
RYWR.CON.10110	Section 35 Direction - Submit s35 Request	0	0%		17-Nov-21	84
RYWR.CON.10120	Section 35 Direction - SoS Review s35 Request	28	0%	18-Nov-21	15-Dec-21	126
RYWR.CON.10130	Section 35 Direction - SoS s35 Direction Given (KEY)	0	0%		15-Dec-21	82
S42		162		14-Feb-22	06-Oct-22	169
RYWR.CON.10220	Section 42 Notice - Issue Letter to Consultees	0	0%		08-Aug-22	169
RYWR.CON.10210	Section 42 Notice - Collate List of Consultees	120	0%	14-Feb-22	08-Aug-22	169
RYWR.CON.10240	Section 42 Notice - All Responses received from Consultees	0	0%		06-Oct-22	169
RYWR.CON.10230	Section 42 Notice - Response Period from Consultees	42	0%	08-Aug-22	06-Oct-22	169
S46		0		22-Nov-21	22-Nov-21	0
RYWR.CON.10310	Section 46 Notice - Notification letter to Planning Inspectorate	0	0%	22-Nov-21*		0
S47		197		15-Dec-21	04-Oct-22	2048
RYWR.CON.10410	Section 47 Notice - Prepare SoCC Report	129	0%	15-Dec-21	29-Jun-22	2038
RYWR.CON.10420	Section 47 Notice - Consult with Local Authorities (2month in advance of Statutory Consultation)	28	0%	29-Jun-22	08-Aug-22	2038
RYWR.CON.10440	Section 47 Notice - Publish Notice in Paper	0	0%		04-Oct-22	2048
RYWR.CON.10430	Section 47 Notice - Publish SoCC	40	0%	08-Aug-22	04-Oct-22	2048
S48		50		08-Aug-22	18-Oct-22	2038
RYWR.CON.10510	Section 48 Notice - Prepare Notice	30	0%	08-Aug-22	20-Sep-22	2038
RYWR.CON.10520	Section 48 Notice - Review Notice	10	0%	20-Sep-22	04-Oct-22	2038
RYWR.CON.10540	Section 48 Notice - Notice Published	0	0%		18-Oct-22	2038
RYWR.CON.10530	Section 48 Notice - Update Notice	10	0%	04-Oct-22	18-Oct-22	2038
WRMP19 AMENDMENT		266		30-Jun-21 A	31-Aug-22	320
RYWR.CON.00010	WRMP 19 - Submit Request to DefRA to re-consult	0	100%		30-Jun-21 A	
RYWR.CON.00020	WRMP 19 - DefRA 1st Review Period	0	100%	09-Jul-21 A	05-Aug-21 A	
RYWR.CON.00030	WRMP 19 - SW Optional Appraisals	50	28.57%	09-Jul-21 A	15-Oct-21	326
RYWR.CON.00040	WRMP 19 - DefRA 2nd Review Period	20	0%	18-Oct-21	12-Nov-21	326
RYWR.CON.00100	WRMP19 - Submit Statement to SoS	0	0%		22-Nov-21	320
RYWR.CON.00090	WRMP 19 - Engagement with RAPID & Regulators	76	20.83%	09-Jul-21 A	22-Nov-21	320
RYWR.CON.00080	WRMP 19 - RAPID Gateway 2 Draft Decision	0	0%		22-Nov-21	320
RYWR.CON.00110	WRMP 19 - Prepare Draft Revised WRMP19	20	0%	23-Nov-21	20-Dec-21	320
RYWR.CON.00160	WRMP 19 - Statutory Consultation Commence (KEY)	0	0%		01-Feb-22	320
RYWR.CON.00140	WRMP 19 - SoS Decision Period (Grant Permission to start Consultation)	25	0%	21-Dec-21	01-Feb-22	320
RYWR.CON.00150	WRMP 19 - SoS Decision	0	0%		01-Feb-22	320
RYWR.CON.00170	WRMP 19 - Statutory Consultation Period	60	0%	02-Feb-22	28-Apr-22	320
RYWR.CON.00180	WRMP 19 - Statutory Consultation Completed (KEY)	0	0%		28-Apr-22	320
RYWR.CON.00210	WRMP 19 - SoS Grant Permission to Publish	0	0%		02-Aug-22	320
RYWR.CON.00190	WRMP 19 - SoS Consideration period for publishing Revised WRMP19	65	0%	29-Apr-22	02-Aug-22	320
RYWR.CON.00220	WRMP 19 - SW Preparation for Publishing Revised WRMP19	20	0%	02-Aug-22	31-Aug-22	320
RYWR.CON.00270	WRMP 19 - FINAL WRMP 19 PUBLISHED	0	0%		31-Aug-22	320
PROCUREMENT & COMMERCIAL		1079		23-Mar-21 A	01-Dec-25	1259
ECI (EARLY CONTRACTOR INVOLVEMENT)		92		26-Jul-21 A	14-Dec-21	1916
RYWR.PRO.02010	Information Available for ECI Consultant (Scope & Terms of Contract)	2	90%	26-Jul-21 A	09-Aug-21	1916
RYWR.PRO.02060	Issue Draft Contract to ECI Consultant	0	0%		07-Sep-21	1916
RYWR.PRO.02020	Procurement to Produce Contract Documentation for ECI Consultant	20	0%	10-Aug-21	07-Sep-21	1916
RYWR.PRO.02070	ECI Consultant Submit Cost & Schedule	20	0%	08-Sep-21	05-Oct-21	1916
RYWR.PRO.02150	ECI CONSULTANT START DATE	0	0%		02-Nov-21	1916
RYWR.PRO.02140	Issue Contract to ECI Consultant	0	0%		02-Nov-21	1916
RYWR.PRO.02080	Contract Negotiation with ECI Consultant	20	0%	06-Oct-21	02-Nov-21	1916
RYWR.PRO.02160	ECI Consultant Mobilisation	10	0%	03-Nov-21	16-Nov-21	1916
RYWR.PRO.02190	ECI Confirm Roles & Responsibilities (RACI)	0	0%		14-Dec-21	1916
RYWR.PRO.02180	ECI Confirm Surveys & Designs Scope Required for DCO. Procurement. Cost Modelling.	0	0%		14-Dec-21	1916
RYWR.PRO.02170	Workshops with ECI Consultant	20	0%	17-Nov-21	14-Dec-21	1916
LAND ACQUISITION		1079		23-Mar-21 A	01-Dec-25	1259
RYWR.PRO.03010	Identify Sites	129	0%	20-Jul-22	25-Jan-23	823
RYWR.PRO.03020	Identify Landowner & Perform Land Referencing Activities	129	0%	26-Jan-23	31-Jul-23	823



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WATER RECYCLING PLANT - OPTION B2 (BASED ON DPC PROCUREMENT ROUTE)
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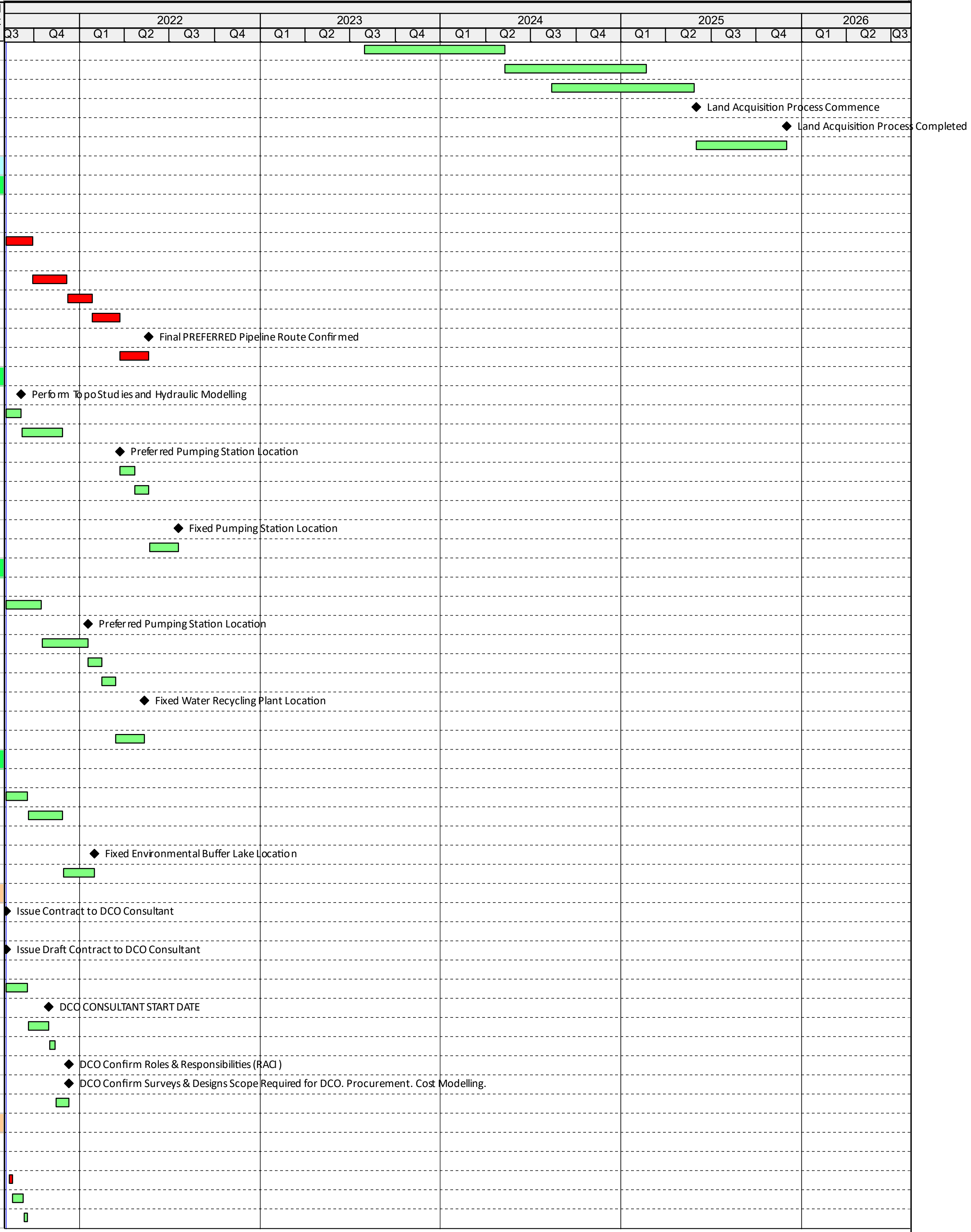
Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
RYWR.PRO.03040	Secure Option Agreement	194	0%	01-Aug-23	10-May-24	823
RYWR.PRO.03050	Negotiation with Landowner on Options and Terms	194	0%	10-May-24	19-Feb-25	823
RYWR.PRO.03060	Establish Agreed Head of Terms	194	0%	12-Aug-24	27-May-25	823
RYWR.PRO.03070	Land Acquisition Process Commence	0	0%		02-Jun-25	819
RYWR.PRO.03090	Land Acquisition Process Completed	0	0%		01-Dec-25	819
RYWR.PRO.03080	Land Acquisition Process Indicative Timeline	129	0%	02-Jun-25	01-Dec-25	819
SITE SELECTION		236		23-Mar-21 A	19-Jul-22	2102
Pipelines		196		23-Mar-21 A	20-May-22	2142
RYWR.PRO.06010	Identify Pipeline Corridors Through Stancheck Tool	0	100%	23-Mar-21 A	13-Apr-21 A	
RYWR.PRO.06020	Review Pipeline Corridors to Stage 2B	0	100%	14-Apr-21 A	25-Jun-21 A	
RYWR.PRO.06030	Identify Preferred Pipline Corridor	36	0%	28-Jun-21 A	27-Sep-21	11
RYWR.PRO.06041	Perform Stakeholder Engagement	0	0%	28-Sep-21	28-Sep-21	2302
RYWR.PRO.06040	Review Initial Data from Early Surveys	50	0%	28-Sep-21	06-Dec-21	11
RYWR.PRO.06042	Revise and Evaluate Route by Engineering & Enabling	30	0%	07-Dec-21	25-Jan-22	11
RYWR.PRO.06050	Check and Amend Route	40	0%	26-Jan-22	22-Mar-22	11
RYWR.PRO.06060	Final PREFERRED Pipeline Route Confirmed	0	0%		20-May-22	11
RYWR.PRO.06055	Final Decision & Governance Process for Preferred Route Selection	40	0%	23-Mar-22	20-May-22	11
Pumping Stations		236		02-Aug-21 A	19-Jul-22	289
RYWR.PRO.06520	Perform Topo Studies and Hydraulic Modelling	0	0%		03-Sep-21	365
RYWR.PRO.06510	Develop Zonal areas on Pipeline Corridors for Possible Pumping Station Locations	20	0%	02-Aug-21 A	03-Sep-21	365
RYWR.PRO.06530	Perform Site Selection Stage 0-5 for Pumping Station Locations for Preferred Locations	60	0%	06-Sep-21	26-Nov-21	365
RYWR.PRO.06540	Preferred Pumping Station Location	0	0%		22-Mar-22	289
RYWR.PRO.06545	Review Initial Data from Early Surveys	20	0%	23-Mar-22	21-Apr-22	289
RYWR.PRO.06550	Revise and Evaluate Route by Engineering & Enabling	20	0%	22-Apr-22	20-May-22	289
RYWR.PRO.06551	Perform Stakeholder Engagement	40	0%	23-Mar-22	20-May-22	289
RYWR.PRO.06560	Fixed Pumping Station Location	0	0%		19-Jul-22	289
RYWR.PRO.06553	Final Decision & Governance Process for Preferred Pumping Station Location	40	0%	23-May-22	19-Jul-22	289
Water Recyclingn Plant		190		01-Jun-21 A	12-May-22	2148
RYWR.PRO.06710	Identify Preferred Location for Water Recycling Plant	0	100%	01-Jun-21 A	28-Jun-21 A	
RYWR.PRO.06730	Perform Topo Studies and Hydraulic Modelling	50	0%	06-Aug-21	15-Oct-21	2148
RYWR.PRO.06732	Preferred Pumping Station Location	0	0%		17-Jan-22	2148
RYWR.PRO.06731	Perform Site Selection Stage 0-5 for Pumping Station Locations for Preferred Locations	60	0%	18-Oct-21	17-Jan-22	2148
RYWR.PRO.06733	Review Initial Data from Early Surveys	20	0%	18-Jan-22	14-Feb-22	2148
RYWR.PRO.06734	Revise and Evaluate Route by Engineering & Enabling	20	0%	15-Feb-22	14-Mar-22	2148
RYWR.PRO.06740	Fixed Water Recycling Plant Location	0	0%		12-May-22	2148
RYWR.PRO.06735	Perform Stakeholder Engagement	80	0%	18-Jan-22	12-May-22	2148
RYWR.PRO.06736	Final Decision & Governance Process for Preferred Pumping Station Location	40	0%	15-Mar-22	12-May-22	2148
Environmental Buffer Lake		120		01-Jun-21 A	31-Jan-22	2218
RYWR.PRO.06910	Identify Preferred Site and Adjacent Area	0	100%	01-Jun-21 A	28-Jun-21 A	
RYWR.PRO.06930	Review Initial Data from Early Surveys	30	40%	09-Jul-21 A	17-Sep-21	2218
RYWR.PRO.06940	Revise and Evaluate Route by Engineering & Enabling	50	0%	20-Sep-21	26-Nov-21	2218
RYWR.PRO.06941	Perform Stakeholder Engagement	0	0%	29-Nov-21	29-Nov-21	2258
RYWR.PRO.06950	Fixed Environmental Buffer Lake Location	0	0%		31-Jan-22	2218
RYWR.PRO.06942	Final Decision & Governance Process for Preferred EBL Location	40	0%	29-Nov-21	31-Jan-22	2218
RESOURCES TO SUPPORT DCO CONSENT		90		28-Jun-21 A	10-Dec-21	1988
RYWR.PRO.02530	Issue Contract to DCO Consultant	0	100%		06-Aug-21 A	
RYWR.PRO.02510	Information Available for DCO Consultant (Scope & Terms of Contract) 6th July	0	100%	28-Jun-21 A	06-Aug-21 A	
RYWR.PRO.02560	Issue Draft Contract to DCO Consultant	0	100%		06-Aug-21 A	
RYWR.PRO.02520	Procurement to Produce Contract Documentation for DCO Consultant	0	100%	06-Aug-21 A	07-Aug-21 A	
RYWR.PRO.02540	DCO Consultant Submit Cost & Schedule	30	0%	06-Aug-21	17-Sep-21	1988
RYWR.PRO.02570	DCO CONSULTANT START DATE	0	0%		29-Oct-21	1988
RYWR.PRO.02550	Contract Negotiation with DCO Consultant	30	0%	20-Sep-21	29-Oct-21	1988
RYWR.PRO.02580	DCO Consultant Mobilisation	10	0%	01-Nov-21	12-Nov-21	1988
RYWR.PRO.02620	DCO Confirm Roles & Responsibilities (RACI)	0	0%		10-Dec-21	1988
RYWR.PRO.02610	DCO Confirm Surveys & Designs Scope Required for DCO. Procurement. Cost Modelling.	0	0%		10-Dec-21	1988
RYWR.PRO.02590	Workshops with DCO Consultant	20	0%	15-Nov-21	10-Dec-21	1988
DCO CONSULTATION SUPPORT SERVICE		60		07-Jul-21 A	04-Nov-21	152
RYWR.PRO.05010	Agree scope with Supplier	0	100%	07-Jul-21 A	23-Jul-21 A	
RYWR.PRO.05020	Supplier to submit Cost, Proposal & Schedule	0	100%	26-Jul-21 A	05-Aug-21 A	
RYWR.PRO.05030	SW review supplier cost, Proposal & Schedule	5	0%	12-Aug-21*	18-Aug-21	0
RYWR.PRO.05040	Contract Negotiation	15	0%	19-Aug-21	09-Sep-21	152
RYWR.PRO.05050	Supplier to submit BAFO	5	0%	10-Sep-21	16-Sep-21	152



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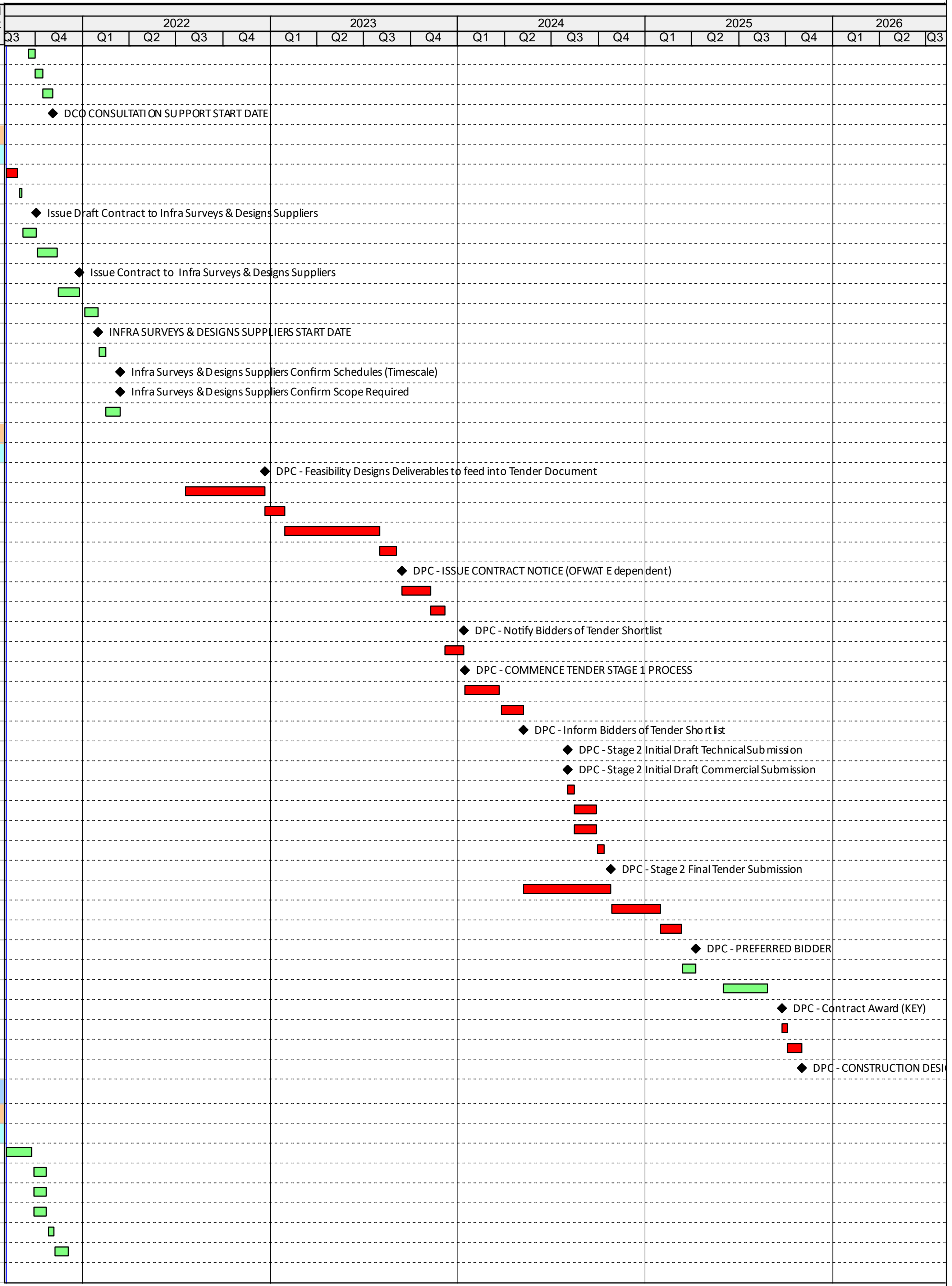
Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
RYWR.PRO.05060	SW Governance and sign off	10	0%	17-Sep-21	30-Sep-21	152
RYWR.PRO.05070	Contract Award & Execution	10	0%	01-Oct-21	14-Oct-21	152
RYWR.PRO.05080	Time Risk Allowance	15	0%	15-Oct-21	04-Nov-21	152
RYWR.PRO.05090	DCO CONSULTATION SUPPORT START DATE	0	0%		04-Nov-21	152
PROCUREMENT OF SURVEYS & DESIGNS FOR PIPELINE ROUTE. PUMPING STATION & BREAK PRESSURE T		150		14-Jun-21 A	14-Mar-22	53
INFRA		150		14-Jun-21 A	14-Mar-22	53
RYWR.PRO.04000	Agree Pre-Construction Work Packages	16	20%	14-Jun-21 A	27-Aug-21	7
RYWR.PRO.04010	Works Information Available for Infra Surveys & Designs	4	0%	31-Aug-21	03-Sep-21	53
RYWR.PRO.04030	Issue Draft Contract to Infra Surveys & Designs Suppliers	0	0%		01-Oct-21	53
RYWR.PRO.04020	Procurement to Produce Contract Documentation for Infra Surveys & Designs	20	0%	06-Sep-21	01-Oct-21	53
RYWR.PRO.04040	Supplier Submit Cost & Schedule for Infra Surveys & Designs	30	0%	04-Oct-21	12-Nov-21	53
RYWR.PRO.04060	Issue Contract to Infra Surveys & Designs Suppliers	0	0%		24-Dec-21	53
RYWR.PRO.04050	Contract & Cost & Schedule Negotiation with Infra Surveys & Designs Suppliers	30	0%	15-Nov-21	24-Dec-21	53
RYWR.PRO.04070	Infra Surveys & Designs Supplier Step Down Contracts to Sub-Contractors	20	0%	04-Jan-22	31-Jan-22	53
RYWR.PRO.04080	INFRA SURVEYS & DESIGNS SUPPLIERS START DATE	0	0%		31-Jan-22	53
RYWR.PRO.04090	Infra Surveys & Designs Supplier Mobilisation	10	0%	01-Feb-22	14-Feb-22	53
RYWR.PRO.04140	Infra Surveys & Designs Suppliers Confirm Schedules (Timescale)	0	0%		14-Mar-22	53
RYWR.PRO.04130	Infra Surveys & Designs Suppliers Confirm Scope Required	0	0%		14-Mar-22	53
RYWR.PRO.04120	Workshops with Infra Surveys & Designs Suppliers	20	0%	15-Feb-22	14-Mar-22	53
CONSTRUCTIONS		822		20-Jul-22	31-Oct-25	0
DPC (Direct Procurement for Customer)		822		20-Jul-22	31-Oct-25	0
RYWR.PRO.00040	DPC - Feasibility Designs Deliverables to feed into Tender Document	0	0%		21-Dec-22	7
RYWR.PRO.00050	DPC - Product Tender Documentation. PQQ Questionnaire. Contract. Contract Notice	110	0%	20-Jul-22	21-Dec-22	7
RYWR.PRO.00060	DPC - Procurement Assurance & Governance	22	0%	22-Dec-22	30-Jan-23	7
RYWR.PRO.00070	DPC - Refine Tender Documentation	129	0%	30-Jan-23	03-Aug-23	7
RYWR.PRO.00080	DPC - Procurement Assurance & Governance (Ready for Issue Contract Notice)	22	0%	03-Aug-23	04-Sep-23	7
RYWR.PRO.00100	DPC - ISSUE CONTRACT NOTICE (OFWAT E dependent)	0	0%		13-Sep-23	0
RYWR.PRO.00110	DPC - Pre-Qualification Questionnaire (PQQ) Period	40	0%	15-Sep-23	09-Nov-23	0
RYWR.PRO.00111	DPC - PQQ Evaluation Period	20	0%	10-Nov-23	07-Dec-23	0
RYWR.PRO.00113	DPC - Notify Bidders of Tender Shortlist	0	0%		12-Jan-24	0
RYWR.PRO.00112	DPC - Assurance and Governance	20	0%	08-Dec-23	12-Jan-24	0
RYWR.PRO.00120	DPC - COMMENCE TENDER STAGE 1 PROCESS	0	0%	15-Jan-24		0
RYWR.PRO.00130	DPC - Stage 1 Tender Period	50	0%	15-Jan-24	22-Mar-24	0
RYWR.PRO.00131	DPC - Stage 1 Assurance and Governance	30	0%	25-Mar-24	08-May-24	0
RYWR.PRO.00140	DPC - Inform Bidders of Tender Shortlist	0	0%		08-May-24	0
RYWR.PRO.00152	DPC - Stage 2 Initial Draft Technical Submission	0	0%		01-Aug-24	10
RYWR.PRO.00151	DPC - Stage 2 Initial Draft Commercial Submission	0	0%		01-Aug-24	10
RYWR.PRO.00153	DPC - Stage 2 Initial Draft Review. Feedback and Dialogue	10	0%	02-Aug-24	15-Aug-24	10
RYWR.PRO.00155	DPC - Stage 2 2nd Draft Technical Submission	30	0%	16-Aug-24	27-Sep-24	10
RYWR.PRO.00154	DPC - Stage 2 2nd Draft Commercial Submission	30	0%	16-Aug-24	27-Sep-24	10
RYWR.PRO.00156	DPC - Stage 2 2nd Draft Review. Feedback and Dialogue	10	0%	30-Sep-24	11-Oct-24	10
RYWR.PRO.00157	DPC - Stage 2 Final Tender Submission	0	0%		25-Oct-24	0
RYWR.PRO.00150	DPC - Stage 2 Tender Period	120	0%	09-May-24	25-Oct-24	0
RYWR.PRO.00158	DPC - Stage 2 Tender Assessment	60	0%	28-Oct-24	29-Jan-25	0
RYWR.PRO.00160	(GIVE) - DPC - PREFERRED BIDDER NEGOTIATION	30	0%	30-Jan-25	12-Mar-25	0
RYWR.PRO.00171	DPC - PREFERRED BIDDER	0	0%		09-Apr-25	54
RYWR.PRO.00170	DPC - SW Procurement Governance and Assurance	20	0%	13-Mar-25	09-Apr-25	54
RYWR.PRO.00180	DPC - SW Financial Close Period	60	0%	02-Jun-25	26-Aug-25	20
RYWR.PRO.00190	DPC - Contract Award (KEY)	0	0%		23-Sep-25	0
RYWR.PRO.00200	DPC - Standstill Period (10 calendar days)	10	0%	24-Sep-25	03-Oct-25	0
RYWR.PRO.00210	DPC - Execute Contract	20	0%	03-Oct-25	31-Oct-25	0
RYWR.PRO.00220	DPC - CONSTRUCTION DESIGN COMMENCE (KEY)	0	0%		31-Oct-25	0
SURVEYS		375		12-Jul-21 A	08-Feb-23	1963
LAND ACCESS		205		12-Jul-21 A	06-Jun-22	1973
Phase 1 Ecological Surveys Access		105		12-Jul-21 A	10-Jan-22	2073
RYWR.SVY.04710	Establish Initial Survey Needs for Land Access	35	0%	12-Jul-21 A	24-Sep-21	1823
RYWR.SVY.04750	Confirm Scope of Survey Activities Require Land Access (from Draft Scoping Report)	20	0%	27-Sep-21	22-Oct-21	1823
RYWR.SVY.04730	Further Checks & Land Referencing	20	0%	27-Sep-21	22-Oct-21	1823
RYWR.SVY.04720	Land Registry Search to Identify Land Owners	20	0%	27-Sep-21	22-Oct-21	1823
RYWR.SVY.04760	Send Letters to Land Owners	10	0%	25-Oct-21	05-Nov-21	2073
RYWR.SVY.04770	Engagement with PIL (Person with Interest in Land)	20	0%	08-Nov-21	03-Dec-21	2073
RYWR.SVY.04780	Stakeholder Engagement for Land Owners	70	0%	27-Sep-21	10-Jan-22	2073



🟩 Remaining Work
🟥 Critical Remaining Work
◆ ◆ Milestone

Date	Revision	Checked	Approved
26-Aug-21	WR (B2) Schedule for G1.5 Submission	DC	BM

WATER RECYCLING PLANT - OPTION B2 (BASED ON DPC PROCUREMENT ROUTE)

Progressed to 06-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
RYWR.SVY.04800	Land Access 'Handshake' for Phase 1 Ecological Surveys	0	0%		10-Jan-22	2073
RYWR.SVY.04790	Land Access (Licence Agreement) Negotiation	20	0%	06-Dec-21	10-Jan-22	2073
Phase 2 Ecological Surveys Access		150		25-Oct-21	06-Jun-22	1823
RYWR.SVY.05010	Establish Initial Survey Needs for Land Access	40	0%	25-Oct-21	17-Dec-21	1823
RYWR.SVY.05050	Confirm Scope of Survey Activities Require Land Access (from Draft Scoping Report)	20	0%	20-Dec-21	24-Jan-22	1843
RYWR.SVY.05030	Further Checks & Land Referencing	40	0%	20-Dec-21	21-Feb-22	1823
RYWR.SVY.05020	Land Registry Search to Identify Land Owners	40	0%	20-Dec-21	21-Feb-22	1823
RYWR.SVY.05060	Send Letters to Land Owners	10	0%	22-Feb-22	07-Mar-22	1823
RYWR.SVY.05080	Engagement with PIL (Person with Interest in Land)	40	0%	08-Mar-22	05-May-22	1823
RYWR.SVY.05090	Stakeholder Engagement for Land Owners	110	0%	20-Dec-21	06-Jun-22	1823
RYWR.SVY.05110	Land Access 'Handshake' for Phase 2 Ecological Surveys	0	0%		06-Jun-22	1823
RYWR.SVY.05100	Land Access (Licence Agreement) Negotiation	40	0%	05-Apr-22	06-Jun-22	1823
Engineering Surveys Land Entry		161		12-Jul-21 A	29-Mar-22	1867
RYWR.SVY.04910	Establish Initial Survey Needs for Land Access	21	0%	12-Jul-21 A	06-Sep-21	1867
RYWR.SVY.04940	Understand Preferred Route Coverage	40	0%	07-Sep-21	01-Nov-21	1867
RYWR.SVY.04930	Further Checks & Land Referencing	40	0%	07-Sep-21	01-Nov-21	1887
RYWR.SVY.04920	Land Registry Search to Identify Land Owners	40	0%	07-Sep-21	01-Nov-21	1887
RYWR.SVY.04950	Confirm Scope of Survey Activities Require Land Access (from Draft Scoping Report)	20	0%	02-Nov-21	29-Nov-21	1867
RYWR.SVY.04960	Send Letters to Land Owners	20	0%	30-Nov-21	04-Jan-22	1867
RYWR.SVY.04970	Engagement with PIL (Person with Interest in Land)	40	0%	05-Jan-22	01-Mar-22	1867
RYWR.SVY.04980	Stakeholder Engagement for Land Owners	100	0%	02-Nov-21	29-Mar-22	1867
RYWR.SVY.05000	Land Entry 'Handshake' for Engineering Surveys	0	0%		29-Mar-22	1867
RYWR.SVY.04990	Land Access (Licence Agreement) Negotiation	40	0%	02-Feb-22	29-Mar-22	1867
ECOLOGICAL SURVEYS		213		14-Dec-21	25-Oct-22	1973
RYWR.SVY.01010	CONTRACT AWARD - ECOLOGICAL SURVEYS	0	0%		14-Dec-21	2076
RYWR.SVY.01020	Ecological Surveys - Mobilisation	9	0%	16-Dec-21	05-Jan-22	2076
RYWR.SVY.01030	Ecological Surveys - THE START DATE	0	0%	06-Jan-22		2076
RYWR.SVY.01040	Ecological Surveys - Phase 1 On Site Survey Period (LAND REF SCHEDULE / NOTICE REQUIRED)	100	0%	11-Jan-22	06-Jun-22	2073
RYWR.SVY.01050	Ecological Surveys - Phase 2 On Site Survey Period (LAND REF SCHEDULE / NOTICE REQUIRED)	100	0%	07-Jun-22	25-Oct-22	1967
ENGINEERING SURVEYS FOR FEASIBILITY DESIGNS		359		31-Aug-21	08-Feb-23	1963
PIPELINES		359		31-Aug-21	08-Feb-23	1963
Walk Over Survey		90		31-Aug-21	11-Jan-22	953
RYWR.SVY.01110	Consttructibility Review . Walk Over Work Pack Scope Agreement	10	0%	31-Aug-21	13-Sep-21	7
RYWR.SVY.01120	Walk Over Surveys (Engineering, Enabling & Delivery Partner)	10	0%	14-Sep-21	27-Sep-21	48
RYWR.SVY.01130	Utility Drawings to mark out on CAD [redacted]	30	0%	14-Sep-21	25-Oct-21	953
RYWR.SVY.01140	Assessment of High Risk Areas (maybe with [redacted]	30	0%	14-Sep-21	25-Oct-21	953
RYWR.SVY.01150	Adjustment to the Route & Corridor	30	0%	26-Oct-21	06-Dec-21	953
RYWR.SVY.01160	Walk Over Surveys Output: Revised Pipeline Route	20	0%	07-Dec-21	11-Jan-22	953
Mobilisation for all Survey Works		55		15-Mar-22	06-Jun-22	1823
RYWR.SVY.00010	Infra Surveys & Designs Contractor produce Risk Assessment & Method Statement (RAMS)	10	0%	15-Mar-22	28-Mar-22	1858
RYWR.SVY.00020	SW Review & Accept RAMS	10	0%	29-Mar-22	11-Apr-22	1858
RYWR.SVY.00100	Infra Surveys & Designs Contractor START ON SITE FOR SURVEY	0	0%		06-Jun-22	1823
RYWR.SVY.00060	Permit for Access granted for Survey Works	0	0%		06-Jun-22	1823
Geotechnical		125		15-Mar-22	13-Sep-22	1823
RYWR.SVY.00310	Geotechnical and Geoenvironmental Desk Study	20	0%	15-Mar-22	11-Apr-22	1823
RYWR.SVY.00330	Geotechnical and Geoenvironmental Desk Study Report	40	0%	12-Apr-22	13-Jun-22	1823
RYWR.SVY.00360	Geotechnical Site Investigation Spec	20	0%	20-May-22	20-Jun-22	1823
RYWR.SVY.00370	Geotechnical Site Investigation (LAND REF SCHEDULE / NOTICE REQUIRED)	40	0%	21-Jun-22	15-Aug-22	1823
RYWR.SVY.00390	Geotechnical and Geoenvironmental Interpretation report	50	0%	05-Jul-22	13-Sep-22	1823
Topographic		70		07-Jun-22	13-Sep-22	1823
RYWR.SVY.00410	Topographical Survey Specification (for Key Crossings only)	10	0%	07-Jun-22	20-Jun-22	1823
RYWR.SVY.00430	Topographical Surveys (LAND REF SCHEDULE / NOTICE REQUIRED)	40	0%	21-Jun-22	15-Aug-22	1823
RYWR.SVY.00450	Topographical Surveys Report	20	0%	16-Aug-22	13-Sep-22	1823
Utilities		283		15-Dec-21	08-Feb-23	1963
RYWR.SVY.00530	GIS File produced	0	0%		19-Jan-22	1986
RYWR.SVY.00510	Utility Search Request for Remaining Services	20	0%	15-Dec-21	19-Jan-22	1986
RYWR.SVY.00550	Full Utility Search for Preferred Route	30	0%	20-Jan-22	02-Mar-22	2176
RYWR.SVY.00570	Refresh GIS File	20	0%	03-Mar-22	30-Mar-22	2176
RYWR.SVY.00590	Consultation with NR / Highways	283	0%	15-Dec-21	08-Feb-23	1963
Hydraulic		110		12-Jan-22	21-Jun-22	2122
RYWR.SVY.00630	Hydraulic Spec Request	20	0%	12-Jan-22	08-Feb-22	2192
RYWR.SVY.00660	Hydraulic Assessment / Calculations	20	0%	23-May-22	21-Jun-22	2122

🟩 Remaining Work
🟥 Critical Remaining Work
◆ ◆ Milestone

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26-Aug-21	WR (B2) Schedule for G1.5 Submission	DC	BM

Print: 26-Aug-21

WATER RECYCLING PLANT - OPTION B2 (BASED ON DPC PROCUREMENT ROUTE)

Progressed to 06-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
PIPELINES INFRASTRUCTURE (ASSETS)		359		31-Aug-21	08-Feb-23	1963
Walk Over Survey		90		31-Aug-21	11-Jan-22	2162
RYWR.SVY.01210	Consttructibility Review . Walk Over Work Pack Scope Agreement	10	0%	31-Aug-21	13-Sep-21	1982
RYWR.SVY.01220	Walk Over Surveys (Engineering, Enabling & Delivery Partner)	10	0%	14-Sep-21	27-Sep-21	1982
RYWR.SVY.01230	Utility Drawings to mark out on CAD [redacted]	30	0%	14-Sep-21	25-Oct-21	2162
RYWR.SVY.01240	Assessment of High Risk Areas (maybe with [redacted])	30	0%	14-Sep-21	25-Oct-21	2162
RYWR.SVY.01260	Adjustment to the Route & Corridor	30	0%	26-Oct-21	06-Dec-21	2162
RYWR.SVY.01270	Walk Over Surveys Output: Revised Pipeline Route	20	0%	07-Dec-21	11-Jan-22	2162
Mobilisation for all Survey Works		20		15-Mar-22	11-Apr-22	2108
RYWR.SVY.01310	Infra Surveys & Designs Contractor produce Risk Assessment & Method Statement (RAMS)	10	0%	15-Mar-22	28-Mar-22	2108
RYWR.SVY.01340	Infra Surveys & Designs Contractor START ON SITE FOR SURVEY	0	0%		11-Apr-22	2108
RYWR.SVY.01320	SW Review & Accept RAMS	10	0%	29-Mar-22	11-Apr-22	2108
RYWR.SVY.01330	Permit for Access granted for Survey Works	0	0%		11-Apr-22	2108
Geotechnical		125		15-Mar-22	13-Sep-22	2063
RYWR.SVY.01410	Geotechnical and Geoenvironmental Desk Study	20	0%	15-Mar-22	11-Apr-22	2063
RYWR.SVY.01420	Geotechnical and Geoenvironmental Desk Study Report	40	0%	12-Apr-22	13-Jun-22	2063
RYWR.SVY.01430	Geotechnical Site Investigation Spec	20	0%	20-May-22	20-Jun-22	2063
RYWR.SVY.01440	Geotechnical Site Investigation (LAND REF SCHEDULE / NOTICE REQUIRED)	40	0%	21-Jun-22	15-Aug-22	2063
RYWR.SVY.01450	Geotechnical and Geoenvironmental Interpretation report	50	0%	05-Jul-22	13-Sep-22	2063
Topographic		124		12-Jan-22	11-Jul-22	2108
RYWR.SVY.01510	Topographical Survey Specification (for Key Crossings only)	10	0%	12-Jan-22	25-Jan-22	2162
RYWR.SVY.01520	Topographical Surveys (LAND REF SCHEDULE / NOTICE REQUIRED)	40	0%	12-Apr-22	13-Jun-22	2108
RYWR.SVY.01530	Topographical Surveys Report	20	0%	14-Jun-22	11-Jul-22	2108
Utilities		269		12-Jan-22	08-Feb-23	1963
RYWR.SVY.01620	GIS File produced	0	0%		08-Feb-22	2162
RYWR.SVY.01610	Utility Search Request for Remaining Services	20	0%	12-Jan-22	08-Feb-22	2162
RYWR.SVY.01630	Full Utility Search for Preferred Route	30	0%	09-Feb-22	22-Mar-22	2162
RYWR.SVY.01640	Refresh GIS File	20	0%	23-Mar-22	21-Apr-22	2162
RYWR.SVY.01650	Consultation with NR / Highways	269	0%	12-Jan-22	08-Feb-23	1963
Hydraulic		40		12-Jan-22	08-Mar-22	2192
RYWR.SVY.01710	Hydraulic Spec Request	20	0%	12-Jan-22	08-Feb-22	2192
RYWR.SVY.01720	Hydraulic Assessment / Calculations	20	0%	09-Feb-22	08-Mar-22	2192
FEASIBILITY DESIGNS		480		06-Aug-21	11-Jul-23	1858
RYWR.DGN.00810	EQUIPMENT SELECTED	0	0%		14-Dec-21	1916
RYWR.DGN.00840	(GIVE) - REDLINE for Preferred Route Announcement (PRA) CONFIRMED	0	0%		20-May-22	11
RYWR.DGN.00820	(GIVE) - SUFFICIENT DESIGN COMPLETE for PRE-APPLICATION CONSULTATION	0	0%		21-Dec-22	179
RYWR.DGN.00830	(GIVE) - DESIGNS INFORMATION COMPLETE for PROCUREMENT TENDER DOCUMENTATION	0	0%		21-Dec-22	7
BUDDS FARM TO WRP		454		14-Sep-21	11-Jul-23	1858
Civils Designs (more details to be developed)		120		14-Sep-21	08-Mar-22	7
RYWR.DGN.01510	Initial Buildability Review	30	0%	14-Sep-21	25-Oct-21	7
RYWR.DGN.01520	Pipeline Long Section Drawings	30	0%	26-Oct-21	06-Dec-21	7
RYWR.DGN.01530	Estimate of Civil Structure Dimensions	30	0%	07-Dec-21	25-Jan-22	7
RYWR.DGN.01540	Preliminary Pipe Routing 3D Model	30	0%	26-Jan-22	08-Mar-22	7
Mechanical Designs		290		15-Mar-22	15-May-23	1898
RYWR.DGN.02010	Pump Sizing Calculations	20	0%	15-Mar-22	11-Apr-22	73
RYWR.DGN.02040	EQUIPMENT SELECTED	0	0%		27-Apr-22	63
RYWR.DGN.02020	Hydraulic Modelling	30	0%	15-Mar-22	27-Apr-22	63
RYWR.DGN.02050	M&E Equipment Layout	30	0%	28-Apr-22	13-Jun-22	113
RYWR.DGN.02060	Mechanical Input to P&ID	80	0%	28-Apr-22	22-Aug-22	63
RYWR.DGN.02070	Pipe Material Selection	10	0%	23-Aug-22	06-Sep-22	83
RYWR.DGN.02080	Pipework Pressure Ratings	10	0%	23-Aug-22	06-Sep-22	83
RYWR.DGN.02090	Preliminary Pipe, Valve and Actuator Schedule	30	0%	23-Aug-22	04-Oct-22	63
RYWR.DGN.02100	Surge Protection Equipment Specification	20	0%	05-Oct-22	01-Nov-22	1898
RYWR.DGN.02160	Initial HVAC Systems Design Strategy	10	0%	02-Nov-22	15-Nov-22	1898
RYWR.DGN.02180	Initial Lifting Schedule	10	0%	16-Nov-22	29-Nov-22	1898
RYWR.DGN.02190	Critical Spares Assessment (MED4900) & Maintenance Assessment (MED4002)	10	0%	30-Nov-22	13-Dec-22	1898
RYWR.DGN.02230	Plant Specification / Data Sheet	30	0%	14-Dec-22	01-Feb-23	1898
RYWR.DGN.02250	WQM 425 Materials in Contact with Potable Water RA (Initial Assessment of Shortlisted Options)	10	0%	02-Feb-23	15-Feb-23	1918
RYWR.DGN.02260	Initial ALM Design Strategy	30	0%	02-Feb-23	15-Mar-23	1898
RYWR.DGN.02270	Mcerts Schematic Diagram (if applicable)	10	0%	16-Mar-23	29-Mar-23	1898
RYWR.DGN.02280	Input to Technical Report / Works Specification	30	0%	30-Mar-23	15-May-23	1898
RYWR.DGN.02290	Process and Mechanical Equipment Specifications	30	0%	30-Mar-23	15-May-23	1898

🟩 Remaining Work

🟥 Critical Remaining Work

◆ ◆ Milestone

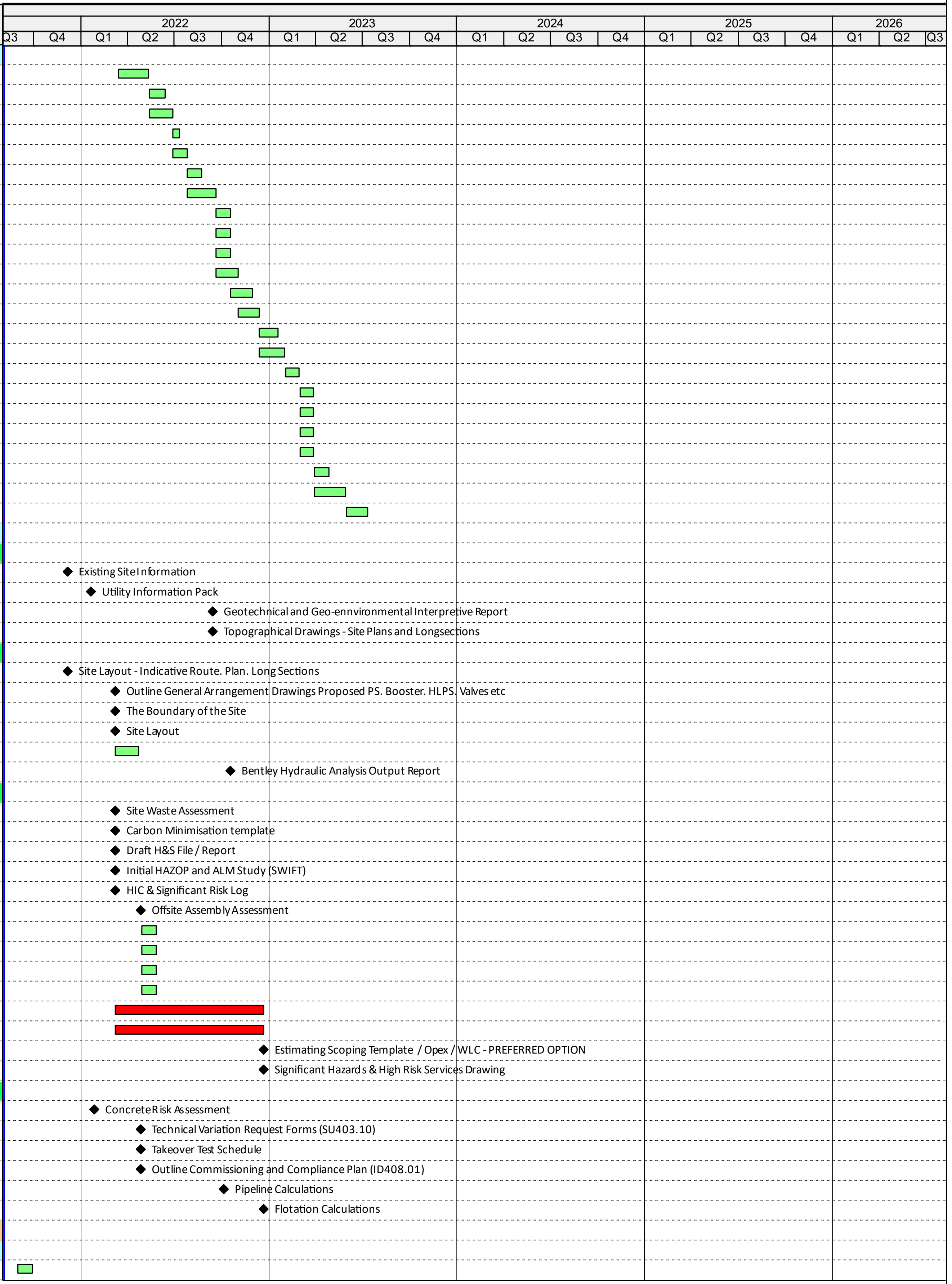
Project ID: 710060-B2-1 CURR Standard Layout for Distribution

Date	Revision	Checked	Approved
26-Aug-21	WR (B2) Schedule for G1.5 Submission	DC	BM

WATER RECYCLING PLANT - OPTION B2 (BASED ON DPC PROCUREMENT ROUTE)

Progressed to 06-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
Electrical Designs		330		15-Mar-22	11-Jul-23	1858
RYWR.DGN.03010	Input to P&IDs	40	0%	15-Mar-22	12-May-22	53
RYWR.DGN.03040	Preliminary Single Line Diagrams (All Shortlisted Options)	20	0%	13-May-22	13-Jun-22	63
RYWR.DGN.03030	Outline ICA System Architecture Drawing	30	0%	13-May-22	27-Jun-22	53
RYWR.DGN.03070	ECM 4006.2 (Details of New Supplies or Changes to Existing Supplies)	10	0%	28-Jun-22	11-Jul-22	63
RYWR.DGN.03060	Preliminary Load Assessment / Schedule (All Shortlisted Options)	20	0%	28-Jun-22	25-Jul-22	53
RYWR.DGN.03110	Preliminary Generator Sizing	20	0%	26-Jul-22	22-Aug-22	73
RYWR.DGN.03120	MCC Sizes & Calculation	40	0%	26-Jul-22	20-Sep-22	53
RYWR.DGN.03140	Preliminary Instrument Schedule	20	0%	21-Sep-22	18-Oct-22	53
RYWR.DGN.03150	Preliminary Telemetry I/O Schedule	20	0%	21-Sep-22	18-Oct-22	1868
RYWR.DGN.03160	Telemetry Strategy	20	0%	21-Sep-22	18-Oct-22	1868
RYWR.DGN.03170	SCADA Strategy (Consultation with IT/OT)	30	0%	21-Sep-22	01-Nov-22	1858
RYWR.DGN.03190	Outline Electrical Layout Drawing(s)	30	0%	19-Oct-22	29-Nov-22	1868
RYWR.DGN.03180	M&E Equipment Layout	30	0%	02-Nov-22	13-Dec-22	1858
RYWR.DGN.03510	Initial Earthing Layout & Specification	20	0%	14-Dec-22	18-Jan-23	1868
RYWR.DGN.03520	Outline Electrical Site Plan (cable duct layout)	30	0%	14-Dec-22	01-Feb-23	1858
RYWR.DGN.03200	Outline Operation and Control Philosophy	20	0%	02-Feb-23	01-Mar-23	1858
RYWR.DGN.03580	Local Isolator & Estop Assessment	20	0%	02-Mar-23	29-Mar-23	1858
RYWR.DGN.03560	Lightning & Surge Protection Assessment	20	0%	02-Mar-23	29-Mar-23	1858
RYWR.DGN.03540	Fire Alarm and Gas Detection Assessment	20	0%	02-Mar-23	29-Mar-23	1858
RYWR.DGN.03530	Lighting calculations / drawings	20	0%	02-Mar-23	29-Mar-23	1858
RYWR.DGN.03590	BCDs (Block cable diagram)	20	0%	30-Mar-23	28-Apr-23	1878
RYWR.DGN.03610	Electrical Installation Specification	40	0%	30-Mar-23	30-May-23	1858
RYWR.DGN.03630	Input to Technical Report	30	0%	31-May-23	11-Jul-23	1858
Other Deliverables		260		06-Dec-21	21-Dec-22	1992
Site Information		189		06-Dec-21	13-Sep-22	2063
RYWR.DGN.00130	Existing Site Information	0	0%		06-Dec-21	2252
RYWR.DGN.00140	Utility Information Pack	0	0%		19-Jan-22	2226
RYWR.DGN.00120	Geotechnical and Geo-ennvironmental Interpretive Report	0	0%		13-Sep-22	2063
RYWR.DGN.00110	Topographical Drawings - Site Plans and Longsections	0	0%		13-Sep-22	2063
Works Information		214		06-Dec-21	18-Oct-22	53
RYWR.DGN.00030	Site Layout - Indicative Route. Plan. Long Sections	0	0%		06-Dec-21	267
RYWR.DGN.00040	Outline General Arrangement Drawings Proposed PS. Booster. HLPS. Valves etc	0	0%		08-Mar-22	207
RYWR.DGN.00020	The Boundary of the Site	0	0%		08-Mar-22	207
RYWR.DGN.00010	Site Layout	0	0%		08-Mar-22	207
RYWR.DGN.00070	Civil Specification	30	0%	09-Mar-22	21-Apr-22	177
RYWR.DGN.00060	Bentley Hydraulic Analysis Output Report	0	0%		18-Oct-22	53
Pre-Construction		200		08-Mar-22	21-Dec-22	179
RYWR.DGN.00260	Site Waste Assessment	0	0%		08-Mar-22	379
RYWR.DGN.00250	Carbon Minimisation template	0	0%		08-Mar-22	379
RYWR.DGN.00240	Draft H&S File / Report	0	0%		08-Mar-22	207
RYWR.DGN.00230	Initial HAZOP and ALM Study (SWIFT)	0	0%		08-Mar-22	207
RYWR.DGN.00210	HIC & Significant Risk Log	0	0%		08-Mar-22	207
RYWR.DGN.00270	Offsite Assembly Assessment	0	0%		27-Apr-22	173
RYWR.DGN.00440	MEICA Related - Local Isolator / Emergency Stop Risk Assessment (MED4001)	20	0%	28-Apr-22	26-May-22	153
RYWR.DGN.00430	MEICA Related - Lightning Protection Risk Assessment	20	0%	28-Apr-22	26-May-22	153
RYWR.DGN.00420	MEICA Related - ECM 4007 (Assessment of Requirement for Site Standby Power)	20	0%	28-Apr-22	26-May-22	153
RYWR.DGN.00410	MEICA Related - DSEAR and Potential Explosive Atmosphere Zone (PEAZ) RA & Drawing(s)	20	0%	28-Apr-22	26-May-22	153
RYWR.DGN.00490	Design Drawings to support the Planning DCO Process	200	0%	09-Mar-22	21-Dec-22	7
RYWR.DGN.00480	3D Model Layouts	200	0%	09-Mar-22	21-Dec-22	7
RYWR.DGN.00280	Estimating Scoping Template / Opex / WLC - PREFERRED OPTION	0	0%		21-Dec-22	179
RYWR.DGN.00220	Significant Hazards & High Risk Services Drawing	0	0%		21-Dec-22	7
Outline Operational Strategy		230		25-Jan-22	21-Dec-22	7
RYWR.DGN.00360	Concrete Risk Assessment	0	0%		25-Jan-22	237
RYWR.DGN.00330	Technical Variation Request Forms (SU403.10)	0	0%		27-Apr-22	173
RYWR.DGN.00320	Takeover Test Schedule	0	0%		27-Apr-22	173
RYWR.DGN.00310	Outline Commissioning and Compliance Plan (ID408.01)	0	0%		27-Apr-22	173
RYWR.DGN.00340	Pipeline Calculations	0	0%		04-Oct-22	63
RYWR.DGN.00350	Flotation Calculations	0	0%		21-Dec-22	7
ENVIRONMENTAL BUFFER LAKE AT OTTERBOURNE PRE-DISINFECTION PLANT		205		31-Aug-21	28-Jun-22	2117
LEADING IN ACTIVITIES		122		31-Aug-21	24-Feb-22	2200
RYWR.DGN.01010	Initial Buildability Review	20	0%	31-Aug-21	27-Sep-21	2117



🟩 Remaining Work
🟥 Critical Remaining Work
◆ ◆ Milestone

Project ID: 710060-B2-1 CURR Standard Layout for Distribution

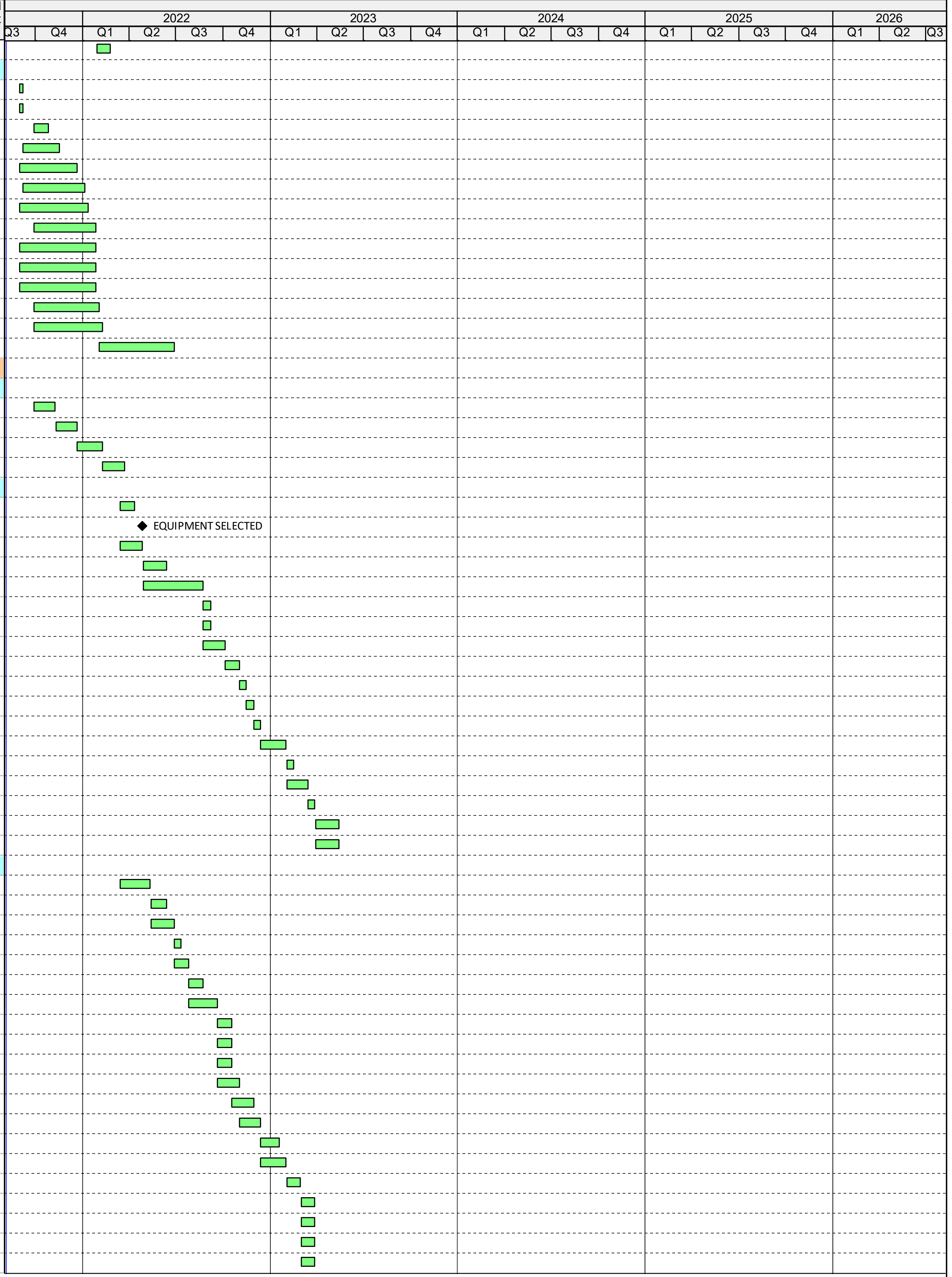
Date	Revision	Checked	Approved
26-Aug-21	WR (B2) Schedule for G1.5 Submission	DC	BM

WATER RECYCLING PLANT - OPTION B2 (BASED ON DPC PROCUREMENT ROUTE)

Progressed to 06-Aug-21

Print: 26-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
RYWR.DGN.01020	Design Estimate (SW) to Facilitate OFWAT Control Point C data	20	0%	28-Jan-22	24-Feb-22	2297
ENGINEERING DESIGNS		205		31-Aug-21	28-Jun-22	2117
RYWR.DGN.01120	Process Block Diagram	5	0%	31-Aug-21	06-Sep-21	2137
RYWR.DGN.01110	Process Flow Diagram	5	0%	31-Aug-21	06-Sep-21	2137
RYWR.DGN.01250	Architectural	20	0%	28-Sep-21	25-Oct-21	2182
RYWR.DGN.01150	Piping and Instrumentation Diagrams	50	0%	07-Sep-21	15-Nov-21	2167
RYWR.DGN.01180	WQ Risk Identification Workshop	80	0%	31-Aug-21	20-Dec-21	2142
RYWR.DGN.01170	Process Equipment Sizing	80	0%	07-Sep-21	04-Jan-22	2137
RYWR.DGN.01100	Mass Balances	89	0%	31-Aug-21	10-Jan-22	2133
RYWR.DGN.01260	Modelling	80	0%	28-Sep-21	25-Jan-22	2122
RYWR.DGN.01220	Mechanical	102	0%	31-Aug-21	27-Jan-22	2200
RYWR.DGN.01230	CDM	102	0%	31-Aug-21	27-Jan-22	2220
RYWR.DGN.01240	CIvil	102	0%	31-Aug-21	27-Jan-22	2200
RYWR.DGN.01190	Process Safety	85	0%	28-Sep-21	01-Feb-22	2117
RYWR.DGN.01210	CAD	90	0%	28-Sep-21	08-Feb-22	2212
RYWR.DGN.01290	Feasibility Design Amendment Post-PEIR (following Non-Stat Consultation)	100	0%	02-Feb-22	28-Jun-22	2117
CONNECTION BETWEEN EBL AND OTTERBOURNE PRE-DISINFECTION PLANT		444		28-Sep-21	11-Jul-23	1858
Civils Designs (more details to be developed)		120		28-Sep-21	22-Mar-22	1982
RYWR.DGN.5850	Initial Buildability Review	30	0%	28-Sep-21	08-Nov-21	1982
RYWR.DGN.5830	Pipeline Long Section Drawings	30	0%	09-Nov-21	20-Dec-21	1982
RYWR.DGN.5860	Estimate of Civil Structure Dimensions	30	0%	21-Dec-21	08-Feb-22	1982
RYWR.DGN.5820	Preliminary Pipe Routing 3D Model	30	0%	09-Feb-22	22-Mar-22	1982
Mechanical Designs		290		15-Mar-22	15-May-23	1898
RYWR.DGN.5730	Pump Sizing Calculations	20	0%	15-Mar-22	11-Apr-22	1908
RYWR.DGN.5880	EQUIPMENT SELECTED	0	0%		27-Apr-22	1898
RYWR.DGN.5870	Hydraulic Modelling	30	0%	15-Mar-22	27-Apr-22	1898
RYWR.DGN.5890	M&E Equipment Layout	30	0%	28-Apr-22	13-Jun-22	1948
RYWR.DGN.5770	Mechanical Input to P&ID	80	0%	28-Apr-22	22-Aug-22	1898
RYWR.DGN.5750	Pipe Material Selection	10	0%	23-Aug-22	06-Sep-22	1918
RYWR.DGN.5740	Pipework Pressure Ratings	10	0%	23-Aug-22	06-Sep-22	1918
RYWR.DGN.5690	Preliminary Pipe, Valve and Actuator Schedule	30	0%	23-Aug-22	04-Oct-22	1898
RYWR.DGN.5810	Surge Protection Equipment Specification	20	0%	05-Oct-22	01-Nov-22	1898
RYWR.DGN.5780	Initial HVAC Systems Design Strategy	10	0%	02-Nov-22	15-Nov-22	1898
RYWR.DGN.5710	Initial Lifting Schedule	10	0%	16-Nov-22	29-Nov-22	1898
RYWR.DGN.5720	Critical Spares Assessment (MED4900) & Maintenance Assessment (MED4002)	10	0%	30-Nov-22	13-Dec-22	1898
RYWR.DGN.5760	Plant Specification / Data Sheet	30	0%	14-Dec-22	01-Feb-23	1898
RYWR.DGN.5660	WQM 425 Materials in Contact with Potable Water RA (Initial Assessment of Shortlisted Options)	10	0%	02-Feb-23	15-Feb-23	1918
RYWR.DGN.5700	Initial ALM Design Strategy	30	0%	02-Feb-23	15-Mar-23	1898
RYWR.DGN.5670	Mcerts Schematic Diagram (if applicable)	10	0%	16-Mar-23	29-Mar-23	1898
RYWR.DGN.5900	Input to Technical Report / Works Specification	30	0%	30-Mar-23	15-May-23	1898
RYWR.DGN.5680	Process and Mechanical Equipment Specifications	30	0%	30-Mar-23	15-May-23	1898
Electrical Designs		330		15-Mar-22	11-Jul-23	1858
RYWR.DGN.5910	Input to P&IDs	40	0%	15-Mar-22	12-May-22	1858
RYWR.DGN.5510	Preliminary Single Line Diagrams (All Shortlisted Options)	20	0%	13-May-22	13-Jun-22	1868
RYWR.DGN.5560	Outline ICA System Architecture Drawing	30	0%	13-May-22	27-Jun-22	1858
RYWR.DGN.5540	ECM 4006.2 (Details of New Supplies or Changes to Existing Supplies)	10	0%	28-Jun-22	11-Jul-22	1868
RYWR.DGN.5480	Preliminary Load Assessment / Schedule (All Shortlisted Options)	20	0%	28-Jun-22	25-Jul-22	1858
RYWR.DGN.5520	Preliminary Generator Sizing	20	0%	26-Jul-22	22-Aug-22	1878
RYWR.DGN.5630	MCC Sizes & Calculation	40	0%	26-Jul-22	20-Sep-22	1858
RYWR.DGN.5530	Preliminary Instrument Schedule	20	0%	21-Sep-22	18-Oct-22	1868
RYWR.DGN.5500	Preliminary Telemetry I/O Schedule	20	0%	21-Sep-22	18-Oct-22	1868
RYWR.DGN.5490	Telemetry Strategy	20	0%	21-Sep-22	18-Oct-22	1868
RYWR.DGN.5930	SCADA Strategy (Consultation with IT/OT)	30	0%	21-Sep-22	01-Nov-22	1858
RYWR.DGN.5580	Outline Electrical Layout Drawing(s)	30	0%	19-Oct-22	29-Nov-22	1868
RYWR.DGN.5640	M&E Equipment Layout	30	0%	02-Nov-22	13-Dec-22	1858
RYWR.DGN.5650	Initial Earthing Layout & Specification	20	0%	14-Dec-22	18-Jan-23	1868
RYWR.DGN.5590	Outline Electrical Site Plan (cable duct layout)	30	0%	14-Dec-22	01-Feb-23	1858
RYWR.DGN.5550	Outline Operation and Control Philosophy	20	0%	02-Feb-23	01-Mar-23	1858
RYWR.DGN.5950	Local Isolator & Estop Assessment	20	0%	02-Mar-23	29-Mar-23	1858
RYWR.DGN.5940	Lightning & Surge Protection Assessment	20	0%	02-Mar-23	29-Mar-23	1858
RYWR.DGN.5610	Fire Alarm and Gas Detection Assessment	20	0%	02-Mar-23	29-Mar-23	1858
RYWR.DGN.5570	Lighting calculations / drawings	20	0%	02-Mar-23	29-Mar-23	1858



🟩 Remaining Work

🟥 Critical Remaining Work

◆ ◆ Milestone

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Project ID: 710060-B2-1 CURR Standard Layout for Distribution

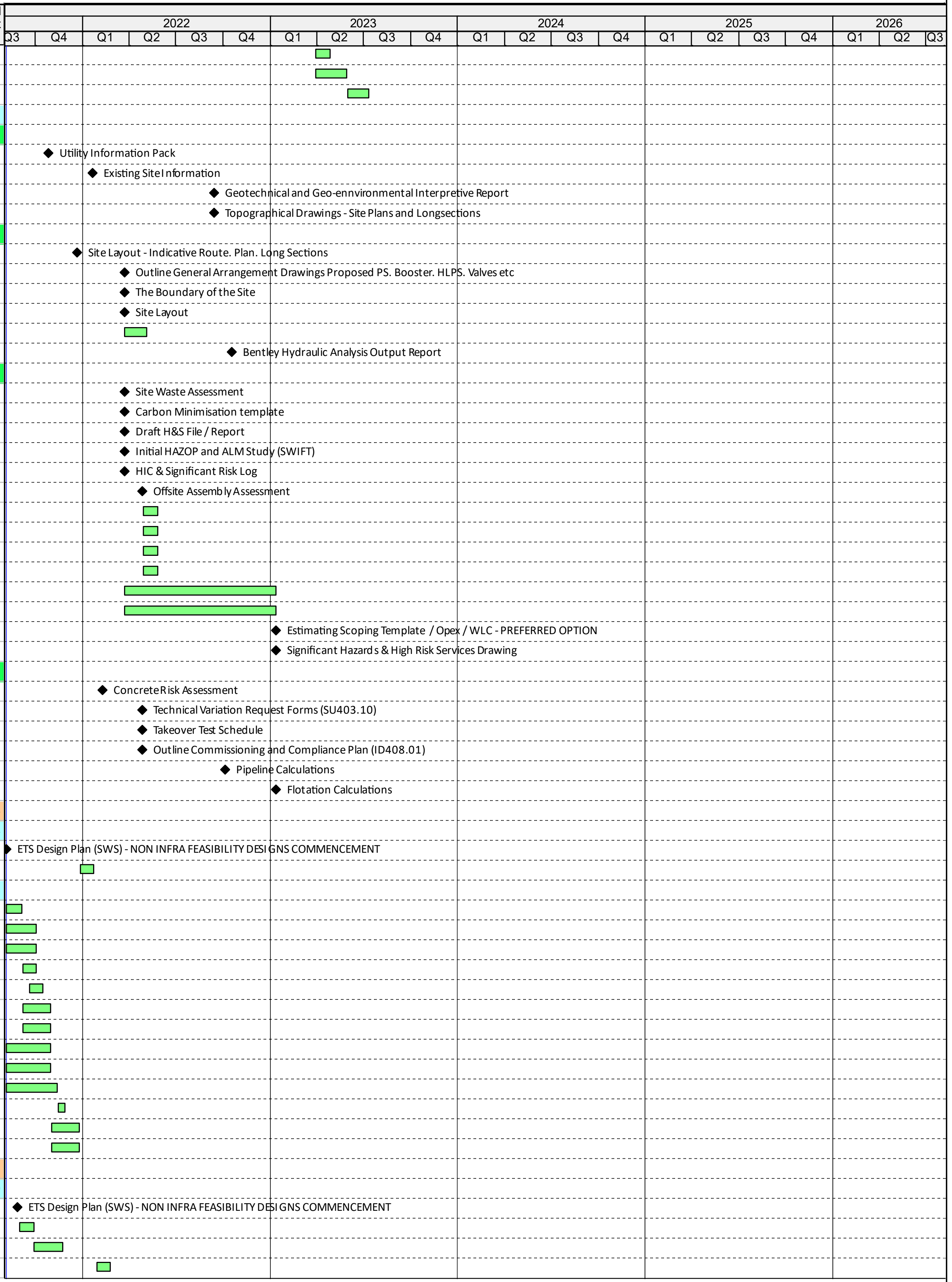
Date	Revision	Checked	Approved
26-Aug-21	WR (B2) Schedule for G1.5 Submission	DC	BM

WATER RECYCLING PLANT - OPTION B2 (BASED ON DPC PROCUREMENT ROUTE)

Progressed to 06-Aug-21

Print: 26-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
RYWR.DGN.5600	BCDs (Block cable diagram)	20	0%	30-Mar-23	28-Apr-23	1878
RYWR.DGN.5620	Electrical Installation Specification	40	0%	30-Mar-23	30-May-23	1858
RYWR.DGN.5920	Input to Technical Report	30	0%	31-May-23	11-Jul-23	1858
Other Deliverables		300		25-Oct-21	12-Jan-23	1982
Site Information		219		25-Oct-21	13-Sep-22	2063
RYWR.DGN.5350	Utility Information Pack	0	0%		25-Oct-21	2282
RYWR.DGN.5340	Existing Site Information	0	0%		19-Jan-22	2226
RYWR.DGN.5330	Geotechnical and Geo-ennvironmental Interpretive Report	0	0%		13-Sep-22	2063
RYWR.DGN.5320	Topographical Drawings - Site Plans and Longsections	0	0%		13-Sep-22	2063
Works Information		204		20-Dec-21	18-Oct-22	2038
RYWR.DGN.5230	Site Layout - Indicative Route. Plan. Long Sections	0	0%		20-Dec-21	2242
RYWR.DGN.5240	Outline General Arrangement Drawings Proposed PS. Booster. HLPS. Valves etc	0	0%		22-Mar-22	2182
RYWR.DGN.5220	The Boundary of the Site	0	0%		22-Mar-22	2182
RYWR.DGN.5210	Site Layout	0	0%		22-Mar-22	2182
RYWR.DGN.5840	Civil Specification	30	0%	23-Mar-22	06-May-22	2152
RYWR.DGN.5250	Bentley Hydraulic Analysis Output Report	0	0%		18-Oct-22	2038
Pre-Construction		200		22-Mar-22	12-Jan-23	1982
RYWR.DGN.5410	Site Waste Assessment	0	0%		22-Mar-22	2182
RYWR.DGN.5400	Carbon Minimisation template	0	0%		22-Mar-22	2182
RYWR.DGN.5390	Draft H&S File / Report	0	0%		22-Mar-22	2182
RYWR.DGN.5380	Initial HAZOP and ALM Study (SWIFT)	0	0%		22-Mar-22	2182
RYWR.DGN.5360	HIC & Significant Risk Log	0	0%		22-Mar-22	2182
RYWR.DGN.5420	Offsite Assembly Assessment	0	0%		27-Apr-22	2158
RYWR.DGN.5470	MEICA Related - Local Isolator / Emergency Stop Risk Assessment (MED4001)	20	0%	28-Apr-22	26-May-22	2138
RYWR.DGN.5460	MEICA Related - Lightning Protection Risk Assessment	20	0%	28-Apr-22	26-May-22	2138
RYWR.DGN.5450	MEICA Related - ECM 4007 (Assessment of Requirement for Site Standby Power)	20	0%	28-Apr-22	26-May-22	2138
RYWR.DGN.5440	MEICA Related - DSEAR and Potential Explosive Atmosphere Zone (PEAZ) RA & Drawing(s)	20	0%	28-Apr-22	26-May-22	2138
RYWR.DGN.5800	Design Drawings to support the Planning DCO Process	200	0%	23-Mar-22	12-Jan-23	1982
RYWR.DGN.5790	3D Model Layouts	200	0%	23-Mar-22	12-Jan-23	1982
RYWR.DGN.5430	Estimating Scoping Template / Opex / WLC - PREFERRED OPTION	0	0%		12-Jan-23	1982
RYWR.DGN.5370	Significant Hazards & High Risk Services Drawing	0	0%		12-Jan-23	1982
Outline Operational Strategy		230		08-Feb-22	12-Jan-23	1982
RYWR.DGN.5310	Concrete Risk Assessment	0	0%		08-Feb-22	2212
RYWR.DGN.5280	Technical Variation Request Forms (SU403.10)	0	0%		27-Apr-22	2158
RYWR.DGN.5270	Takeover Test Schedule	0	0%		27-Apr-22	2158
RYWR.DGN.5260	Outline Commissioning and Compliance Plan (ID408.01)	0	0%		27-Apr-22	2158
RYWR.DGN.5290	Pipeline Calculations	0	0%		04-Oct-22	2048
RYWR.DGN.5300	Flotation Calculations	0	0%		12-Jan-23	1982
OTTERBOURNE PRE-DISINFECTION PLANT		114		06-Aug-21	21-Jan-22	2224
LEADING IN ACTIVITIES		114		06-Aug-21	21-Jan-22	2224
RYWR.DGN.01410	ETS Design Plan (SWS) - NON INFRA FEASIBILITY DESIGNS COMMENCEMENT	0	0%		06-Aug-21	2218
RYWR.DGN.01420	Design Estimate (SW) to Facilitate OFWAT Control Point C data	20	0%	27-Dec-21	21-Jan-22	2321
ENGINEERING DESIGNS		100		06-Aug-21	24-Dec-21	2218
RYWR.DGN.01740	Initial Load Assessment & DNO Discussion	20	0%	06-Aug-21	03-Sep-21	2298
RYWR.DGN.01680	Initial Hydraulics	40	0%	06-Aug-21	01-Oct-21	2278
RYWR.DGN.01670	Below Ground Pipeline Routes	40	0%	06-Aug-21	01-Oct-21	2278
RYWR.DGN.01650	Geotech Desk Study	20	0%	06-Sep-21	01-Oct-21	2258
RYWR.DGN.01620	Review and Update Mass Balance P&ID	20	0%	20-Sep-21	15-Oct-21	2268
RYWR.DGN.01690	Estimate of Civil Structure Dimensions	40	0%	06-Sep-21	29-Oct-21	2258
RYWR.DGN.01660	Review of Constructability and Sequencing	40	0%	06-Sep-21	29-Oct-21	2258
RYWR.DGN.01640	Optimise Site Layout Options	60	0%	06-Aug-21	29-Oct-21	2218
RYWR.DGN.01630	Mechanical Input into Design Review	60	0%	06-Aug-21	29-Oct-21	2258
RYWR.DGN.01610	Process View of Design to-date	70	0%	06-Aug-21	12-Nov-21	2238
RYWR.DGN.01730	Preliminary Architectural Support	10	0%	15-Nov-21	26-Nov-21	2238
RYWR.DGN.01720	Preliminary Pipe Routing 3D Model	40	0%	01-Nov-21	24-Dec-21	2218
RYWR.DGN.01710	Preliminary General Arrangements 3D Model	40	0%	01-Nov-21	24-Dec-21	2218
WATER RECYCLING PLANT 72		289		27-Aug-21	25-Oct-22	2033
LEADING IN ACTIVITIES		122		27-Aug-21	24-Feb-22	2200
RYWR.DGN.04710	ETS Design Plan (SWS) - NON INFRA FEASIBILITY DESIGNS COMMENCEMENT	0	0%		27-Aug-21	2033
RYWR.DGN.04720	Initial Buildability Review	20	0%	31-Aug-21	27-Sep-21	2182
RYWR.DGN.04730	Biodiversity Net Gain	40	0%	28-Sep-21	22-Nov-21	2242
RYWR.DGN.04740	Design Estimate (SW) to Facilitate OFWAT Control Point C data?	20	0%	28-Jan-22	24-Feb-22	2297



🟩 Remaining Work
🟥 Critical Remaining Work
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Project ID: 710060-B2-1 CURR Standard Layout for Distribution

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26-Aug-21	WR (B2) Schedule for G1.5 Submission	DC	BM

WATER RECYCLING PLANT - OPTION B2 (BASED ON DPC PROCUREMENT ROUTE)

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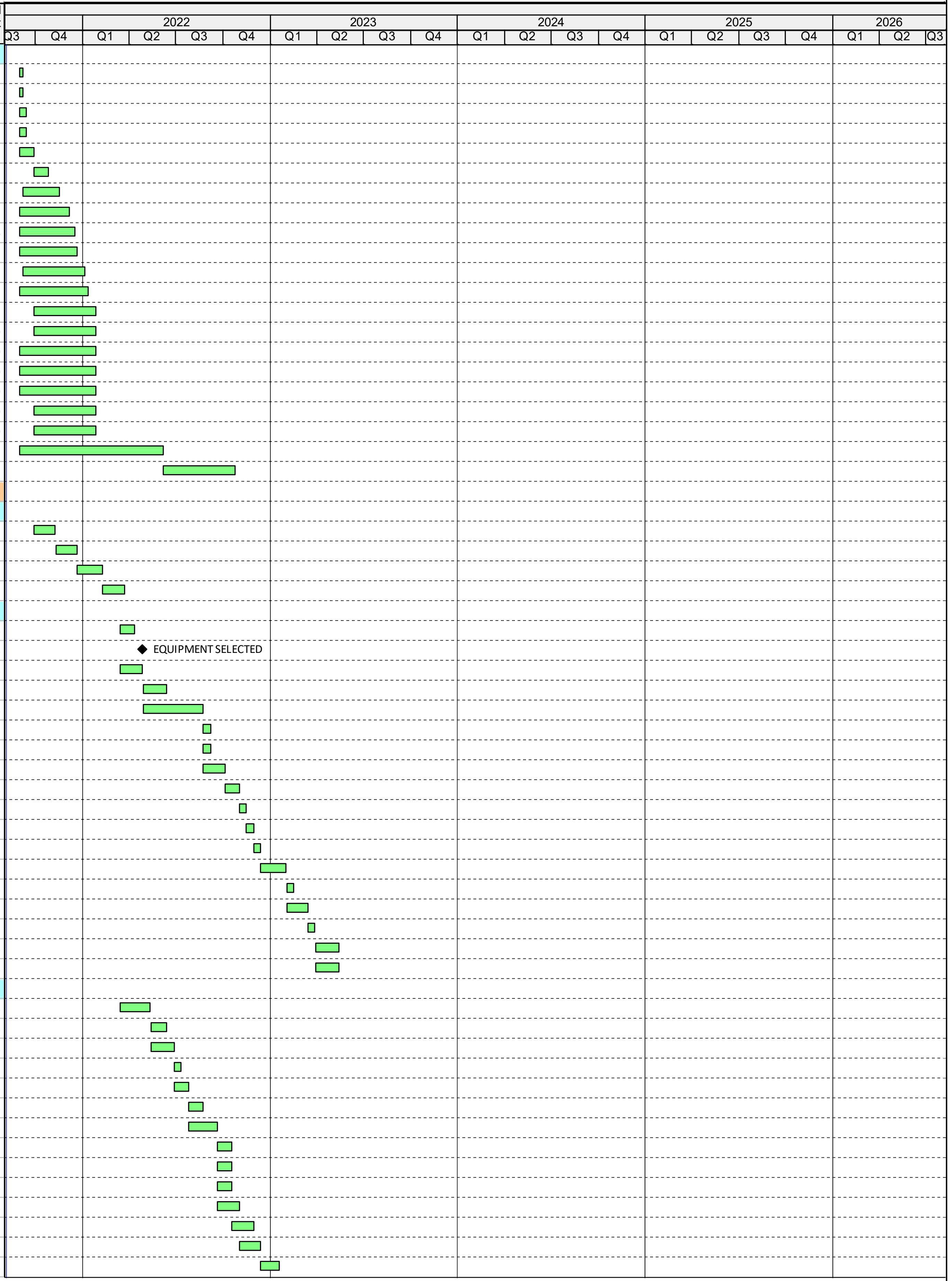
Print: 26-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
ENGINEERING DESIGNS		289		31-Aug-21	25-Oct-22	2033
RYWR.DGN.04840	Process Block Diagram	5	0%	31-Aug-21	06-Sep-21	2137
RYWR.DGN.04860	Process Flow Diagram	5	0%	31-Aug-21	06-Sep-21	2137
RYWR.DGN.04910	Initial WQ Shutdown Setpoints	10	0%	31-Aug-21	13-Sep-21	2212
RYWR.DGN.04920	Operating Strategy	10	0%	31-Aug-21	13-Sep-21	2212
RYWR.DGN.04940	Waste Stream Solid Discharge Composition	20	0%	31-Aug-21	27-Sep-21	2202
RYWR.DGN.05030	Architectural	20	0%	28-Sep-21	25-Oct-21	2182
RYWR.DGN.04870	Piping and Instrumentation Diagrams	50	0%	07-Sep-21	15-Nov-21	2167
RYWR.DGN.04930	Outline Compliance and Commissioning Plan	70	0%	31-Aug-21	06-Dec-21	2152
RYWR.DGN.04820	Jar Testing	78	0%	31-Aug-21	16-Dec-21	2144
RYWR.DGN.04890	WQ Risk Identification Workshop	80	0%	31-Aug-21	20-Dec-21	2142
RYWR.DGN.04880	Process Equipment Sizing	80	0%	07-Sep-21	04-Jan-22	2137
RYWR.DGN.04830	Mass Balances	89	0%	31-Aug-21	10-Jan-22	2133
RYWR.DGN.05080	Modelling	80	0%	28-Sep-21	25-Jan-22	2202
RYWR.DGN.04970	CAD	82	0%	28-Sep-21	27-Jan-22	2200
RYWR.DGN.04990	Mechanical	102	0%	31-Aug-21	27-Jan-22	2200
RYWR.DGN.05010	CDM	102	0%	31-Aug-21	27-Jan-22	2200
RYWR.DGN.05020	CIvil	102	0%	31-Aug-21	27-Jan-22	2200
RYWR.DGN.04950	Process Safety	82	0%	28-Sep-21	27-Jan-22	2200
RYWR.DGN.05050	EICA	82	0%	28-Sep-21	27-Jan-22	2200
RYWR.DGN.04810	Water Sampling	189	0%	31-Aug-21	06-Jun-22	2033
RYWR.DGN.05090	Feasibility Design Amendment Post-PEIR (following Non-Stat Consultation)	100	0%	06-Jun-22	25-Oct-22	2033
CONVEYANCE PIPEWORK WRP TO EBL		444		28-Sep-21	11-Jul-23	1858
Civils Designs (more details to be developed)		120		28-Sep-21	22-Mar-22	1982
RYWR.DGN.7370	Initial Buildability Review	30	0%	28-Sep-21	08-Nov-21	1982
RYWR.DGN.7350	Pipeline Long Section Drawings	30	0%	09-Nov-21	20-Dec-21	1982
RYWR.DGN.7380	Estimate of Civil Structure Dimensions	30	0%	21-Dec-21	08-Feb-22	1982
RYWR.DGN.7340	Preliminary Pipe Routing 3D Model	30	0%	09-Feb-22	22-Mar-22	1982
Mechanical Designs		290		15-Mar-22	15-May-23	1898
RYWR.DGN.7250	Pump Sizing Calculations	20	0%	15-Mar-22	11-Apr-22	1908
RYWR.DGN.7400	EQUIPMENT SELECTED	0	0%		27-Apr-22	1898
RYWR.DGN.7390	Hydraulic Modelling	30	0%	15-Mar-22	27-Apr-22	1898
RYWR.DGN.7410	M&E Equipment Layout	30	0%	28-Apr-22	13-Jun-22	1948
RYWR.DGN.7290	Mechanical Input to P&ID	80	0%	28-Apr-22	22-Aug-22	1898
RYWR.DGN.7270	Pipe Material Selection	10	0%	23-Aug-22	06-Sep-22	1918
RYWR.DGN.7260	Pipework Pressure Ratings	10	0%	23-Aug-22	06-Sep-22	1918
RYWR.DGN.7210	Preliminary Pipe, Valve and Actuator Schedule	30	0%	23-Aug-22	04-Oct-22	1898
RYWR.DGN.7330	Surge Protection Equipment Specification	20	0%	05-Oct-22	01-Nov-22	1898
RYWR.DGN.7300	Initial HVAC Systems Design Strategy	10	0%	02-Nov-22	15-Nov-22	1898
RYWR.DGN.7230	Initial Lifting Schedule	10	0%	16-Nov-22	29-Nov-22	1898
RYWR.DGN.7240	Critical Spares Assessment (MED4900) & Maintenance Assessment (MED4002)	10	0%	30-Nov-22	13-Dec-22	1898
RYWR.DGN.7280	Plant Specification / Data Sheet	30	0%	14-Dec-22	01-Feb-23	1898
RYWR.DGN.7180	WQM 425 Materials in Contact with Potable Water RA (Initial Assessment of Shortlisted Options)	10	0%	02-Feb-23	15-Feb-23	1918
RYWR.DGN.7220	Initial ALM Design Strategy	30	0%	02-Feb-23	15-Mar-23	1898
RYWR.DGN.7190	Mcerts Schematic Diagram (if applicable)	10	0%	16-Mar-23	29-Mar-23	1898
RYWR.DGN.7420	Input to Technical Report / Works Specification	30	0%	30-Mar-23	15-May-23	1898
RYWR.DGN.7200	Process and Mechanical Equipment Specifications	30	0%	30-Mar-23	15-May-23	1898
Electrical Designs		330		15-Mar-22	11-Jul-23	1858
RYWR.DGN.7430	Input to P&IDs	40	0%	15-Mar-22	12-May-22	1858
RYWR.DGN.7030	Preliminary Single Line Diagrams (All Shortlisted Options)	20	0%	13-May-22	13-Jun-22	1868
RYWR.DGN.7080	Outline ICA System Architecture Drawing	30	0%	13-May-22	27-Jun-22	1858
RYWR.DGN.7060	ECM 4006.2 (Details of New Supplies or Changes to Existing Supplies)	10	0%	28-Jun-22	11-Jul-22	1868
RYWR.DGN.7000	Preliminary Load Assessment / Schedule (All Shortlisted Options)	20	0%	28-Jun-22	25-Jul-22	1858
RYWR.DGN.7040	Preliminary Generator Sizing	20	0%	26-Jul-22	22-Aug-22	1878
RYWR.DGN.7150	MCC Sizes & Calculation	40	0%	26-Jul-22	20-Sep-22	1858
RYWR.DGN.7050	Preliminary Instrument Schedule	20	0%	21-Sep-22	18-Oct-22	1868
RYWR.DGN.7020	Preliminary Telemetry I/O Schedule	20	0%	21-Sep-22	18-Oct-22	1868
RYWR.DGN.7010	Telemetry Strategy	20	0%	21-Sep-22	18-Oct-22	1868
RYWR.DGN.7450	SCADA Strategy (Consultation with IT/OT)	30	0%	21-Sep-22	01-Nov-22	1858
RYWR.DGN.7100	Outline Electrical Layout Drawing(s)	30	0%	19-Oct-22	29-Nov-22	1868
RYWR.DGN.7160	M&E Equipment Layout	30	0%	02-Nov-22	13-Dec-22	1858
RYWR.DGN.7170	Initial Earthing Layout & Specification	20	0%	14-Dec-22	18-Jan-23	1868



🟩 Remaining Work
🟥 Critical Remaining Work
◆ ◆ Milestone

Project ID: 710060-B2-1 CURR Standard Layout for Distribution

Date	Revision	Checked	Approved
26-Aug-21	WR (B2) Schedule for G1.5 Submission	DC	BM

WATER RECYCLING PLANT - OPTION B2 (BASED ON DPC PROCUREMENT ROUTE)

Progressed to 06-Aug-21

Print: 26-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
RYWR.DGN.7110	Outline Electrical Site Plan (cable duct layout)	30	0%	14-Dec-22	01-Feb-23	1858
RYWR.DGN.7070	Outline Operation and Control Philosophy	20	0%	02-Feb-23	01-Mar-23	1858
RYWR.DGN.7470	Local Isolator & Estop Assessment	20	0%	02-Mar-23	29-Mar-23	1858
RYWR.DGN.7460	Lightning & Surge Protection Assessment	20	0%	02-Mar-23	29-Mar-23	1858
RYWR.DGN.7130	Fire Alarm and Gas Detection Assessment	20	0%	02-Mar-23	29-Mar-23	1858
RYWR.DGN.7090	Lighting calculations / drawings	20	0%	02-Mar-23	29-Mar-23	1858
RYWR.DGN.7120	BCDs (Block cable diagram)	20	0%	30-Mar-23	28-Apr-23	1878
RYWR.DGN.7140	Electrical Installation Specification	40	0%	30-Mar-23	30-May-23	1858
RYWR.DGN.7440	Input to Technical Report	30	0%	31-May-23	11-Jul-23	1858
Other Deliverables		270		06-Dec-21	12-Jan-23	1982
Site Information		189		06-Dec-21	13-Sep-22	2063
RYWR.DGN.6860	Existing Site Information	0	0%		06-Dec-21	2252
RYWR.DGN.6870	Utility Information Pack	0	0%		19-Jan-22	2226
RYWR.DGN.6850	Geotechnical and Geo-ennvironmental Interpretive Report	0	0%		13-Sep-22	2063
RYWR.DGN.6840	Topographical Drawings - Site Plans and Longsections	0	0%		13-Sep-22	2063
Works Information		204		20-Dec-21	18-Oct-22	2038
RYWR.DGN.6750	Site Layout - Indicative Route. Plan. Long Sections	0	0%		20-Dec-21	2242
RYWR.DGN.6760	Outline General Arrangement Drawings Proposed PS. Booster. HLPS. Valves etc	0	0%		22-Mar-22	2182
RYWR.DGN.6740	The Boundary of the Site	0	0%		22-Mar-22	2182
RYWR.DGN.6730	Site Layout	0	0%		22-Mar-22	2182
RYWR.DGN.7360	Civil Specification	30	0%	23-Mar-22	06-May-22	2152
RYWR.DGN.6770	Bentley Hydraulic Analysis Output Report	0	0%		18-Oct-22	2038
Pre-Construction		200		22-Mar-22	12-Jan-23	1982
RYWR.DGN.6930	Site Waste Assessment	0	0%		22-Mar-22	2182
RYWR.DGN.6920	Carbon Minimisation template	0	0%		22-Mar-22	2182
RYWR.DGN.6910	Draft H&S File / Report	0	0%		22-Mar-22	2182
RYWR.DGN.6900	Initial HAZOP and ALM Study (SWIFT)	0	0%		22-Mar-22	2182
RYWR.DGN.6880	HIC & Significant Risk Log	0	0%		22-Mar-22	2182
RYWR.DGN.6940	Offsite Assembly Assessment	0	0%		27-Apr-22	2158
RYWR.DGN.6990	MEICA Related - Local Isolator / Emergency Stop Risk Assessment (MED4001)	20	0%	28-Apr-22	26-May-22	2138
RYWR.DGN.6980	MEICA Related - Lightning Protection Risk Assessment	20	0%	28-Apr-22	26-May-22	2138
RYWR.DGN.6970	MEICA Related - ECM 4007 (Assessment of Requirement for Site Standby Power)	20	0%	28-Apr-22	26-May-22	2138
RYWR.DGN.6960	MEICA Related - DSEAR and Potential Explosive Atmosphere Zone (PEAZ) RA & Drawing(s)	20	0%	28-Apr-22	26-May-22	2138
RYWR.DGN.7320	Design Drawings to support the Planning DCO Process	200	0%	23-Mar-22	12-Jan-23	1982
RYWR.DGN.7310	3D Model Layouts	200	0%	23-Mar-22	12-Jan-23	1982
RYWR.DGN.6950	Estimating Scoping Template / Opex / WLC - PREFERRED OPTION	0	0%		12-Jan-23	1982
RYWR.DGN.6890	Significant Hazards & High Risk Services Drawing	0	0%		12-Jan-23	1982
Outline Operational Strategy		230		08-Feb-22	12-Jan-23	1982
RYWR.DGN.6830	Concrete Risk Assessment	0	0%		08-Feb-22	2212
RYWR.DGN.6800	Technical Variation Request Forms (SU403.10)	0	0%		27-Apr-22	2158
RYWR.DGN.6790	Takeover Test Schedule	0	0%		27-Apr-22	2158
RYWR.DGN.6780	Outline Commissioning and Compliance Plan (ID408.01)	0	0%		27-Apr-22	2158
RYWR.DGN.6810	Pipeline Calculations	0	0%		04-Oct-22	2048
RYWR.DGN.6820	Flotation Calculations	0	0%		12-Jan-23	1982
BREAK PRESSURE TANK BETWEEN WRP AND OTTERBOURNE		422		06-Aug-21	18-Apr-23	1916
Civils Designs (more details to be developed)		120		28-Sep-21	22-Mar-22	1982
RYWR.DGN.8890	Initial Buildability Review	30	0%	28-Sep-21	08-Nov-21	1982
RYWR.DGN.8870	Pipeline Long Section Drawings	30	0%	09-Nov-21	20-Dec-21	1982
RYWR.DGN.8900	Estimate of Civil Structure Dimensions	30	0%	21-Dec-21	08-Feb-22	1982
RYWR.DGN.8860	Preliminary Pipe Routing 3D Model	30	0%	09-Feb-22	22-Mar-22	1982
Mechanical Designs		372		06-Aug-21	03-Feb-23	1966
RYWR.DGN.8910	Hydraulic Modelling	30	0%	06-Aug-21	17-Sep-21	2048
RYWR.DGN.8920	EQUIPMENT SELECTED	0	0%		19-Jan-22	1966
RYWR.DGN.8770	Pump Sizing Calculations	20	0%	15-Dec-21	19-Jan-22	1966
RYWR.DGN.8930	M&E Equipment Layout	30	0%	20-Jan-22	02-Mar-22	2016
RYWR.DGN.8810	Mechanical Input to P&ID	80	0%	20-Jan-22	16-May-22	1966
RYWR.DGN.8790	Pipe Material Selection	10	0%	17-May-22	30-May-22	1986
RYWR.DGN.8780	Pipework Pressure Ratings	10	0%	17-May-22	30-May-22	1986
RYWR.DGN.8730	Preliminary Pipe, Valve and Actuator Schedule	30	0%	17-May-22	29-Jun-22	1966
RYWR.DGN.8850	Surge Protection Equipment Specification	20	0%	30-Jun-22	27-Jul-22	1966
RYWR.DGN.8820	Initial HVAC Systems Design Strategy	10	0%	28-Jul-22	10-Aug-22	1966
RYWR.DGN.8750	Initial Lifting Schedule	10	0%	11-Aug-22	24-Aug-22	1966

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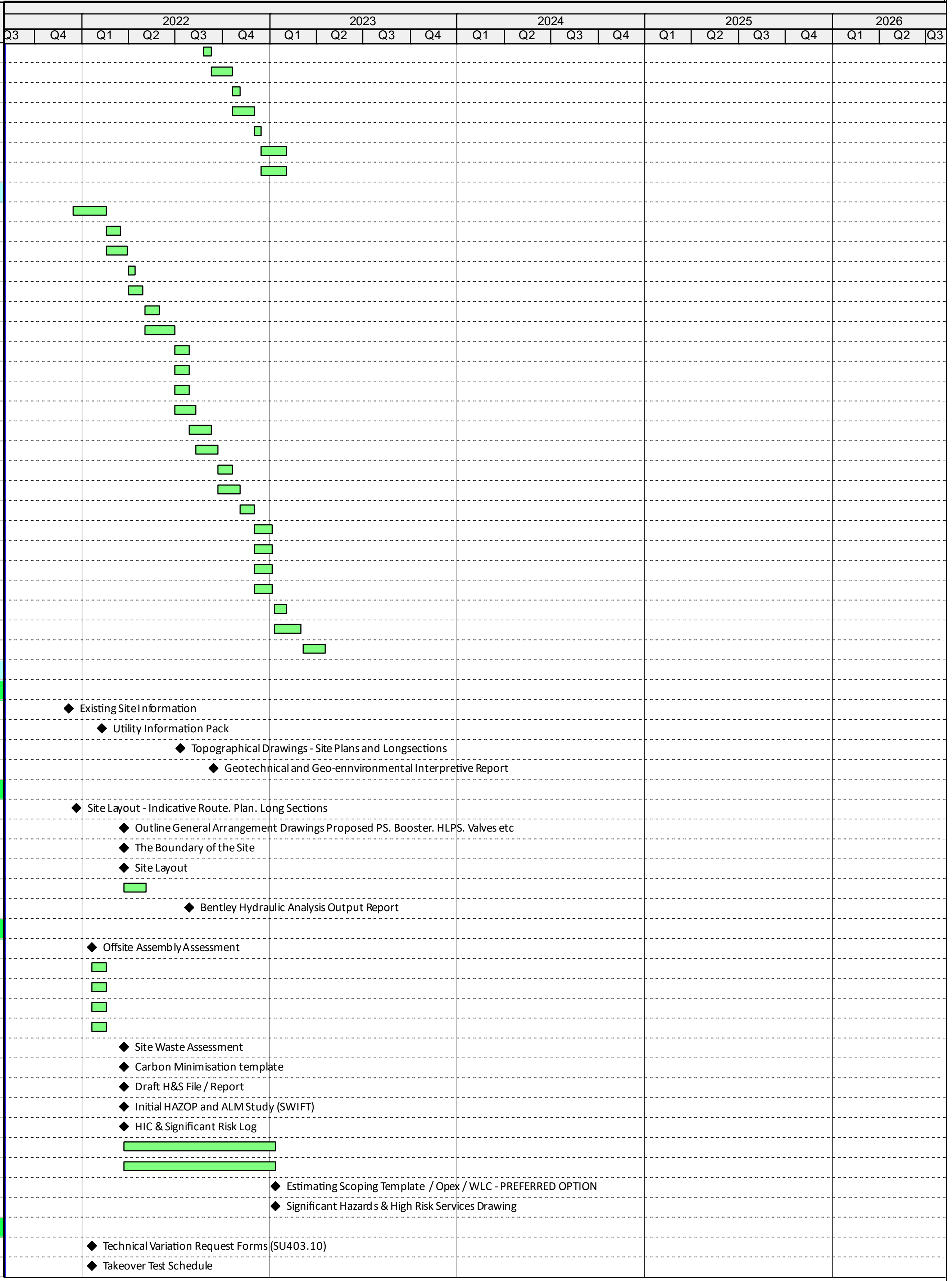
Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
RYWR.DGN.8760	Critical Spares Assessment (MED4900) & Maintenance Assessment (MED4002)	10	0%	25-Aug-22	08-Sep-22	1966
RYWR.DGN.8800	Plant Specification / Data Sheet	30	0%	09-Sep-22	20-Oct-22	1966
RYWR.DGN.8700	WQM 425 Materials in Contact with Potable Water RA (Initial Assessment of Shortlisted Options)	10	0%	21-Oct-22	03-Nov-22	1986
RYWR.DGN.8740	Initial ALM Design Strategy	30	0%	21-Oct-22	01-Dec-22	1966
RYWR.DGN.8710	Mcerts Schematic Diagram (if applicable)	10	0%	02-Dec-22	15-Dec-22	1966
RYWR.DGN.8940	Input to Technical Report / Works Specification	30	0%	16-Dec-22	03-Feb-23	1966
RYWR.DGN.8720	Process and Mechanical Equipment Specifications	30	0%	16-Dec-22	03-Feb-23	1966
Electrical Designs		330		15-Dec-21	18-Apr-23	1916
RYWR.DGN.8950	Input to P&IDs	40	0%	15-Dec-21	16-Feb-22	1916
RYWR.DGN.8550	Preliminary Single Line Diagrams (All Shortlisted Options)	20	0%	17-Feb-22	16-Mar-22	1926
RYWR.DGN.8600	Outline ICA System Architecture Drawing	30	0%	17-Feb-22	30-Mar-22	1916
RYWR.DGN.8580	ECM 4006.2 (Details of New Supplies or Changes to Existing Supplies)	10	0%	31-Mar-22	13-Apr-22	1926
RYWR.DGN.8520	Preliminary Load Assessment / Schedule (All Shortlisted Options)	20	0%	31-Mar-22	29-Apr-22	1916
RYWR.DGN.8560	Preliminary Generator Sizing	20	0%	03-May-22	30-May-22	1936
RYWR.DGN.8670	MCC Sizes & Calculation	40	0%	03-May-22	29-Jun-22	1916
RYWR.DGN.8570	Preliminary Instrument Schedule	20	0%	30-Jun-22	27-Jul-22	1926
RYWR.DGN.8540	Preliminary Telemetry I/O Schedule	20	0%	30-Jun-22	27-Jul-22	1926
RYWR.DGN.8530	Telemetry Strategy	20	0%	30-Jun-22	27-Jul-22	1926
RYWR.DGN.8970	SCADA Strategy (Consultation with IT/OT)	30	0%	30-Jun-22	10-Aug-22	1916
RYWR.DGN.8620	Outline Electrical Layout Drawing(s)	30	0%	28-Jul-22	08-Sep-22	1926
RYWR.DGN.8680	M&E Equipment Layout	30	0%	11-Aug-22	22-Sep-22	1916
RYWR.DGN.8690	Initial Earthing Layout & Specification	20	0%	23-Sep-22	20-Oct-22	1926
RYWR.DGN.8630	Outline Electrical Site Plan (cable duct layout)	30	0%	23-Sep-22	03-Nov-22	1916
RYWR.DGN.8590	Outline Operation and Control Philosophy	20	0%	04-Nov-22	01-Dec-22	1916
RYWR.DGN.8990	Local Isolator & Estop Assessment	20	0%	02-Dec-22	06-Jan-23	1916
RYWR.DGN.8980	Lightning & Surge Protection Assessment	20	0%	02-Dec-22	06-Jan-23	1916
RYWR.DGN.8650	Fire Alarm and Gas Detection Assessment	20	0%	02-Dec-22	06-Jan-23	1916
RYWR.DGN.8610	Lighting calculations / drawings	20	0%	02-Dec-22	06-Jan-23	1916
RYWR.DGN.8640	BCDs (Block cable diagram)	20	0%	09-Jan-23	03-Feb-23	1936
RYWR.DGN.8660	Electrical Installation Specification	40	0%	09-Jan-23	03-Mar-23	1916
RYWR.DGN.8960	Input to Technical Report	30	0%	06-Mar-23	18-Apr-23	1916
Other Deliverables		270		06-Dec-21	12-Jan-23	1982
Site Information		189		06-Dec-21	13-Sep-22	2063
RYWR.DGN.8380	Existing Site Information	0	0%		06-Dec-21	2252
RYWR.DGN.8390	Utility Information Pack	0	0%		08-Feb-22	2212
RYWR.DGN.8360	Topographical Drawings - Site Plans and Longsections	0	0%		11-Jul-22	2108
RYWR.DGN.8370	Geotechnical and Geo-ennvironmental Interpretive Report	0	0%		13-Sep-22	2063
Works Information		146		20-Dec-21	27-Jul-22	2096
RYWR.DGN.8270	Site Layout - Indicative Route. Plan. Long Sections	0	0%		20-Dec-21	2242
RYWR.DGN.8280	Outline General Arrangement Drawings Proposed PS. Booster. HLPS. Valves etc	0	0%		22-Mar-22	2182
RYWR.DGN.8260	The Boundary of the Site	0	0%		22-Mar-22	2182
RYWR.DGN.8250	Site Layout	0	0%		22-Mar-22	2182
RYWR.DGN.8880	Civil Specification	30	0%	23-Mar-22	06-May-22	2152
RYWR.DGN.8290	Bentley Hydraulic Analysis Output Report	0	0%		27-Jul-22	2096
Pre-Construction		244		19-Jan-22	12-Jan-23	1982
RYWR.DGN.8460	Offsite Assembly Assessment	0	0%		19-Jan-22	2226
RYWR.DGN.8510	MEICA Related - Local Isolator / Emergency Stop Risk Assessment (MED4001)	20	0%	20-Jan-22	16-Feb-22	2206
RYWR.DGN.8500	MEICA Related - Lightning Protection Risk Assessment	20	0%	20-Jan-22	16-Feb-22	2206
RYWR.DGN.8490	MEICA Related - ECM 4007 (Assessment of Requirement for Site Standby Power)	20	0%	20-Jan-22	16-Feb-22	2206
RYWR.DGN.8480	MEICA Related - DSEAR and Potential Explosive Atmosphere Zone (PEAZ) RA & Drawing(s)	20	0%	20-Jan-22	16-Feb-22	2206
RYWR.DGN.8450	Site Waste Assessment	0	0%		22-Mar-22	2182
RYWR.DGN.8440	Carbon Minimisation template	0	0%		22-Mar-22	2182
RYWR.DGN.8430	Draft H&S File / Report	0	0%		22-Mar-22	2182
RYWR.DGN.8420	Initial HAZOP and ALM Study (SWIFT)	0	0%		22-Mar-22	2182
RYWR.DGN.8400	HIC & Significant Risk Log	0	0%		22-Mar-22	2182
RYWR.DGN.8840	Design Drawings to support the Planning DCO Process	200	0%	23-Mar-22	12-Jan-23	1982
RYWR.DGN.8830	3D Model Layouts	200	0%	23-Mar-22	12-Jan-23	1982
RYWR.DGN.8470	Estimating Scoping Template / Opex / WLC - PREFERRED OPTION	0	0%		12-Jan-23	1982
RYWR.DGN.8410	Significant Hazards & High Risk Services Drawing	0	0%		12-Jan-23	1982
Outline Operational Strategy		244		19-Jan-22	12-Jan-23	1982
RYWR.DGN.8320	Technical Variation Request Forms (SU403.10)	0	0%		19-Jan-22	2226
RYWR.DGN.8310	Takeover Test Schedule	0	0%		19-Jan-22	2226



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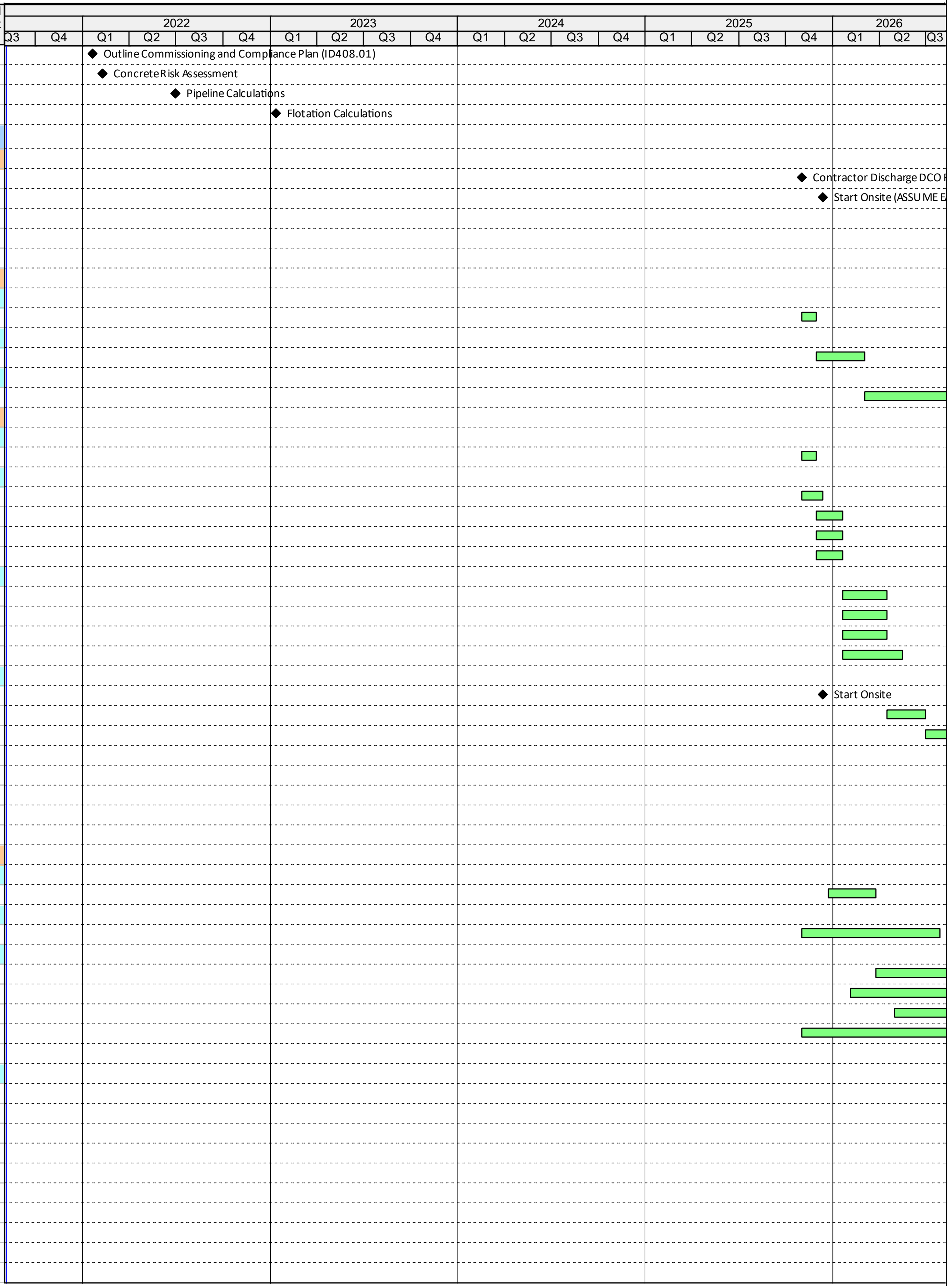
RYWR.DGN.8300	Outline Commissioning and Compliance Plan (ID408.01)	0	0%		19-Jan-22	2226
RYWR.DGN.8350	Concrete Risk Assessment	0	0%		08-Feb-22	2212
RYWR.DGN.8330	Pipeline Calculations	0	0%		29-Jun-22	2116
RYWR.DGN.8340	Flotation Calculations	0	0%		12-Jan-23	1982
POST-CONTRACT AWARD (DPC ROUTE)		1280		31-Oct-25	17-Dec-30	0
KEY MILESTONES		1280		31-Oct-25	17-Dec-30	0
4	Contractor Discharge DCO Requirement	0	0%		31-Oct-25	0
5	Start Onsite (ASSUME EARLIEST START ON SITE)	0	0%	12-Dec-25		810
6	Start Commissioning	0	0%	15-Apr-30		0
7	Water Into Supply	0	0%	12-Jul-30		0
8	Benefit Realisation Commence	0	0%	17-Dec-30		0
BUDDS FARM TO WRP		605		31-Oct-25	06-Apr-28	505
Site Investigations		20		31-Oct-25	28-Nov-25	505
17	Site Investigations	20	0%	31-Oct-25	28-Nov-25	505
Design		60		28-Nov-25	03-Mar-26	505
19	Design	60	0%	28-Nov-25	03-Mar-26	505
Construction		525		03-Mar-26	06-Apr-28	505
21	Shafts and Twin Pipe Jack Construction	525	0%	03-Mar-26	06-Apr-28	505
ENVIRONMENTAL BUFFER LAKE AT OTTERBOURNE PRE-DISINFECTION PLANT		380		31-Oct-25	17-May-27	730
Site Investigation		20		31-Oct-25	28-Nov-25	730
30	Site Investigations	20	0%	31-Oct-25	28-Nov-25	730
Design		50		31-Oct-25	20-Jan-26	870
32	Process Design	30	0%	31-Oct-25	12-Dec-25	810
35	Electrical Design	30	0%	28-Nov-25	20-Jan-26	730
34	Mechanical Design	30	0%	28-Nov-25	20-Jan-26	870
33	Civil Design	30	0%	28-Nov-25	20-Jan-26	840
Procurement		80		20-Jan-26	15-May-26	930
56	MCC - Lead Time	60	0%	20-Jan-26	16-Apr-26	730
49	Step Down Trnfmr - Lead Time	60	0%	20-Jan-26	16-Apr-26	950
42	Trnfr Pumps - Lead Time	60	0%	20-Jan-26	16-Apr-26	890
63	Valves - Lead Time	80	0%	20-Jan-26	15-May-26	870
Constructions		350		12-Dec-25	17-May-27	730
66	Start Onsite	0	0%	12-Dec-25		810
67	Site Clearance and Compound Set Up	50	0%	16-Apr-26	29-Jun-26	730
68	Bulk Earthworks	60	0%	29-Jun-26	22-Sep-26	730
69	Civil Construction (PS/ Lining Lake/ Chambers)	50	0%	22-Sep-26	01-Dec-26	730
70	Transfer Pumping Station - M&E Install and Dry Commissioning (inc MCC)	60	0%	01-Dec-26	03-Mar-27	730
71	Step Down Transformer Install	30	0%	03-Mar-27	16-Apr-27	730
73	Works ready for Wet Commissioning	0	0%	17-May-27		730
72	Roads/ Paths/ Security and Finishes works	20	0%	16-Apr-27	17-May-27	730
WATER RECYCLING PLANT SITE 72		747		31-Oct-25	30-Oct-28	533
Site Investigation		60		23-Dec-25	26-Mar-26	363
153	Site Investigations	60	0%	23-Dec-25	26-Mar-26	363
Catchment Water Quality Sampling		180		31-Oct-25	27-Jul-26	420
155	Water quality sampling	180	0%	31-Oct-25	27-Jul-26	420
Designs		417		31-Oct-25	08-Jul-27	393
158A	Civil Design (Sufficient to START ON SITE)	160	0%	26-Mar-26	12-Nov-26	363
159	Mechanical Design (52w)	260	0%	03-Feb-26	17-Feb-27	420
160	Electrical Design (52w)	260	0%	30-Apr-26	17-May-27	420
157	Process Design (78w)	390	0%	31-Oct-25	01-Jun-27	420
158	Civil Design (Remaining designs)	160	0%	12-Nov-26	08-Jul-27	363
Procurement		190		17-Feb-27	17-Nov-27	635
490	Insoluble Waste Pumps - Lead Time	60	0%	17-Feb-27	17-May-27	650
482	Service Wtr R/M Bstr Pumps - Lead Time	60	0%	17-Feb-27	17-May-27	620
347	CO2 Carrier Water Feed Pump - Lead Time	60	0%	17-Feb-27	17-May-27	650
332	UV Bldg Vent Fans - Lead Time	60	0%	17-Feb-27	17-May-27	580
325	UV Building Gantry Crane - Lead Time	60	0%	17-Feb-27	17-May-27	625
296	RO/UF Bldg Gantry Crane - Lead Time	60	0%	17-Feb-27	17-May-27	625
289	RO Permeate Flush Pumps - Lead Time	60	0%	17-Feb-27	17-May-27	640
282	RO CIP Pumps - Lead Time	60	0%	17-Feb-27	17-May-27	640
275	RO CIP Make-up Tank Heater - Lead Time	60	0%	17-Feb-27	17-May-27	640
268	RO CIP Make-up Tank Mxr - Lead Time	60	0%	17-Feb-27	17-May-27	640



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Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
261	RO CIP Recycle Pumps - Lead Time	60	0%	17-Feb-27	17-May-27	640
254	RO 2nd Interstage Booster Pumps - Lead Time	60	0%	17-Feb-27	17-May-27	640
247	RO 1st Interstage Booster Pumps - Lead Time	60	0%	17-Feb-27	17-May-27	640
218	MicroFiltration Air Scour Blowers - Lead Time	60	0%	17-Feb-27	17-May-27	640
211	MicroFiltration CIP/EFM Makeup Tank Mxr - Lead Time	60	0%	17-Feb-27	17-May-27	640
204	MicroFiltration Backwash Pumps - Lead Time	60	0%	17-Feb-27	17-May-27	640
197	MicroFiltration CIP/EFM Recycle Pumps - Lead Time	60	0%	17-Feb-27	17-May-27	640
190	MicroFiltration CIP Tank Heater - Lead Time	60	0%	17-Feb-27	17-May-27	640
497	Waste Transfer Pumps - Lead Time	80	0%	17-Feb-27	15-Jun-27	630
361	CO2 Evaporators - Lead Time	80	0%	17-Feb-27	15-Jun-27	630
240	RO Feed Pumps - Lead Time	80	0%	17-Feb-27	15-Jun-27	620
233	RO Trnfr Pumps - Lead Time	80	0%	17-Feb-27	15-Jun-27	620
183	MicroFiltration Plant Feed Pumps - Lead Time	80	0%	17-Feb-27	15-Jun-27	620
467	Lime Saturator Rake Drives -Lead Time	100	0%	17-Feb-27	13-Jul-27	580
460	Lime Slurry Augers -Lead Time	100	0%	17-Feb-27	13-Jul-27	580
453	Lime Slurry Tank Impeller - Lead Time	100	0%	17-Feb-27	13-Jul-27	580
446	Lime Silo Powder Auger - Lead Time	100	0%	17-Feb-27	13-Jul-27	580
439	Lime Silo Vibrating Bin Activators - Lead Time	100	0%	17-Feb-27	13-Jul-27	580
168	Raw Water Intake Pump - Lead Time	100	0%	17-Feb-27	13-Jul-27	600
303	RO/UF Bldg Vent Fans - Lead Time	60	0%	17-May-27	10-Aug-27	520
505	Treated Water Pumps (HLPS) - Lead Time	135	0%	17-Feb-27	01-Sep-27	624
318	UV Reactors - Lead Time	80	0%	17-May-27	08-Sep-27	560
407	Sodium Hydroxide Dosing System - Lead Time	80	0%	01-Jun-27	22-Sep-27	580
399	Hydrogen Peroxide Dosing System - Lead Time	80	0%	01-Jun-27	22-Sep-27	580
512	HLPS MCC - Lead Time	100	0%	17-May-27	06-Oct-27	465
354	CO2 MCC - Lead Time	100	0%	17-May-27	06-Oct-27	465
339	UV Building MCC - Lead Time	100	0%	17-May-27	06-Oct-27	665
310	Chem Dosing and RO MCC - Lead Time	100	0%	17-May-27	06-Oct-27	540
225	MicroFiltration MCC - Lead Time	100	0%	17-May-27	06-Oct-27	540
175	Raw Water Intake PS MCC - Lead Time	100	0%	17-May-27	06-Oct-27	465
423	Antiscalant Dosing System - Lead Time	95	0%	01-Jun-27	13-Oct-27	565
431	Hydrochloric Acid Dosing System - Lead Time	110	0%	01-Jun-27	03-Nov-27	530
415	Sodium Bisulphite Dosing System - Lead Time	110	0%	01-Jun-27	03-Nov-27	530
368	CO2 Dosing System - Lead Time	110	0%	01-Jun-27	03-Nov-27	530
474	Lime Dosing System - Lead Time	115	0%	01-Jun-27	10-Nov-27	495
391	Citric Acid Dosing System - Lead Time	115	0%	01-Jun-27	10-Nov-27	545
383	Sodium Hypocholorite Chiller System - Lead Time	115	0%	01-Jun-27	10-Nov-27	545
376	Sodium Hypocholorite - Sodium Dosing System - Lead Time	115	0%	01-Jun-27	10-Nov-27	545
534	Generators - Lead Time	130	0%	17-May-27	17-Nov-27	420
527	Transformers - Lead Time	130	0%	17-May-27	17-Nov-27	420
520	HV Switchgear - Lead Time	130	0%	17-May-27	17-Nov-27	420
Construction		747		31-Oct-25	30-Oct-28	533
Early Works		416		31-Oct-25	07-Jul-27	403
538	Site Clearance and Compound Set Up	40	0%	31-Oct-25	06-Jan-26	620
539	Bulk Earthworks	32	0%	12-Nov-26	05-Jan-27	403
540	Piling	127	0%	05-Jan-27	07-Jul-27	403
East Section		247		15-Jun-27	09-Jun-28	433
Civil Works		195		08-Jul-27	19-Apr-28	468
543	Intake Pumping Station Building/ Chamber	40	0%	08-Jul-27	03-Sep-27	363
544	Buffer Tanks and MPR// ROC Slabs	25	0%	03-Sep-27	08-Oct-27	363
545	Lime & Co2 Process Slabs	30	0%	08-Oct-27	19-Nov-27	363
546	Inlet Buffer Tank/ MFR/ROC Tank Construction	130	0%	08-Oct-27	19-Apr-28	468
Mechanical & Electrical Cabling Works		192		15-Jun-27	20-Mar-28	488
644	Buffer Tank MPR . ROC	50	0%	15-Jun-27	24-Aug-27	630
550	Intake Pumping Station	60	0%	03-Sep-27	26-Nov-27	563
549	Co2 Process	50	0%	19-Nov-27	07-Feb-28	518
548	Lime Process	80	0%	19-Nov-27	20-Mar-28	488
Electrical & ICA Works		135		19-Nov-27	09-Jun-28	433
552	MCC and Transformer Installation	135	0%	19-Nov-27	09-Jun-28	433
Main Building		261		08-Jul-27	24-Jul-28	602
Civil Works		141		08-Jul-27	01-Feb-28	402
555	Main Building Slab (include HCl & Chemical dosing Slabs)	66	0%	08-Jul-27	11-Oct-27	402

🟩 Remaining Work

🟥 Critical Remaining Work

◆ ◆ Milestone

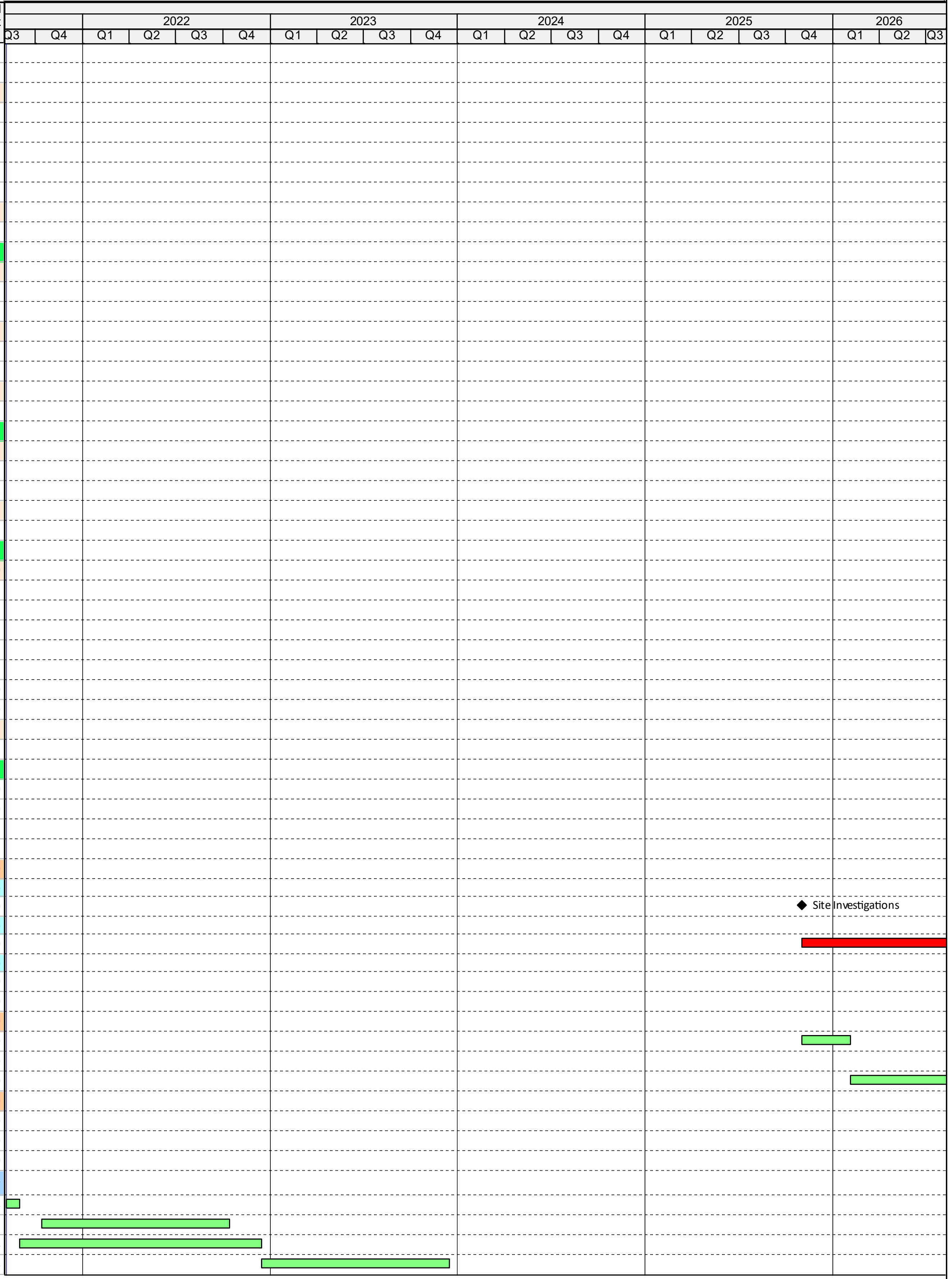
Project ID: 710060-B2-1 CURR Standard Layout for Distribution

Date	Revision	Checked	Approved
26-Aug-21	WR (B2) Schedule for G1.5 Submission	DC	BM

WATER RECYCLING PLANT - OPTION B2 (BASED ON DPC PROCUREMENT ROUTE)

Progressed to 06-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
557	MFF Tank Slab	23	0%	19-Nov-27	22-Dec-27	363
556	Main building and Gantry construction	75	0%	11-Oct-27	01-Feb-28	402
Mechanical and Electrical Cabling Works		120		01-Feb-28	24-Jul-28	402
561	UVAOP	60	0%	01-Feb-28	27-Apr-28	462
560	Reverse Osmosis Plant	60	0%	01-Feb-28	27-Apr-28	462
559	Microfiltration	60	0%	01-Feb-28	27-Apr-28	462
563	Main Building Gantry	75	0%	01-Feb-28	19-May-28	447
562	Main Building M&E	120	0%	01-Feb-28	24-Jul-28	402
Electrical & ICA Works		135		06-Oct-27	24-Apr-28	665
565	MCC and Transformer Installation	135	0%	06-Oct-27	24-Apr-28	665
North Section		175		19-Nov-27	04-Aug-28	393
Civil Works		40		19-Nov-27	24-Jan-28	363
568	Treated Water Tank Slabs	24	0%	19-Nov-27	23-Dec-27	379
569	HLPS and Bases	40	0%	19-Nov-27	24-Jan-28	363
Mechanical and Electrical Cabling Works		17		23-Dec-27	25-Jan-28	527
571	Treated Water Tanks	1	0%	23-Dec-27	24-Dec-27	543
572	Treated Water HLPS	1	0%	24-Jan-28	25-Jan-28	527
Electrical & ICA Works		135		24-Jan-28	04-Aug-28	393
574	MCC and Transformer Installation	135	0%	24-Jan-28	04-Aug-28	393
South West Section		165		24-Jan-28	18-Sep-28	363
Civil Works		130		24-Jan-28	28-Jul-28	398
578	Fuel, Generator, Incoming Transformer Telecoms Slab	35	0%	24-Jan-28	13-Mar-28	363
577	Admin Building (including building services)	130	0%	24-Jan-28	28-Jul-28	398
Mechanical and Electrical Cabling Works		130		13-Mar-28	18-Sep-28	363
580	Telecoms	130	0%	13-Mar-28	18-Sep-28	363
Chemical Dosing Section		135		11-Oct-27	27-Apr-28	462
Mechanical and Electrical Cabling Works		67		11-Oct-27	20-Jan-28	530
586	Sodium Hydroxide	30	0%	11-Oct-27	22-Nov-27	567
585	Hydrogen Peroxide	30	0%	11-Oct-27	22-Nov-27	567
588	Antiscalant Dosing	30	0%	13-Oct-27	24-Nov-27	565
584	Citric Acid	30	0%	10-Nov-27	22-Dec-27	545
583	Sodium Hypochlorite	30	0%	10-Nov-27	22-Dec-27	545
589	Hydrochloric Acid Dosing System	50	0%	03-Nov-27	20-Jan-28	530
587	Sodium Bisulphite	50	0%	03-Nov-27	20-Jan-28	530
Electrical & ICA Works		135		11-Oct-27	27-Apr-28	462
591	MCC and Transformer Installation	135	0%	11-Oct-27	27-Apr-28	462
Site Wide		237		17-Nov-27	30-Oct-28	363
593	Main Site Switch Gear, Transformer and Generator Install	135	0%	17-Nov-27	07-Jun-28	420
594	Road, Pathways and Making Good	150	0%	17-Nov-27	28-Jun-28	420
596	Ready for Wet Commissioning	0	0%	30-Oct-28		363
595	M&E Install & Dry Commissioning	30	0%	18-Sep-28	30-Oct-28	363
CONVEYANCE PIPEWORK WRP TO EBL		1110		31-Oct-25	15-Apr-30	0
Site Investigation		0		31-Oct-25	31-Oct-25	0
605	Site Investigations	0	0%	31-Oct-25		0
Design		260		31-Oct-25	17-Nov-26	0
607	Design (Assume reduced duration from 390d to 260d)	260	0%	31-Oct-25	17-Nov-26	0
Construction		850		17-Nov-26	15-Apr-30	0
611	Wet Commissioning Ready	0	0%	15-Apr-30		0
610	Conveyance Pipework Construction (Gang of 4 = 174 week)	850	0%	17-Nov-26	15-Apr-30	0
BREAK PRESSURE TANK BETWEEN WRP AND OTTERBOURNE PRE-DISINFECTION PLANT		260		31-Oct-25	17-Nov-26	850
628	Design	60	0%	31-Oct-25	03-Feb-26	850
630	Wet Commissioning Ready	0	0%	17-Nov-26		850
629	Build (Civil/ MEICA/ Finishes)	200	0%	03-Feb-26	17-Nov-26	850
COMMISSIONING		170		15-Apr-30	16-Dec-30	0
632	WRP Dry Commissioning Period	60	0%	15-Apr-30	12-Jul-30	0
633	Wet Commissioning Period	80	0%	12-Jul-30	04-Nov-30	0
634	Handover Period	30	0%	04-Nov-30	16-Dec-30	0
OTTERBOURNE PRE-DISINFECTION PLANT		1365		08-Mar-21 A	29-Jan-27	974
A10000	Indicative Concept Design	17	73.64%	08-Mar-21 A	31-Aug-21	974
A10020	Indicative Procurement Period	250	0%	13-Oct-21	13-Oct-22	1019
A10010	Feasibility Design (DWI DESIGN CONFIRMATION)	325	0%	01-Sep-21	15-Dec-22	974
A10030	Indicative Detailed Designs	250	0%	16-Dec-22	15-Dec-23	974



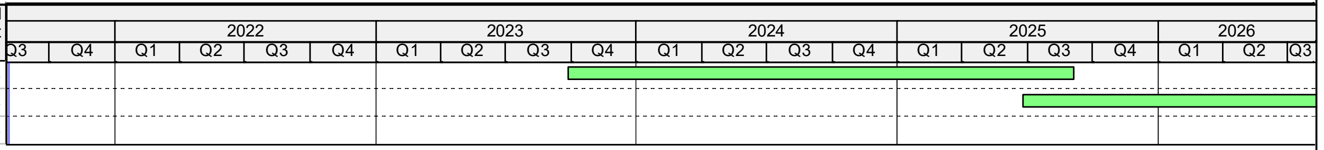
🟩 Remaining Work
🟥 Critical Remaining Work
◆ ◆ Milestone

Project ID: 710060-B2-1 CURR Standard Layout for Distribution

Date	Revision	Checked	Approved
26-Aug-21	WR (B2) Schedule for G1.5 Submission	DC	BM

WATER RECYCLING PLANT - OPTION B2 (BASED ON DPC PROCUREMENT ROUTE)
Progressed to 06-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
A10040	Indicative Construction Period	480	0%	28-Sep-23	03-Sep-25	974
A10050	Indicative Commissioning Period	370	0%	24-Jun-25	11-Dec-26	974
A10060	Confirmation the Completion of Pre-Disinfection Treatment (TARGET 31ST JAN 2027)	29	0%	11-Dec-26	29-Jan-27	974



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Option B.5 Full Gantt Chart

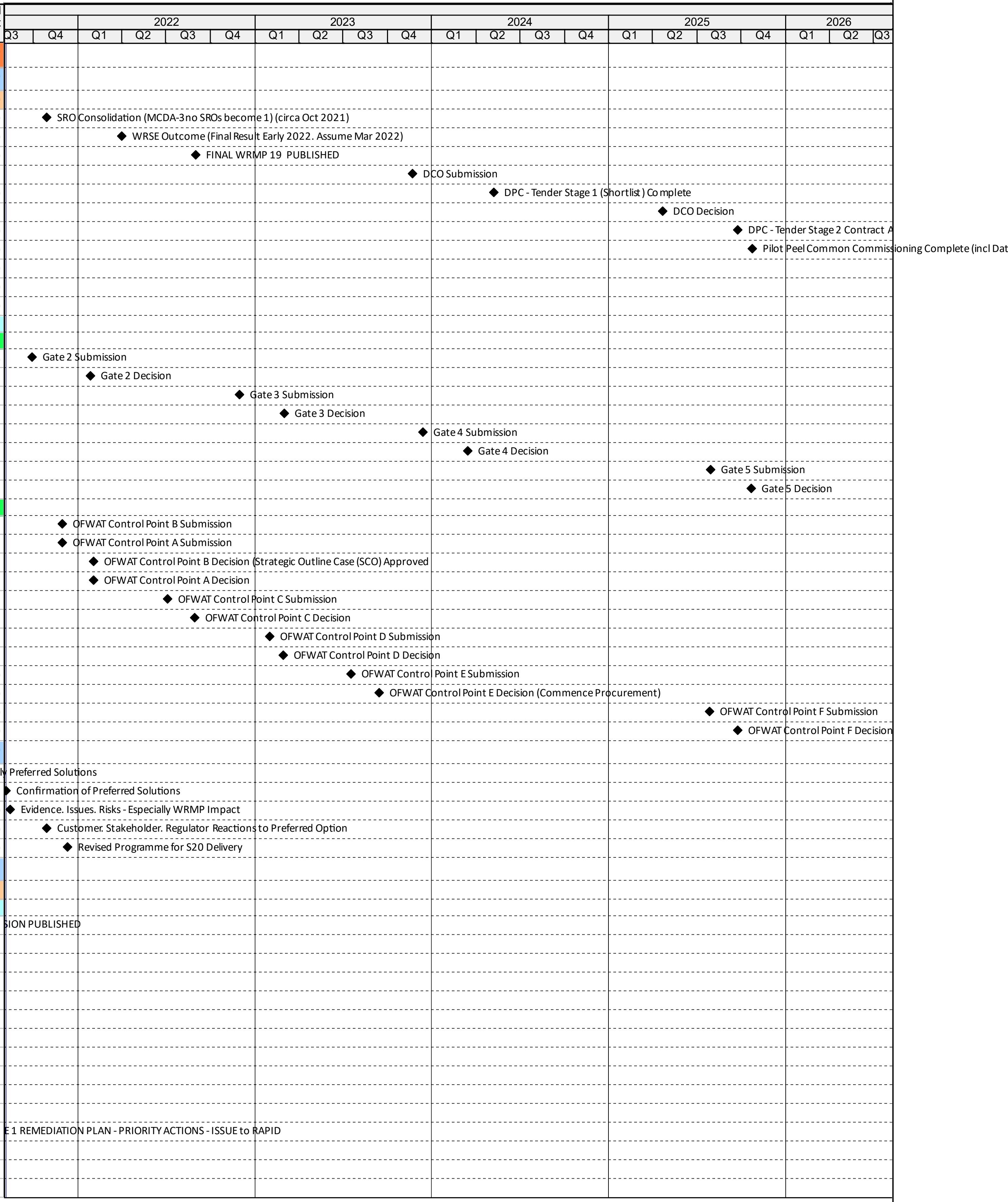
Water for LIFE from Southern Water

What-if 1: WATER RECYCLING PLANT - OPTION B5 (ABE STAGE 1 - DPC PROCUREMENT ROUTE)

Progressed to 06-Aug-21

Print: 25-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
What-if 1: WATER RECYCLING PLANT - OPTION B5 (ABE STAGE 1 - DPC PROCUREM		2338		28-Sep-20 A	16-Dec-30	0
KEY MILESTONES		2302		27-Sep-21	16-Dec-30	0
LEVEL 2 PROJECT MILESTONES		2302		27-Sep-21	16-Dec-30	0
RYWR.KEY.00910	SRO Consolidation (MCDA-3no SROs become 1) (circa Oct 2021)	0	0%		29-Oct-21*	0
RYWR.KEY.01000	WRSE Outcome (Final Result Early 2022. Assume Mar 2022)	0	0%		31-Mar-22*	0
RYWR.KEY.00510	FINAL WRMP 19 PUBLISHED	0	0%		31-Aug-22	320
RYWR.KEY.00710	DCO Submission	0	0%		21-Nov-23	11
RYWR.KEY.00810	DPC - Tender Stage 1 (Shortlist) Complete	0	0%		08-May-24	0
RYWR.KEY.00720	DCO Decision	0	0%		22-Apr-25	19
RYWR.KEY.00820	DPC - Tender Stage 2 Contract Award	0	0%		23-Sep-25	0
RYWR.KEY.00060	Pilot Peel Common Commissioning Complete (incl Data collection up to CAP Contract Award)	0	0%		23-Oct-25*	0
RYWR.KEY.00010	SECTION 20 AGREEMENT - SRO Operational (75Mld DE-SAL @ FAWLEY OPERATIONAL)	0	0%		31-Mar-27*	0
RYWR.KEY.00050	75 Ml/d WATER RECYCLING PLANT - READY FOR WET COMMISSIONING	0	0%		16-May-30	150
RYWR.KEY.00040	75 Ml/d WATER RECYCLING PLANT - OPERATIONAL	0	0%		16-Dec-30	0
GOVERNANCE		1015		27-Sep-21	22-Oct-25	1287
RAPID		1015		27-Sep-21	22-Oct-25	1287
RYWR.KEY.00110	Gate 2 Submission	0	0%		27-Sep-21	44
RYWR.KEY.00120	Gate 2 Decision	0	0%		27-Jan-22	1543
RYWR.KEY.00130	Gate 3 Submission	0	0%		30-Nov-22	1577
RYWR.KEY.00140	Gate 3 Decision	0	0%		02-Mar-23	1527
RYWR.KEY.00150	Gate 4 Submission	0	0%		14-Dec-23	1569
RYWR.KEY.00160	Gate 4 Decision	0	0%		15-Mar-24	1519
RYWR.KEY.00170	Gate 5 Submission	0	0%		29-Jul-25	1327
RYWR.KEY.00180	Gate 5 Decision	0	0%		22-Oct-25	1287
OFWAT		949		29-Nov-21	23-Sep-25	1308
RYWR.KEY.00230	OFWAT Control Point B Submission	0	0%		29-Nov-21	205
RYWR.KEY.00210	OFWAT Control Point A Submission	0	0%		29-Nov-21	2257
RYWR.KEY.00240	OFWAT Control Point B Decision (Strategic Outline Case (SCO) Approved	0	0%		01-Feb-22	165
RYWR.KEY.00220	OFWAT Control Point A Decision	0	0%		01-Feb-22	2217
RYWR.KEY.00250	OFWAT Control Point C Submission	0	0%		04-Jul-22	152
RYWR.KEY.00260	OFWAT Control Point C Decision	0	0%		30-Aug-22	112
RYWR.KEY.00270	OFWAT Control Point D Submission	0	0%		30-Jan-23	102
RYWR.KEY.00280	OFWAT Control Point D Decision	0	0%		27-Feb-23	82
RYWR.KEY.00290	OFWAT Control Point E Submission	0	0%		18-Jul-23	40
RYWR.KEY.00300	OFWAT Control Point E Decision (Commence Procurement)	0	0%		13-Sep-23	0
RYWR.KEY.00310	OFWAT Control Point F Submission	0	0%		28-Jul-25	40
RYWR.KEY.00320	OFWAT Control Point F Decision (Contract Award Enabler)	0	0%		23-Sep-25	0
SENIOR STAKEHOLDER MEETINGS		88		01-Jun-21 A	09-Dec-21	0
RYWR.CON.00710	Early Preferred Solutions	0	100%		01-Jun-21 A	
RYWR.CON.00720	Confirmation of Preferred Solutions	0	0%		06-Aug-21*	-22
RYWR.CON.00730	Evidence. Issues. Risks - Especially WRMP Impact	0	0%		13-Aug-21*	0
RYWR.CON.00740	Customer. Stakeholder. Regulator Reactions to Preferred Option	0	0%		28-Oct-21*	0
RYWR.CON.00750	Revised Programme for S20 Delivery	0	0%		09-Dec-21*	0
GATEWAYS (RAPID)		1071		28-Sep-20 A	19-Nov-25	1267
GATEWAY 1		0		28-Sep-20 A	26-Jul-21 A	
DELIVERABLES		0		29-Sep-20 A	26-Jul-21 A	
NWSR.GWY.02190	(GIVE) RAPID Gate 1 - SUBMISSION PUBLISHED	0	100%		01-Oct-20 A	
NWSR.GWY.02180	RAPID Gate 1 - Adapt Submission for Publication	0	100%	29-Sep-20 A	01-Oct-20 A	
NWSR.GWY.02200	RAPID Gate 1 - Queries Process	0	100%	29-Sep-20 A	19-Oct-20 A	
NWSR.GWY.02020	RAPID GATE 1 REMEDIATION PLAN - Confirm Priority Actions with Designated Owners	0	100%	11-Jan-21 A	15-Jan-21 A	
NWSR.GWY.02010	RAPID GATE 1 REMEDIATION PLAN - Identify Priority Action Owners	0	100%	04-Jan-21 A	15-Jan-21 A	
NWSR.GWY.02030	RAPID GATE 1 REMEDIATION PLAN - Priority Actions - Workshops - Round 1	0	100%	18-Jan-21 A	22-Jan-21 A	
NWSR.GWY.02040	RAPID GATE 1 REMEDIATION PLAN - Priority Actions - Workshops - Round 2	0	100%	25-Jan-21 A	29-Jan-21 A	
NWSR.GWY.02050	RAPID GATE 1 REMEDIATION PLAN - Develop Draft Schedule for all Priority Actions	0	100%	08-Feb-21 A	12-Feb-21 A	
NWSR.GWY.02070	RAPID GATE 1 REMEDIATION PLAN - Desalination - Peer SME Legal Review	0	100%	05-Mar-21 A	18-Mar-21 A	
NWSR.GWY.02060	RAPID GATE 1 REMEDIATION PLAN - Desalination - Prepare Priority Actions Detailed Response	0	100%	15-Feb-21 A	18-Mar-21 A	
NWSR.GWY.02090	RAPID GATE 1 REMEDIATION PLAN - MARCH UPDATE	0	100%	22-Mar-21 A	26-Mar-21 A	
NWSR.GWY.02110	RAPID GATE 1 REMEDIATION PLAN - PRIORITY ACTIONS - ISSUE to RAPID	0	100%		31-Mar-21 A	
NWSR.GWY.02080	RAPID GATE 1 REMEDIATION PLAN - SWS Review, Governance & Sign Off	0	100%	19-Mar-21 A	31-Mar-21 A	
NWSR.GWY.02120	RAPID GATE 1 REMEDIATION PLAN - APRIL UPDATE	0	100%	26-Apr-21 A	30-Apr-21 A	
NWSR.GWY.02130	RAPID GATE 1 REMEDIATION PLAN - MAY UPDATE	0	100%	24-May-21 A	28-May-21 A	



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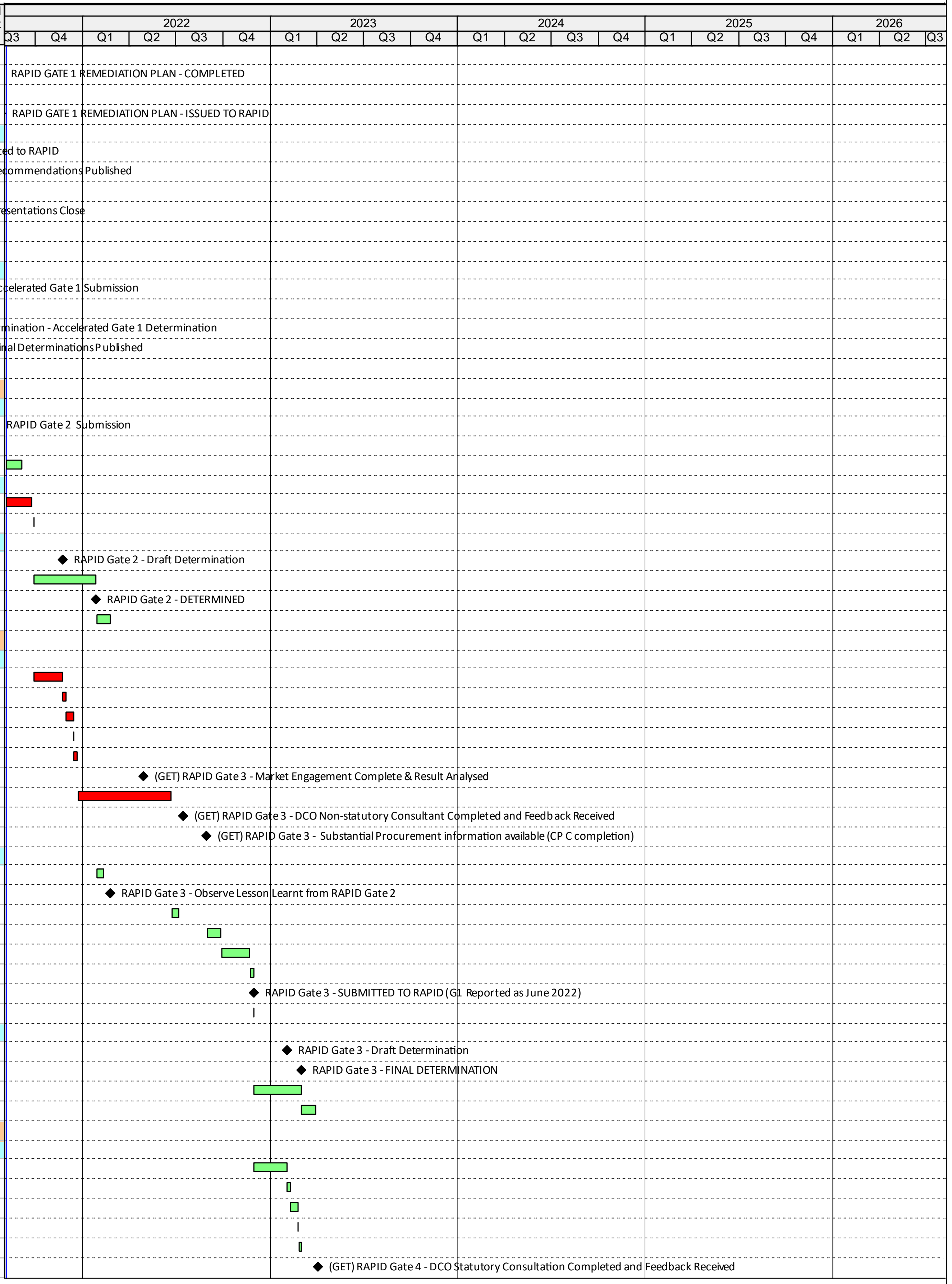
What-if 1: WATER RECYCLING PLANT - OPTION B5 (ABE STAGE 1 - DPC PROCUREMENT ROUTE)
Progressed to 06-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
NWSR.GWY.0214 0	RAPID GATE 1 REMEDIATION PLAN - JUNE UPDATE	0	100%	26-May-21 A	02-Jun-21 A	
NWSR.GWY.0216 0	RAPID GATE 1 REMEDIATION PLAN - COMPLETED	0	100%		23-Jul-21 A	
NWSR.GWY.0215 0	RAPID GATE 1 REMEDIATION PLAN - JULY UPDATE	0	100%	19-Jul-21 A	23-Jul-21 A	
NWSR.GWY.0217 0	RAPID GATE 1 REMEDIATION PLAN - ISSUED TO RAPID	0	100%		26-Jul-21 A	
ASSURANCE & GOVERNANCE		0		28-Sep-20 A	19-Feb-21 A	
NWSR.GWY.0231 0	(GIVE) RAPID Gate 1 - Submitted to RAPID	0	100%		28-Sep-20 A	
NWSR.GWY.0227 0	RAPID Gate 1 - Draft Recommendations Published	0	100%		01-Dec-20 A	
NWSR.GWY.0225 0	RAPID Gate 1 - Draft Recommendations	0	100%	20-Oct-20 A	01-Dec-20 A	
NWSR.GWY.0228 0	RAPID Gate 1 - Representations Close	0	100%		31-Dec-20 A	
NWSR.GWY.0229 0	RAPID Gate 1 - Representations	0	100%	01-Dec-20 A	31-Dec-20 A	
NWSR.GWY.0226 0	RAPID Gate 1 - Review RAPID Determination & Lessons Learned	0	100%	28-Jan-21 A	19-Feb-21 A	
DETERMINATION		0		28-Sep-20 A	28-Jan-21 A	
NWSR.GWY.0242 0	PR19 Final Determination - Accelerated Gate 1 Submission	0	100%		28-Sep-20 A	
NWSR.GWY.0245 0	RAPID Gate 1 - Draft Determinations	0	100%	04-Jan-21 A	28-Jan-21 A	
NWSR.GWY.0244 0	PR19 Final Determination - Accelerated Gate 1 Determination	0	100%		28-Jan-21 A	
NWSR.GWY.0247 0	RAPID Gate 1 - Final Determinations Published	0	100%		28-Jan-21 A	
NWSR.GWY.0243 0	LoE - RAPID Gate 1 - Determination Period	0	100%	28-Sep-20 A	28-Jan-21 A	
GATEWAY 2		138		05-May-21 A	24-Feb-22	2200
DELIVERABLES		20		05-May-21 A	03-Sep-21	2318
NWSR.KEY.00010	START - RAPID Gate 2 Submission	0	100%	05-May-21 A		
NWSR.GWY.0001 0	RAPID Gate 2 - Authors Briefing	0	100%	05-May-21 A	05-May-21 A	
NWSR.GWY.0002 0	RAPID Gate 2 - Document Freeze - Collation & Printing - Allowance 1 Calendar Week	29	0%	31-May-21 A	03-Sep-21	3391
ASSURANCE & GOVERNANCE		36		07-Jun-21 A	27-Sep-21	4
NWSR.GWY.0003 0	RAPID Gate 2 - SW Governance Approvals	35	0%	07-Jun-21 A	24-Sep-21	4
NWSR.GWY.0004 0	RAPID Gate 2 - SUBMISSION TO RAPID	1	0%	27-Sep-21	27-Sep-21	4
DETERMINATION		102		28-Sep-21	24-Feb-22	1533
NWSR.GWY.0005 5	RAPID Gate 2 - Draft Determination	0	0%		22-Nov-21	4
NWSR.GWY.0005 0	RAPID Gate 2 - Determination Period (27th January 2022)	82	0%	28-Sep-21	27-Jan-22	1533
NWSR.KEY.00020	RAPID Gate 2 - DETERMINED	0	0%		27-Jan-22	1533
NWSR.GWY.0005 6	RAPID Gate 2 - Lesson Learnt	20	0%	28-Jan-22	24-Feb-22	1533
GATEWAY 3		375		28-Sep-21	30-Mar-23	1517
DELIVERABLES		229		28-Sep-21	30-Aug-22	1416
NWSR.GWY.0301 0	RAPID Gate 3 - Create Submission Structure	40	0%	28-Sep-21	22-Nov-21	9
NWSR.GWY.0302 0	RAPID Gate 3 - Review & Incorporate Feedback from RAPID Gate2 Draft Determination	5	0%	23-Nov-21	29-Nov-21	4
NWSR.GWY.0303 0	RAPID Gate 3 - Sign Off by Director. Legal	10	0%	30-Nov-21	13-Dec-21	4
NWSR.GWY.0304 0	RAPID Gate 3 - Confirm by RAPID	1	0%	14-Dec-21	14-Dec-21	4
NWSR.GWY.0308 0	RAPID Gate 3 - Brief Authors	5	0%	15-Dec-21	21-Dec-21	4
NWSR.GWY.0310 2	(GET) RAPID Gate 3 - Market Engagement Complete & Result Analysed	0	0%		29-Apr-22	1499
NWSR.GWY.0309 0	RAPID Gate 3 - Create Gateway Deliverables	120	0%	22-Dec-21	22-Jun-22	4
NWSR.GWY.0310 3	(GET) RAPID Gate 3 - DCO Non-statutory Consultant Completed and Feedback Received	0	0%		15-Jul-22	1447
NWSR.GWY.0310 1	(GET) RAPID Gate 3 - Substantial Procurement information available (CP C completion)	0	0%		30-Aug-22	1416
ASSURANCE & GOVERNANCE		213		28-Jan-22	30-Nov-22	1416
NWSR.GWY.0311 0	RAPID Gate 3 - Review & Incorporate Feedback from RAPID Gate2 FinalDetermination	10	0%	28-Jan-22	10-Feb-22	1543
NWSR.GWY.0312 0	RAPID Gate 3 - Observe Lesson Learnt from RAPID Gate 2	0	0%		24-Feb-22	1533
NWSR.GWY.0313 0	RAPID Gate 3 - Amend Deliverables based on RAPID Gate 2 & Lesson Learnt	10	0%	23-Jun-22	06-Jul-22	1454
NWSR.GWY.0315 0	RAPID Gate 3 - Internal Assurance	20	0%	31-Aug-22	27-Sep-22	1416
NWSR.GWY.0319 0	RAPID Gate 3 - External Assurance	40	0%	28-Sep-22	22-Nov-22	1416
NWSR.GWY.0321 0	RAPID Gate 3 - Legal Review	5	0%	23-Nov-22	29-Nov-22	1416
NWSR.GWY.0325 0	RAPID Gate 3 - SUBMITTED TO RAPID (G1 Reported as June 2022)	0	0%		30-Nov-22	1416
NWSR.GWY.0323 0	RAPID Gate 3 - Sign off by Board	1	0%	30-Nov-22	30-Nov-22	1416
DETERMINATION		80		01-Dec-22	30-Mar-23	1517
NWSR.GWY.0332 0	RAPID Gate 3 - Draft Determination	0	0%		02-Feb-23	1416
NWSR.GWY.0333 0	RAPID Gate 3 - FINAL DETERMINATION	0	0%		02-Mar-23	1517
NWSR.GWY.0331 0	RAPID Gate 3 - RAPID Determination Period (incl Q&A)	60	0%	01-Dec-22	02-Mar-23	1416
NWSR.GWY.0334 0	RAPID Gate 3 - Lesson Learnt	20	0%	03-Mar-23	30-Mar-23	1517
GATEWAY 4		340		01-Dec-22	16-Apr-24	1509
DELIVERABLES		194		01-Dec-22	13-Sep-23	1413
NWSR.GWY.0411 0	RAPID Gate 4 - Create Submission Structure	40	0%	01-Dec-22	02-Feb-23	1421
NWSR.GWY.0412 0	RAPID Gate 4 - Review & Incorporate Feedback from RAPID Gate3 Draft Determination	5	0%	03-Feb-23	09-Feb-23	1416
NWSR.GWY.0413 0	RAPID Gate 4 - Sign Off by Director. Legal	10	0%	10-Feb-23	23-Feb-23	1416
NWSR.GWY.0414 0	RAPID Gate 4 - Confirm by RAPID	1	0%	24-Feb-23	24-Feb-23	1416
NWSR.GWY.0415 0	RAPID Gate 4 - Brief Authors	5	0%	27-Feb-23	03-Mar-23	1416
NWSR.GWY.0417 0	(GET) RAPID Gate 4 - DCO Statutory Consultation Completed and Feedback Received	0	0%		04-Apr-23	1524



🟩 Remaining Work
🟥 Critical Remaining Work
◆ ◆ Milestone

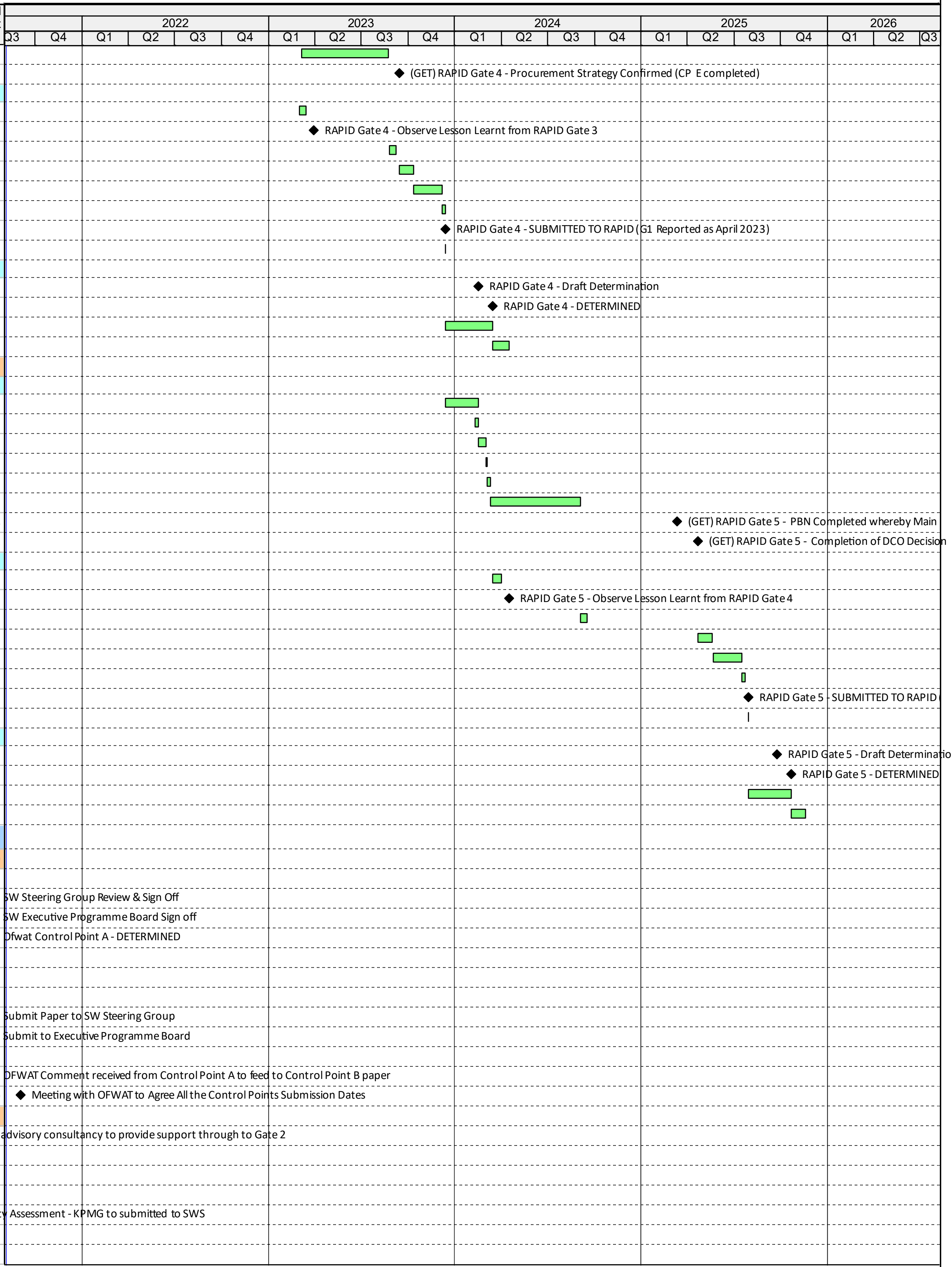
Date	Revision	Checked	Approved
25-Aug-21	WR (B5) Schedule for G1.5 Submission	DC	BM

What-if 1: WATER RECYCLING PLANT - OPTION B5 (ABE STAGE 1 - DPC PROCUREMENT ROUTE)

Progressed to 06-Aug-21

Print: 25-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
NWSR.GWY.04160	RAPID Gate 4 - Create Gateway Deliverables	120	0%	06-Mar-23	24-Aug-23	1416
NWSR.GWY.04180	(GET) RAPID Gate 4 - Procurement Strategy Confirmed (CP E completed)	0	0%		13-Sep-23	1413
ASSURANCE & GOVERNANCE		200		03-Mar-23	14-Dec-23	1413
NWSR.GWY.04210	RAPID Gate 4 - Review & Incorporate Feedback from RAPID Gate3 Final Determination	10	0%	03-Mar-23	16-Mar-23	1527
NWSR.GWY.04220	RAPID Gate 4 - Observe Lesson Learnt from RAPID Gate 3	0	0%		30-Mar-23	1517
NWSR.GWY.04230	RAPID Gate 4 - Amend Deliverables based on RAPID Gate 3 & Lesson Learnt	10	0%	25-Aug-23	08-Sep-23	1416
NWSR.GWY.04270	RAPID Gate 4 - Internal Assurance	20	0%	13-Sep-23	11-Oct-23	1413
NWSR.GWY.04280	RAPID Gate 4 - External Assurance	40	0%	11-Oct-23	06-Dec-23	1413
NWSR.GWY.04310	RAPID Gate 4 - Legal Review	5	0%	06-Dec-23	13-Dec-23	1413
NWSR.GWY.04350	RAPID Gate 4 - SUBMITTED TO RAPID (G1 Reported as April 2023)	0	0%		14-Dec-23	1413
NWSR.GWY.04330	RAPID Gate 4 - Sign off by Board	1	0%	13-Dec-23	14-Dec-23	1413
DETERMINATION		80		14-Dec-23	16-Apr-24	1509
NWSR.GWY.04520	RAPID Gate 4 - Draft Determination	0	0%		16-Feb-24	1413
NWSR.GWY.04550	RAPID Gate 4 - DETERMINED	0	0%		15-Mar-24	1509
NWSR.GWY.04510	RAPID Gate 4 - RAPID Determination Period (incl Q&A)	60	0%	14-Dec-23	15-Mar-24	1413
NWSR.GWY.04580	RAPID Gate 4 - Lesson Learnt	20	0%	15-Mar-24	16-Apr-24	1509
GATEWAY 5		480		14-Dec-23	19-Nov-25	1267
DELIVERABLES		331		14-Dec-23	22-Apr-25	1268
NWSR.GWY.05110	RAPID Gate 5 - Create Submission Structure	40	0%	14-Dec-23	16-Feb-24	1448
NWSR.GWY.05120	RAPID Gate 5 - Review & Incorporate Feedback from RAPID Gate 4 Draft Determination	5	0%	09-Feb-24	16-Feb-24	1413
NWSR.GWY.05130	RAPID Gate 5 - Sign Off by Director. Legal	10	0%	16-Feb-24	01-Mar-24	1413
NWSR.GWY.05150	RAPID Gate 5 - Confirm by RAPID	1	0%	01-Mar-24	04-Mar-24	1413
NWSR.GWY.05160	RAPID Gate 5 - Brief Authors	5	0%	04-Mar-24	11-Mar-24	1413
NWSR.GWY.05170	RAPID Gate 5 - Create Gateway Deliverables	120	0%	11-Mar-24	02-Sep-24	1413
NWSR.GWY.05190	(GET) RAPID Gate 5 - PBN Completed whereby Main Contract ready to be Awarded	0	0%		12-Mar-25	1294
NWSR.GWY.05180	(GET) RAPID Gate 5 - Completion of DCO Decision	0	0%		22-Apr-25	1268
ASSURANCE & GOVERNANCE		340		15-Mar-24	29-Jul-25	1267
NWSR.GWY.05410	RAPID Gate 5 - Review & Incorporate Feedback from RAPID Gate4 Final Determination	10	0%	15-Mar-24	02-Apr-24	1519
NWSR.GWY.05420	RAPID Gate 5 - Observe Lesson Learnt from RAPID Gate 4	0	0%		16-Apr-24	1509
NWSR.GWY.05430	RAPID Gate 5 - Amend Deliverables based on RAPID Gate 4 & Lesson Learnt	10	0%	02-Sep-24	16-Sep-24	1413
NWSR.GWY.05490	RAPID Gate 5 - Internal Assurance	20	0%	22-Apr-25	20-May-25	1268
NWSR.GWY.05510	RAPID Gate 5 - External Assurance	40	0%	21-May-25	16-Jul-25	1268
NWSR.GWY.05520	RAPID Gate 5 - Legal Review	5	0%	17-Jul-25	23-Jul-25	1268
NWSR.GWY.05560	RAPID Gate 5 - SUBMITTED TO RAPID (G1 Reported as Autumn 2024)	0	0%		29-Jul-25	1267
NWSR.GWY.05540	RAPID Gate 5 - Sign off by Board	1	0%	29-Jul-25	29-Jul-25	529
DETERMINATION		80		29-Jul-25	19-Nov-25	1267
NWSR.GWY.05820	RAPID Gate 5 - Draft Determination	0	0%		24-Sep-25	1287
NWSR.GWY.05860	RAPID Gate 5 - DETERMINED	0	0%		22-Oct-25	1267
NWSR.GWY.05810	RAPID Gate 5 - RAPID Determination Period (incl Q&A)	60	0%	29-Jul-25	22-Oct-25	1267
NWSR.GWY.05880	RAPID Gate 5 - Lesson Learnt	20	0%	22-Oct-25	19-Nov-25	1267
OFWAT		1030		15-Jan-21 A	23-Sep-25	1308
CONTROL POINT A (TO COMBINE WITH CONTROL POINT B)		0		08-Jul-21 A	01-Sep-21	0
NWSR.GWY.11010	Southern Water to ask OFWAT if Control Point A if required	0	100%	08-Jul-21 A	08-Jul-21 A	
NWSR.GWY.11040	SW Steering Group Review & Sign Off	0	100%		08-Jul-21 A	
NWSR.GWY.11060	SW Executive Programme Board Sign off	0	100%		08-Jul-21 A	
NWSR.GWY.11130	Ofwat Control Point A - DETERMINED	0	100%		08-Jul-21 A	
NWSR.GWY.11100	Ofwat Control Point A - Review Period	0	100%	08-Jul-21 A	08-Jul-21 A	
NWSR.GWY.11090	Ofwat Control Point A - SUBMISSION TO OFWAT	0	100%	08-Jul-21 A	08-Jul-21 A	
NWSR.GWY.11020	Produce Control Point A Paper (1no SRO decided)	0	100%	08-Jul-21 A	08-Jul-21 A	
NWSR.GWY.11030	Submit Paper to SW Steering Group	0	100%		08-Jul-21 A	
NWSR.GWY.11050	Submit to Executive Programme Board	0	100%		08-Jul-21 A	
NWSR.GWY.11080	Amend Paper incorporating comments from Programme Board	0	100%	08-Jul-21 A	08-Jul-21 A	
NWSR.GWY.11110	OFWAT Comment received from Control Point A to feed to Control Point B paper	0	100%		08-Jul-21 A	
NWSR.GWY.10000	Meeting with OFWAT to Agree All the Control Points Submission Dates	0	0%		01-Sep-21*	0
CONTROL POINT B (COMBINE WITH CONTROL POINT A)		121		15-Jan-21 A	01-Feb-22	121
NWSR.GWY.12010	(GET) - Identify an advisory consultancy to provide support through to Gate 2	0	100%		15-Jan-21 A	
NWSR.GWY.12020	DPC Eligibility Assessment input collection	0	100%	01-Feb-21 A	19-Feb-21 A	
NWSR.GWY.12030	DPC Eligibility Assessment (40% complete)	0	100%	08-Feb-21 A	01-Mar-21 A	
NWSR.GWY.12040	DPC Eligibility Assessment (100% complete)	0	100%	01-Mar-21 A	12-Mar-21 A	
NWSR.GWY.12050	DPC Eligibility Assessment - KPMG to submitted to SWS	0	100%		15-Mar-21 A	
NWSR.GWY.12060	Produce Draft Control Point B Report (30% complete)	0	100%	15-Mar-21 A	02-Apr-21 A	
NWSR.GWY.12080	Produce Draft Control Point B Report (70% complete)	0	100%	05-Apr-21 A	16-May-21 A	



🟩 Remaining Work
🟥 Critical Remaining Work
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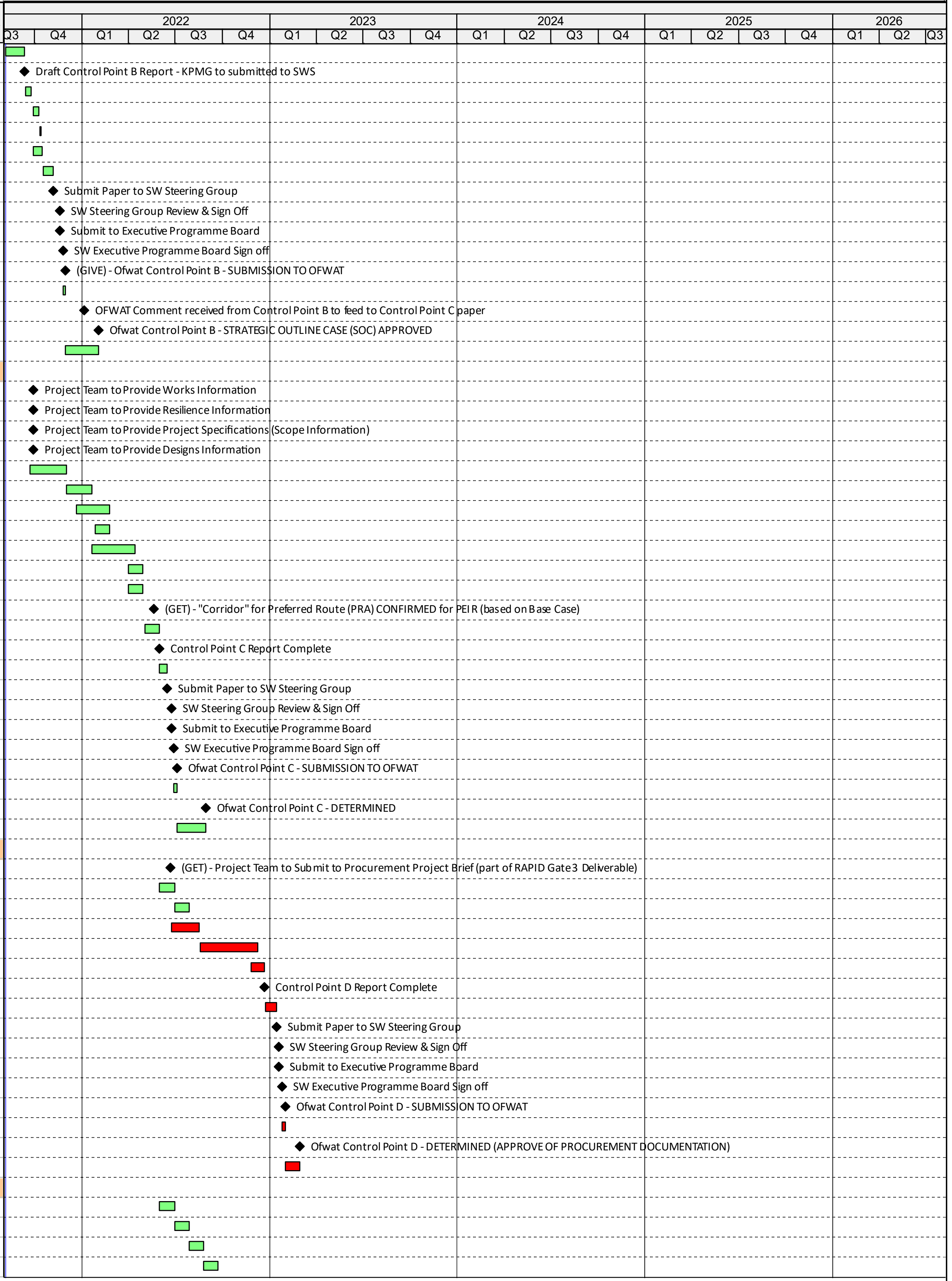
Project ID: 710060-2-2 CURR Standard Layout for Distribution

Date	Revision	Checked	Approved
25-Aug-21	WR (B5) Schedule for G1.5 Submission	DC	BM

Print: 25-Aug-21

What-if 1: WATER RECYCLING PLANT - OPTION B5 (ABE STAGE 1 - DPC PROCUREMENT ROUTE)
Progressed to 06-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
NWSR.GWY.12090	Produce Draft Control Point B Report (100% complete)	25	0%	27-May-21 A	10-Sep-21	50
NWSR.GWY.12210	Draft Control Point B Report - KPMG to submitted to SWS	0	0%		10-Sep-21	50
NWSR.GWY.12220	SWS to review and comment on Draft Control Point B Report	10	0%	13-Sep-21	24-Sep-21	93
NWSR.GWY.12230	Produce Final Control Point B Report	10	0%	27-Sep-21	08-Oct-21	96
NWSR.GWY.12240	Final Control Point B Report - SWS Incorporating Control Point A Comments	2	0%	11-Oct-21	12-Oct-21	96
NWSR.GWY.12250	Procurement Team to Submit Report for Internal assurance	15	0%	27-Sep-21	15-Oct-21	93
NWSR.GWY.12255	Procurement Team to Submit Report for External assurance	15	0%	18-Oct-21	05-Nov-21	93
NWSR.GWY.12260	Submit Paper to SW Steering Group	0	0%		05-Nov-21	93
NWSR.GWY.12270	SW Steering Group Review & Sign Off	0	0%		18-Nov-21	5
NWSR.GWY.12280	Submit to Executive Programme Board	0	0%		18-Nov-21	105
NWSR.GWY.12290	SW Executive Programme Board Sign off	0	0%		24-Nov-21	5
NWSR.GWY.12340	(GIVE) - Ofwat Control Point B - SUBMISSION TO OFWAT	0	0%		29-Nov-21	121
NWSR.GWY.12300	Amend Paper incorporating comments from Programme Board	4	0%	24-Nov-21	29-Nov-21	121
NWSR.GWY.12360	OFWAT Comment received from Control Point B to feed to Control Point C paper	0	0%		04-Jan-22	141
NWSR.GWY.12370	Ofwat Control Point B - STRATEGIC OUTLINE CASE (SOC) APPROVED	0	0%		01-Feb-22	121
NWSR.GWY.12350	Ofwat Control Point B - Review Period	40	0%	30-Nov-21	01-Feb-22	121
CONTROL POINT C		233		22-Sep-21	30-Aug-22	2073
NWSR.GWY.13210	Project Team to Provide Works Information	0	0%		27-Sep-21	126
NWSR.GWY.13220	Project Team to Provide Resilience Information	0	0%		27-Sep-21	126
NWSR.GWY.13230	Project Team to Provide Project Specifications (Scope Information)	0	0%		27-Sep-21	126
NWSR.GWY.13240	Project Team to Provide Designs Information	0	0%		27-Sep-21	126
NWSR.GWY.13140	Prepare for Market Engagement (attendees, invites, objectives)	50	0%	22-Sep-21	30-Nov-21	50
NWSR.GWY.13160	Market Engagement Material Sign off	30	0%	01-Dec-21	19-Jan-22	50
NWSR.GWY.13250	Received Cost Intelligence data	40	0%	21-Dec-21	22-Feb-22	76
NWSR.GWY.13270	Produce Control Point C Report (30% complete) (Inc Eligibility Assessment)	20	0%	26-Jan-22	22-Feb-22	76
NWSR.GWY.13170	Market Engagement Activities (based on RAPID G3 Draft Deliverables)	60	0%	20-Jan-22	13-Apr-22	50
NWSR.GWY.13280	Produce Control Point C Report (70% complete)	20	0%	31-Mar-22	29-Apr-22	50
NWSR.GWY.13180	Gather Market Engagement Feedback	20	0%	31-Mar-22	29-Apr-22	50
NWSR.GWY.13110	(GET) - "Corridor" for Preferred Route (PRA) CONFIRMED for PEIR (based on Base Case)	0	0%		20-May-22	2142
NWSR.GWY.13290	Produce Control Point C Report (100% complete) Incorporate OFWAT Comment from Control Point B	20	0%	03-May-22	30-May-22	50
NWSR.GWY.13310	Control Point C Report Complete	0	0%		30-May-22	70
NWSR.GWY.13340	Procurement Team to Submit Report for Internal assurance	10	0%	31-May-22	15-Jun-22	70
NWSR.GWY.13350	Submit Paper to SW Steering Group	0	0%		15-Jun-22	70
NWSR.GWY.13360	SW Steering Group Review & Sign Off	0	0%		23-Jun-22	4
NWSR.GWY.13370	Submit to Executive Programme Board	0	0%		23-Jun-22	68
NWSR.GWY.13380	SW Executive Programme Board Sign off	0	0%		28-Jun-22	2
NWSR.GWY.13450	Ofwat Control Point C - SUBMISSION TO OFWAT	0	0%		04-Jul-22	66
NWSR.GWY.13390	Amend Paper incorporating comments from Programme Board	5	0%	28-Jun-22	04-Jul-22	66
NWSR.GWY.13470	Ofwat Control Point C - DETERMINED	0	0%		30-Aug-22	66
NWSR.GWY.13460	Ofwat Control Point C - Review Period	40	0%	05-Jul-22	30-Aug-22	66
CONTROL POINT D		186		31-May-22	27-Feb-23	14
NWSR.GWY.14160	(GET) - Project Team to Submit to Procurement Project Brief (part of RAPID Gate3 Deliverable)	0	0%		22-Jun-22	4
NWSR.GWY.14190	Produce Control Point D Report (30% complete)	20	0%	31-May-22	29-Jun-22	50
NWSR.GWY.14200	Produce Control Point D Report (70% complete)	20	0%	30-Jun-22	27-Jul-22	89
NWSR.GWY.14230	Prepare & Run for Market Engagement (attendees, invites, objectives)	40	0%	23-Jun-22	17-Aug-22	4
NWSR.GWY.14240	Produce Contractual Requirements (to revisit this activity once Option Selection is completed)	80	0%	18-Aug-22	08-Dec-22	4
NWSR.GWY.14250	Produce Control Point D Report (100% complete) Incorporate OFWAT Comment from Control Point C	20	0%	25-Nov-22	22-Dec-22	4
NWSR.GWY.14260	Control Point D Report Complete	0	0%		22-Dec-22	4
NWSR.GWY.14270	Procurement Team to Submit Report for Internal assurance	10	0%	23-Dec-22	13-Jan-23	4
NWSR.GWY.14280	Submit Paper to SW Steering Group	0	0%		13-Jan-23	4
NWSR.GWY.14290	SW Steering Group Review & Sign Off	0	0%		19-Jan-23	1
NWSR.GWY.14310	Submit to Executive Programme Board	0	0%		19-Jan-23	15
NWSR.GWY.14330	SW Executive Programme Board Sign off	0	0%		24-Jan-23	6
NWSR.GWY.14350	Ofwat Control Point D - SUBMISSION TO OFWAT	0	0%		30-Jan-23	14
NWSR.GWY.14340	Amend Paper incorporating comments from Programme Board	5	0%	24-Jan-23	30-Jan-23	14
NWSR.GWY.14370	Ofwat Control Point D - DETERMINED (APPROVE OF PROCUREMENT DOCUMENTATION)	0	0%		27-Feb-23	14
NWSR.GWY.14360	Ofwat Control Point D - Review Period	20	0%	31-Jan-23	27-Feb-23	14
CONTROL POINT E		323		31-May-22	13-Sep-23	1813
NWSR.GWY.15040	Prepare for Market Engagement (attendees, invites, objectives)	20	0%	31-May-22	29-Jun-22	50
NWSR.GWY.15050	Prepare for Market Engagement (material)	20	0%	30-Jun-22	27-Jul-22	50
NWSR.GWY.15060	Market Engagement Material Sign off	20	0%	28-Jul-22	24-Aug-22	50
NWSR.GWY.15120	Market Engagement Activities	20	0%	25-Aug-22	22-Sep-22	50



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Project ID: 710060-2-2 CURR Standard Layout for Distribution

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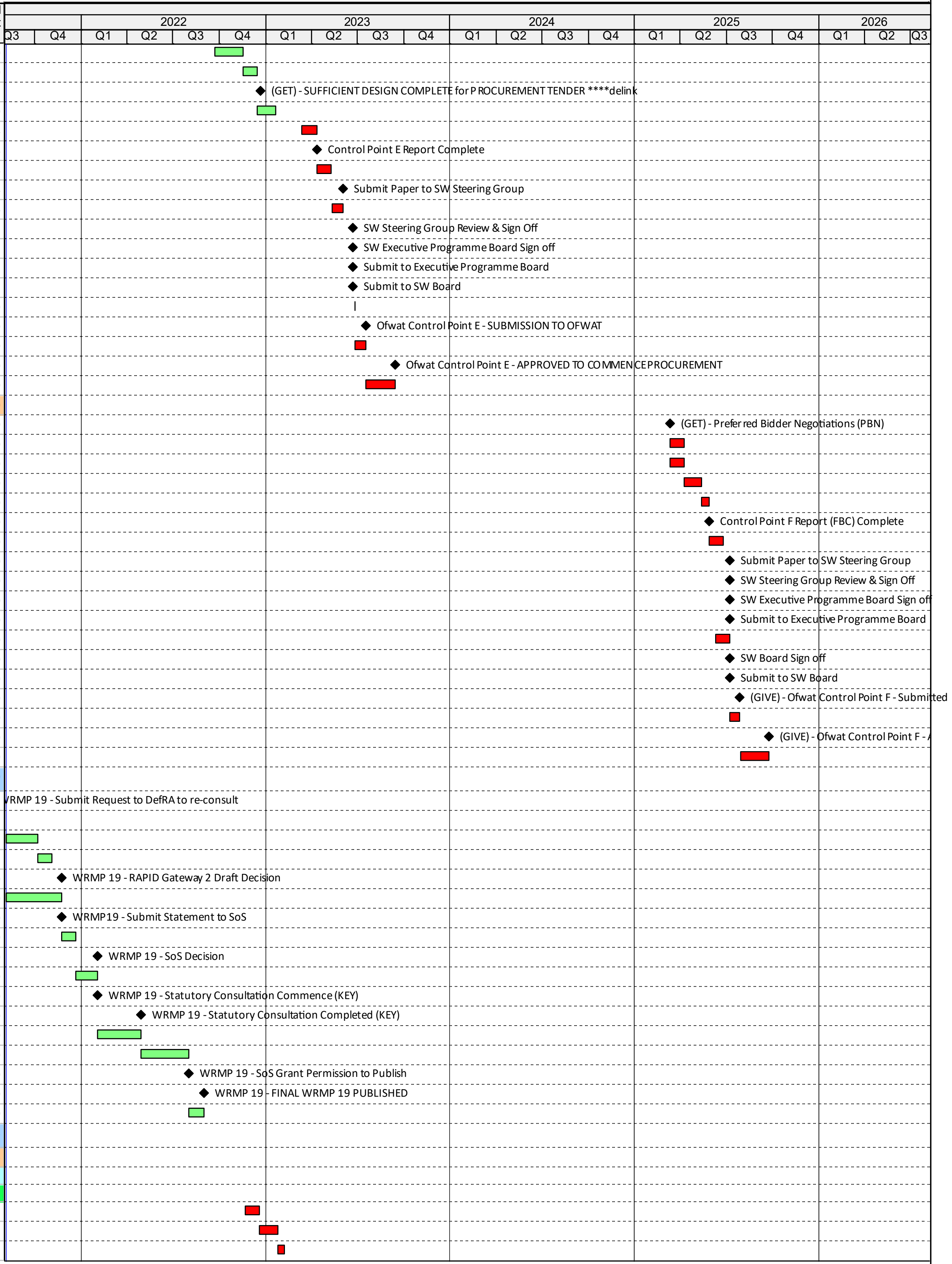
What-if 1: WATER RECYCLING PLANT - OPTION B5 (ABE STAGE 1 - DPC PROCUREMENT ROUTE)
Progressed to 06-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
NWSR.GWY.15170	Received Cost Intelligence data	40	0%	23-Sep-22	17-Nov-22	50
NWSR.GWY.15180	Produce Control Point E Report (30% complete) (Inc Eligibility Assessment)	20	0%	18-Nov-22	15-Dec-22	50
NWSR.GWY.15150	(GET) - SUFFICIENT DESIGN COMPLETE for PROCUREMENT TENDER ****delink	0	0%		21-Dec-22	1992
NWSR.GWY.15210	Produce Control Point E Report (70% complete)	20	0%	16-Dec-22	20-Jan-23	50
NWSR.GWY.15220	Produce Control Point E Report (100% complete) Incorporate OFWAT Comment from Control Point D	20	0%	14-Mar-23	12-Apr-23	14
NWSR.GWY.15230	Control Point E Report Complete	0	0%		12-Apr-23	14
NWSR.GWY.15240	Procurement Team to Submit Report for Internal assurance	20	0%	13-Apr-23	11-May-23	14
NWSR.GWY.15260	Submit Paper to SW Steering Group	0	0%		02-Jun-23	14
NWSR.GWY.15250	External Assurance Period	15	0%	12-May-23	02-Jun-23	14
NWSR.GWY.15270	SW Steering Group Review & Sign Off	0	0%		22-Jun-23	1
NWSR.GWY.15290	SW Executive Programme Board Sign off	0	0%		22-Jun-23	3
NWSR.GWY.15280	Submit to Executive Programme Board	0	0%		22-Jun-23	3
NWSR.GWY.15300	Submit to SW Board	0	0%		22-Jun-23	3
NWSR.GWY.15310	SW Board Sign off	1	0%	27-Jun-23	27-Jun-23	0
NWSR.GWY.15330	Ofwat Control Point E - SUBMISSION TO OFWAT	0	0%		18-Jul-23	0
NWSR.GWY.15320	Amend Paper incorporating comments from SW Board	15	0%	27-Jun-23	18-Jul-23	0
NWSR.GWY.15350	Ofwat Control Point E - APPROVED TO COMMENCEPROCUREMENT	0	0%		13-Sep-23	0
NWSR.GWY.15340	Ofwat Control Point E - Review Period	40	0%	18-Jul-23	13-Sep-23	0
CONTROL POINT F		134		12-Mar-25	23-Sep-25	0
NWSR.GWY.16090	(GET) - Preferred Bidder Negotiations (PBN)	0	0%		12-Mar-25	0
NWSR.GWY.16100	Received Cost Intelligence data	20	0%	12-Mar-25	09-Apr-25	0
NWSR.GWY.16110	Produce Control Point F Report (FBC) (30% complete) (Inc Eligibility Assessment)	20	0%	12-Mar-25	09-Apr-25	0
NWSR.GWY.16120	Produce Control Point F Report (FBC) (70% complete)	20	0%	09-Apr-25	12-May-25	0
NWSR.GWY.16130	Produce Control Point F Report (FBC) (100% complete) Incorporate OFWAT Comment from Control Poi	10	0%	12-May-25	27-May-25	0
NWSR.GWY.16140	Control Point F Report (FBC) Complete	0	0%		27-May-25	0
NWSR.GWY.16180	Procurement Team to Submit Report for Internal assurance	20	0%	27-May-25	24-Jun-25	0
NWSR.GWY.16230	Submit Paper to SW Steering Group	0	0%		08-Jul-25	0
NWSR.GWY.16240	SW Steering Group Review & Sign Off	0	0%		08-Jul-25	0
NWSR.GWY.16260	SW Executive Programme Board Sign off	0	0%		08-Jul-25	0
NWSR.GWY.16250	Submit to Executive Programme Board	0	0%		08-Jul-25	0
NWSR.GWY.16190	External Assurance Period	20	0%	10-Jun-25	08-Jul-25	0
NWSR.GWY.16280	SW Board Sign off	0	0%		08-Jul-25	0
NWSR.GWY.16270	Submit to SW Board	0	0%		08-Jul-25	0
NWSR.GWY.16320	(GIVE) - Ofwat Control Point F - Submitted	0	0%		28-Jul-25	0
NWSR.GWY.16300	Amend Paper incorporating comments from Programme Board	14	0%	08-Jul-25	28-Jul-25	0
NWSR.GWY.16360	(GIVE) - Ofwat Control Point F - APPROVED TO CAP AGREEMENT	0	0%		23-Sep-25	0
NWSR.GWY.16330	Ofwat Control Point F - Review Period	40	0%	29-Jul-25	23-Sep-25	0
WRMP19 AMENDMENT		266		30-Jun-21 A	31-Aug-22	320
RYWR.CON.00010	WRMP 19 - Submit Request to DefRA to re-consult	0	100%		30-Jun-21 A	
RYWR.CON.00020	WRMP 19 - DefRA 1st Review Period	0	100%	09-Jul-21 A	05-Aug-21 A	
RYWR.CON.00030	WRMP 19 - SW Optional Appraisals	43	38.57%	09-Jul-21 A	06-Oct-21	333
RYWR.CON.00040	WRMP 19 - DefRA 2nd Review Period	20	0%	07-Oct-21	03-Nov-21	333
RYWR.CON.00080	WRMP 19 - RAPID Gateway 2 Draft Decision	0	0%		22-Nov-21	320
RYWR.CON.00090	WRMP 19 - Engagement with RAPID & Regulators	76	20.83%	09-Jul-21 A	22-Nov-21	320
RYWR.CON.00100	WRMP19 - Submit Statement to SoS	0	0%		22-Nov-21	320
RYWR.CON.00110	WRMP 19 - Prepare Draft Revised WRMP19	20	0%	23-Nov-21	20-Dec-21	320
RYWR.CON.00150	WRMP 19 - SoS Decision	0	0%		01-Feb-22	320
RYWR.CON.00140	WRMP 19 - SoS Decision Period (Grant Permission to start Consultation)	25	0%	21-Dec-21	01-Feb-22	320
RYWR.CON.00160	WRMP 19 - Statutory Consultation Commence (KEY)	0	0%		01-Feb-22	320
RYWR.CON.00180	WRMP 19 - Statutory Consultation Completed (KEY)	0	0%		28-Apr-22	320
RYWR.CON.00170	WRMP 19 - Statutory Consultation Period	60	0%	02-Feb-22	28-Apr-22	320
RYWR.CON.00190	WRMP 19 - SoS Consideration period for publishing Revised WRMP19	65	0%	29-Apr-22	02-Aug-22	320
RYWR.CON.00210	WRMP 19 - SoS Grant Permission to Publish	0	0%		02-Aug-22	320
RYWR.CON.00270	WRMP 19 - FINAL WRMP 19 PUBLISHED	0	0%		31-Aug-22	320
RYWR.CON.00220	WRMP 19 - SW Preparation for Publishing Revised WRMP19	20	0%	02-Aug-22	31-Aug-22	320
CONSENT & PERMIT & LICENCING		1052		04-Jan-21 A	23-Oct-25	1286
CONSENT - DCO (Development Consent Order)		1052		04-Jan-21 A	23-Oct-25	1286
STAKEHOLDER ENGAGEMENT		285		14-Feb-22	04-Apr-23	11
STATUTORY CONSULTATION		90		22-Nov-22	04-Apr-23	11
RYWR.CON.00510	Statutory Consultation - Literature Generation	20	0%	22-Nov-22	19-Dec-22	11
RYWR.CON.00520	Statutory Consultation - Legal Review & SWS Governance & Assurance	20	0%	20-Dec-22	24-Jan-23	11
RYWR.CON.00530	Statutory Consultation - Publishing (Hard/Virtual)	10	0%	25-Jan-23	07-Feb-23	11



🟩 Remaining Work
🟥 Critical Remaining Work
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Date	Revision	Checked	Approved
25-Aug-21	WR (B5) Schedule for G1.5 Submission	DC	BM

What-if 1: WATER RECYCLING PLANT - OPTION B5 (ABE STAGE 1 - DPC PROCUREMENT ROUTE)

Progressed to 06-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
RYWR.CON.00540	Statutory Consultation - Period for Consultation	40	0%	08-Feb-23	04-Apr-23	11
NON-STATUTORY CONSULTATION		195		14-Feb-22	21-Nov-22	11
RYWR.CON.00610	Non Statutory Consultation - Literature Generation	45	0%	14-Feb-22	19-Apr-22	11
RYWR.CON.00620	Non Statutory Consultation - Legal Review & SWS Governance & Assurance	20	0%	20-Apr-22	18-May-22	11
RYWR.CON.00630	Non Statutory Consultation - Publishing (Hard/Virtual)	10	0%	19-May-22	01-Jun-22	11
RYWR.CON.00640	Non Statutory Consultation - Period for Consultation	30	0%	06-Jun-22	15-Jul-22	11
RYWR.CON.00650	Non Statutory Consultation - 2m Feedback 2m. Designs. 2w float	90	0%	18-Jul-22	21-Nov-22	11
DCO APPLICATION DOCUMENTS		596		04-Jan-21 A	21-Dec-23	1742
RYWR.CON.00560	Statutory Consultation - 4MO - DCO Dcoumentation Preparation Complete	80	0%	05-Apr-23	31-Jul-23	11
RYWR.CON.00550	Statutory Consultation - Finalised DCO Dcoumentation Preparation	60	0%	08-Aug-23	31-Oct-23	1779
Environmental Reports		446		04-Jan-21 A	23-May-23	1892
Scoping		139		04-Jan-21 A	25-Feb-22	2139
RYWR.CON.08010	Scoping Report - Stakeholder Engagement	45	0%	04-Jan-21 A	15-Oct-21	6
RYWR.CON.08020	Scoping Report - Draft Scoping Report	50	0%	01-Jun-21 A	15-Oct-21	6
RYWR.CON.08030	Scoping Report - Finalise Draft Report	25	0%	18-Oct-21	19-Nov-21	6
RYWR.CON.08040	Scoping Report - Assurance Review & Update (incl Legal Input)	10	0%	22-Nov-21	03-Dec-21	6
RYWR.CON.08060	Scoping Report - APPROVED FOR PUBLISHING	0	0%		17-Dec-21	6
RYWR.CON.08050	Scoping Report - Southern Water Governance Period (incl LegalReview)	9	0%	06-Dec-21	17-Dec-21	6
RYWR.CON.08080	APPLICATION for a SCOPING OPINION - SUBMITTED to PINS (KEY)	0	0%		17-Dec-21	6
RYWR.CON.08090	Scoping Opinion - Adoption Period	42	0%	17-Dec-21	28-Jan-22	17
RYWR.CON.08100	Scoping Opinion - Statutory Consultation Period	28	0%	15-Jan-22	12-Feb-22	17
RYWR.CON.08120	SCOPING OPINION - ADOPTED by PINS	0	0%		14-Feb-22	11
RYWR.CON.08110	Scoping Opinion - Review & Feedback to SW EIA Team	10	0%	14-Feb-22	25-Feb-22	2139
PEIR		246		08-Feb-22	02-Feb-23	1967
RYWR.CON.08410	PEIR - Draft PEIR for Non Statutory Consultation	80	0%	08-Feb-22	06-Jun-22	1983
RYWR.CON.08450	PEIR - Amend with Non Statutory Consultation Feedback	60	0%	01-Aug-22	25-Oct-22	2033
RYWR.CON.08460	PEIR - Finalise PEIR (incl Revised Feasibility Designs)	150	0%	29-Jun-22	02-Feb-23	1967
HRA Report		250		23-May-22	23-May-23	31
RYWR.CON.08820	HRA - Screening - Start Screening	0	0%	23-May-22		31
RYWR.CON.08810	HRA - Screening - Collate information on Natura 2000 sites	20	0%	23-May-22	21-Jun-22	31
RYWR.CON.08830	HRA - Screening - Prepare HRA Screening Report	20	0%	22-Jun-22	19-Jul-22	31
RYWR.CON.08850	HRA - Screening - issue Report to Natural England for Review	0	0%		16-Aug-22	31
RYWR.CON.08840	HRA - Screening - Assurance Review & Update Report	20	0%	20-Jul-22	16-Aug-22	31
RYWR.CON.08890	HRA - Screening - Receive Feedback from Natural England	0	0%		28-Sep-22	51
RYWR.CON.08870	HRA - Screening - Natural England Consultation Period	30	0%	17-Aug-22	28-Sep-22	51
RYWR.CON.08880	HRA - Draft Report - Stage 2 - Undertake Draft Appropriate Assessment	30	0%	17-Aug-22	28-Sep-22	31
RYWR.CON.08910	HRA - Screening - Assess Feedback and Respond	20	0%	29-Sep-22	26-Oct-22	51
RYWR.CON.08920	HRA - Draft Report - Stage 3 - Review Draft Alternatives	20	0%	29-Sep-22	26-Oct-22	31
RYWR.CON.08930	HRA - Draft Report - Stage 4 - Assess Draft IROPI Implications	20	0%	27-Oct-22	23-Nov-22	31
RYWR.CON.08940	HRA - Draft Report - Assess Compensatory Measures	20	0%	24-Nov-22	21-Dec-22	31
RYWR.CON.08960	HRA - Draft Report - Issue Draft HRA Report for PEIR	0	0%		26-Jan-23	31
RYWR.CON.08860	HRA - Draft Report - Maintain & Update SoCG	110	0%	17-Aug-22	26-Jan-23	31
RYWR.CON.08950	HRA - Draft Report - Complete Draft Report for PEIR	20	0%	22-Dec-22	26-Jan-23	31
RYWR.CON.08980	HRA - Final Report - Stage 2 - Update Appropriate Assessment	20	0%	27-Jan-23	23-Feb-23	31
RYWR.CON.08990	HRA - Final Report - Stage 3 - Update Alternatives	20	0%	24-Feb-23	23-Mar-23	31
RYWR.CON.09010	HRA - Final Report - Stage 4 - Update IROPI Implications	20	0%	24-Mar-23	24-Apr-23	31
RYWR.CON.09040	HRA - Final Report - Issue Final HRA Report for DCO Application	0	0%		23-May-23	31
RYWR.CON.08970	HRA - Final Report - Maintain & Update SoCG	80	0%	27-Jan-23	23-May-23	31
RYWR.CON.09030	HRA - Final Report - Complete Final Report for DCO Application	20	0%	25-Apr-23	23-May-23	31
RYWR.CON.09020	HRA - Final Report - Update Compensatory Measures	20	0%	25-Apr-23	23-May-23	31
DCO Design Deliverables (to be validated with ECI)		504		15-Dec-21	21-Dec-23	1742
RYWR.CON.04130	Draft Lighting Strategy	120	0%	15-Dec-21	15-Jun-22	2126
RYWR.CON.04140	Draft Property Hardship / Mitigation Scheme	120	0%	15-Dec-21	15-Jun-22	2126
RYWR.CON.04160	Draft Biodiversity Management Plan	120	0%	15-Dec-21	15-Jun-22	2126
RYWR.CON.04170	Draft Sustainability Strategy	120	0%	15-Dec-21	15-Jun-22	2126
RYWR.CON.04180	Draft SWS Related Employment Land Study	120	0%	15-Dec-21	15-Jun-22	2126
RYWR.CON.04190	Draft Population & Housing Analysis	120	0%	15-Dec-21	15-Jun-22	2126
RYWR.CON.04210	Draft Commercial Development Strategy	120	0%	15-Dec-21	15-Jun-22	2126
RYWR.CON.04220	Draft Economic Impact Assessment	120	0%	15-Dec-21	15-Jun-22	2126
RYWR.CON.04370	Draft Buildability Report	120	0%	15-Dec-21	15-Jun-22	1976
RYWR.CON.04230	Identify & Agree Mitigation Proposals	120	0%	15-Dec-21	15-Jun-22	2126
RYWR.CON.04450	Construction Noise Modelling	120	0%	15-Dec-21	15-Jun-22	2126
RYWR.CON.04290	Draft Major Accidents & Disasters	120	0%	15-Dec-21	15-Jun-22	2126

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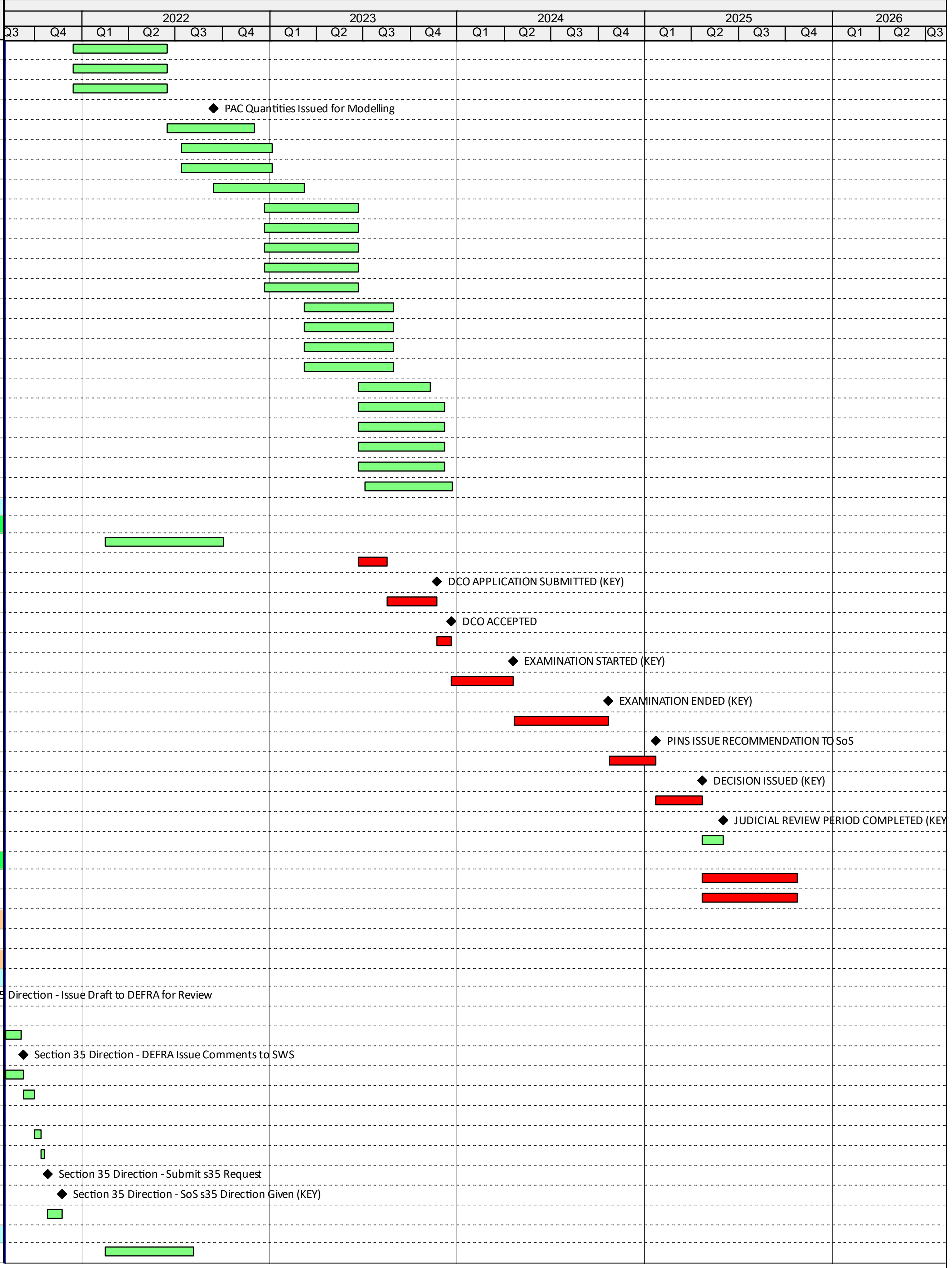
Progressed to 06-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
RYWR.CON.04320	Draft Energy Strategy	120	0%	15-Dec-21	15-Jun-22	2126
RYWR.CON.04330	WebTag Options Assessment	120	0%	15-Dec-21	15-Jun-22	2126
RYWR.CON.04340	Draft TA Appendices	120	0%	15-Dec-21	15-Jun-22	2126
RYWR.CON.04110	PAC Quantities Issued for Modelling	0	0%	14-Sep-22		1793
RYWR.CON.04420	Ground Noise Modelling	120	0%	16-Jun-22	01-Dec-22	1976
RYWR.CON.04480	Ground Noise Mitigation	120	0%	14-Jul-22	06-Jan-23	1976
RYWR.CON.04470	Draft Ground Noise	120	0%	14-Jul-22	06-Jan-23	1986
RYWR.CON.04120	Construction Traffic Modelling	120	0%	14-Sep-22	08-Mar-23	1793
RYWR.CON.04150	Draft Landscaping Strategy	120	0%	22-Dec-22	21-Jun-23	1872
RYWR.CON.04240	Pluvial Water Flood Modelling	120	0%	22-Dec-22	21-Jun-23	1752
RYWR.CON.04250	Fluvial Water Flood Modelling	120	0%	22-Dec-22	21-Jun-23	1752
RYWR.CON.04260	VISSIM Traffic Modelling	120	0%	22-Dec-22	21-Jun-23	1742
RYWR.CON.04270	Strategic Traffic Modelling	120	0%	22-Dec-22	21-Jun-23	1742
RYWR.CON.04430	Draft Materials Management Plan	120	0%	09-Mar-23	30-Aug-23	1823
RYWR.CON.04460	Draft Construction Environmental Management Plan (CEMP)	120	0%	09-Mar-23	30-Aug-23	1823
RYWR.CON.04280	Draft Construction Traffic Management Plan	120	0%	09-Mar-23	30-Aug-23	1823
RYWR.CON.04530	Draft Waste Strategy	120	0%	09-Mar-23	30-Aug-23	1823
RYWR.CON.04440	Draft Transport Assessment (TA)	100	0%	22-Jun-23	09-Nov-23	1772
RYWR.CON.04490	Traffic Noise Mitigation	120	0%	22-Jun-23	07-Dec-23	1742
RYWR.CON.04520	Traffic Noise Modelling	120	0%	22-Jun-23	07-Dec-23	1742
RYWR.CON.04380	Draft Flood Risk Assessment (FRA)	120	0%	22-Jun-23	07-Dec-23	1752
RYWR.CON.04410	Draft Surface Water Management Strategy	120	0%	22-Jun-23	07-Dec-23	1752
RYWR.CON.04540	Draft Noise Mitigation Strategy	120	0%	06-Jul-23	21-Dec-23	1742
DCO CONSENT PROCESS		923		14-Feb-22	23-Oct-25	6
Submission & Determination		821		14-Feb-22	02-Jun-25	20
RYWR.CON.06010	DCO Application - Produce Application Document	160	0%	14-Feb-22	03-Oct-22	228
RYWR.CON.06020	DCO Application - Complete Environmental Statement	40	0%	22-Jun-23	16-Aug-23	11
RYWR.CON.06090	DCO APPLICATION SUBMITTED (KEY)	0	0%		21-Nov-23	9
RYWR.CON.06060	DCO Application - Southern Water Assurance & Governance Period	68	0%	17-Aug-23	21-Nov-23	11
RYWR.CON.06140	DCO ACCEPTED	0	0%		19-Dec-23	5
RYWR.CON.06130	DCO ACCEPTANCE PERIOD (Stated Duration No Greater than 4 calendar weeks)	28	0%	22-Nov-23	19-Dec-23	15
RYWR.CON.06160	EXAMINATION STARTED (KEY)	0	0%		19-Apr-24	8
RYWR.CON.06150	PRE-EXAMINATION PERIOD (Assumed to be no more than 65 working days)	80	0%	19-Dec-23	19-Apr-24	5
RYWR.CON.06180	EXAMINATION ENDED (KEY)	0	0%		21-Oct-24	8
RYWR.CON.06170	EXAMINATION PERIOD (Stated Duration No Greater than 6 calendar months)	185	0%	20-Apr-24	21-Oct-24	8
RYWR.CON.06210	PINS ISSUE RECOMMENDATION TO SoS	0	0%		20-Jan-25	8
RYWR.CON.06190	PINS RECOMMENDATION REPORT PERIOD (Stated Duration No Greater than 3 calendar months)	91	0%	22-Oct-24	20-Jan-25	8
RYWR.CON.06230	DECISION ISSUED (KEY)	0	0%		21-Apr-25	8
RYWR.CON.06220	SoS DECISION PERIOD (Stated Duration No Greater than 3 calendar months)	91	0%	21-Jan-25	21-Apr-25	8
RYWR.CON.06270	JUDICIAL REVIEW PERIOD COMPLETED (KEY)	0	0%		02-Jun-25	28
RYWR.CON.06250	JUDICIAL REVIEW PERIOD (Stated Duration No Greater than 6 calendar weeks)	42	0%	22-Apr-25	02-Jun-25	28
Discharge DCO Requirement		130		22-Apr-25	23-Oct-25	6
RYWR.CON.07120	Pumping Facilities - Discharge DCO Requirements	130	0%	22-Apr-25	23-Oct-25	6
RYWR.CON.07110	Conveyance Pipework - Discharge DCO Requirements	130	0%	22-Apr-25	23-Oct-25	6
CONSENT - DWI (Driving Water Inspectorate)		0		08-Feb-21 A	29-Mar-21 A	
D2 CD G2 02050	Concept Draft Water Safety Plans Water Recycling & Havant Thicket	0	100%	08-Feb-21 A	29-Mar-21 A	
STATUTORY PERMIT		383		29-Mar-21 A	20-Feb-23	1955
S35		76		29-Mar-21 A	22-Nov-21	2262
RYWR.CON.10040	Section 35 Direction - Issue Draft to DEFRA for Review	0	100%		04-Apr-21 A	
RYWR.CON.10010	Section 35 Direction - Draft Project Description	0	100%	29-Mar-21 A	20-Apr-21 A	
RYWR.CON.10030	Section 35 Direction - Draft s35 Request	20	0%	06-Aug-21	03-Sep-21	2318
RYWR.CON.10060	Section 35 Direction - DEFRA Issue Comments to SWS	0	0%		08-Sep-21	24
RYWR.CON.10050	Section 35 Direction - DEFRA Review of Draft s35 Request	23	0%	06-Aug-21	08-Sep-21	24
RYWR.CON.10070	Section 35 Direction - Finalise s35 Request	15	0%	09-Sep-21	29-Sep-21	24
RYWR.CON.10020	Section 35 Direction - Engagement with PINS on Draft Request	38	0%	29-Mar-21 A	29-Sep-21	24
RYWR.CON.10080	Section 35 Direction - Assurance Review & Update	10	0%	30-Sep-21	13-Oct-21	24
RYWR.CON.10090	Section 35 Direction - SWS Governance	5	0%	14-Oct-21	20-Oct-21	24
RYWR.CON.10110	Section 35 Direction - Submit s35 Request	0	0%		25-Oct-21	24
RYWR.CON.10130	Section 35 Direction - SoS s35 Direction Given (KEY)	0	0%		22-Nov-21	24
RYWR.CON.10120	Section 35 Direction - SoS Review s35 Request	28	0%	26-Oct-21	22-Nov-21	32
S42		162		14-Feb-22	05-Oct-22	94
RYWR.CON.10210	Section 42 Notice - Collate List of Consultees	120	0%	14-Feb-22	05-Aug-22	94



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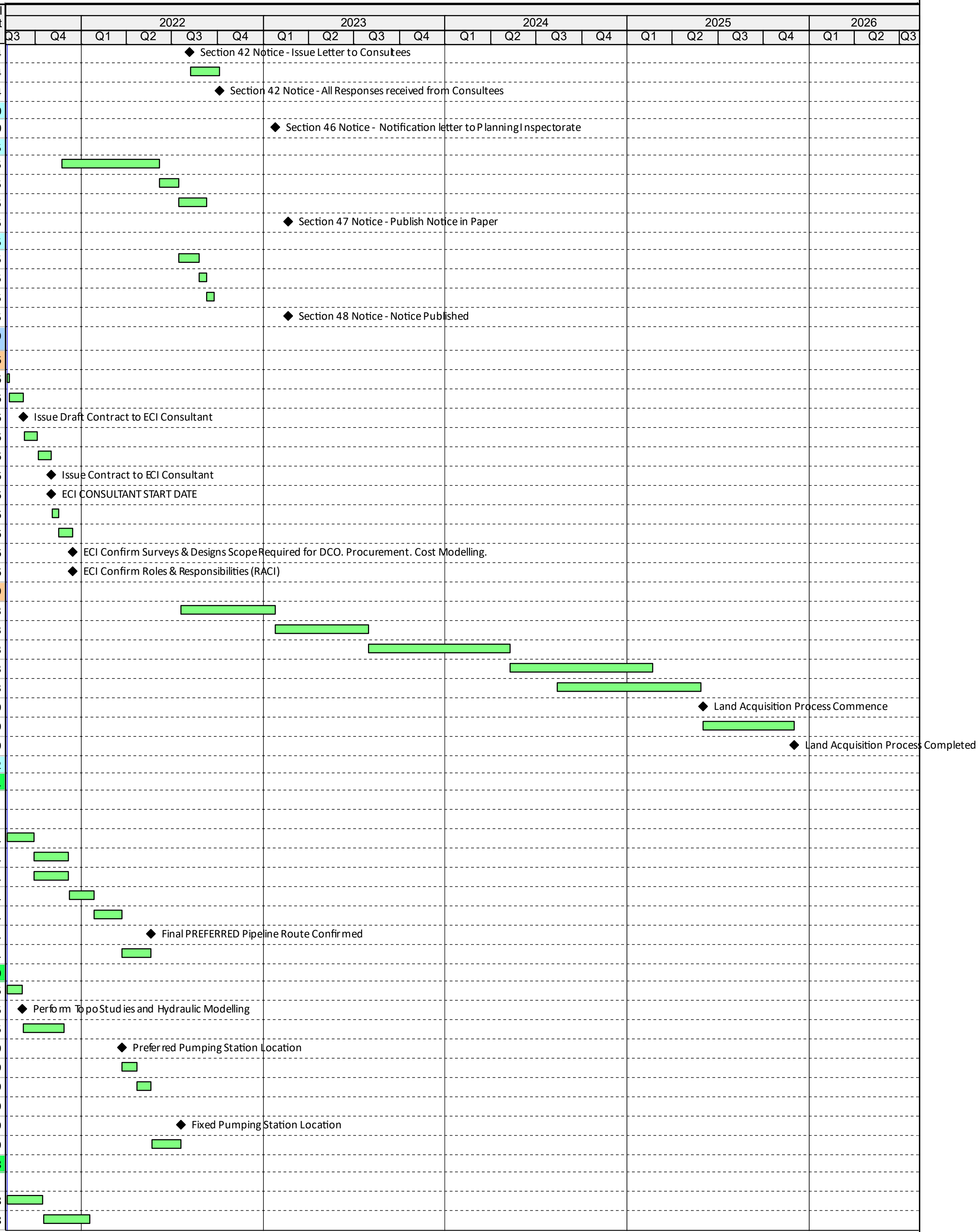
What-if 1: WATER RECYCLING PLANT - OPTION B5 (ABE STAGE 1 - DPC PROCUREMENT ROUTE)
Progressed to 06-Aug-21

Print: 25-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
RYWR.CON.10220	Section 42 Notice - Issue Letter to Consultees	0	0%		05-Aug-22	94
RYWR.CON.10230	Section 42 Notice - Response Period from Consultees	42	0%	08-Aug-22	05-Oct-22	94
RYWR.CON.10240	Section 42 Notice - All Responses received from Consultees	0	0%		05-Oct-22	94
S46		0		24-Jan-23	24-Jan-23	0
RYWR.CON.10310	Section 46 Notice - Notification letter to Planning Inspectorate	0	0%	24-Jan-23*		0
S47		307		22-Nov-21	20-Feb-23	1955
RYWR.CON.10410	Section 47 Notice - Prepare SoCC Report	129	0%	22-Nov-21	06-Jun-22	2055
RYWR.CON.10420	Section 47 Notice - Consult with Local Authorities (2month in advance of Statutory Consultation)	28	0%	06-Jun-22	14-Jul-22	2055
RYWR.CON.10430	Section 47 Notice - Publish SoCC	40	0%	14-Jul-22	09-Sep-22	2065
RYWR.CON.10440	Section 47 Notice - Publish Notice in Paper	0	0%		20-Feb-23	1955
S48		150		14-Jul-22	20-Feb-23	1955
RYWR.CON.10510	Section 48 Notice - Prepare Notice	30	0%	14-Jul-22	25-Aug-22	2055
RYWR.CON.10520	Section 48 Notice - Review Notice	10	0%	25-Aug-22	09-Sep-22	2055
RYWR.CON.10530	Section 48 Notice - Update Notice	10	0%	09-Sep-22	23-Sep-22	2055
RYWR.CON.10540	Section 48 Notice - Notice Published	0	0%		20-Feb-23	1955
PROCUREMENT & COMMERCIAL		1079		23-Mar-21 A	01-Dec-25	1259
ECI (EARLY CONTRACTOR INVOLVEMENT)		92		26-Jul-21 A	14-Dec-21	1956
RYWR.PRO.02010	Information Available for ECI Consultant (Scope & Terms of Contract)	2	90%	26-Jul-21 A	09-Aug-21	1956
RYWR.PRO.02020	Procurement to Produce Contract Documentation for ECI Consultant	20	0%	10-Aug-21	07-Sep-21	1956
RYWR.PRO.02060	Issue Draft Contract to ECI Consultant	0	0%		07-Sep-21	1956
RYWR.PRO.02070	ECI Consultant Submit Cost & Schedule	20	0%	08-Sep-21	05-Oct-21	1956
RYWR.PRO.02080	Contract Negotiation with ECI Consultant	20	0%	06-Oct-21	02-Nov-21	1956
RYWR.PRO.02140	Issue Contract to ECI Consultant	0	0%		02-Nov-21	1956
RYWR.PRO.02150	ECI CONSULTANT START DATE	0	0%		02-Nov-21	1956
RYWR.PRO.02160	ECI Consultant Mobilisation	10	0%	03-Nov-21	16-Nov-21	1956
RYWR.PRO.02170	Workshops with ECI Consultant	20	0%	17-Nov-21	14-Dec-21	1956
RYWR.PRO.02180	ECI Confirm Surveys & Designs Scope Required for DCO. Procurement. Cost Modelling.	0	0%		14-Dec-21	1956
RYWR.PRO.02190	ECI Confirm Roles & Responsibilities (RACI)	0	0%		14-Dec-21	1956
LAND ACQUISITION		1079		23-Mar-21 A	01-Dec-25	1259
RYWR.PRO.03010	Identify Sites	129	0%	20-Jul-22	25-Jan-23	843
RYWR.PRO.03020	Identify Landowner & Perform Land Referencing Activities	129	0%	26-Jan-23	31-Jul-23	843
RYWR.PRO.03040	Secure Option Agreement	194	0%	01-Aug-23	10-May-24	843
RYWR.PRO.03050	Negotiation with Landowner on Options and Terms	194	0%	10-May-24	19-Feb-25	843
RYWR.PRO.03060	Establish Agreed Head of Terms	194	0%	12-Aug-24	27-May-25	843
RYWR.PRO.03070	Land Acquisition Process Commence	0	0%		02-Jun-25	839
RYWR.PRO.03080	Land Acquisition Process Indicative Timeline	129	0%	02-Jun-25	01-Dec-25	839
RYWR.PRO.03090	Land Acquisition Process Completed	0	0%		01-Dec-25	839
SITE SELECTION		236		23-Mar-21 A	19-Jul-22	2102
Pipelines		196		23-Mar-21 A	20-May-22	31
RYWR.PRO.06010	Identify Pipeline Corridors Through Stancheck Tool	0	100%	23-Mar-21 A	13-Apr-21 A	
RYWR.PRO.06020	Review Pipeline Corridors to Stage 2B	0	100%	14-Apr-21 A	25-Jun-21 A	
RYWR.PRO.06030	Identify Preferred Pipline Corridor	36	0%	28-Jun-21 A	27-Sep-21	31
RYWR.PRO.06040	Review Initial Data from Early Surveys	50	0%	28-Sep-21	06-Dec-21	31
RYWR.PRO.06041	Perform Stakeholder Engagement	50	0%	28-Sep-21	06-Dec-21	31
RYWR.PRO.06042	Revise and Evaluate Route by Engineering & Enabling	30	0%	07-Dec-21	25-Jan-22	31
RYWR.PRO.06050	Check and Amend Route	40	0%	26-Jan-22	22-Mar-22	31
RYWR.PRO.06060	Final PREFERRED Pipeline Route Confirmed	0	0%		20-May-22	31
RYWR.PRO.06055	Final Decision & Governance Process for Preferred Route Selection	40	0%	23-Mar-22	20-May-22	31
Pumping Stations		236		02-Aug-21 A	19-Jul-22	289
RYWR.PRO.06510	Develop Zonal areas on Pipeline Corridors for Possible Pumping Station Locations	20	0%	02-Aug-21 A	03-Sep-21	365
RYWR.PRO.06520	Perform Topo Studies and Hydraulic Modelling	0	0%		03-Sep-21	365
RYWR.PRO.06530	Perform Site Selection Stage 0-5 for Pumping Station Locations for Preferred Locations	60	0%	06-Sep-21	26-Nov-21	365
RYWR.PRO.06540	Preferred Pumping Station Location	0	0%		22-Mar-22	289
RYWR.PRO.06550	Review Initial Data from Early Surveys	20	0%	23-Mar-22	21-Apr-22	289
RYWR.PRO.06551	Revise and Evaluate Route by Engineering & Enabling	20	0%	22-Apr-22	20-May-22	289
RYWR.PRO.06552	Perform Stakeholder Engagement	40	0%	23-Mar-22	20-May-22	289
RYWR.PRO.06560	Fixed Pumping Station Location	0	0%		19-Jul-22	289
RYWR.PRO.06553	Final Decision & Governance Process for Preferred Pumping Station Location	40	0%	23-May-22	19-Jul-22	289
Water Recyclingn Plant		190		01-Jun-21 A	12-May-22	2148
RYWR.PRO.06710	Identify Preferred Location for Water Recycling Plant	0	100%	01-Jun-21 A	28-Jun-21 A	
RYWR.PRO.06730	Perform Topo Studies and Hydraulic Modelling	50	0%	06-Aug-21	15-Oct-21	2148
RYWR.PRO.06731	Perform Site Selection Stage 0-5 for Water Recycling Plant Preferred Locations	60	0%	18-Oct-21	17-Jan-22	2148



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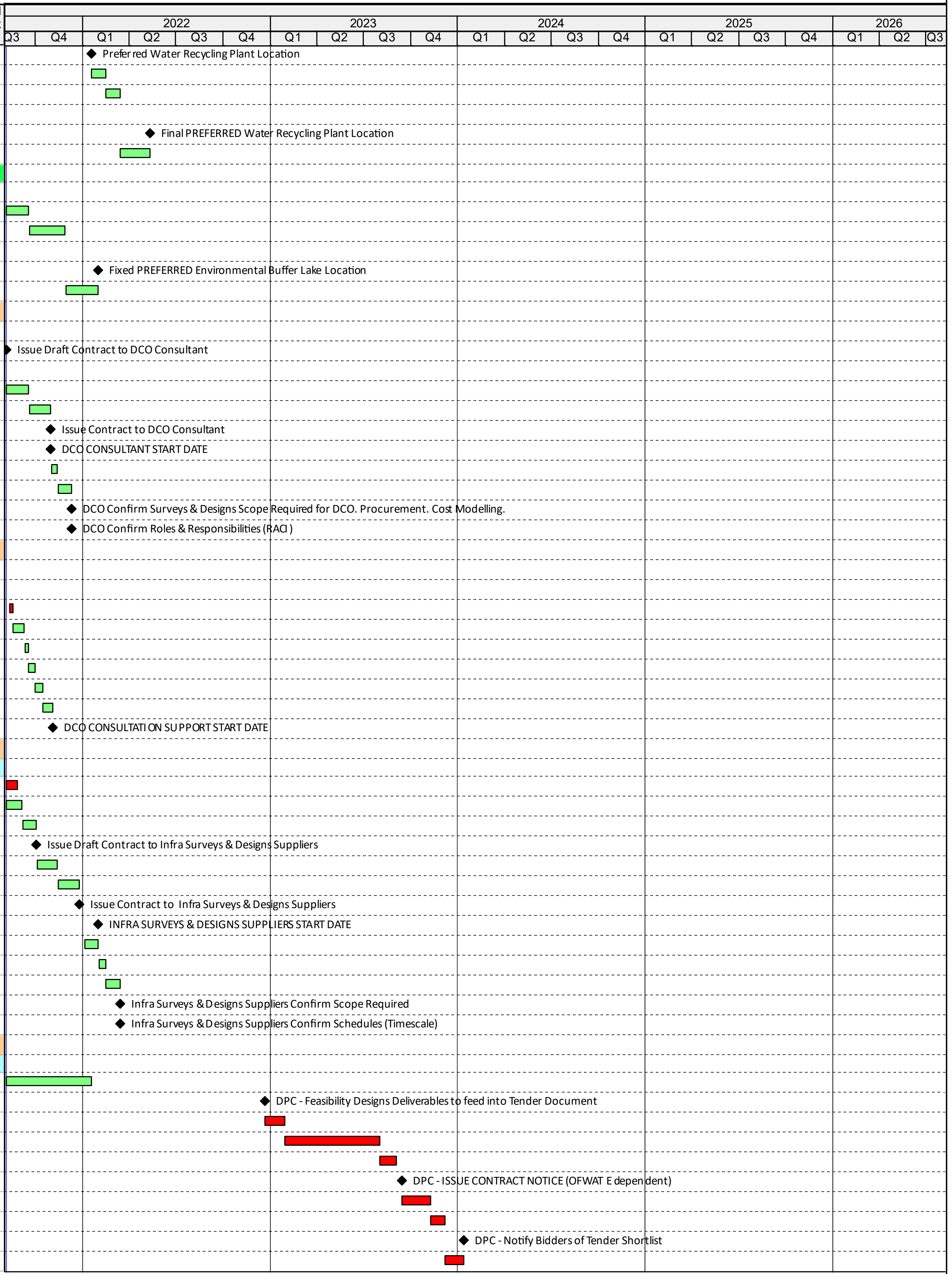
What-if 1: WATER RECYCLING PLANT - OPTION B5 (ABE STAGE 1 - DPC PROCUREMENT ROUTE)

Progressed to 06-Aug-21

Print: 25-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
RYWR.PRO.06732	Preferred Water Recycling Plant Location	0	0%		17-Jan-22	2148
RYWR.PRO.06733	Review Initial Data from Early Surveys	20	0%	18-Jan-22	14-Feb-22	2148
RYWR.PRO.06734	Revise and Evaluate Route by Engineering & Enabling	20	0%	15-Feb-22	14-Mar-22	2148
RYWR.PRO.06735	Perform Stakeholder Engagement	40	0%	18-Jan-22	14-Mar-22	2148
RYWR.PRO.06740	Final PREFERRED Water Recycling Plant Location	0	0%		12-May-22	2148
RYWR.PRO.06736	Final Decision & Governance Process for Preferred Water Recycling Plant Location	40	0%	15-Mar-22	12-May-22	2148
Environmental Buffer Lake		120		01-Jun-21 A	31-Jan-22	2218
RYWR.PRO.06910	Identify Preferred Site and Adjacent Area	0	100%	01-Jun-21 A	28-Jun-21 A	
RYWR.PRO.06930	Review Initial Data from Early Surveys	30	40%	09-Jul-21 A	17-Sep-21	2218
RYWR.PRO.06940	Revise and Evaluate Route by Engineering & Enabling	50	0%	20-Sep-21	26-Nov-21	2218
RYWR.PRO.06944	Perform Stakeholder Engagement	50	0%	20-Sep-21	26-Nov-21	2218
RYWR.PRO.06950	Fixed PREFERRED Environmental Buffer Lake Location	0	0%		31-Jan-22	2218
RYWR.PRO.06945	Final Decision & Governance Process for Preferred EBL Location	40	0%	29-Nov-21	31-Jan-22	2218
RESOURCES TO SUPPORT DCO CONSENT		90		28-Jun-21 A	10-Dec-21	1978
RYWR.PRO.02510	Information Available for DCO Consent Consultant (Scope & Terms of Contract) 6th July	0	100%	28-Jun-21 A	06-Aug-21 A	
RYWR.PRO.02560	Issue Draft Contract to DCO Consultant	0	100%		06-Aug-21 A	
RYWR.PRO.02520	Procurement to Produce Contract Documentation for DCO Consultant	0	100%	06-Aug-21 A	07-Aug-21 A	
RYWR.PRO.02540	DCO Consultant Submit Cost & Schedule	30	0%	06-Aug-21	17-Sep-21	1978
RYWR.PRO.02550	Contract Negotiation with DCO Consultant	30	0%	20-Sep-21	29-Oct-21	1978
RYWR.PRO.02530	Issue Contract to DCO Consultant	0	0%		29-Oct-21	1978
RYWR.PRO.02570	DCO CONSULTANT START DATE	0	0%		29-Oct-21	1978
RYWR.PRO.02580	DCO Consultant Mobilisation	10	0%	01-Nov-21	12-Nov-21	1978
RYWR.PRO.02590	Workshops with DCO Consultant	20	0%	15-Nov-21	10-Dec-21	1978
RYWR.PRO.02610	DCO Confirm Surveys & Designs Scope Required for DCO. Procurement. Cost Modelling.	0	0%		10-Dec-21	1978
RYWR.PRO.02620	DCO Confirm Roles & Responsibilities (RACI)	0	0%		10-Dec-21	1978
DCO CONSULTATION SUPPORT SERVICE		60		07-Jul-21 A	04-Nov-21	76
RYWR.PRO.05010	Agree scope with Supplier	0	100%	07-Jul-21 A	23-Jul-21 A	
RYWR.PRO.05020	Supplier to submit Cost, Proposal & Schedule	0	100%	26-Jul-21 A	05-Aug-21 A	
RYWR.PRO.05030	SW review supplier cost, Proposal & Schedule	5	0%	12-Aug-21*	18-Aug-21	0
RYWR.PRO.05040	Contract Negotiation	15	0%	19-Aug-21	09-Sep-21	76
RYWR.PRO.05050	Supplier to submit BAFO	5	0%	10-Sep-21	16-Sep-21	76
RYWR.PRO.05060	SW Governance and sign off	10	0%	17-Sep-21	30-Sep-21	76
RYWR.PRO.05070	Contract Award & Execution	10	0%	01-Oct-21	14-Oct-21	76
RYWR.PRO.05080	Time Risk Allowance	15	0%	15-Oct-21	04-Nov-21	76
RYWR.PRO.05090	DCO CONSULTATION SUPPORT START DATE	0	0%		04-Nov-21	76
PROCUREMENT OF SURVEYS & DESIGNS FOR PIPELINE ROUTE. PUMPING STATION & BREAK PRESSURE T		150		14-Jun-21 A	14-Mar-22	53
INFRA		150		14-Jun-21 A	14-Mar-22	53
RYWR.PRO.04000	Agree Pre-Construction Work Packages	16	20%	14-Jun-21 A	27-Aug-21	7
RYWR.PRO.04010	Works Information Available for Infra Surveys & Designs	20	0%	29-Jul-21 A	03-Sep-21	53
RYWR.PRO.04020	Procurement to Produce Contract Documentation for Infra Surveys & Designs	20	0%	06-Sep-21	01-Oct-21	53
RYWR.PRO.04030	Issue Draft Contract to Infra Surveys & Designs Suppliers	0	0%		01-Oct-21	53
RYWR.PRO.04040	Supplier Submit Cost & Schedule for Infra Surveys & Designs	30	0%	04-Oct-21	12-Nov-21	53
RYWR.PRO.04050	Contract & Cost & Schedule Negotiation with Infra Surveys & Designs Suppliers	30	0%	15-Nov-21	24-Dec-21	53
RYWR.PRO.04060	Issue Contract to Infra Surveys & Designs Suppliers	0	0%		24-Dec-21	53
RYWR.PRO.04080	INFRA SURVEYS & DESIGNS SUPPLIERS START DATE	0	0%		31-Jan-22	53
RYWR.PRO.04070	Infra Surveys & Designs Supplier Step Down Contracts to Sub-Contractors	20	0%	04-Jan-22	31-Jan-22	53
RYWR.PRO.04090	Infra Surveys & Designs Supplier Mobilisation	10	0%	01-Feb-22	14-Feb-22	53
RYWR.PRO.04120	Workshops with Infra Surveys & Designs Suppliers	20	0%	15-Feb-22	14-Mar-22	53
RYWR.PRO.04130	Infra Surveys & Designs Suppliers Confirm Scope Required	0	0%		14-Mar-22	53
RYWR.PRO.04140	Infra Surveys & Designs Suppliers Confirm Schedules (Timescale)	0	0%		14-Mar-22	53
CONSTRUCTIONS		1058		06-Aug-21	31-Oct-25	0
DPC (Direct Procurement for Customer)		1058		06-Aug-21	31-Oct-25	0
RYWR.PRO.00050	DPC - Product Tender Documentation. PQQ Questionnaire. Contract. Contract Notice	110	0%	06-Aug-21	17-Jan-22	243
RYWR.PRO.00040	DPC - Feasibility Designs Deliverables to feed into Tender Document	0	0%		21-Dec-22	7
RYWR.PRO.00060	DPC - Procurement Assurance & Governance	22	0%	22-Dec-22	30-Jan-23	7
RYWR.PRO.00070	DPC - Refine Tender Documentation	129	0%	30-Jan-23	03-Aug-23	7
RYWR.PRO.00080	DPC - Procurement Assurance & Governance (Ready for Issue Contract Notice)	22	0%	03-Aug-23	04-Sep-23	7
RYWR.PRO.00100	DPC - ISSUE CONTRACT NOTICE (OFWAT E dependent)	0	0%		13-Sep-23	0
RYWR.PRO.00110	DPC - Pre-Qualification Questionnaire (PQQ) Period	40	0%	14-Sep-23	09-Nov-23	0
RYWR.PRO.00111	DPC - PQQ Evaluation Period	20	0%	09-Nov-23	07-Dec-23	0
RYWR.PRO.00113	DPC - Notify Bidders of Tender Shortlist	0	0%		12-Jan-24	0
RYWR.PRO.00112	DPC - Assurance and Governance	20	0%	07-Dec-23	12-Jan-24	0



- 🟩 Remaining Work
- 🟥 Critical Remaining Work
- ◆ ◆ Milestone

Project ID: 710060-2-2 CURR Standard Layout for Distribution

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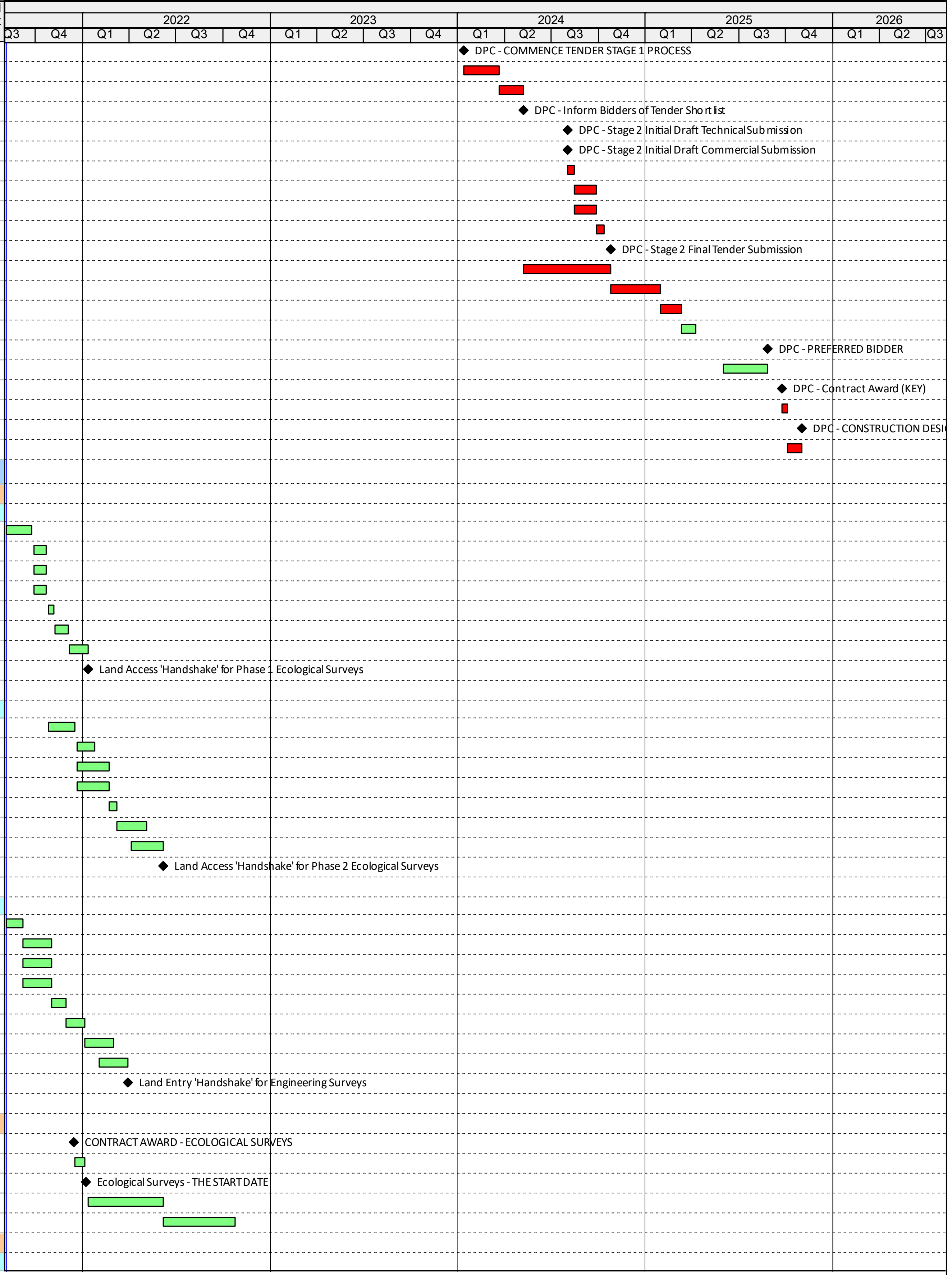
Print: 25-Aug-21

What-if 1: WATER RECYCLING PLANT - OPTION B5 (ABE STAGE 1 - DPC PROCUREMENT ROUTE)

Progressed to 06-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
RYWR.PRO.00120	DPC - COMMENCE TENDER STAGE 1 PROCESS	0	0%	12-Jan-24		0
RYWR.PRO.00130	DPC - Stage 1 Tender Period	50	0%	12-Jan-24	22-Mar-24	0
RYWR.PRO.00131	DPC - Stage 1 Assessment and Governance	30	0%	22-Mar-24	08-May-24	0
RYWR.PRO.00140	DPC - Inform Bidders of Tender Shortlist	0	0%		08-May-24	0
RYWR.PRO.00152	DPC - Stage 2 Initial Draft Technical Submission	0	0%		01-Aug-24	10
RYWR.PRO.00151	DPC - Stage 2 Initial Draft Commercial Submission	0	0%		01-Aug-24	10
RYWR.PRO.00153	DPC - Stage 2 Initial Draft Review. Feedback and Dialogue	10	0%	01-Aug-24	15-Aug-24	10
RYWR.PRO.00155	DPC - Stage 2 2nd Draft Technical Submission	30	0%	15-Aug-24	27-Sep-24	10
RYWR.PRO.00154	DPC - Stage 2 2nd Draft Commercial Submission	30	0%	15-Aug-24	27-Sep-24	10
RYWR.PRO.00156	DPC - Stage 2 2nd Draft Review. Feedback and Dialogue	10	0%	27-Sep-24	11-Oct-24	10
RYWR.PRO.00157	DPC - Stage 2 Final Tender Submission	0	0%		25-Oct-24	0
RYWR.PRO.00150	DPC - Stage 2 Tender Period	120	0%	08-May-24	25-Oct-24	0
RYWR.PRO.00158	DPC - Stage 2 Tender Assessment	60	0%	25-Oct-24	29-Jan-25	0
RYWR.PRO.00160	(GIVE) - DPC - PREFERRED BIDDER NEGOTIATION	30	0%	29-Jan-25	12-Mar-25	0
RYWR.PRO.00170	DPC - SW Procurement Governance and Assurance	20	0%	12-Mar-25	09-Apr-25	54
RYWR.PRO.00181	DPC - PREFERRED BIDDER	0	0%		26-Aug-25	20
RYWR.PRO.00180	DPC - SW Financial Close Period	60	0%	02-Jun-25	26-Aug-25	20
RYWR.PRO.00190	DPC - Contract Award (KEY)	0	0%		23-Sep-25	0
RYWR.PRO.00200	DPC - Standstill Period (10 calendar days)	10	0%	24-Sep-25	03-Oct-25	0
RYWR.PRO.00220	DPC - CONSTRUCTION DESIGN COMMENCE (KEY)	0	0%		31-Oct-25	0
RYWR.PRO.00210	DPC - Execute Contract	20	0%	03-Oct-25	31-Oct-25	0
SURVEYS		374		12-Jul-21 A	07-Feb-23	1964
LAND ACCESS		205		12-Jul-21 A	06-Jun-22	1883
Phase 1 Ecological Surveys Access		105		12-Jul-21 A	10-Jan-22	1983
RYWR.SVY.04710	Establish Initial Survey Needs for Land Access	35	0%	12-Jul-21 A	24-Sep-21	1793
RYWR.SVY.04720	Land Registry Search to Identify Land Owners	20	0%	27-Sep-21	22-Oct-21	1983
RYWR.SVY.04730	Further Checks & Land Referencing	20	0%	27-Sep-21	22-Oct-21	1983
RYWR.SVY.04750	Confirm Scope of Survey Activities Require Land Access (from Draft Scoping Report)	20	0%	27-Sep-21	22-Oct-21	1793
RYWR.SVY.04760	Send Letters to Land Owners	10	0%	25-Oct-21	05-Nov-21	1983
RYWR.SVY.04770	Engagement with PIL (Person with Interest in Land)	20	0%	08-Nov-21	03-Dec-21	1983
RYWR.SVY.04790	Land Access (Licence Agreement) Negotiation	20	0%	06-Dec-21	10-Jan-22	1983
RYWR.SVY.04800	Land Access 'Handshake' for Phase 1 Ecological Surveys	0	0%		10-Jan-22	1983
RYWR.SVY.04780	Stakeholder Engagement for Land Owners	70	0%	27-Sep-21	10-Jan-22	1983
Phase 2 Ecological Surveys Access		150		25-Oct-21	06-Jun-22	1793
RYWR.SVY.05010	Establish Initial Survey Needs for Land Access	40	0%	25-Oct-21	17-Dec-21	1793
RYWR.SVY.05050	Confirm Scope of Survey Activities Require Land Access (from Draft Scoping Report)	20	0%	20-Dec-21	24-Jan-22	1813
RYWR.SVY.05020	Land Registry Search to Identify Land Owners	40	0%	20-Dec-21	21-Feb-22	1793
RYWR.SVY.05030	Further Checks & Land Referencing	40	0%	20-Dec-21	21-Feb-22	1793
RYWR.SVY.05060	Send Letters to Land Owners	10	0%	22-Feb-22	07-Mar-22	1793
RYWR.SVY.05080	Engagement with PIL (Person with Interest in Land)	40	0%	08-Mar-22	05-May-22	1793
RYWR.SVY.05100	Land Access (Licence Agreement) Negotiation	40	0%	05-Apr-22	06-Jun-22	1793
RYWR.SVY.05110	Land Access 'Handshake' for Phase 2 Ecological Surveys	0	0%		06-Jun-22	1793
RYWR.SVY.05090	Stakeholder Engagement for Land Owners	110	0%	20-Dec-21	06-Jun-22	1793
Engineering Surveys Land Entry		161		12-Jul-21 A	29-Mar-22	1837
RYWR.SVY.04900	Establish Initial Survey Needs for Land Access	21	0%	12-Jul-21 A	06-Sep-21	1837
RYWR.SVY.04910	Land Registry Search to Identify Land Owners	40	0%	07-Sep-21	01-Nov-21	1837
RYWR.SVY.04920	Further Checks & Land Referencing	40	0%	07-Sep-21	01-Nov-21	1837
RYWR.SVY.04940	Under Preferred Route Coverage	40	0%	07-Sep-21	01-Nov-21	1837
RYWR.SVY.04950	Confirm Scope of Survey Activities Require Land Access (from Draft Scoping Report)	20	0%	02-Nov-21	29-Nov-21	1837
RYWR.SVY.04960	Send Letters to Land Owners	20	0%	30-Nov-21	04-Jan-22	1837
RYWR.SVY.04970	Engagement with PIL (Person with Interest in Land)	40	0%	05-Jan-22	01-Mar-22	1837
RYWR.SVY.04990	Land Access (Licence Agreement) Negotiation	40	0%	02-Feb-22	29-Mar-22	1837
RYWR.SVY.05000	Land Entry 'Handshake' for Engineering Surveys	0	0%		29-Mar-22	1837
RYWR.SVY.04980	Stakeholder Engagement for Land Owners	100	0%	02-Nov-21	29-Mar-22	1837
ECOLOGICAL SURVEYS		213		14-Dec-21	25-Oct-22	1967
RYWR.SVY.01010	CONTRACT AWARD - ECOLOGICAL SURVEYS	0	0%		14-Dec-21	1986
RYWR.SVY.01020	Ecological Surveys - Mobilisation	9	0%	16-Dec-21	05-Jan-22	1986
RYWR.SVY.01030	Ecological Surveys - THE START DATE	0	0%	06-Jan-22		1986
RYWR.SVY.01040	Ecological Surveys - Phase 1 On Site Survey Period (LAND REF SCHEDULE / NOTICE REQUIRED)	100	0%	11-Jan-22	06-Jun-22	1983
RYWR.SVY.5110	Ecological Surveys - Phase 2 On Site Survey Period (LAND REF SCHEDULE / NOTICE REQUIRED)	100	0%	07-Jun-22	25-Oct-22	1967
ENGINEERING SURVEYS FOR FEASIBILITY DESIGNS		358		31-Aug-21	07-Feb-23	1964
PIPELINES		358		31-Aug-21	07-Feb-23	1964



🟩 Remaining Work
🟥 Critical Remaining Work
◆ ◆ Milestone

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What-if 1: WATER RECYCLING PLANT - OPTION B5 (ABE STAGE 1 - DPC PROCUREMENT ROUTE)

Progressed to 06-Aug-21

Print: 25-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
Walk Over Survey		90		31-Aug-21	11-Jan-22	973
RYWR.SVY.01110	Consttructibility Review . Walk Over Work Pack Scope Agreement	10	0%	31-Aug-21	13-Sep-21	7
RYWR.SVY.01120	Walk Over Surveys (Engineering, Enabling & Delivery Partner)	10	0%	14-Sep-21	27-Sep-21	107
RYWR.SVY.01140	Assessment of High Risk Areas (maybe with [redacted]	30	0%	14-Sep-21	25-Oct-21	973
RYWR.SVY.01130	Utility Drawings to mark out on CAD [redacted]	30	0%	14-Sep-21	25-Oct-21	973
RYWR.SVY.01150	Adjustment to the Route & Corridor	30	0%	26-Oct-21	06-Dec-21	973
RYWR.SVY.01160	Walk Over Surveys Output: Revised Pipeline Route	20	0%	07-Dec-21	11-Jan-22	973
Mobilisation for all Survey Works		55		15-Mar-22	06-Jun-22	1793
RYWR.SVY.00010	Infra Surveys & Designs Contractor produce Risk Assessment & Method Statement (RAMS)	10	0%	15-Mar-22	28-Mar-22	1828
RYWR.SVY.00020	SW Review & Accept RAMS	10	0%	29-Mar-22	11-Apr-22	1828
RYWR.SVY.00060	Permit for Access granted for Survey Works	0	0%		06-Jun-22	1793
RYWR.SVY.00100	Infra Surveys & Designs Contractor START ON SITE FOR SURVEY	0	0%		06-Jun-22	1793
Geotechnical		125		15-Mar-22	13-Sep-22	1793
RYWR.SVY.00310	Geotechnical and Geoenvironmental Desk Study	20	0%	15-Mar-22	11-Apr-22	1793
RYWR.SVY.00330	Geotechnical and Geoenvironmental Desk Study Report	40	0%	12-Apr-22	13-Jun-22	1793
RYWR.SVY.00360	Geotechnical Site Investigation Spec	20	0%	20-May-22	20-Jun-22	1793
RYWR.SVY.00370	Geotechnical Site Investigation (LAND REF SCHEDULE / NOTICE REQUIRED)	40	0%	21-Jun-22	15-Aug-22	1793
RYWR.SVY.00390	Geotechnical and Geoenvironmental Interpretation report	50	0%	05-Jul-22	13-Sep-22	1793
Topographic		70		07-Jun-22	13-Sep-22	1793
RYWR.SVY.00410	Topographical Survey Specification (for Key Crossings only)	10	0%	07-Jun-22	20-Jun-22	1793
RYWR.SVY.00430	Topographical Surveys (LAND REF SCHEDULE / NOTICE REQUIRED)	40	0%	21-Jun-22	15-Aug-22	1793
RYWR.SVY.00450	Topographical Surveys Report	20	0%	16-Aug-22	13-Sep-22	1793
Utilities		282		15-Dec-21	07-Feb-23	1964
RYWR.SVY.00510	Utility Search Request for Remaining Services	20	0%	15-Dec-21	19-Jan-22	1956
RYWR.SVY.00530	GIS File produced	0	0%		19-Jan-22	1956
RYWR.SVY.00550	Full Utility Search for Preferred Route	30	0%	20-Jan-22	02-Mar-22	2176
RYWR.SVY.00570	Refresh GIS File	20	0%	03-Mar-22	30-Mar-22	2176
RYWR.SVY.00590	Consultation with NR / Highways	282	0%	15-Dec-21	07-Feb-23	1964
Hydraulic		110		12-Jan-22	21-Jun-22	2122
RYWR.SVY.00630	Hydraulic Spec Request	20	0%	12-Jan-22	08-Feb-22	2192
RYWR.SVY.00660	Hydraulic Assessment / Calculations	20	0%	23-May-22	21-Jun-22	2122
PIPELINES INFRASTRUCTURE (ASSETS)		358		31-Aug-21	07-Feb-23	1964
Walk Over Survey		90		31-Aug-21	11-Jan-22	2162
RYWR.SVY.01210	Consttructibility Review . Walk Over Work Pack Scope Agreement	10	0%	31-Aug-21	13-Sep-21	1982
RYWR.SVY.01220	Walk Over Surveys (Engineering, Enabling & Delivery Partner)	10	0%	14-Sep-21	27-Sep-21	1982
RYWR.SVY.01240	Assessment of High Risk Areas (maybe with [redacted]	30	0%	14-Sep-21	25-Oct-21	2162
RYWR.SVY.01230	Utility Drawings to mark out on CAD [redacted]	30	0%	14-Sep-21	25-Oct-21	2162
RYWR.SVY.01260	Adjustment to the Route & Corridor	30	0%	26-Oct-21	06-Dec-21	2162
RYWR.SVY.01270	Walk Over Surveys Output: Revised Pipeline Route	20	0%	07-Dec-21	11-Jan-22	2162
Mobilisation for all Survey Works		20		15-Mar-22	11-Apr-22	2108
RYWR.SVY.01310	Infra Surveys & Designs Contractor produce Risk Assessment & Method Statement (RAMS)	10	0%	15-Mar-22	28-Mar-22	2108
RYWR.SVY.01330	Permit for Access granted for Survey Works	0	0%		11-Apr-22	2108
RYWR.SVY.01320	SW Review & Accept RAMS	10	0%	29-Mar-22	11-Apr-22	2108
RYWR.SVY.01340	Infra Surveys & Designs Contractor START ON SITE FOR SURVEY	0	0%		11-Apr-22	2108
Geotechnical		125		15-Mar-22	13-Sep-22	2063
RYWR.SVY.01410	Geotechnical and Geoenvironmental Desk Study	20	0%	15-Mar-22	11-Apr-22	2063
RYWR.SVY.01420	Geotechnical and Geoenvironmental Desk Study Report	40	0%	12-Apr-22	13-Jun-22	2063
RYWR.SVY.01430	Geotechnical Site Investigation Spec	20	0%	20-May-22	20-Jun-22	2063
RYWR.SVY.01440	Geotechnical Site Investigation (LAND REF SCHEDULE / NOTICE REQUIRED)	40	0%	21-Jun-22	15-Aug-22	2063
RYWR.SVY.01450	Geotechnical and Geoenvironmental Interpretation report	50	0%	05-Jul-22	13-Sep-22	2063
Topographic		124		12-Jan-22	11-Jul-22	2108
RYWR.SVY.01510	Topographical Survey Specification (for Key Crossings only)	10	0%	12-Jan-22	25-Jan-22	2162
RYWR.SVY.01520	Topographical Surveys (LAND REF SCHEDULE / NOTICE REQUIRED)	40	0%	12-Apr-22	13-Jun-22	2108
RYWR.SVY.01530	Topographical Surveys Report	20	0%	14-Jun-22	11-Jul-22	2108
Utilities		268		12-Jan-22	07-Feb-23	1964
RYWR.SVY.01610	Utility Search Request for Remaining Services	20	0%	12-Jan-22	08-Feb-22	2162
RYWR.SVY.01620	GIS File produced	0	0%		08-Feb-22	2162
RYWR.SVY.01630	Full Utility Search for Preferred Route	30	0%	09-Feb-22	22-Mar-22	2162
RYWR.SVY.01640	Refresh GIS File	20	0%	23-Mar-22	21-Apr-22	2162
RYWR.SVY.01650	Consultation with NR / Highways	268	0%	12-Jan-22	07-Feb-23	1964
Hydraulic		40		12-Jan-22	08-Mar-22	2192
RYWR.SVY.01710	Hydraulic Spec Request	20	0%	12-Jan-22	08-Feb-22	2192
RYWR.SVY.01720	Hydraulic Assessment / Calculations	20	0%	09-Feb-22	08-Mar-22	2192

🟩 Remaining Work
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What-if 1: WATER RECYCLING PLANT - OPTION B5 (ABE STAGE 1 - DPC PROCUREMENT ROUTE)

Progressed to 06-Aug-21

Print: 25-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
FEASIBILITY DESIGNS		480		06-Aug-21	11-Jul-23	1858
RYWR.DGN.00810	EQUIPMENT SELECTED	0	0%		06-Aug-21	2008
RYWR.DGN.00840	(GIVE) - REDLINE for Preferred Route Announcement (PRA) CONFIRMED	0	0%		20-May-22	31
RYWR.DGN.00830	(GIVE) - DESIGNS INFORMATION COMPLETE for PROCUREMENT TENDER DOCUMENTATION	0	0%		21-Dec-22	7
RYWR.DGN.00820	(GIVE) - SUFFICIENT DESIGN COMPLETE for PRE-APPLICATION CONSULTATION	0	0%		21-Dec-22	179
BUDDS FARM TO WRP		454		14-Sep-21	11-Jul-23	1858
INFRA		454		14-Sep-21	11-Jul-23	1858
Civils Designs (more details to be developed)		120		14-Sep-21	08-Mar-22	7
RYWR.DGN.01510	Initial Buildability Review	30	0%	14-Sep-21	25-Oct-21	7
RYWR.DGN.01520	Pipeline Long Section Drawings	30	0%	26-Oct-21	06-Dec-21	7
RYWR.DGN.01530	Estimate of Civil Structure Dimensions	30	0%	07-Dec-21	25-Jan-22	7
RYWR.DGN.01540	Preliminary Pipe Routing 3D Model	30	0%	26-Jan-22	08-Mar-22	7
Mechanical Designs		290		15-Mar-22	15-May-23	1898
RYWR.DGN.02010	Pump Sizing Calculations	20	0%	15-Mar-22	11-Apr-22	73
RYWR.DGN.02020	Hydraulic Modelling	30	0%	15-Mar-22	27-Apr-22	63
RYWR.DGN.02040	EQUIPMENT SELECTED	0	0%		27-Apr-22	63
RYWR.DGN.02050	M&E Equipment Layout	30	0%	28-Apr-22	13-Jun-22	113
RYWR.DGN.02060	Mechanical Input to P&ID	80	0%	28-Apr-22	22-Aug-22	63
RYWR.DGN.02080	Pipework Pressure Ratings	10	0%	23-Aug-22	06-Sep-22	83
RYWR.DGN.02070	Pipe Material Selection	10	0%	23-Aug-22	06-Sep-22	83
RYWR.DGN.02090	Preliminary Pipe, Valve and Actuator Schedule	30	0%	23-Aug-22	04-Oct-22	63
RYWR.DGN.02100	Surge Protection Equipment Specification	20	0%	05-Oct-22	01-Nov-22	1898
RYWR.DGN.02160	Initial HVAC Systems Design Strategy	10	0%	02-Nov-22	15-Nov-22	1898
RYWR.DGN.02180	Initial Lifting Schedule	10	0%	16-Nov-22	29-Nov-22	1898
RYWR.DGN.02190	Critical Spares Assessment (MED4900) & Maintenance Assessment (MED4002)	10	0%	30-Nov-22	13-Dec-22	1898
RYWR.DGN.02230	Plant Specification / Data Sheet	30	0%	14-Dec-22	01-Feb-23	1898
RYWR.DGN.02250	WQM 425 Materials in Contact with Potable Water RA (Initial Assessment of Shortlisted Options)	10	0%	02-Feb-23	15-Feb-23	1918
RYWR.DGN.02260	Initial ALM Design Strategy	30	0%	02-Feb-23	15-Mar-23	1898
RYWR.DGN.02270	Mcerts Schematic Diagram (if applicable)	10	0%	16-Mar-23	29-Mar-23	1898
RYWR.DGN.02290	Process and Mechanical Equipment Specifications	30	0%	30-Mar-23	15-May-23	1898
RYWR.DGN.02280	Input to Technical Report / Works Specification	30	0%	30-Mar-23	15-May-23	1898
Electrical Designs		330		15-Mar-22	11-Jul-23	1858
RYWR.DGN.03010	Input to P&IDs	40	0%	15-Mar-22	12-May-22	53
RYWR.DGN.03040	Preliminary Single Line Diagrams (All Shortlisted Options)	20	0%	13-May-22	13-Jun-22	63
RYWR.DGN.03030	Outline ICA System Architecture Drawing	30	0%	13-May-22	27-Jun-22	53
RYWR.DGN.03070	ECM 4006.2 (Details of New Supplies or Changes to Existing Supplies)	10	0%	28-Jun-22	11-Jul-22	63
RYWR.DGN.03060	Preliminary Load Assessment / Schedule (All Shortlisted Options)	20	0%	28-Jun-22	25-Jul-22	53
RYWR.DGN.03110	Preliminary Generator Sizing	20	0%	26-Jul-22	22-Aug-22	73
RYWR.DGN.03120	MCC Sizes & Calculation	40	0%	26-Jul-22	20-Sep-22	53
RYWR.DGN.03160	Telemetry Strategy	20	0%	21-Sep-22	18-Oct-22	1868
RYWR.DGN.03150	Preliminary Telemetry I/O Schedule	20	0%	21-Sep-22	18-Oct-22	1868
RYWR.DGN.03140	Preliminary Instrument Schedule	20	0%	21-Sep-22	18-Oct-22	53
RYWR.DGN.03170	SCADA Strategy (Consultation with IT/OT)	30	0%	21-Sep-22	01-Nov-22	1858
RYWR.DGN.03190	Outline Electrical Layout Drawing(s)	30	0%	19-Oct-22	29-Nov-22	1868
RYWR.DGN.03180	M&E Equipment Layout	30	0%	02-Nov-22	13-Dec-22	1858
RYWR.DGN.03510	Initial Earthing Layout & Specification	20	0%	14-Dec-22	18-Jan-23	1868
RYWR.DGN.03520	Outline Electrical Site Plan (cable duct layout)	30	0%	14-Dec-22	01-Feb-23	1858
RYWR.DGN.03200	Outline Operation and Control Philosophy	20	0%	02-Feb-23	01-Mar-23	1858
RYWR.DGN.03530	Lighting calculations / drawings	20	0%	02-Mar-23	29-Mar-23	1858
RYWR.DGN.03540	Fire Alarm and Gas Detection Assessment	20	0%	02-Mar-23	29-Mar-23	1858
RYWR.DGN.03560	Lightning & Surge Protection Assessment	20	0%	02-Mar-23	29-Mar-23	1858
RYWR.DGN.03580	Local Isolator & Estop Assessment	20	0%	02-Mar-23	29-Mar-23	1858
RYWR.DGN.03590	BCDs (Block cable diagram)	20	0%	30-Mar-23	28-Apr-23	1878
RYWR.DGN.03610	Electrical Installation Specification	40	0%	30-Mar-23	30-May-23	1858
RYWR.DGN.03630	Input to Technical Report	30	0%	31-May-23	11-Jul-23	1858
Other Deliverables		260		06-Dec-21	21-Dec-22	1992
Site Information		189		06-Dec-21	13-Sep-22	2063
RYWR.DGN.00130	Existing Site Information	0	0%		06-Dec-21	2252
RYWR.DGN.00140	Utility Information Pack	0	0%		19-Jan-22	2226
RYWR.DGN.00110	Topographical Drawings - Site Plans and Longsections	0	0%		13-Sep-22	2063
RYWR.DGN.00120	Geotechnical and Geo-ennvironmental Interpretive Report	0	0%		13-Sep-22	2063
Works Information		214		06-Dec-21	18-Oct-22	53

🟩	Remaining Work
🟥	Critical Remaining Work
◆ ◆	Milestone

Project ID: 710060-2-2 CURR Standard Layout for Distribution

Date	Revision	Checked	Approved
25-Aug-21	WR (B5) Schedule for G1.5 Submission	DC	BM

What-if 1: WATER RECYCLING PLANT - OPTION B5 (ABE STAGE 1 - DPC PROCUREMENT ROUTE)

Progressed to 06-Aug-21

Print: 25-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
RYWR.DGN.00030	Site Layout - Indicative Route. Plan. Long Sections	0	0%		06-Dec-21	267
RYWR.DGN.00010	Site Layout	0	0%		08-Mar-22	207
RYWR.DGN.00020	The Boundary of the Site	0	0%		08-Mar-22	207
RYWR.DGN.00040	Outline General Arrangement Drawings Proposed PS. Booster. HLPS. Valves etc	0	0%		08-Mar-22	207
RYWR.DGN.00070	Civil Specification	30	0%	09-Mar-22	21-Apr-22	177
RYWR.DGN.00060	Bentley Hydraulic Analysis Output Report	0	0%		18-Oct-22	53
Pre-Construction		200		08-Mar-22	21-Dec-22	179
RYWR.DGN.00210	HIC & Significant Risk Log	0	0%		08-Mar-22	207
RYWR.DGN.00230	Initial HAZOP and ALM Study (SWIFT)	0	0%		08-Mar-22	207
RYWR.DGN.00240	Draft H&S File / Report	0	0%		08-Mar-22	207
RYWR.DGN.00250	Carbon Minimisation template	0	0%		08-Mar-22	379
RYWR.DGN.00260	Site Waste Assessment	0	0%		08-Mar-22	379
RYWR.DGN.00270	Offsite Assembly Assessment	0	0%		27-Apr-22	173
RYWR.DGN.00410	MEICA Related - DSEAR and Potential Explosive Atmosphere Zone (PEAZ) RA & Drawing(s)	20	0%	28-Apr-22	26-May-22	153
RYWR.DGN.00420	MEICA Related - ECM 4007 (Assessment of Requirement for Site Standby Power)	20	0%	28-Apr-22	26-May-22	153
RYWR.DGN.00430	MEICA Related - Lightning Protection Risk Assessment	20	0%	28-Apr-22	26-May-22	153
RYWR.DGN.00440	MEICA Related - Local Isolator / Emergency Stop Risk Assessment (MED4001)	20	0%	28-Apr-22	26-May-22	153
RYWR.DGN.00220	Significant Hazards & High Risk Services Drawing	0	0%		21-Dec-22	7
RYWR.DGN.00280	Estimating Scoping Template / Opex / WLC - PREFERRED OPTION	0	0%		21-Dec-22	179
RYWR.DGN.00480	3D Model Layouts	200	0%	09-Mar-22	21-Dec-22	7
RYWR.DGN.00490	Design Drawings to support the Planning DCO Process	200	0%	09-Mar-22	21-Dec-22	7
Outline Operational Strategy		230		25-Jan-22	21-Dec-22	7
RYWR.DGN.00360	Concrete Risk Assessment	0	0%		25-Jan-22	237
RYWR.DGN.00310	Outline Commissioning and Compliance Plan (ID408.01)	0	0%		27-Apr-22	173
RYWR.DGN.00320	Takeover Test Schedule	0	0%		27-Apr-22	173
RYWR.DGN.00330	Technical Variation Request Forms (SU403.10)	0	0%		27-Apr-22	173
RYWR.DGN.00340	Pipeline Calculations	0	0%		04-Oct-22	63
RYWR.DGN.00350	Flotation Calculations	0	0%		21-Dec-22	7
ENVIRONMENTAL BUFFER LAKE AT OTTERBOURNE PRE-DISINFECTION PLANT		204		31-Aug-21	27-Jun-22	2118
LEADING IN ACTIVITIES		122		31-Aug-21	24-Feb-22	2200
RYWR.DGN.01010	Initial Buildability Review	20	0%	31-Aug-21	27-Sep-21	2118
RYWR.DGN.01020	Design Estimate (SW) to Facilitate OFWAT Control Point C data	20	0%	28-Jan-22	24-Feb-22	2297
ENGINEERING DESIGNS		204		31-Aug-21	27-Jun-22	2118
RYWR.DGN.01110	Process Flow Diagram	5	0%	31-Aug-21	06-Sep-21	2138
RYWR.DGN.01120	Process Block Diagram	5	0%	31-Aug-21	06-Sep-21	2138
RYWR.DGN.01250	Architectural	20	0%	28-Sep-21	25-Oct-21	2183
RYWR.DGN.01150	Piping and Instrumentation Diagrams	50	0%	07-Sep-21	15-Nov-21	2168
RYWR.DGN.01180	WQ Risk Identification Workshop	80	0%	31-Aug-21	20-Dec-21	2143
RYWR.DGN.01170	Process Equipment Sizing	80	0%	07-Sep-21	04-Jan-22	2138
RYWR.DGN.01100	Mass Balances	89	0%	31-Aug-21	10-Jan-22	2134
RYWR.DGN.01260	Modelling	80	0%	28-Sep-21	25-Jan-22	2123
RYWR.DGN.01240	CIvil	102	0%	31-Aug-21	27-Jan-22	2200
RYWR.DGN.01230	CDM	102	0%	31-Aug-21	27-Jan-22	2220
RYWR.DGN.01220	Mechanical	102	0%	31-Aug-21	27-Jan-22	2200
RYWR.DGN.01190	Process Safety	85	0%	28-Sep-21	01-Feb-22	2118
RYWR.DGN.01210	CAD	90	0%	28-Sep-21	08-Feb-22	2212
RYWR.DGN.01290	Feasibility Design Amendment Post-PEIR (following Non-Stat Consultation)	99	0%	02-Feb-22	27-Jun-22	2118
CONNECTION BETWEEN EBL AND OTTERBOURNE PRE-DISINFECTION PLANT		444		28-Sep-21	11-Jul-23	1858
Civils Designs (more details to be developed)		120		28-Sep-21	22-Mar-22	1982
RYWR.DGN.5850	Initial Buildability Review	30	0%	28-Sep-21	08-Nov-21	1982
RYWR.DGN.5830	Pipeline Long Section Drawings	30	0%	09-Nov-21	20-Dec-21	1982
RYWR.DGN.5860	Estimate of Civil Structure Dimensions	30	0%	21-Dec-21	08-Feb-22	1982
RYWR.DGN.5820	Preliminary Pipe Routing 3D Model	30	0%	09-Feb-22	22-Mar-22	1982
Mechanical Designs		290		15-Mar-22	15-May-23	1898
RYWR.DGN.5730	Pump Sizing Calculations	20	0%	15-Mar-22	11-Apr-22	1908
RYWR.DGN.5870	Hydraulic Modelling	30	0%	15-Mar-22	27-Apr-22	1898
RYWR.DGN.5880	EQUIPMENT SELECTED	0	0%		27-Apr-22	1898
RYWR.DGN.5890	M&E Equipment Layout	30	0%	28-Apr-22	13-Jun-22	1948
RYWR.DGN.5770	Mechanical Input to P&ID	80	0%	28-Apr-22	22-Aug-22	1898
RYWR.DGN.5740	Pipework Pressure Ratings	10	0%	23-Aug-22	06-Sep-22	1918
RYWR.DGN.5750	Pipe Material Selection	10	0%	23-Aug-22	06-Sep-22	1918
RYWR.DGN.5690	Preliminary Pipe, Valve and Actuator Schedule	30	0%	23-Aug-22	04-Oct-22	1898
RYWR.DGN.5810	Surge Protection Equipment Specification	20	0%	05-Oct-22	01-Nov-22	1898

🟩 Remaining Work
🟥 Critical Remaining Work
◆ ◆ Milestone

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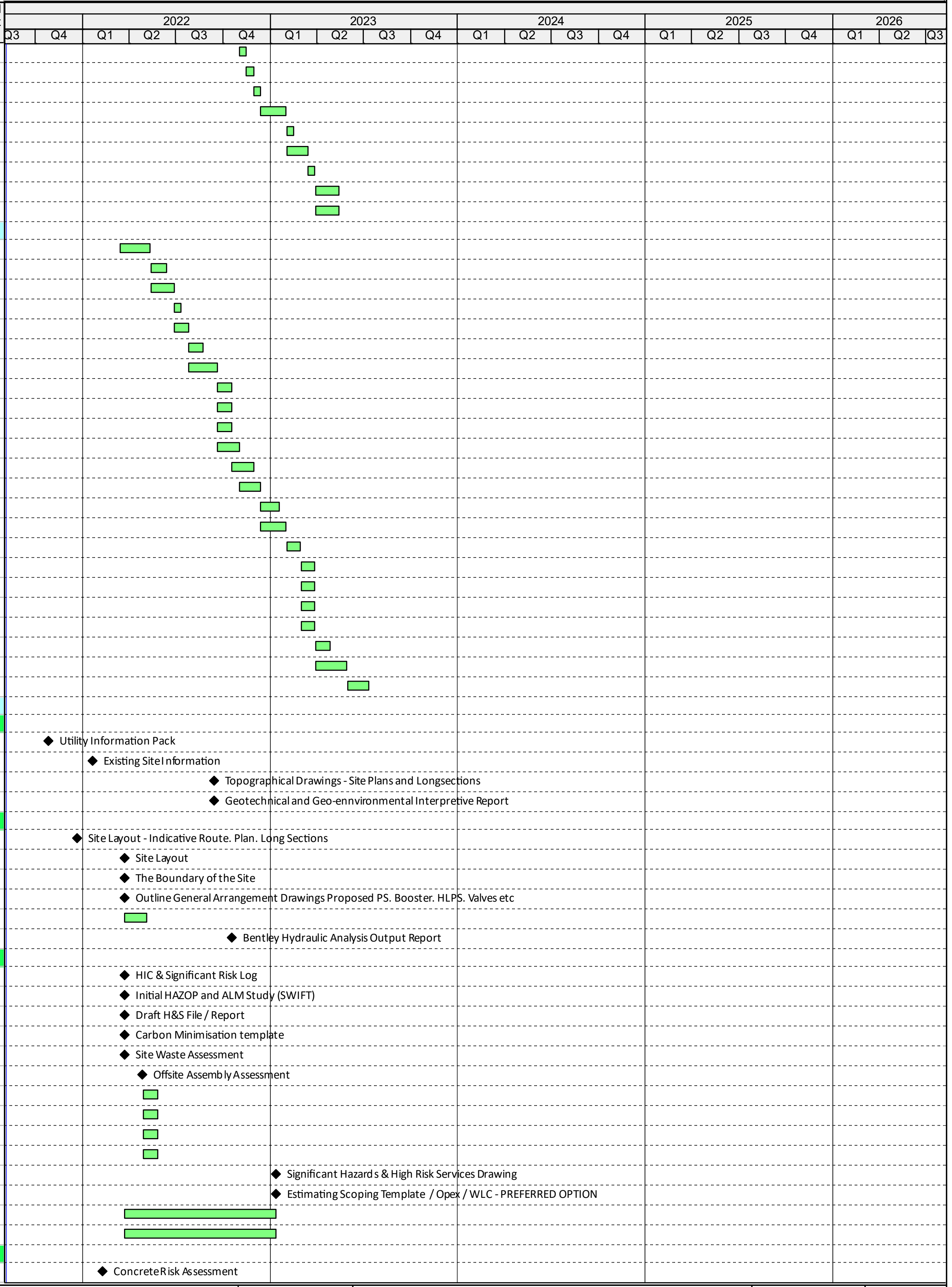
25-Aug-21	WR (B5) Schedule for G1.5 Submission	DC	BM

What-if 1: WATER RECYCLING PLANT - OPTION B5 (ABE STAGE 1 - DPC PROCUREMENT ROUTE)

Progressed to 06-Aug-21

Print: 25-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
RYWR.DGN.5780	Initial HVAC Systems Design Strategy	10	0%	02-Nov-22	15-Nov-22	1898
RYWR.DGN.5710	Initial Lifting Schedule	10	0%	16-Nov-22	29-Nov-22	1898
RYWR.DGN.5720	Critical Spares Assessment (MED4900) & Maintenance Assessment (MED4002)	10	0%	30-Nov-22	13-Dec-22	1898
RYWR.DGN.5760	Plant Specification / Data Sheet	30	0%	14-Dec-22	01-Feb-23	1898
RYWR.DGN.5660	WQM 425 Materials in Contact with Potable Water RA (Initial Assessment of Shortlisted Options)	10	0%	02-Feb-23	15-Feb-23	1918
RYWR.DGN.5700	Initial ALM Design Strategy	30	0%	02-Feb-23	15-Mar-23	1898
RYWR.DGN.5670	Mcerts Schematic Diagram (if applicable)	10	0%	16-Mar-23	29-Mar-23	1898
RYWR.DGN.5680	Process and Mechanical Equipment Specifications	30	0%	30-Mar-23	15-May-23	1898
RYWR.DGN.5900	Input to Technical Report / Works Specification	30	0%	30-Mar-23	15-May-23	1898
Electrical Designs		330		15-Mar-22	11-Jul-23	1858
RYWR.DGN.5910	Input to P&IDs	40	0%	15-Mar-22	12-May-22	1858
RYWR.DGN.5510	Preliminary Single Line Diagrams (All Shortlisted Options)	20	0%	13-May-22	13-Jun-22	1868
RYWR.DGN.5560	Outline ICA System Architecture Drawing	30	0%	13-May-22	27-Jun-22	1858
RYWR.DGN.5540	ECM 4006.2 (Details of New Supplies or Changes to Existing Supplies)	10	0%	28-Jun-22	11-Jul-22	1868
RYWR.DGN.5480	Preliminary Load Assessment / Schedule (All Shortlisted Options)	20	0%	28-Jun-22	25-Jul-22	1858
RYWR.DGN.5520	Preliminary Generator Sizing	20	0%	26-Jul-22	22-Aug-22	1878
RYWR.DGN.5630	MCC Sizes & Calculation	40	0%	26-Jul-22	20-Sep-22	1858
RYWR.DGN.5490	Telemetry Strategy	20	0%	21-Sep-22	18-Oct-22	1868
RYWR.DGN.5500	Preliminary Telemetry I/O Schedule	20	0%	21-Sep-22	18-Oct-22	1868
RYWR.DGN.5530	Preliminary Instrument Schedule	20	0%	21-Sep-22	18-Oct-22	1868
RYWR.DGN.5930	SCADA Strategy (Consultation with IT/OT)	30	0%	21-Sep-22	01-Nov-22	1858
RYWR.DGN.5580	Outline Electrical Layout Drawing(s)	30	0%	19-Oct-22	29-Nov-22	1868
RYWR.DGN.5640	M&E Equipment Layout	30	0%	02-Nov-22	13-Dec-22	1858
RYWR.DGN.5650	Initial Earthing Layout & Specification	20	0%	14-Dec-22	18-Jan-23	1868
RYWR.DGN.5590	Outline Electrical Site Plan (cable duct layout)	30	0%	14-Dec-22	01-Feb-23	1858
RYWR.DGN.5550	Outline Operation and Control Philosophy	20	0%	02-Feb-23	01-Mar-23	1858
RYWR.DGN.5570	Lighting calculations / drawings	20	0%	02-Mar-23	29-Mar-23	1858
RYWR.DGN.5610	Fire Alarm and Gas Detection Assessment	20	0%	02-Mar-23	29-Mar-23	1858
RYWR.DGN.5940	Lightning & Surge Protection Assessment	20	0%	02-Mar-23	29-Mar-23	1858
RYWR.DGN.5950	Local Isolator & Estop Assessment	20	0%	02-Mar-23	29-Mar-23	1858
RYWR.DGN.5600	BCDs (Block cable diagram)	20	0%	30-Mar-23	28-Apr-23	1878
RYWR.DGN.5620	Electrical Installation Specification	40	0%	30-Mar-23	30-May-23	1858
RYWR.DGN.5920	Input to Technical Report	30	0%	31-May-23	11-Jul-23	1858
Other Deliverables		300		25-Oct-21	12-Jan-23	1982
Site Information		219		25-Oct-21	13-Sep-22	2063
RYWR.DGN.5350	Utility Information Pack	0	0%		25-Oct-21	2282
RYWR.DGN.5340	Existing Site Information	0	0%		19-Jan-22	2226
RYWR.DGN.5320	Topographical Drawings - Site Plans and Longsections	0	0%		13-Sep-22	2063
RYWR.DGN.5330	Geotechnical and Geo-ennvironmental Interpretive Report	0	0%		13-Sep-22	2063
Works Information		204		20-Dec-21	18-Oct-22	2038
RYWR.DGN.5230	Site Layout - Indicative Route. Plan. Long Sections	0	0%		20-Dec-21	2242
RYWR.DGN.5210	Site Layout	0	0%		22-Mar-22	2182
RYWR.DGN.5220	The Boundary of the Site	0	0%		22-Mar-22	2182
RYWR.DGN.5240	Outline General Arrangement Drawings Proposed PS. Booster. HLPS. Valves etc	0	0%		22-Mar-22	2182
RYWR.DGN.5840	Civil Specification	30	0%	23-Mar-22	06-May-22	2152
RYWR.DGN.5250	Bentley Hydraulic Analysis Output Report	0	0%		18-Oct-22	2038
Pre-Construction		200		22-Mar-22	12-Jan-23	1982
RYWR.DGN.5360	HIC & Significant Risk Log	0	0%		22-Mar-22	2182
RYWR.DGN.5380	Initial HAZOP and ALM Study (SWIFT)	0	0%		22-Mar-22	2182
RYWR.DGN.5390	Draft H&S File / Report	0	0%		22-Mar-22	2182
RYWR.DGN.5400	Carbon Minimisation template	0	0%		22-Mar-22	2182
RYWR.DGN.5410	Site Waste Assessment	0	0%		22-Mar-22	2182
RYWR.DGN.5420	Offsite Assembly Assessment	0	0%		27-Apr-22	2158
RYWR.DGN.5440	MEICA Related - DSEAR and Potential Explosive Atmosphere Zone (PEAZ) RA & Drawing(s)	20	0%	28-Apr-22	26-May-22	2138
RYWR.DGN.5450	MEICA Related - ECM 4007 (Assessment of Requirement for Site Standby Power)	20	0%	28-Apr-22	26-May-22	2138
RYWR.DGN.5460	MEICA Related - Lightning Protection Risk Assessment	20	0%	28-Apr-22	26-May-22	2138
RYWR.DGN.5470	MEICA Related - Local Isolator / Emergency Stop Risk Assessment (MED4001)	20	0%	28-Apr-22	26-May-22	2138
RYWR.DGN.5370	Significant Hazards & High Risk Services Drawing	0	0%		12-Jan-23	1982
RYWR.DGN.5430	Estimating Scoping Template / Opex / WLC - PREFERRED OPTION	0	0%		12-Jan-23	1982
RYWR.DGN.5790	3D Model Layouts	200	0%	23-Mar-22	12-Jan-23	1982
RYWR.DGN.5800	Design Drawings to support the Planning DCO Process	200	0%	23-Mar-22	12-Jan-23	1982
Outline Operational Strategy		230		08-Feb-22	12-Jan-23	1982
RYWR.DGN.5310	Concrete Risk Assessment	0	0%		08-Feb-22	2212



🟩	Remaining Work
🟥	Critical Remaining Work
◆ ◆	Milestone

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What-if 1: WATER RECYCLING PLANT - OPTION B5 (ABE STAGE 1 - DPC PROCUREMENT ROUTE)
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Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
RYWR.DGN.5260	Outline Commissioning and Compliance Plan (ID408.01)	0	0%		27-Apr-22	2158
RYWR.DGN.5270	Takeover Test Schedule	0	0%		27-Apr-22	2158
RYWR.DGN.5280	Technical Variation Request Forms (SU403.10)	0	0%		27-Apr-22	2158
RYWR.DGN.5290	Pipeline Calculations	0	0%		04-Oct-22	2048
RYWR.DGN.5300	Flotation Calculations	0	0%		12-Jan-23	1982
PEEL COMMON PUMPING STATION		356		06-Aug-21	12-Jan-23	1982
Civils Designs (more details to be developed)		120		28-Sep-21	22-Mar-22	1982
RYWR.DGN.6610	Initial Buildability Review	30	0%	28-Sep-21	08-Nov-21	1982
RYWR.DGN.6590	Pipeline Long Section Drawings	30	0%	09-Nov-21	20-Dec-21	1982
RYWR.DGN.6620	Estimate of Civil Structure Dimensions	30	0%	21-Dec-21	08-Feb-22	1982
RYWR.DGN.6580	Preliminary Pipe Routing 3D Model	30	0%	09-Feb-22	22-Mar-22	1982
Mechanical Designs		290		06-Aug-21	04-Oct-22	2048
RYWR.DGN.6490	Pump Sizing Calculations	20	0%	06-Aug-21	03-Sep-21	2058
RYWR.DGN.6630	Hydraulic Modelling	30	0%	06-Aug-21	17-Sep-21	2048
RYWR.DGN.6640	EQUIPMENT SELECTED	0	0%		17-Sep-21	2048
RYWR.DGN.6650	M&E Equipment Layout	30	0%	20-Sep-21	29-Oct-21	2098
RYWR.DGN.6530	Mechanical Input to P&ID	80	0%	20-Sep-21	17-Jan-22	2048
RYWR.DGN.6500	Pipework Pressure Ratings	10	0%	18-Jan-22	31-Jan-22	2068
RYWR.DGN.6510	Pipe Material Selection	10	0%	18-Jan-22	31-Jan-22	2068
RYWR.DGN.6450	Preliminary Pipe, Valve and Actuator Schedule	30	0%	18-Jan-22	28-Feb-22	2048
RYWR.DGN.6570	Surge Protection Equipment Specification	20	0%	01-Mar-22	28-Mar-22	2048
RYWR.DGN.6540	Initial HVAC Systems Design Strategy	10	0%	29-Mar-22	11-Apr-22	2048
RYWR.DGN.6470	Initial Lifting Schedule	10	0%	12-Apr-22	27-Apr-22	2048
RYWR.DGN.6480	Critical Spares Assessment (MED4900) & Maintenance Assessment (MED4002)	10	0%	28-Apr-22	12-May-22	2048
RYWR.DGN.6520	Plant Specification / Data Sheet	30	0%	13-May-22	27-Jun-22	2048
RYWR.DGN.6420	WQM 425 Materials in Contact with Potable Water RA (Initial Assessment of Shortlisted Options)	10	0%	28-Jun-22	11-Jul-22	2068
RYWR.DGN.6460	Initial ALM Design Strategy	30	0%	28-Jun-22	08-Aug-22	2048
RYWR.DGN.6430	Mcerts Schematic Diagram (if applicable)	10	0%	09-Aug-22	22-Aug-22	2048
RYWR.DGN.6440	Process and Mechanical Equipment Specifications	30	0%	23-Aug-22	04-Oct-22	2048
RYWR.DGN.6660	Input to Technical Report / Works Specification	30	0%	23-Aug-22	04-Oct-22	2048
Electrical Designs		330		06-Aug-21	29-Nov-22	2008
RYWR.DGN.6670	Input to P&IDs	40	0%	06-Aug-21	01-Oct-21	2008
RYWR.DGN.6270	Preliminary Single Line Diagrams (All Shortlisted Options)	20	0%	04-Oct-21	29-Oct-21	2018
RYWR.DGN.6320	Outline ICA System Architecture Drawing	30	0%	04-Oct-21	12-Nov-21	2008
RYWR.DGN.6300	ECM 4006.2 (Details of New Supplies or Changes to Existing Supplies)	10	0%	15-Nov-21	26-Nov-21	2018
RYWR.DGN.6240	Preliminary Load Assessment / Schedule (All Shortlisted Options)	20	0%	15-Nov-21	10-Dec-21	2008
RYWR.DGN.6280	Preliminary Generator Sizing	20	0%	13-Dec-21	17-Jan-22	2028
RYWR.DGN.6390	MCC Sizes & Calculation	40	0%	13-Dec-21	14-Feb-22	2008
RYWR.DGN.6250	Telemetry Strategy	20	0%	15-Feb-22	14-Mar-22	2018
RYWR.DGN.6260	Preliminary Telemetry I/O Schedule	20	0%	15-Feb-22	14-Mar-22	2018
RYWR.DGN.6290	Preliminary Instrument Schedule	20	0%	15-Feb-22	14-Mar-22	2018
RYWR.DGN.6690	SCADA Strategy (Consultation with IT/OT)	30	0%	15-Feb-22	28-Mar-22	2008
RYWR.DGN.6340	Outline Electrical Layout Drawing(s)	30	0%	15-Mar-22	27-Apr-22	2018
RYWR.DGN.6400	M&E Equipment Layout	30	0%	29-Mar-22	12-May-22	2008
RYWR.DGN.6410	Initial Earthing Layout & Specification	20	0%	13-May-22	13-Jun-22	2018
RYWR.DGN.6350	Outline Electrical Site Plan (cable duct layout)	30	0%	13-May-22	27-Jun-22	2008
RYWR.DGN.6310	Outline Operation and Control Philosophy	20	0%	28-Jun-22	25-Jul-22	2008
RYWR.DGN.6330	Lighting calculations / drawings	20	0%	26-Jul-22	22-Aug-22	2008
RYWR.DGN.6370	Fire Alarm and Gas Detection Assessment	20	0%	26-Jul-22	22-Aug-22	2008
RYWR.DGN.6700	Lightning & Surge Protection Assessment	20	0%	26-Jul-22	22-Aug-22	2008
RYWR.DGN.6710	Local Isolator & Estop Assessment	20	0%	26-Jul-22	22-Aug-22	2008
RYWR.DGN.6360	BCDs (Block cable diagram)	20	0%	23-Aug-22	20-Sep-22	2028
RYWR.DGN.6380	Electrical Installation Specification	40	0%	23-Aug-22	18-Oct-22	2008
RYWR.DGN.6680	Input to Technical Report	30	0%	19-Oct-22	29-Nov-22	2008
Other Deliverables		326		17-Sep-21	12-Jan-23	1982
Site Information		129		08-Feb-22	15-Aug-22	2083
RYWR.DGN.6100	Existing Site Information	0	0%		08-Feb-22	2212
RYWR.DGN.6110	Utility Information Pack	0	0%		08-Feb-22	2212
RYWR.DGN.6080	Topographical Drawings - Site Plans and Longsections	0	0%		13-Jun-22	2128
RYWR.DGN.6090	Geotechnical and Geo-ennvironmental Interpretive Report	0	0%		15-Aug-22	2083
Works Information		90		20-Dec-21	06-May-22	2152
RYWR.DGN.5990	Site Layout - Indicative Route. Plan. Long Sections	0	0%		20-Dec-21	2242
RYWR.DGN.6010	Bentley Hydraulic Analysis Output Report	0	0%		14-Mar-22	2188

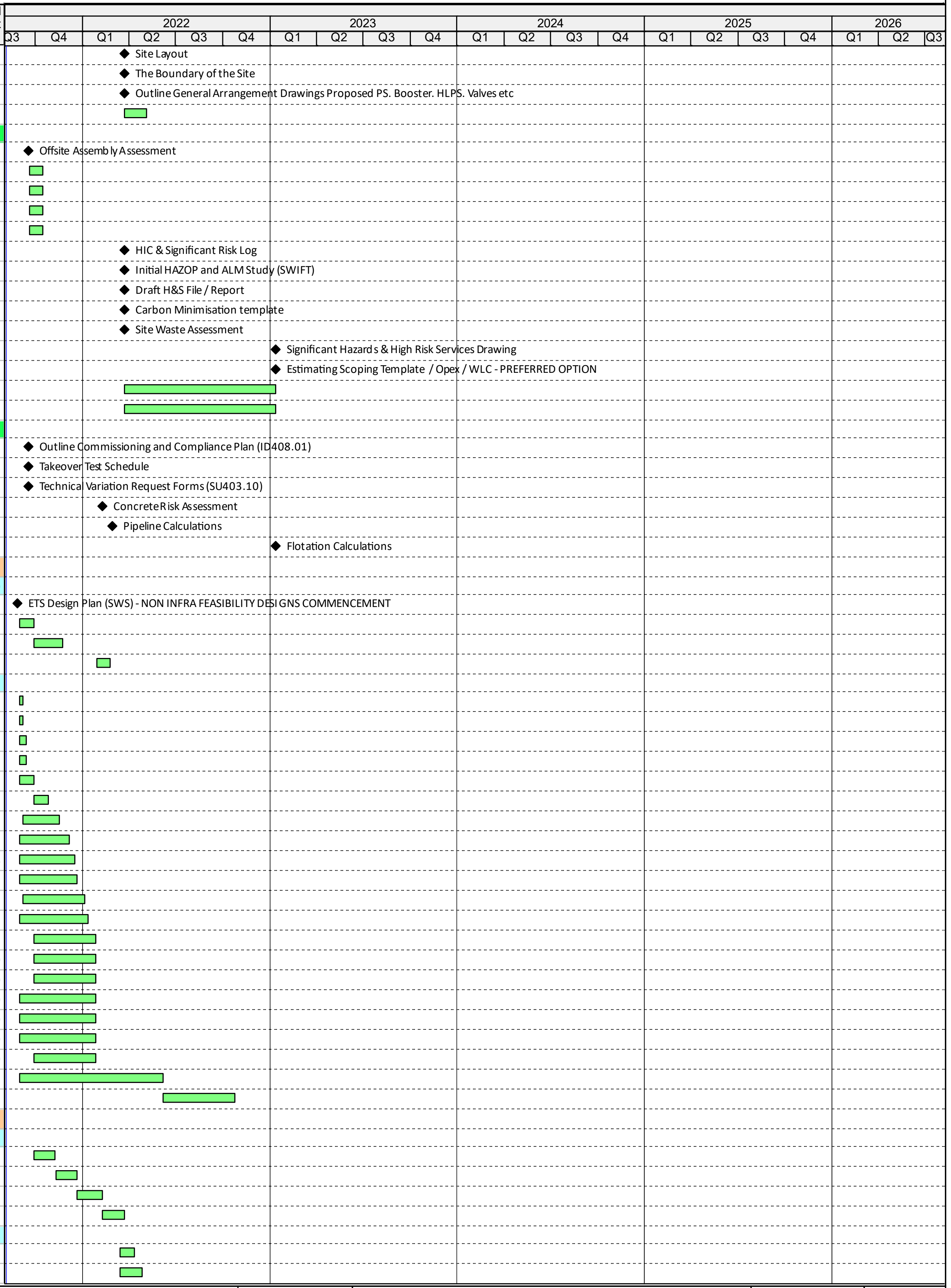
🟩	Remaining Work
🟥	Critical Remaining Work
◆ ◆	Milestone

Project ID: 710060-2-2 CURR Standard Layout for Distribution

Date	Revision	Checked	Approved
25-Aug-21	WR (B5) Schedule for G1.5 Submission	DC	BM

What-if 1: WATER RECYCLING PLANT - OPTION B5 (ABE STAGE 1 - DPC PROCUREMENT ROUTE)
Progressed to 06-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
RYWR.DGN.5970	Site Layout	0	0%		22-Mar-22	2182
RYWR.DGN.5980	The Boundary of the Site	0	0%		22-Mar-22	2182
RYWR.DGN.6000	Outline General Arrangement Drawings Proposed PS. Booster. HLPS. Valves etc	0	0%		22-Mar-22	2182
RYWR.DGN.6600	Civil Specification	30	0%	23-Mar-22	06-May-22	2152
Pre-Construction		326		17-Sep-21	12-Jan-23	1982
RYWR.DGN.6180	Offsite Assembly Assessment	0	0%		17-Sep-21	2308
RYWR.DGN.6200	MEICA Related - DSEAR and Potential Explosive Atmosphere Zone (PEAZ) RA & Drawing(s)	20	0%	20-Sep-21	15-Oct-21	2288
RYWR.DGN.6210	MEICA Related - ECM 4007 (Assessment of Requirement for Site Standby Power)	20	0%	20-Sep-21	15-Oct-21	2288
RYWR.DGN.6220	MEICA Related - Lightning Protection Risk Assessment	20	0%	20-Sep-21	15-Oct-21	2288
RYWR.DGN.6230	MEICA Related - Local Isolator / Emergency Stop Risk Assessment (MED4001)	20	0%	20-Sep-21	15-Oct-21	2288
RYWR.DGN.6120	HIC & Significant Risk Log	0	0%		22-Mar-22	2182
RYWR.DGN.6140	Initial HAZOP and ALM Study (SWIFT)	0	0%		22-Mar-22	2182
RYWR.DGN.6150	Draft H&S File / Report	0	0%		22-Mar-22	2182
RYWR.DGN.6160	Carbon Minimisation template	0	0%		22-Mar-22	2182
RYWR.DGN.6170	Site Waste Assessment	0	0%		22-Mar-22	2182
RYWR.DGN.6130	Significant Hazards & High Risk Services Drawing	0	0%		12-Jan-23	1982
RYWR.DGN.6190	Estimating Scoping Template / Opex / WLC - PREFERRED OPTION	0	0%		12-Jan-23	1982
RYWR.DGN.6550	3D Model Layouts	200	0%	23-Mar-22	12-Jan-23	1982
RYWR.DGN.6560	Design Drawings to support the Planning DCO Process	200	0%	23-Mar-22	12-Jan-23	1982
Outline Operational Strategy		326		17-Sep-21	12-Jan-23	1982
RYWR.DGN.6020	Outline Commissioning and Compliance Plan (ID408.01)	0	0%		17-Sep-21	2308
RYWR.DGN.6030	Takeover Test Schedule	0	0%		17-Sep-21	2308
RYWR.DGN.6040	Technical Variation Request Forms (SU403.10)	0	0%		17-Sep-21	2308
RYWR.DGN.6070	Concrete Risk Assessment	0	0%		08-Feb-22	2212
RYWR.DGN.6050	Pipeline Calculations	0	0%		28-Feb-22	2198
RYWR.DGN.6060	Flotation Calculations	0	0%		12-Jan-23	1982
WATER RECYCLING PLANT 72		289		27-Aug-21	25-Oct-22	2033
LEADING IN ACTIVITIES		122		27-Aug-21	24-Feb-22	2200
RYWR.DGN.04710	ETS Design Plan (SWS) - NON INFRA FEASIBILITY DESIGNS COMMENCEMENT	0	0%		27-Aug-21	2033
RYWR.DGN.04720	Initial Buildability Review	20	0%	31-Aug-21	27-Sep-21	2182
RYWR.DGN.04730	Biodiversity Net Gain	40	0%	28-Sep-21	22-Nov-21	2242
RYWR.DGN.04740	Design Estimate (SW) to Facilitate OFWAT Control Point C data?	20	0%	28-Jan-22	24-Feb-22	2297
ENGINEERING DESIGNS		289		31-Aug-21	25-Oct-22	2033
RYWR.DGN.04860	Process Flow Diagram	5	0%	31-Aug-21	06-Sep-21	2137
RYWR.DGN.04840	Process Block Diagram	5	0%	31-Aug-21	06-Sep-21	2137
RYWR.DGN.04920	Operating Strategy	10	0%	31-Aug-21	13-Sep-21	2212
RYWR.DGN.04910	Initial WQ Shutdown Setpoints	10	0%	31-Aug-21	13-Sep-21	2212
RYWR.DGN.04940	Waste Stream Solid Discharge Composition	20	0%	31-Aug-21	27-Sep-21	2202
RYWR.DGN.05030	Architectural	20	0%	28-Sep-21	25-Oct-21	2182
RYWR.DGN.04870	Piping and Instrumentation Diagrams	50	0%	07-Sep-21	15-Nov-21	2167
RYWR.DGN.04930	Outline Compliance and Commissioning Plan	70	0%	31-Aug-21	06-Dec-21	2152
RYWR.DGN.04820	Jar Testing	78	0%	31-Aug-21	16-Dec-21	2144
RYWR.DGN.04890	WQ Risk Identification Workshop	80	0%	31-Aug-21	20-Dec-21	2142
RYWR.DGN.04880	Process Equipment Sizing	80	0%	07-Sep-21	04-Jan-22	2137
RYWR.DGN.04830	Mass Balances	89	0%	31-Aug-21	10-Jan-22	2133
RYWR.DGN.05080	Modelling	80	0%	28-Sep-21	25-Jan-22	2202
RYWR.DGN.05050	EICA	82	0%	28-Sep-21	27-Jan-22	2200
RYWR.DGN.04950	Process Safety	82	0%	28-Sep-21	27-Jan-22	2200
RYWR.DGN.05020	CIvil	102	0%	31-Aug-21	27-Jan-22	2200
RYWR.DGN.05010	CDM	102	0%	31-Aug-21	27-Jan-22	2200
RYWR.DGN.04990	Mechanical	102	0%	31-Aug-21	27-Jan-22	2200
RYWR.DGN.04970	CAD	82	0%	28-Sep-21	27-Jan-22	2200
RYWR.DGN.04810	Water Sampling	189	0%	31-Aug-21	06-Jun-22	2033
RYWR.DGN.05090	Feasibility Design Amendment Post-PEIR (following Non-Stat Consultation)	100	0%	06-Jun-22	25-Oct-22	2033
CONVEYANCE PIPEWORK WRP TO EBL		444		28-Sep-21	11-Jul-23	1858
Civils Designs (more details to be developed)		120		28-Sep-21	22-Mar-22	1982
RYWR.DGN.7370	Initial Buildability Review	30	0%	28-Sep-21	08-Nov-21	1982
RYWR.DGN.7350	Pipeline Long Section Drawings	30	0%	09-Nov-21	20-Dec-21	1982
RYWR.DGN.7380	Estimate of Civil Structure Dimensions	30	0%	21-Dec-21	08-Feb-22	1982
RYWR.DGN.7340	Preliminary Pipe Routing 3D Model	30	0%	09-Feb-22	22-Mar-22	1982
Mechanical Designs		290		15-Mar-22	15-May-23	1898
RYWR.DGN.7250	Pump Sizing Calculations	20	0%	15-Mar-22	11-Apr-22	1908
RYWR.DGN.7390	Hydraulic Modelling	30	0%	15-Mar-22	27-Apr-22	1898



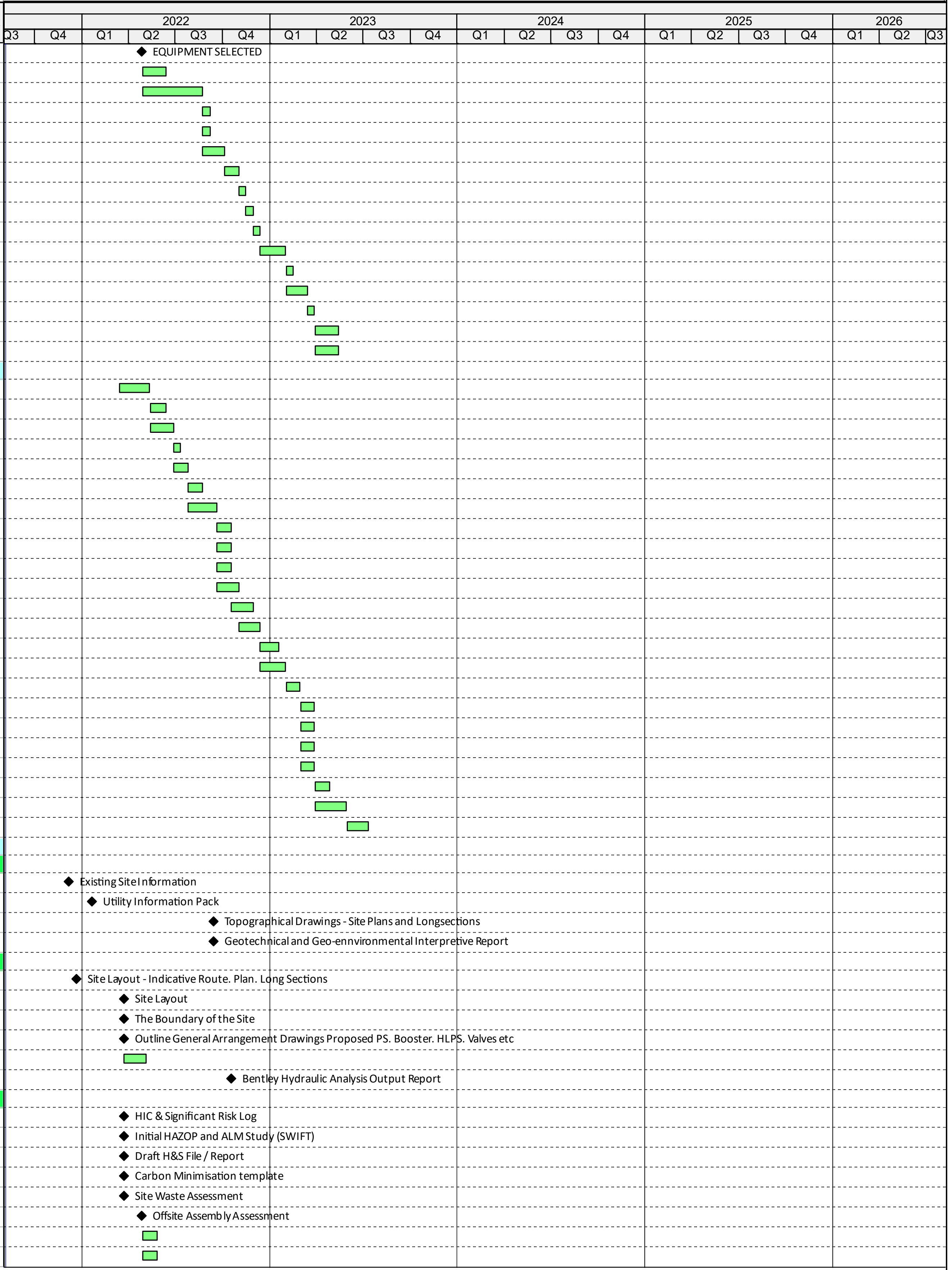
🟩	Remaining Work
🟥	Critical Remaining Work
◆ ◆	Milestone

Date	Revision	Checked	Approved
25-Aug-21	WR (B5) Schedule for G1.5 Submission	DC	BM

What-if 1: WATER RECYCLING PLANT - OPTION B5 (ABE STAGE 1 - DPC PROCUREMENT ROUTE)

Progressed to 06-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
RYWR.DGN.7400	EQUIPMENT SELECTED	0	0%		27-Apr-22	1898
RYWR.DGN.7410	M&E Equipment Layout	30	0%	28-Apr-22	13-Jun-22	1948
RYWR.DGN.7290	Mechanical Input to P&ID	80	0%	28-Apr-22	22-Aug-22	1898
RYWR.DGN.7260	Pipework Pressure Ratings	10	0%	23-Aug-22	06-Sep-22	1918
RYWR.DGN.7270	Pipe Material Selection	10	0%	23-Aug-22	06-Sep-22	1918
RYWR.DGN.7210	Preliminary Pipe, Valve and Actuator Schedule	30	0%	23-Aug-22	04-Oct-22	1898
RYWR.DGN.7330	Surge Protection Equipment Specification	20	0%	05-Oct-22	01-Nov-22	1898
RYWR.DGN.7300	Initial HVAC Systems Design Strategy	10	0%	02-Nov-22	15-Nov-22	1898
RYWR.DGN.7230	Initial Lifting Schedule	10	0%	16-Nov-22	29-Nov-22	1898
RYWR.DGN.7240	Critical Spares Assessment (MED4900) & Maintenance Assessment (MED4002)	10	0%	30-Nov-22	13-Dec-22	1898
RYWR.DGN.7280	Plant Specification / Data Sheet	30	0%	14-Dec-22	01-Feb-23	1898
RYWR.DGN.7180	WQM 425 Materials in Contact with Potable Water RA (Initial Assessment of Shortlisted Options)	10	0%	02-Feb-23	15-Feb-23	1918
RYWR.DGN.7220	Initial ALM Design Strategy	30	0%	02-Feb-23	15-Mar-23	1898
RYWR.DGN.7190	Mcerts Schematic Diagram (if applicable)	10	0%	16-Mar-23	29-Mar-23	1898
RYWR.DGN.7200	Process and Mechanical Equipment Specifications	30	0%	30-Mar-23	15-May-23	1898
RYWR.DGN.7420	Input to Technical Report / Works Specification	30	0%	30-Mar-23	15-May-23	1898
Electrical Designs		330		15-Mar-22	11-Jul-23	1858
RYWR.DGN.7430	Input to P&IDs	40	0%	15-Mar-22	12-May-22	1858
RYWR.DGN.7030	Preliminary Single Line Diagrams (All Shortlisted Options)	20	0%	13-May-22	13-Jun-22	1868
RYWR.DGN.7080	Outline ICA System Architecture Drawing	30	0%	13-May-22	27-Jun-22	1858
RYWR.DGN.7060	ECM 4006.2 (Details of New Supplies or Changes to Existing Supplies)	10	0%	28-Jun-22	11-Jul-22	1868
RYWR.DGN.7000	Preliminary Load Assessment / Schedule (All Shortlisted Options)	20	0%	28-Jun-22	25-Jul-22	1858
RYWR.DGN.7040	Preliminary Generator Sizing	20	0%	26-Jul-22	22-Aug-22	1878
RYWR.DGN.7150	MCC Sizes & Calculation	40	0%	26-Jul-22	20-Sep-22	1858
RYWR.DGN.7010	Telemetry Strategy	20	0%	21-Sep-22	18-Oct-22	1868
RYWR.DGN.7020	Preliminary Telemetry I/O Schedule	20	0%	21-Sep-22	18-Oct-22	1868
RYWR.DGN.7050	Preliminary Instrument Schedule	20	0%	21-Sep-22	18-Oct-22	1868
RYWR.DGN.7450	SCADA Strategy (Consultation with IT/OT)	30	0%	21-Sep-22	01-Nov-22	1858
RYWR.DGN.7100	Outline Electrical Layout Drawing(s)	30	0%	19-Oct-22	29-Nov-22	1868
RYWR.DGN.7160	M&E Equipment Layout	30	0%	02-Nov-22	13-Dec-22	1858
RYWR.DGN.7170	Initial Earthing Layout & Specification	20	0%	14-Dec-22	18-Jan-23	1868
RYWR.DGN.7110	Outline Electrical Site Plan (cable duct layout)	30	0%	14-Dec-22	01-Feb-23	1858
RYWR.DGN.7070	Outline Operation and Control Philosophy	20	0%	02-Feb-23	01-Mar-23	1858
RYWR.DGN.7090	Lighting calculations / drawings	20	0%	02-Mar-23	29-Mar-23	1858
RYWR.DGN.7130	Fire Alarm and Gas Detection Assessment	20	0%	02-Mar-23	29-Mar-23	1858
RYWR.DGN.7460	Lightning & Surge Protection Assessment	20	0%	02-Mar-23	29-Mar-23	1858
RYWR.DGN.7470	Local Isolator & Estop Assessment	20	0%	02-Mar-23	29-Mar-23	1858
RYWR.DGN.7120	BCDs (Block cable diagram)	20	0%	30-Mar-23	28-Apr-23	1878
RYWR.DGN.7140	Electrical Installation Specification	40	0%	30-Mar-23	30-May-23	1858
RYWR.DGN.7440	Input to Technical Report	30	0%	31-May-23	11-Jul-23	1858
Other Deliverables		270		06-Dec-21	12-Jan-23	1982
Site Information		189		06-Dec-21	13-Sep-22	2063
RYWR.DGN.6860	Existing Site Information	0	0%		06-Dec-21	2252
RYWR.DGN.6870	Utility Information Pack	0	0%		19-Jan-22	2226
RYWR.DGN.6840	Topographical Drawings - Site Plans and Longsections	0	0%		13-Sep-22	2063
RYWR.DGN.6850	Geotechnical and Geo-ennvironmental Interpretive Report	0	0%		13-Sep-22	2063
Works Information		204		20-Dec-21	18-Oct-22	2038
RYWR.DGN.6750	Site Layout - Indicative Route. Plan. Long Sections	0	0%		20-Dec-21	2242
RYWR.DGN.6730	Site Layout	0	0%		22-Mar-22	2182
RYWR.DGN.6740	The Boundary of the Site	0	0%		22-Mar-22	2182
RYWR.DGN.6760	Outline General Arrangement Drawings Proposed PS. Booster. HLPS. Valves etc	0	0%		22-Mar-22	2182
RYWR.DGN.7360	Civil Specification	30	0%	23-Mar-22	06-May-22	2152
RYWR.DGN.6770	Bentley Hydraulic Analysis Output Report	0	0%		18-Oct-22	2038
Pre-Construction		200		22-Mar-22	12-Jan-23	1982
RYWR.DGN.6880	HIC & Significant Risk Log	0	0%		22-Mar-22	2182
RYWR.DGN.6900	Initial HAZOP and ALM Study (SWIFT)	0	0%		22-Mar-22	2182
RYWR.DGN.6910	Draft H&S File / Report	0	0%		22-Mar-22	2182
RYWR.DGN.6920	Carbon Minimisation template	0	0%		22-Mar-22	2182
RYWR.DGN.6930	Site Waste Assessment	0	0%		22-Mar-22	2182
RYWR.DGN.6940	Offsite Assembly Assessment	0	0%		27-Apr-22	2158
RYWR.DGN.6960	MEICA Related - DSEAR and Potential Explosive Atmosphere Zone (PEAZ) RA & Drawing(s)	20	0%	28-Apr-22	26-May-22	2138
RYWR.DGN.6970	MEICA Related - ECM 4007 (Assessment of Requirement for Site Standby Power)	20	0%	28-Apr-22	26-May-22	2138



🟩 Remaining Work
🟥 Critical Remaining Work
◆ Milestone

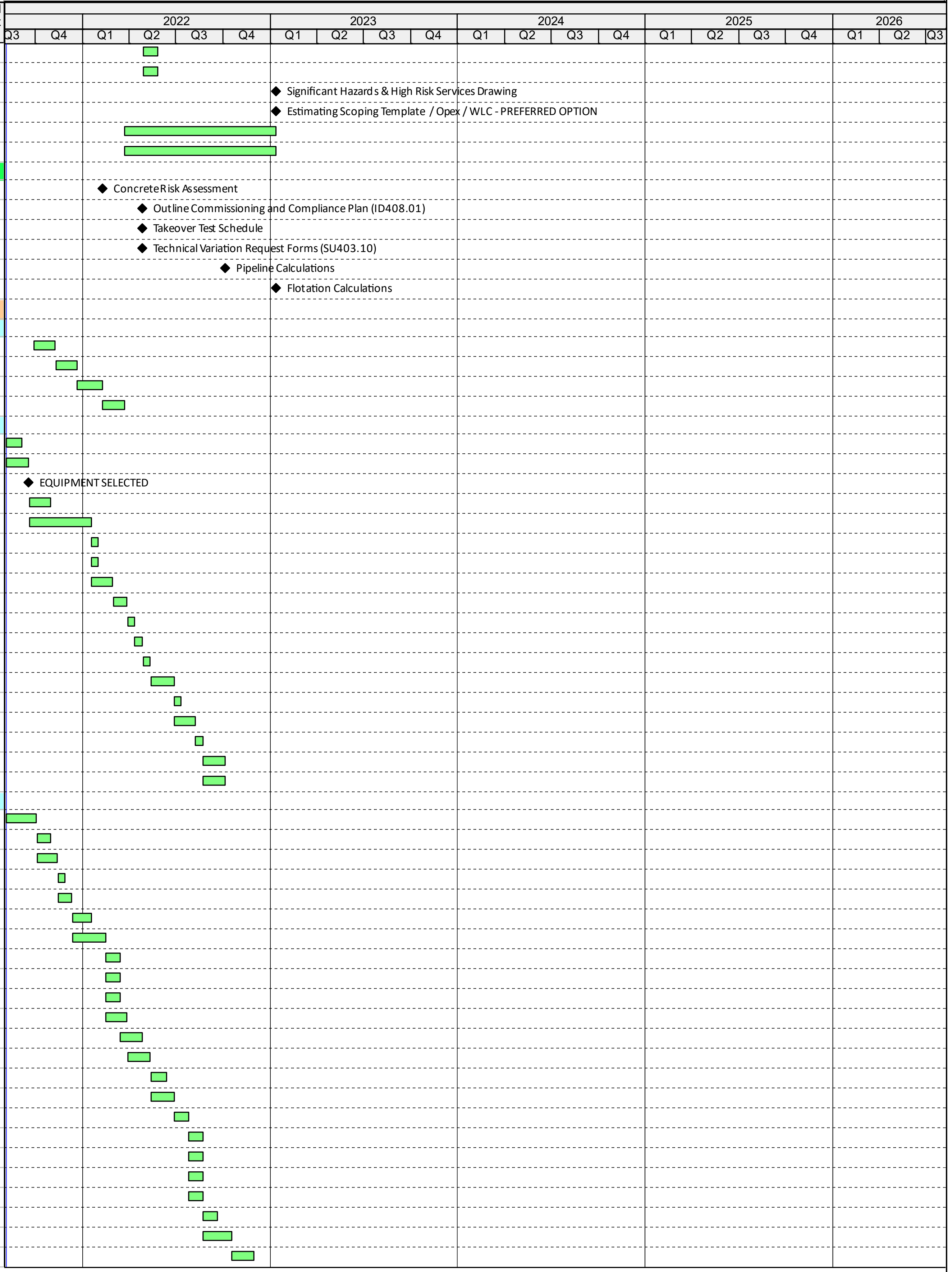
Project ID: 710060-2-2 CURR Standard Layout for Distribution

Date	Revision	Checked	Approved
25-Aug-21	WR (B5) Schedule for G1.5 Submission	DC	BM

Print: 25-Aug-21

What-if 1: WATER RECYCLING PLANT - OPTION B5 (ABE STAGE 1 - DPC PROCUREMENT ROUTE)
Progressed to 06-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
RYWR.DGN.6980	MEICA Related - Lightning Protection Risk Assessment	20	0%	28-Apr-22	26-May-22	2138
RYWR.DGN.6990	MEICA Related - Local Isolator / Emergency Stop Risk Assessment (MED4001)	20	0%	28-Apr-22	26-May-22	2138
RYWR.DGN.6890	Significant Hazards & High Risk Services Drawing	0	0%		12-Jan-23	1982
RYWR.DGN.6950	Estimating Scoping Template / Opex / WLC - PREFERRED OPTION	0	0%		12-Jan-23	1982
RYWR.DGN.7310	3D Model Layouts	200	0%	23-Mar-22	12-Jan-23	1982
RYWR.DGN.7320	Design Drawings to support the Planning DCO Process	200	0%	23-Mar-22	12-Jan-23	1982
Outline Operational Strategy		230		08-Feb-22	12-Jan-23	1982
RYWR.DGN.6830	Concrete Risk Assessment	0	0%		08-Feb-22	2212
RYWR.DGN.6780	Outline Commissioning and Compliance Plan (ID408.01)	0	0%		27-Apr-22	2158
RYWR.DGN.6790	Takeover Test Schedule	0	0%		27-Apr-22	2158
RYWR.DGN.6800	Technical Variation Request Forms (SU403.10)	0	0%		27-Apr-22	2158
RYWR.DGN.6810	Pipeline Calculations	0	0%		04-Oct-22	2048
RYWR.DGN.6820	Flotation Calculations	0	0%		12-Jan-23	1982
CONVEYANCE PIPEWORK PEEL COMMON TO WRP		356		06-Aug-21	12-Jan-23	1982
Civils Designs (more details to be developed)		120		28-Sep-21	22-Mar-22	1982
RYWR.DGN.8130	Initial Buildability Review	30	0%	28-Sep-21	08-Nov-21	1982
RYWR.DGN.8110	Pipeline Long Section Drawings	30	0%	09-Nov-21	20-Dec-21	1982
RYWR.DGN.8140	Estimate of Civil Structure Dimensions	30	0%	21-Dec-21	08-Feb-22	1982
RYWR.DGN.8100	Preliminary Pipe Routing 3D Model	30	0%	09-Feb-22	22-Mar-22	1982
Mechanical Designs		290		06-Aug-21	04-Oct-22	2048
RYWR.DGN.8010	Pump Sizing Calculations	20	0%	06-Aug-21	03-Sep-21	2058
RYWR.DGN.8150	Hydraulic Modelling	30	0%	06-Aug-21	17-Sep-21	2048
RYWR.DGN.8160	EQUIPMENT SELECTED	0	0%		17-Sep-21	2048
RYWR.DGN.8170	M&E Equipment Layout	30	0%	20-Sep-21	29-Oct-21	2098
RYWR.DGN.8050	Mechanical Input to P&ID	80	0%	20-Sep-21	17-Jan-22	2048
RYWR.DGN.8020	Pipework Pressure Ratings	10	0%	18-Jan-22	31-Jan-22	2068
RYWR.DGN.8030	Pipe Material Selection	10	0%	18-Jan-22	31-Jan-22	2068
RYWR.DGN.7970	Preliminary Pipe, Valve and Actuator Schedule	30	0%	18-Jan-22	28-Feb-22	2048
RYWR.DGN.8090	Surge Protection Equipment Specification	20	0%	01-Mar-22	28-Mar-22	2048
RYWR.DGN.8060	Initial HVAC Systems Design Strategy	10	0%	29-Mar-22	11-Apr-22	2048
RYWR.DGN.7990	Initial Lifting Schedule	10	0%	12-Apr-22	27-Apr-22	2048
RYWR.DGN.8000	Critical Spares Assessment (MED4900) & Maintenance Assessment (MED4002)	10	0%	28-Apr-22	12-May-22	2048
RYWR.DGN.8040	Plant Specification / Data Sheet	30	0%	13-May-22	27-Jun-22	2048
RYWR.DGN.7940	WQM 425 Materials in Contact with Potable Water RA (Initial Assessment of Shortlisted Options)	10	0%	28-Jun-22	11-Jul-22	2068
RYWR.DGN.7980	Initial ALM Design Strategy	30	0%	28-Jun-22	08-Aug-22	2048
RYWR.DGN.7950	Mcerts Schematic Diagram (if applicable)	10	0%	09-Aug-22	22-Aug-22	2048
RYWR.DGN.7960	Process and Mechanical Equipment Specifications	30	0%	23-Aug-22	04-Oct-22	2048
RYWR.DGN.8180	Input to Technical Report / Works Specification	30	0%	23-Aug-22	04-Oct-22	2048
Electrical Designs		330		06-Aug-21	29-Nov-22	2008
RYWR.DGN.8190	Input to P&IDs	40	0%	06-Aug-21	01-Oct-21	2008
RYWR.DGN.7790	Preliminary Single Line Diagrams (All Shortlisted Options)	20	0%	04-Oct-21	29-Oct-21	2018
RYWR.DGN.7840	Outline ICA System Architecture Drawing	30	0%	04-Oct-21	12-Nov-21	2008
RYWR.DGN.7820	ECM 4006.2 (Details of New Supplies or Changes to Existing Supplies)	10	0%	15-Nov-21	26-Nov-21	2018
RYWR.DGN.7760	Preliminary Load Assessment / Schedule (All Shortlisted Options)	20	0%	15-Nov-21	10-Dec-21	2008
RYWR.DGN.7800	Preliminary Generator Sizing	20	0%	13-Dec-21	17-Jan-22	2028
RYWR.DGN.7910	MCC Sizes & Calculation	40	0%	13-Dec-21	14-Feb-22	2008
RYWR.DGN.7770	Telemetry Strategy	20	0%	15-Feb-22	14-Mar-22	2018
RYWR.DGN.7780	Preliminary Telemetry I/O Schedule	20	0%	15-Feb-22	14-Mar-22	2018
RYWR.DGN.7810	Preliminary Instrument Schedule	20	0%	15-Feb-22	14-Mar-22	2018
RYWR.DGN.8210	SCADA Strategy (Consultation with IT/OT)	30	0%	15-Feb-22	28-Mar-22	2008
RYWR.DGN.7860	Outline Electrical Layout Drawing(s)	30	0%	15-Mar-22	27-Apr-22	2018
RYWR.DGN.7920	M&E Equipment Layout	30	0%	29-Mar-22	12-May-22	2008
RYWR.DGN.7930	Initial Earthing Layout & Specification	20	0%	13-May-22	13-Jun-22	2018
RYWR.DGN.7870	Outline Electrical Site Plan (cable duct layout)	30	0%	13-May-22	27-Jun-22	2008
RYWR.DGN.7830	Outline Operation and Control Philosophy	20	0%	28-Jun-22	25-Jul-22	2008
RYWR.DGN.7850	Lighting calculations / drawings	20	0%	26-Jul-22	22-Aug-22	2008
RYWR.DGN.7890	Fire Alarm and Gas Detection Assessment	20	0%	26-Jul-22	22-Aug-22	2008
RYWR.DGN.8220	Lightning & Surge Protection Assessment	20	0%	26-Jul-22	22-Aug-22	2008
RYWR.DGN.8230	Local Isolator & Estop Assessment	20	0%	26-Jul-22	22-Aug-22	2008
RYWR.DGN.7880	BCDs (Block cable diagram)	20	0%	23-Aug-22	20-Sep-22	2028
RYWR.DGN.7900	Electrical Installation Specification	40	0%	23-Aug-22	18-Oct-22	2008
RYWR.DGN.8200	Input to Technical Report	30	0%	19-Oct-22	29-Nov-22	2008



🟩 Remaining Work
🟥 Critical Remaining Work
◆ ◆ Milestone

Project ID: 710060-2-2 CURR Standard Layout for Distribution

Date	Revision	Checked	Approved
25-Aug-21	WR (B5) Schedule for G1.5 Submission	DC	BM

Print: 25-Aug-21

What-if 1: WATER RECYCLING PLANT - OPTION B5 (ABE STAGE 1 - DPC PROCUREMENT ROUTE)

Progressed to 06-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
Other Deliverables		326		17-Sep-21	12-Jan-23	1982
Site Information		189		06-Dec-21	13-Sep-22	2063
RYWR.DGN.7620	Existing Site Information	0	0%		06-Dec-21	2252
RYWR.DGN.7630	Utility Information Pack	0	0%		19-Jan-22	2226
RYWR.DGN.7600	Topographical Drawings - Site Plans and Longsections	0	0%		13-Sep-22	2063
RYWR.DGN.7610	Geotechnical and Geo-ennvironmental Interpretive Report	0	0%		13-Sep-22	2063
Works Information		90		20-Dec-21	06-May-22	2152
RYWR.DGN.7510	Site Layout - Indicative Route. Plan. Long Sections	0	0%		20-Dec-21	2242
RYWR.DGN.7530	Bentley Hydraulic Analysis Output Report	0	0%		14-Mar-22	2188
RYWR.DGN.7490	Site Layout	0	0%		22-Mar-22	2182
RYWR.DGN.7500	The Boundary of the Site	0	0%		22-Mar-22	2182
RYWR.DGN.7520	Outline General Arrangement Drawings Proposed PS. Booster. HLPS. Valves etc	0	0%		22-Mar-22	2182
RYWR.DGN.8120	Civil Specification	30	0%	23-Mar-22	06-May-22	2152
Pre-Construction		326		17-Sep-21	12-Jan-23	1982
RYWR.DGN.7700	Offsite Assembly Assessment	0	0%		17-Sep-21	2308
RYWR.DGN.7720	MEICA Related - DSEAR and Potential Explosive Atmosphere Zone (PEAZ) RA & Drawing(s)	20	0%	20-Sep-21	15-Oct-21	2288
RYWR.DGN.7730	MEICA Related - ECM 4007 (Assessment of Requirement for Site Standby Power)	20	0%	20-Sep-21	15-Oct-21	2288
RYWR.DGN.7740	MEICA Related - Lightning Protection Risk Assessment	20	0%	20-Sep-21	15-Oct-21	2288
RYWR.DGN.7750	MEICA Related - Local Isolator / Emergency Stop Risk Assessment (MED4001)	20	0%	20-Sep-21	15-Oct-21	2288
RYWR.DGN.7640	HIC & Significant Risk Log	0	0%		22-Mar-22	2182
RYWR.DGN.7660	Initial HAZOP and ALM Study (SWIFT)	0	0%		22-Mar-22	2182
RYWR.DGN.7670	Draft H&S File / Report	0	0%		22-Mar-22	2182
RYWR.DGN.7680	Carbon Minimisation template	0	0%		22-Mar-22	2182
RYWR.DGN.7690	Site Waste Assessment	0	0%		22-Mar-22	2182
RYWR.DGN.7650	Significant Hazards & High Risk Services Drawing	0	0%		12-Jan-23	1982
RYWR.DGN.7710	Estimating Scoping Template / Opex / WLC - PREFERRED OPTION	0	0%		12-Jan-23	1982
RYWR.DGN.8070	3D Model Layouts	200	0%	23-Mar-22	12-Jan-23	1982
RYWR.DGN.8080	Design Drawings to support the Planning DCO Process	200	0%	23-Mar-22	12-Jan-23	1982
Outline Operational Strategy		326		17-Sep-21	12-Jan-23	1982
RYWR.DGN.7540	Outline Commissioning and Compliance Plan (ID408.01)	0	0%		17-Sep-21	2308
RYWR.DGN.7550	Takeover Test Schedule	0	0%		17-Sep-21	2308
RYWR.DGN.7560	Technical Variation Request Forms (SU403.10)	0	0%		17-Sep-21	2308
RYWR.DGN.7590	Concrete Risk Assessment	0	0%		08-Feb-22	2212
RYWR.DGN.7570	Pipeline Calculations	0	0%		28-Feb-22	2198
RYWR.DGN.7580	Flotation Calculations	0	0%		12-Jan-23	1982
BREAK PRESSURE TANK BETWEEN WRP AND OTTERBOURNE		356		06-Aug-21	12-Jan-23	1982
Civils Designs (more details to be developed)		120		28-Sep-21	22-Mar-22	1982
RYWR.DGN.8890	Initial Buildability Review	30	0%	28-Sep-21	08-Nov-21	1982
RYWR.DGN.8870	Pipeline Long Section Drawings	30	0%	09-Nov-21	20-Dec-21	1982
RYWR.DGN.8900	Estimate of Civil Structure Dimensions	30	0%	21-Dec-21	08-Feb-22	1982
RYWR.DGN.8860	Preliminary Pipe Routing 3D Model	30	0%	09-Feb-22	22-Mar-22	1982
Mechanical Designs		290		06-Aug-21	04-Oct-22	2048
RYWR.DGN.8770	Pump Sizing Calculations	20	0%	06-Aug-21	03-Sep-21	2058
RYWR.DGN.8910	Hydraulic Modelling	30	0%	06-Aug-21	17-Sep-21	2048
RYWR.DGN.8920	EQUIPMENT SELECTED	0	0%		17-Sep-21	2048
RYWR.DGN.8930	M&E Equipment Layout	30	0%	20-Sep-21	29-Oct-21	2098
RYWR.DGN.8810	Mechanical Input to P&ID	80	0%	20-Sep-21	17-Jan-22	2048
RYWR.DGN.8780	Pipework Pressure Ratings	10	0%	18-Jan-22	31-Jan-22	2068
RYWR.DGN.8790	Pipe Material Selection	10	0%	18-Jan-22	31-Jan-22	2068
RYWR.DGN.8730	Preliminary Pipe, Valve and Actuator Schedule	30	0%	18-Jan-22	28-Feb-22	2048
RYWR.DGN.8850	Surge Protection Equipment Specification	20	0%	01-Mar-22	28-Mar-22	2048
RYWR.DGN.8820	Initial HVAC Systems Design Strategy	10	0%	29-Mar-22	11-Apr-22	2048
RYWR.DGN.8750	Initial Lifting Schedule	10	0%	12-Apr-22	27-Apr-22	2048
RYWR.DGN.8760	Critical Spares Assessment (MED4900) & Maintenance Assessment (MED4002)	10	0%	28-Apr-22	12-May-22	2048
RYWR.DGN.8800	Plant Specification / Data Sheet	30	0%	13-May-22	27-Jun-22	2048
RYWR.DGN.8700	WQM 425 Materials in Contact with Potable Water RA (Initial Assessment of Shortlisted Options)	10	0%	28-Jun-22	11-Jul-22	2068
RYWR.DGN.8740	Initial ALM Design Strategy	30	0%	28-Jun-22	08-Aug-22	2048
RYWR.DGN.8710	Mcerts Schematic Diagram (if applicable)	10	0%	09-Aug-22	22-Aug-22	2048
RYWR.DGN.8720	Process and Mechanical Equipment Specifications	30	0%	23-Aug-22	04-Oct-22	2048
RYWR.DGN.8940	Input to Technical Report / Works Specification	30	0%	23-Aug-22	04-Oct-22	2048
Electrical Designs		330		06-Aug-21	29-Nov-22	2008
RYWR.DGN.8950	Input to P&IDs	40	0%	06-Aug-21	01-Oct-21	2008
RYWR.DGN.8550	Preliminary Single Line Diagrams (All Shortlisted Options)	20	0%	04-Oct-21	29-Oct-21	2018

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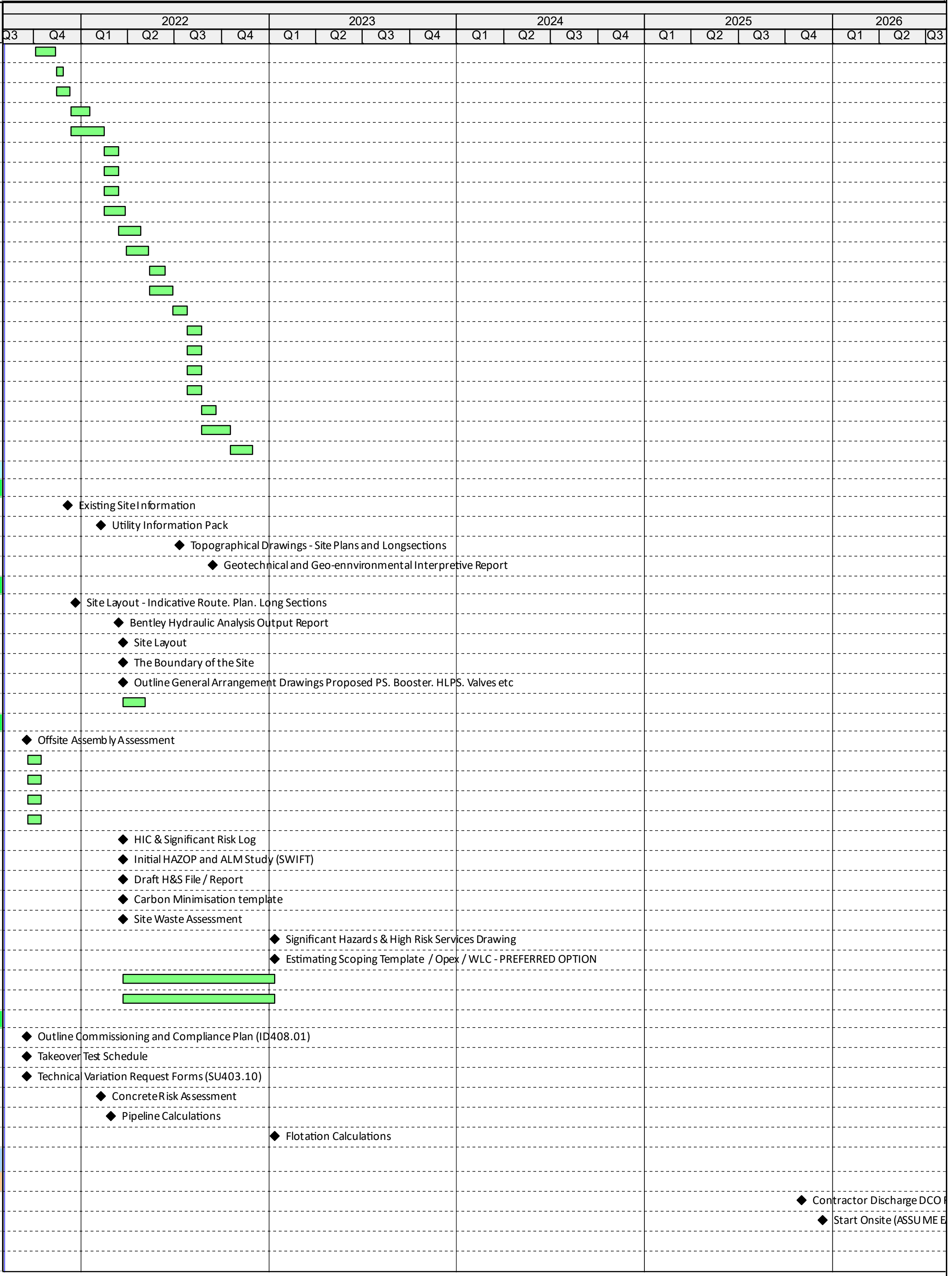
What-if 1: WATER RECYCLING PLANT - OPTION B5 (ABE STAGE 1 - DPC PROCUREMENT ROUTE)
Progressed to 06-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
RYWR.DGN.8600	Outline ICA System Architecture Drawing	30	0%	04-Oct-21	12-Nov-21	2008
RYWR.DGN.8580	ECM 4006.2 (Details of New Supplies or Changes to Existing Supplies)	10	0%	15-Nov-21	26-Nov-21	2018
RYWR.DGN.8520	Preliminary Load Assessment / Schedule (All Shortlisted Options)	20	0%	15-Nov-21	10-Dec-21	2008
RYWR.DGN.8560	Preliminary Generator Sizing	20	0%	13-Dec-21	17-Jan-22	2028
RYWR.DGN.8670	MCC Sizes & Calculation	40	0%	13-Dec-21	14-Feb-22	2008
RYWR.DGN.8530	Telemetry Strategy	20	0%	15-Feb-22	14-Mar-22	2018
RYWR.DGN.8540	Preliminary Telemetry I/O Schedule	20	0%	15-Feb-22	14-Mar-22	2018
RYWR.DGN.8570	Preliminary Instrument Schedule	20	0%	15-Feb-22	14-Mar-22	2018
RYWR.DGN.8970	SCADA Strategy (Consultation with IT/OT)	30	0%	15-Feb-22	28-Mar-22	2008
RYWR.DGN.8620	Outline Electrical Layout Drawing(s)	30	0%	15-Mar-22	27-Apr-22	2018
RYWR.DGN.8680	M&E Equipment Layout	30	0%	29-Mar-22	12-May-22	2008
RYWR.DGN.8690	Initial Earthing Layout & Specification	20	0%	13-May-22	13-Jun-22	2018
RYWR.DGN.8630	Outline Electrical Site Plan (cable duct layout)	30	0%	13-May-22	27-Jun-22	2008
RYWR.DGN.8590	Outline Operation and Control Philosophy	20	0%	28-Jun-22	25-Jul-22	2008
RYWR.DGN.8610	Lighting calculations / drawings	20	0%	26-Jul-22	22-Aug-22	2008
RYWR.DGN.8650	Fire Alarm and Gas Detection Assessment	20	0%	26-Jul-22	22-Aug-22	2008
RYWR.DGN.8980	Lightning & Surge Protection Assessment	20	0%	26-Jul-22	22-Aug-22	2008
RYWR.DGN.8990	Local Isolator & Estop Assessment	20	0%	26-Jul-22	22-Aug-22	2008
RYWR.DGN.8640	BCDs (Block cable diagram)	20	0%	23-Aug-22	20-Sep-22	2028
RYWR.DGN.8660	Electrical Installation Specification	40	0%	23-Aug-22	18-Oct-22	2008
RYWR.DGN.8960	Input to Technical Report	30	0%	19-Oct-22	29-Nov-22	2008
Other Deliverables		**326**		**17-Sep-21**	**12-Jan-23**	**1982**
Site Information		**189**		**06-Dec-21**	**13-Sep-22**	**2063**
RYWR.DGN.8380	Existing Site Information	0	0%		06-Dec-21	2252
RYWR.DGN.8390	Utility Information Pack	0	0%		08-Feb-22	2212
RYWR.DGN.8360	Topographical Drawings - Site Plans and Longsections	0	0%		11-Jul-22	2108
RYWR.DGN.8370	Geotechnical and Geo-ennvironmental Interpretive Report	0	0%		13-Sep-22	2063
Works Information		**90**		**20-Dec-21**	**06-May-22**	**2152**
RYWR.DGN.8270	Site Layout - Indicative Route. Plan. Long Sections	0	0%		20-Dec-21	2242
RYWR.DGN.8290	Bentley Hydraulic Analysis Output Report	0	0%		14-Mar-22	2188
RYWR.DGN.8250	Site Layout	0	0%		22-Mar-22	2182
RYWR.DGN.8260	The Boundary of the Site	0	0%		22-Mar-22	2182
RYWR.DGN.8280	Outline General Arrangement Drawings Proposed PS. Booster. HLPS. Valves etc	0	0%		22-Mar-22	2182
RYWR.DGN.8880	Civil Specification	30	0%	23-Mar-22	06-May-22	2152
Pre-Construction		**326**		**17-Sep-21**	**12-Jan-23**	**1982**
RYWR.DGN.8460	Offsite Assembly Assessment	0	0%		17-Sep-21	2308
RYWR.DGN.8480	MEICA Related - DSEAR and Potential Explosive Atmosphere Zone (PEAZ) RA & Drawing(s)	20	0%	20-Sep-21	15-Oct-21	2288
RYWR.DGN.8490	MEICA Related - ECM 4007 (Assessment of Requirement for Site Standby Power)	20	0%	20-Sep-21	15-Oct-21	2288
RYWR.DGN.8500	MEICA Related - Lightning Protection Risk Assessment	20	0%	20-Sep-21	15-Oct-21	2288
RYWR.DGN.8510	MEICA Related - Local Isolator / Emergency Stop Risk Assessment (MED4001)	20	0%	20-Sep-21	15-Oct-21	2288
RYWR.DGN.8400	HIC & Significant Risk Log	0	0%		22-Mar-22	2182
RYWR.DGN.8420	Initial HAZOP and ALM Study (SWIFT)	0	0%		22-Mar-22	2182
RYWR.DGN.8430	Draft H&S File / Report	0	0%		22-Mar-22	2182
RYWR.DGN.8440	Carbon Minimisation template	0	0%		22-Mar-22	2182
RYWR.DGN.8450	Site Waste Assessment	0	0%		22-Mar-22	2182
RYWR.DGN.8410	Significant Hazards & High Risk Services Drawing	0	0%		12-Jan-23	1982
RYWR.DGN.8470	Estimating Scoping Template / Opex / WLC - PREFERRED OPTION	0	0%		12-Jan-23	1982
RYWR.DGN.8830	3D Model Layouts	200	0%	23-Mar-22	12-Jan-23	1982
RYWR.DGN.8840	Design Drawings to support the Planning DCO Process	200	0%	23-Mar-22	12-Jan-23	1982
Outline Operational Strategy		**326**		**17-Sep-21**	**12-Jan-23**	**1982**
RYWR.DGN.8300	Outline Commissioning and Compliance Plan (ID408.01)	0	0%		17-Sep-21	2308
RYWR.DGN.8310	Takeover Test Schedule	0	0%		17-Sep-21	2308
RYWR.DGN.8320	Technical Variation Request Forms (SU403.10)	0	0%		17-Sep-21	2308
RYWR.DGN.8350	Concrete Risk Assessment	0	0%		08-Feb-22	2212
RYWR.DGN.8330	Pipeline Calculations	0	0%		28-Feb-22	2198
RYWR.DGN.8340	Flotation Calculations	0	0%		12-Jan-23	1982
POST-CONTRACT AWARD (DPC ROUTE)		**1280**		**31-Oct-25**	**16-Dec-30**	**0**
KEY MILESTONES		**1280**		**31-Oct-25**	**16-Dec-30**	**0**
4	Contractor Discharge DCO Requirement	0	0%		31-Oct-25	0
5	Start Onsite (ASSUME EARLIEST START ON SITE)	0	0%	12-Dec-25		830
6	Start Commissioning	0	0%	16-May-30		0
7	Water Into Supply	0	0%	09-Aug-30		0



🟩 Remaining Work
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What-if 1: WATER RECYCLING PLANT - OPTION B5 (ABE STAGE 1 - DPC PROCUREMENT ROUTE)

Progressed to 06-Aug-21

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Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
8	Benefit Realisation Commence	0	0%	16-Dec-30		0
BUDDS FARM TO WRP		605		31-Oct-25	06-Apr-28	525
Site Investigations		20		31-Oct-25	28-Nov-25	525
17	Site Investigations	20	0%	31-Oct-25	28-Nov-25	525
Design		60		28-Nov-25	03-Mar-26	525
19	Design	60	0%	28-Nov-25	03-Mar-26	525
Construction		525		03-Mar-26	06-Apr-28	525
21	Shafts and Twin Pipe Jack Construction	525	0%	03-Mar-26	06-Apr-28	525
ENVIRONMENTAL BUFFER LAKE AT OTTERBOURNE PRE-DISINFECTION PLANT		380		31-Oct-25	17-May-27	750
Site Investigation		20		31-Oct-25	28-Nov-25	750
30	Site Investigations	20	0%	31-Oct-25	28-Nov-25	750
Design		50		31-Oct-25	20-Jan-26	890
32	Process Design	30	0%	31-Oct-25	12-Dec-25	830
33	Civil Design	30	0%	28-Nov-25	20-Jan-26	860
34	Mechanical Design	30	0%	28-Nov-25	20-Jan-26	890
35	Electrical Design	30	0%	28-Nov-25	20-Jan-26	750
Procurement		80		20-Jan-26	15-May-26	950
42	Trnfr Pumps - Lead Time	60	0%	20-Jan-26	16-Apr-26	910
49	Step Down Trnfmr - Lead Time	60	0%	20-Jan-26	16-Apr-26	970
56	MCC - Lead Time	60	0%	20-Jan-26	16-Apr-26	750
63	Valves - Lead Time	80	0%	20-Jan-26	15-May-26	890
Constructions		350		12-Dec-25	17-May-27	750
66	Start Onsite	0	0%	12-Dec-25		830
67	Site Clearance and Compound Set Up	50	0%	16-Apr-26	29-Jun-26	750
68	Bulk Earthworks	60	0%	29-Jun-26	22-Sep-26	750
69	Civil Construction (PS/ Lining Lake/ Chambers)	50	0%	22-Sep-26	01-Dec-26	750
70	Transfer Pumping Station - M&E Install and Dry Commissioning (inc MCC)	60	0%	01-Dec-26	03-Mar-27	750
71	Step Down Transformer Install	30	0%	03-Mar-27	16-Apr-27	750
72	Roads/ Paths/ Security and Finishes works	20	0%	16-Apr-27	17-May-27	750
73	Works ready for Wet Commissioning	0	0%	17-May-27		750
PEEL COMMON PUMPING STATION		460		31-Oct-25	08-Sep-27	670
Site Investigation		20		31-Oct-25	28-Nov-25	670
109	Site Investigations	20	0%	31-Oct-25	28-Nov-25	670
Design		160		31-Oct-25	29-Jun-26	670
111	Process Design	60	0%	31-Oct-25	03-Feb-26	670
112	Civil Design	40	0%	03-Feb-26	31-Mar-26	670
113	Mechanical Design	40	0%	31-Mar-26	01-Jun-26	670
114	Electrical Design	20	0%	01-Jun-26	29-Jun-26	670
Procurement		150		01-Jun-26	06-Jan-27	710
121	Budd Farm Transfer Pumps - Lead Time	100	0%	01-Jun-26	20-Oct-26	720
128	HV Incomer & Trnfmr - Lead Time	130	0%	01-Jun-26	01-Dec-26	730
135	MCC - Lead Time	130	0%	29-Jun-26	06-Jan-27	670
Construction		360		31-Mar-26	08-Sep-27	670
138	Site Clearance and Compound Set Up	12	0%	31-Mar-26	20-Apr-26	703
139	Earthworks	5	0%	20-Apr-26	27-Apr-26	703
140	Civil Construction	140	0%	27-Apr-26	12-Nov-26	703
141	M&E Install	40	0%	06-Jan-27	03-Mar-27	670
142	HV Incomer and New Transformer Install	120	0%	03-Mar-27	24-Aug-27	670
143	Dry Commissioning	10	0%	24-Aug-27	08-Sep-27	670
144	Ready for Wet Commissioning	0	0%	08-Sep-27		670
WATER RECYCLING PLANT SITE 72		690		31-Oct-25	09-Aug-28	590
Site Investigation		60		23-Dec-25	26-Mar-26	483
153	Site Investigations	60	0%	23-Dec-25	26-Mar-26	483
Catchment Water Quality Sampling		180		31-Oct-25	27-Jul-26	440
155	Water quality sampling	180	0%	31-Oct-25	27-Jul-26	440
Designs		390		31-Oct-25	01-Jun-27	440
158A	Civil Design (Sufficient to START ON SITE)	60	0%	26-Mar-26	24-Jun-26	483
158	Civil Design (Remaining Designs)	160	0%	24-Jun-26	12-Feb-27	483
159	Mechanical Design (52w)	260	0%	03-Feb-26	17-Feb-27	440
160	Electrical Design (52w)	260	0%	30-Apr-26	17-May-27	440
157	Process Design (78w)	390	0%	31-Oct-25	01-Jun-27	440
Procurement		190		17-Feb-27	17-Nov-27	635
190	MicroFiltration CIP Tank Heater - Lead Time	60	0%	17-Feb-27	17-May-27	660
197	MicroFiltration CIP/EFM Recycle Pumps - Lead Time	60	0%	17-Feb-27	17-May-27	660

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What-if 1: WATER RECYCLING PLANT - OPTION B5 (ABE STAGE 1 - DPC PROCUREMENT ROUTE)

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Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
204	MicroFiltration Backwash Pumps - Lead Time	60	0%	17-Feb-27	17-May-27	660
211	MicroFiltration CIP/EFM Makeup Tank Mxr - Lead Time	60	0%	17-Feb-27	17-May-27	660
218	MicroFiltration Air Scour Blowers - Lead Time	60	0%	17-Feb-27	17-May-27	660
247	RO 1st Interstage Booster Pumps - Lead Time	60	0%	17-Feb-27	17-May-27	660
254	RO 2nd Interstage Booster Pumps - Lead Time	60	0%	17-Feb-27	17-May-27	660
261	RO CIP Recycle Pumps - Lead Time	60	0%	17-Feb-27	17-May-27	660
268	RO CIP Make-up Tank Mxr - Lead Time	60	0%	17-Feb-27	17-May-27	660
275	RO CIP Make-up Tank Heater - Lead Time	60	0%	17-Feb-27	17-May-27	660
282	RO CIP Pumps - Lead Time	60	0%	17-Feb-27	17-May-27	660
289	RO Permeate Flush Pumps - Lead Time	60	0%	17-Feb-27	17-May-27	660
296	RO/UF Bldg Gantry Crane - Lead Time	60	0%	17-Feb-27	17-May-27	645
325	UV Building Gantry Crane - Lead Time	60	0%	17-Feb-27	17-May-27	645
332	UV Bldg Vent Fans - Lead Time	60	0%	17-Feb-27	17-May-27	600
347	CO2 Carrier Water Feed Pump - Lead Time	60	0%	17-Feb-27	17-May-27	670
482	Service Wtr R/M Bstr Pumps - Lead Time	60	0%	17-Feb-27	17-May-27	640
490	Insoluble Waste Pumps - Lead Time	60	0%	17-Feb-27	17-May-27	670
183	MicroFiltration Plant Feed Pumps - Lead Time	80	0%	17-Feb-27	15-Jun-27	640
233	RO Trnfr Pumps - Lead Time	80	0%	17-Feb-27	15-Jun-27	640
240	RO Feed Pumps - Lead Time	80	0%	17-Feb-27	15-Jun-27	640
361	CO2 Evaporators - Lead Time	80	0%	17-Feb-27	15-Jun-27	650
497	Waste Transfer Pumps - Lead Time	80	0%	17-Feb-27	15-Jun-27	650
168	Raw Water Intake Pump - Lead Time	100	0%	17-Feb-27	13-Jul-27	620
439	Lime Silo Vibrating Bin Activators - Lead Time	100	0%	17-Feb-27	13-Jul-27	600
446	Lime Silo Powder Auger - Lead Time	100	0%	17-Feb-27	13-Jul-27	600
453	Lime Slurry Tank Impeller - Lead Time	100	0%	17-Feb-27	13-Jul-27	600
460	Lime Slurry Augers -Lead Time	100	0%	17-Feb-27	13-Jul-27	600
467	Lime Saturator Rake Drives -Lead Time	100	0%	17-Feb-27	13-Jul-27	600
303	RO/UF Bldg Vent Fans - Lead Time	60	0%	17-May-27	10-Aug-27	540
505	Treated Water Pumps (HLPS) - Lead Time	135	0%	17-Feb-27	01-Sep-27	644
318	UV Reactors - Lead Time	80	0%	17-May-27	08-Sep-27	580
399	Hydrogen Peroxide Dosing System - Lead Time	80	0%	01-Jun-27	22-Sep-27	600
407	Sodium Hydroxide Dosing System - Lead Time	80	0%	01-Jun-27	22-Sep-27	600
175	Raw Water Intake PS MCC - Lead Time	100	0%	17-May-27	06-Oct-27	485
225	MicroFiltration MCC - Lead Time	100	0%	17-May-27	06-Oct-27	560
310	Chem Dosing and RO MCC - Lead Time	100	0%	17-May-27	06-Oct-27	560
339	UV Building MCC - Lead Time	100	0%	17-May-27	06-Oct-27	665
354	CO2 MCC - Lead Time	100	0%	17-May-27	06-Oct-27	485
512	HLPS MCC - Lead Time	100	0%	17-May-27	06-Oct-27	485
423	Antiscalant Dosing System - Lead Time	95	0%	01-Jun-27	13-Oct-27	585
368	CO2 Dosing System - Lead Time	110	0%	01-Jun-27	03-Nov-27	550
415	Sodium Bisulphite Dosing System - Lead Time	110	0%	01-Jun-27	03-Nov-27	550
431	Hydrochloric Acid Dosing System - Lead Time	110	0%	01-Jun-27	03-Nov-27	550
376	Sodium Hypocholorite - Sodium Dosing System - Lead Time	115	0%	01-Jun-27	10-Nov-27	565
383	Sodium Hypocholorite Chiller System - Lead Time	115	0%	01-Jun-27	10-Nov-27	565
391	Citric Acid Dosing System - Lead Time	115	0%	01-Jun-27	10-Nov-27	565
474	Lime Dosing System - Lead Time	115	0%	01-Jun-27	10-Nov-27	515
520	HV Switchgear - Lead Time	130	0%	17-May-27	17-Nov-27	440
527	Transformers - Lead Time	130	0%	17-May-27	17-Nov-27	440
534	Generators - Lead Time	130	0%	17-May-27	17-Nov-27	440
Construction		690		31-Oct-25	09-Aug-28	590
Early Works		316		31-Oct-25	11-Feb-27	523
538	Site Clearance and Compound Set Up	40	0%	31-Oct-25	06-Jan-26	640
539	Bulk Earthworks	32	0%	24-Jun-26	07-Aug-26	523
540	Piling	127	0%	07-Aug-26	11-Feb-27	523
East Section		298		12-Feb-27	24-Apr-28	485
Civil Works		195		12-Feb-27	19-Nov-27	588
543	Intake Pumping Station Building/ Chamber	40	0%	12-Feb-27	13-Apr-27	483
544	Buffer Tanks and MPR// ROC Slabs	25	0%	13-Apr-27	19-May-27	483
545	Lime & Co2 Process Slabs	30	0%	19-May-27	01-Jul-27	483
546	Inlet Buffer Tank/ MFR/ROC Tank Construction	130	0%	19-May-27	19-Nov-27	588
Mechanical & Electrical Cabling Works		185		15-Jun-27	09-Mar-28	515
644	Buffer Tank MPR . ROC	50	0%	15-Jun-27	24-Aug-27	650

🟩	Remaining Work
🟥	Critical Remaining Work
◆ ◆	Milestone

Date	Revision	Checked	Approved
25-Aug-21	WR (B5) Schedule for G1.5 Submission	DC	BM

What-if 1: WATER RECYCLING PLANT - OPTION B5 (ABE STAGE 1 - DPC PROCUREMENT ROUTE)

Progressed to 06-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
550	Intake Pumping Station	60	0%	13-Jul-27	06-Oct-27	620
549	Co2 Process	50	0%	03-Nov-27	20-Jan-28	550
548	Lime Process	80	0%	10-Nov-27	09-Mar-28	515
Electrical & ICA Works		135		06-Oct-27	24-Apr-28	485
552	MCC and Transformer Installation	135	0%	06-Oct-27	24-Apr-28	485
Main Building		298		12-Feb-27	24-Apr-28	665
Civil Works		141		12-Feb-27	06-Sep-27	522
555	Main Building Slab (include HCl & Chemical dosing Slabs)	66	0%	12-Feb-27	20-May-27	522
557	MFF Tank Slab	23	0%	01-Jul-27	03-Aug-27	483
556	Main building and Gantry construction	75	0%	20-May-27	06-Sep-27	522
Mechanical and Electrical Cabling Works		120		06-Sep-27	29-Feb-28	522
561	UVAOP	60	0%	08-Sep-27	01-Dec-27	580
563	Main Building Gantry	75	0%	06-Sep-27	20-Dec-27	567
559	Microfiltration	60	0%	06-Oct-27	06-Jan-28	560
560	Reverse Osmosis Plant	60	0%	06-Oct-27	06-Jan-28	560
562	Main Building M&E	120	0%	06-Sep-27	29-Feb-28	522
Electrical & ICA Works		135		06-Oct-27	24-Apr-28	665
565	MCC and Transformer Installation	135	0%	06-Oct-27	24-Apr-28	665
North Section		203		01-Jul-27	24-Apr-28	485
Civil Works		40		01-Jul-27	26-Aug-27	483
568	Treated Water Tank Slabs	24	0%	01-Jul-27	04-Aug-27	499
569	HLPS and Bases	40	0%	01-Jul-27	26-Aug-27	483
Mechanical and Electrical Cabling Works		20		04-Aug-27	02-Sep-27	644
571	Treated Water Tanks	1	0%	04-Aug-27	05-Aug-27	663
572	Treated Water HLPS	1	0%	01-Sep-27	02-Sep-27	644
Electrical & ICA Works		135		06-Oct-27	24-Apr-28	485
574	MCC and Transformer Installation	135	0%	06-Oct-27	24-Apr-28	485
South West Section		165		26-Aug-27	26-Apr-28	483
Civil Works		130		26-Aug-27	06-Mar-28	518
578	Fuel, Generator, Incoming Transformer Telecoms Slab	35	0%	26-Aug-27	15-Oct-27	483
577	Admin Building (including building services)	130	0%	26-Aug-27	06-Mar-28	518
Mechanical and Electrical Cabling Works		130		15-Oct-27	26-Apr-28	483
580	Telecoms	130	0%	15-Oct-27	26-Apr-28	483
Chemical Dosing Section		145		22-Sep-27	24-Apr-28	485
Mechanical and Electrical Cabling Works		80		22-Sep-27	20-Jan-28	550
585	Hydrogen Peroxide	30	0%	22-Sep-27	03-Nov-27	600
586	Sodium Hydroxide	30	0%	22-Sep-27	03-Nov-27	600
588	Antiscalant Dosing	30	0%	13-Oct-27	24-Nov-27	585
583	Sodium Hypochlorite	30	0%	10-Nov-27	22-Dec-27	565
584	Citric Acid	30	0%	10-Nov-27	22-Dec-27	565
587	Sodium Bisulphite	50	0%	03-Nov-27	20-Jan-28	550
589	Hydrochloric Acid Dosing System	50	0%	03-Nov-27	20-Jan-28	550
Electrical & ICA Works		135		06-Oct-27	24-Apr-28	485
591	MCC and Transformer Installation	135	0%	06-Oct-27	24-Apr-28	485
Site Wide		180		17-Nov-27	09-Aug-28	440
593	Main Site Switch Gear, Transformer and Generator Install	135	0%	17-Nov-27	07-Jun-28	440
594	Road, Path ways and Making Good	150	0%	17-Nov-27	28-Jun-28	440
595	M&E Install & Dry Commissioning	30	0%	28-Jun-28	09-Aug-28	440
596	Ready for Wet Commissioning	0	0%	09-Aug-28		440
CONVEYANCE PIPEWORK WRP TO EBL		1130		31-Oct-25	16-May-30	0
Site Investigation		0		31-Oct-25	31-Oct-25	0
605	Site Investigations	0	0%	31-Oct-25		0
Design		260		31-Oct-25	17-Nov-26	0
607	Design (Assume reduced duration from 390d to 260d)	260	0%	31-Oct-25	17-Nov-26	0
Construction		870		17-Nov-26	16-May-30	0
610	Conveyance Pipework Construction (was 875d, now 174w)	870	0%	17-Nov-26	16-May-30	0
611	Wet Commissioning Ready	0	0%	16-May-30		0
CONVEYANCE PIPEWORK PEEL COMMON TO WRP		1130		31-Oct-25	16-May-30	0
Site Investigations		0		31-Oct-25	31-Oct-25	0
620	Site Investigations	0	0%	31-Oct-25		0
Design		260		31-Oct-25	17-Nov-26	0
622	Design (Assume reduced duration from 390d to 260d)	260	0%	31-Oct-25	17-Nov-26	0
Construction		870		17-Nov-26	16-May-30	0
625	Conveyance Pipework Construction (was 510d, now 174w)	870	0%	17-Nov-26	16-May-30	0

🟩 Remaining Work
🟥 Critical Remaining Work
◆ ◆ Milestone

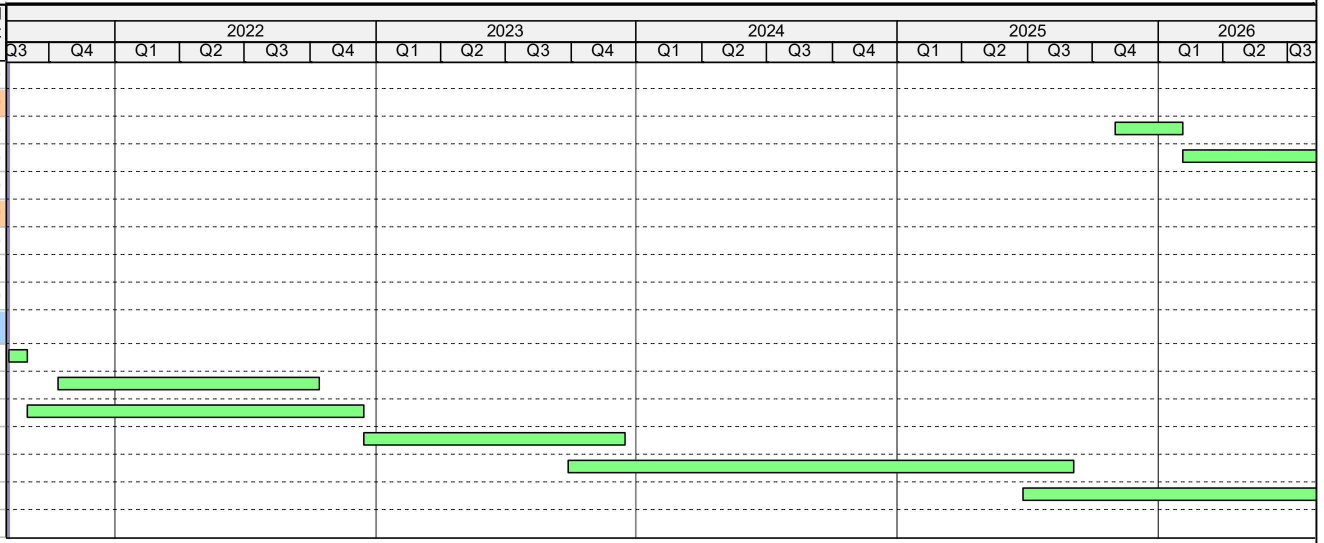
Date	Revision	Checked	Approved
25-Aug-21	WR (B5) Schedule for G1.5 Submission	DC	BM

What-if 1: WATER RECYCLING PLANT - OPTION B5 (ABE STAGE 1 - DPC PROCUREMENT ROUTE)

Progressed to 06-Aug-21

Print: 25-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
626	Wet Commissioning Ready	0	0%	16-May-30		0
BREAK PRESSURE TANK BETWEEN WRP AND OTTERBOURNE PRE-DISINFECTION PLANT		260		31-Oct-25	17-Nov-26	870
628	Design	60	0%	31-Oct-25	03-Feb-26	870
629	Build (Civil/ MEICA/ Finishes)	200	0%	03-Feb-26	17-Nov-26	870
630	Wet Commissioning Ready	0	0%	17-Nov-26		870
COMMISSIONING		150		16-May-30	16-Dec-30	0
632	WRP Dry Commissioning Period	60	0%	16-May-30	09-Aug-30	0
633	Wet Commissioning Period	80	0%	09-Aug-30	02-Dec-30	0
634	Handover Period	28	0%	06-Nov-30	16-Dec-30	0
OTTERBOURNE PRE-DISINFECTION PLANT		1365		08-Mar-21 A	29-Jan-27	973
A10000	Indicative Concept Design	17	73.64%	08-Mar-21 A	31-Aug-21	973
A10020	Indicative Procurement Period	250	0%	13-Oct-21	13-Oct-22	1018
A10010	Feasibility Design (DWI DESIGN CONFIRMATION)	325	0%	01-Sep-21	15-Dec-22	973
A10030	Indicative Detailed Designs	250	0%	16-Dec-22	15-Dec-23	973
A10040	Indicative Construction Period	480	0%	28-Sep-23	03-Sep-25	973
A10050	Indicative Commissioning Period	370	0%	24-Jun-25	11-Dec-26	973
A10060	Confirmation the Completion of Pre-Disinfection Treatment (TARGET 31ST JAN 2027)	29	0%	11-Dec-26	29-Jan-27	973



🟩	Remaining Work
🟥	Critical Remaining Work
◆ ◆	Milestone

Project ID: 710060-2-2 CURR Standard Layout for Distribution

Date	Revision	Checked	Approved
25-Aug-21	WR (B5) Schedule for G1.5 Submission	DC	BM

Appendix C – Critical Path Schedules

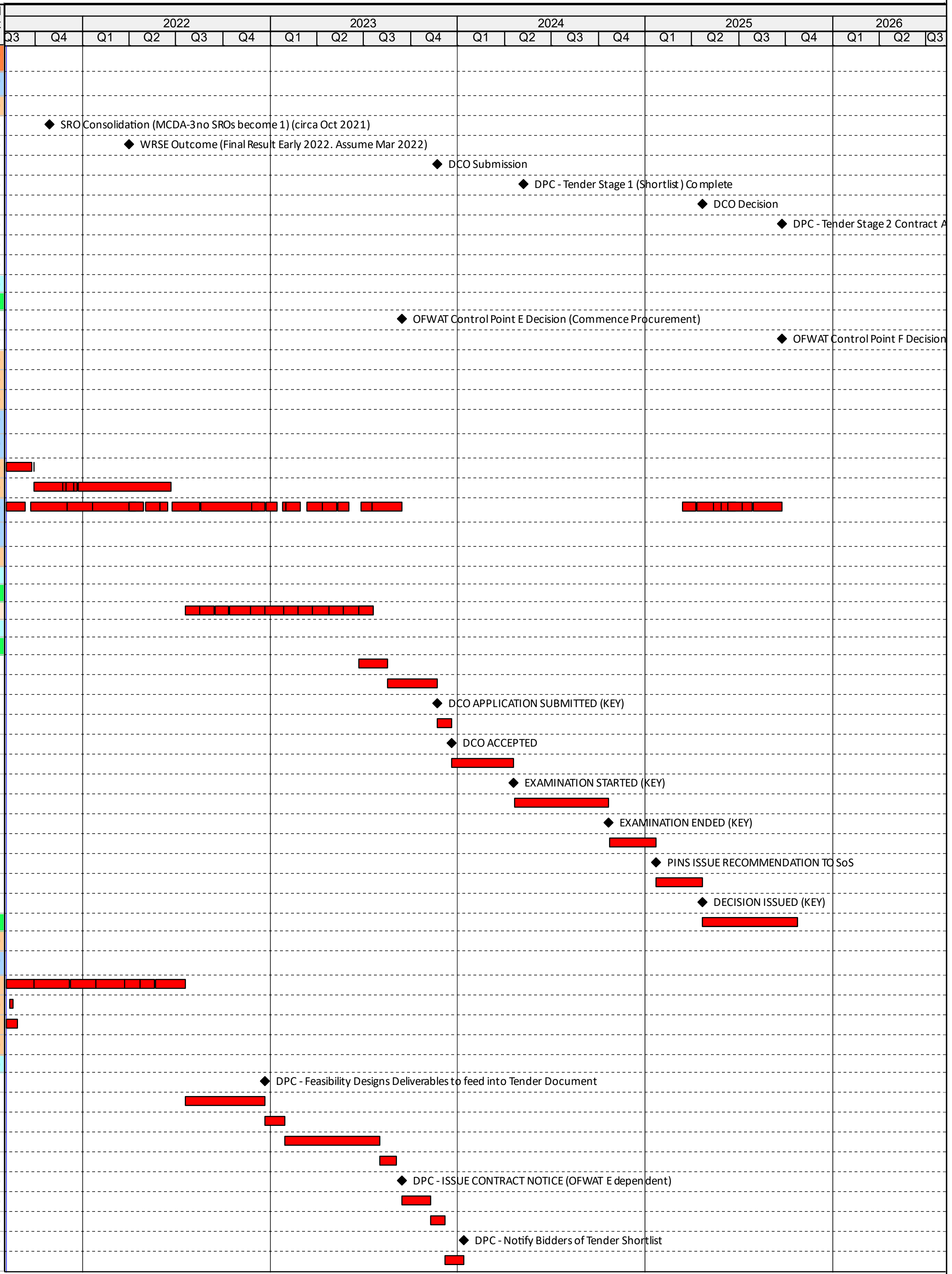
Option B.2 Critical Path Schedule

Print: 26-Aug-21

WATER RECYCLING PLANT - OPTION B2 (BASED ON DPC PROCUREMENT ROUTE)

Progressed to 06-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
WATER RECYCLING PLANT - OPTION B2 (BASED ON DPC PROCUREMENT ROUTE)		2338		27-May-21 A	16-Dec-30	0
KEY MILESTONES		2324		26-Aug-21	16-Dec-30	0
LEVEL 2 PROJECT MILESTONES		2279		29-Oct-21	16-Dec-30	0
RYWR.KEY.00910	SRO Consolidation (MCDA-3no SROs become 1) (circa Oct 2021)	0	0%		29-Oct-21*	0
RYWR.KEY.01000	WRSE Outcome (Final Result Early 2022. Assume Mar 2022)	0	0%		31-Mar-22*	0
RYWR.KEY.00710	DCO Submission	0	0%		21-Nov-23	11
RYWR.KEY.00810	DPC - Tender Stage 1 (Shortlist) Complete	0	0%		08-May-24	0
RYWR.KEY.00720	DCO Decision	0	0%		22-Apr-25	19
RYWR.KEY.00820	DPC - Tender Stage 2 Contract Award	0	0%		23-Sep-25	0
RYWR.KEY.00010	SECTION 20 AGREEMENT - SRO Operational	0	0%		31-Mar-27*	0
RYWR.KEY.00040	WATER RECYCLING PLANT - OPERATIONAL	0	0%		16-Dec-30	0
GOVERNANCE		505		13-Sep-23	23-Sep-25	0
OFWAT		505		13-Sep-23	23-Sep-25	0
RYWR.KEY.00300	OFWAT Control Point E Decision (Commence Procurement)	0	0%		13-Sep-23	0
RYWR.KEY.00320	OFWAT Control Point F Decision (Contract Award Enabler)	0	0%		23-Sep-25	0
HAVANT THICKET RESERVOIR INTERFACE MILESTONES		1955		26-Aug-21	02-Jul-29	0
PORTSMOUTH WATER BOARD MEETINGS		293		23-Sep-21	24-Nov-22	0
PORTSMOUTH / SW COLLABORATIVE EXEC MEETINGS (dates to be confirmed)		0		31-Aug-21	31-Aug-21	0
SENIOR STAKEHOLDER MEETINGS		88		06-Aug-21	09-Dec-21	0
GATEWAYS (RAPID)		217		07-Jun-21 A	22-Jun-22	-10
GATEWAY 2		76		07-Jun-21 A	22-Nov-21	-10
GATEWAY 3		181		28-Sep-21	22-Jun-22	-10
OFWAT		1030		27-May-21 A	23-Sep-25	0
CONSENT & PERMIT & LICENCING		977		22-Nov-21	23-Oct-25	6
CONSENT - DCO (Development Consent Order)		816		20-Jul-22	23-Oct-25	6
DCO APPLICATION DOCUMENTS		250		20-Jul-22	19-Jul-23	11
Environmental Reports		250		20-Jul-22	19-Jul-23	11
HRA Report		250		20-Jul-22	19-Jul-23	11
DCO CONSENT PROCESS		586		22-Jun-23	23-Oct-25	6
Submission & Determination		456		22-Jun-23	21-Apr-25	6
RYWR.CON.06020	DCO Application - Complete Environmental Statement	40	0%	22-Jun-23	16-Aug-23	11
RYWR.CON.06060	DCO Application - Southern Water Assurance & Governance Period	68	0%	17-Aug-23	21-Nov-23	11
RYWR.CON.06090	DCO APPLICATION SUBMITTED (KEY)	0	0%		21-Nov-23	9
RYWR.CON.06130	DCO ACCEPTANCE PERIOD (Stated Duration No Greater than 4 calendar weeks)	28	0%	22-Nov-23	19-Dec-23	15
RYWR.CON.06140	DCO ACCEPTED	0	0%		19-Dec-23	5
RYWR.CON.06150	PRE-EXAMINATION PERIOD (Assumed to be no more than 65 working days)	80	0%	19-Dec-23	19-Apr-24	5
RYWR.CON.06160	EXAMINATION STARTED (KEY)	0	0%		19-Apr-24	8
RYWR.CON.06170	EXAMINATION PERIOD (Stated Duration No Greater than 6 calendar months)	185	0%	20-Apr-24	21-Oct-24	8
RYWR.CON.06180	EXAMINATION ENDED (KEY)	0	0%		21-Oct-24	8
RYWR.CON.06190	PINS RECOMMENDATION REPORT PERIOD (Stated Duration No Greater than 3 calendar months)	91	0%	22-Oct-24	20-Jan-25	8
RYWR.CON.06210	PINS ISSUE RECOMMENDATION TO SoS	0	0%		20-Jan-25	8
RYWR.CON.06220	SoS DECISION PERIOD (Stated Duration No Greater than 3 calendar months)	91	0%	21-Jan-25	21-Apr-25	8
RYWR.CON.06230	DECISION ISSUED (KEY)	0	0%		21-Apr-25	8
Discharge DCO Requirement		130		22-Apr-25	23-Oct-25	6
STATUTORY PERMIT		0		22-Nov-21	22-Nov-21	0
PROCUREMENT & COMMERCIAL		1058		14-Jun-21 A	31-Oct-25	0
LAND ACQUISITION		236		28-Jun-21 A	19-Jul-22	11
DCO CONSULTATION SUPPORT SERVICE		5		12-Aug-21	18-Aug-21	0
PROCUREMENT OF SURVEYS & DESIGNS FOR PIPELINE ROUTE. PUMPING STATION & BREAK PRESSURE T		16		14-Jun-21 A	27-Aug-21	7
CONSTRUCTIONS		822		20-Jul-22	31-Oct-25	0
DPC (Direct Procurement for Customer)		822		20-Jul-22	31-Oct-25	0
RYWR.PRO.00040	DPC - Feasibility Designs Deliverables to feed into Tender Document	0	0%		21-Dec-22	7
RYWR.PRO.00050	DPC - Product Tender Documentation. PQQ Questionnaire. Contract. Contract Notice	110	0%	20-Jul-22	21-Dec-22	7
RYWR.PRO.00060	DPC - Procurement Assurance & Governance	22	0%	22-Dec-22	30-Jan-23	7
RYWR.PRO.00070	DPC - Refine Tender Documentation	129	0%	30-Jan-23	03-Aug-23	7
RYWR.PRO.00080	DPC - Procurement Assurance & Governance (Ready for Issue Contract Notice)	22	0%	03-Aug-23	04-Sep-23	7
RYWR.PRO.00100	DPC - ISSUE CONTRACT NOTICE (OFWAT E dependent)	0	0%		13-Sep-23	0
RYWR.PRO.00110	DPC - Pre-Qualification Questionnaire (PQQ) Period	40	0%	15-Sep-23	09-Nov-23	0
RYWR.PRO.00111	DPC - PQQ Evaluation Period	20	0%	10-Nov-23	07-Dec-23	0
RYWR.PRO.00113	DPC - Notify Bidders of Tender Shortlist	0	0%		12-Jan-24	0
RYWR.PRO.00112	DPC - Assurance and Governance	20	0%	08-Dec-23	12-Jan-24	0



🟩 Remaining Work
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Project ID: 710060-B2-1 CURR Standard Layout for Distribution

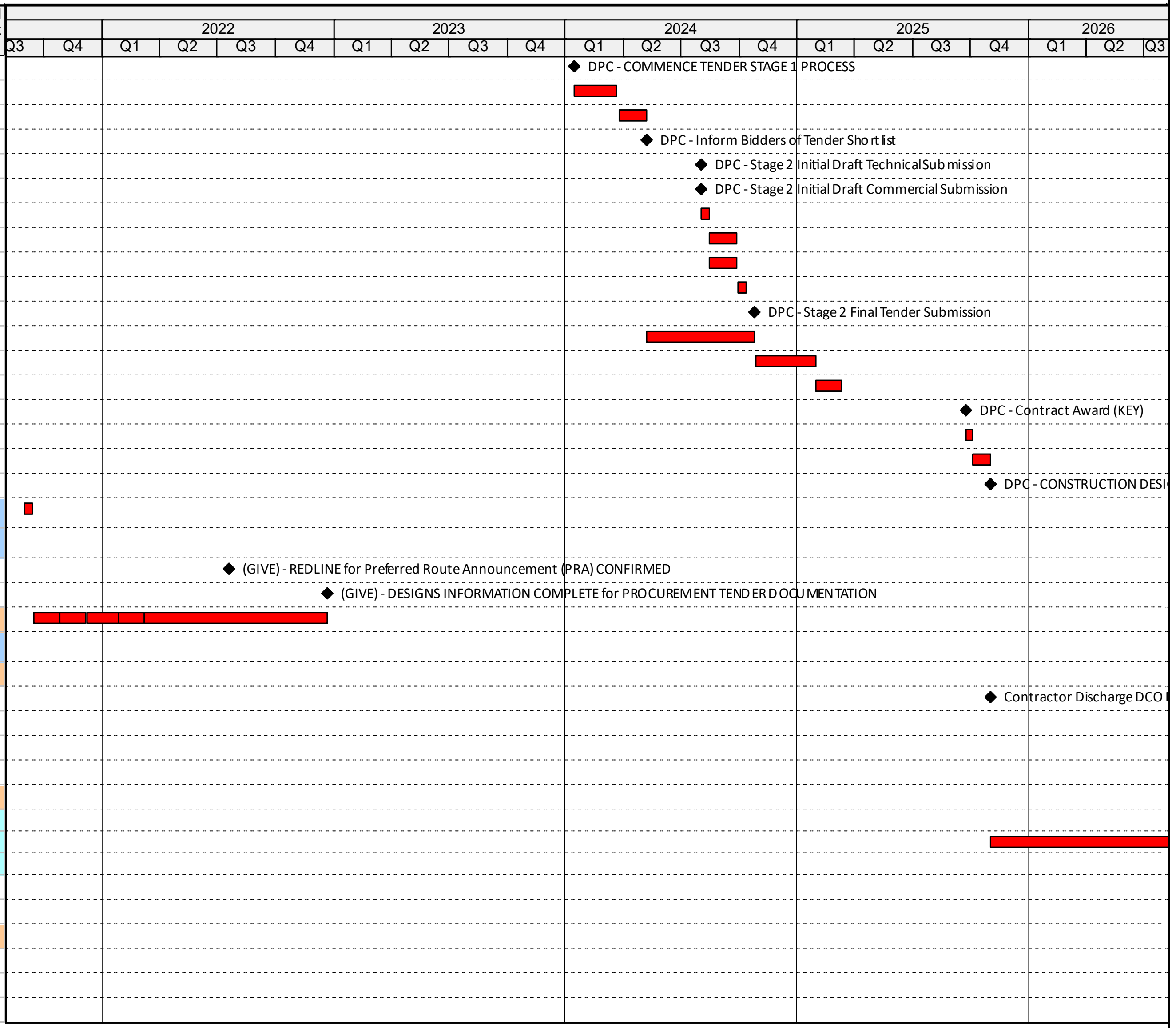
Date	Revision	Checked	Approved
26-Aug-21	WR (B2) Schedule for G1.5 Submission	DC	BM

WATER RECYCLING PLANT - OPTION B2 (BASED ON DPC PROCUREMENT ROUTE)

Progressed to 06-Aug-21

Print: 26-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
RYWR.PRO.00120	DPC - COMMENCE TENDER STAGE 1 PROCESS	0	0%	15-Jan-24		0
RYWR.PRO.00130	DPC - Stage 1 Tender Period	50	0%	15-Jan-24	22-Mar-24	0
RYWR.PRO.00131	DPC - Stage 1 Assurance and Governance	30	0%	25-Mar-24	08-May-24	0
RYWR.PRO.00140	DPC - Inform Bidders of Tender Shortlist	0	0%		08-May-24	0
RYWR.PRO.00152	DPC - Stage 2 Initial Draft Technical Submission	0	0%		01-Aug-24	10
RYWR.PRO.00151	DPC - Stage 2 Initial Draft Commercial Submission	0	0%		01-Aug-24	10
RYWR.PRO.00153	DPC - Stage 2 Initial Draft Review. Feedback and Dialogue	10	0%	02-Aug-24	15-Aug-24	10
RYWR.PRO.00155	DPC - Stage 2 2nd Draft Technical Submission	30	0%	16-Aug-24	27-Sep-24	10
RYWR.PRO.00154	DPC - Stage 2 2nd Draft Commercial Submission	30	0%	16-Aug-24	27-Sep-24	10
RYWR.PRO.00156	DPC - Stage 2 2nd Draft Review. Feedback and Dialogue	10	0%	30-Sep-24	11-Oct-24	10
RYWR.PRO.00157	DPC - Stage 2 Final Tender Submission	0	0%		25-Oct-24	0
RYWR.PRO.00150	DPC - Stage 2 Tender Period	120	0%	09-May-24	25-Oct-24	0
RYWR.PRO.00158	DPC - Stage 2 Tender Assessment	60	0%	28-Oct-24	29-Jan-25	0
RYWR.PRO.00160	(GIVE) - DPC - PREFERRED BIDDER NEGOTIATION	30	0%	30-Jan-25	12-Mar-25	0
RYWR.PRO.00190	DPC - Contract Award (KEY)	0	0%		23-Sep-25	0
RYWR.PRO.00200	DPC - Standstill Period (10 calendar days)	10	0%	24-Sep-25	03-Oct-25	0
RYWR.PRO.00210	DPC - Execute Contract	20	0%	03-Oct-25	31-Oct-25	0
RYWR.PRO.00220	DPC - CONSTRUCTION DESIGN COMMENCE (KEY)	0	0%		31-Oct-25	0
SURVEYS		10		31-Aug-21	13-Sep-21	7
FEASIBILITY DESIGNS		320		14-Sep-21	21-Dec-22	7
RYWR.DGN.00840	(GIVE) - REDLINE for Preferred Route Announcement (PRA) CONFIRMED	0	0%		19-Jul-22	11
RYWR.DGN.00830	(GIVE) - DESIGNS INFORMATION COMPLETE for PROCUREMENT TENDER DOCUMENTATION	0	0%		21-Dec-22	7
BUDDS FARM TO WRP		320		14-Sep-21	21-Dec-22	7
POST-CONTRACT AWARD (DPC ROUTE)		1280		31-Oct-25	16-Dec-30	0
KEY MILESTONES		1280		31-Oct-25	16-Dec-30	0
4	Contractor Discharge DCO Requirement	0	0%		31-Oct-25	0
6	Start Commissioning	0	0%	15-Apr-30		0
7	Water Into Supply	0	0%	12-Jul-30		0
8	Benefit Realisation Commence	0	0%	16-Dec-30		0
CONVEYANCE PIPEWORK WRP TO EBL		1110		31-Oct-25	15-Apr-30	0
Site Investigation		0		31-Oct-25	31-Oct-25	0
Design		260		31-Oct-25	17-Nov-26	0
Construction		850		17-Nov-26	15-Apr-30	0
611	Wet Commissioning Ready	0	0%	15-Apr-30		0
610	Conveyance Pipework Construction (Gang of 4 = 174 week)	850	0%	17-Nov-26	15-Apr-30	0
COMMISSIONING		170		15-Apr-30	16-Dec-30	0
632	WRP Dry Commissioning Period	60	0%	15-Apr-30	12-Jul-30	0
633	Wet Commissioning Period	80	0%	12-Jul-30	04-Nov-30	0
634	Handover Period	30	0%	04-Nov-30	16-Dec-30	0



🟩 Remaining Work
🟥 Critical Remaining Work
◆ ◆ Milestone

Project ID: 710060-B2-1 CURR Standard Layout for Distribution

Date	Revision	Checked	Approved
26-Aug-21	WR (B2) Schedule for G1.5 Submission	DC	BM

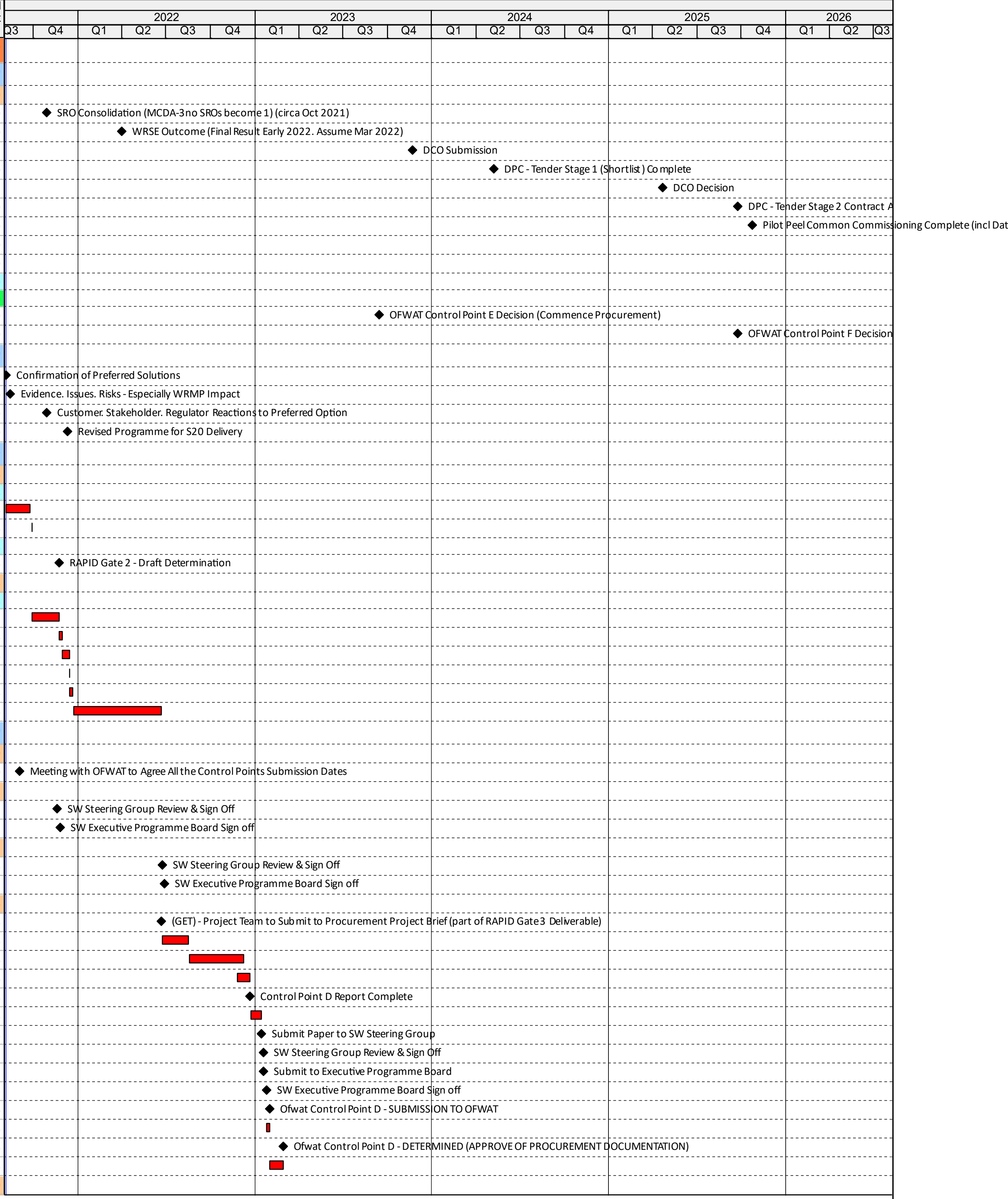
Option B.5 Critical Path Schedule

Print: 25-Aug-21

What-if 1: WATER RECYCLING PLANT - OPTION B5 (ABE STAGE 1 - DPC PROCUREMENT ROUTE)

Progressed to 06-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
What-if 1: WATER RECYCLING PLANT - OPTION B5 (ABE STAGE 1 - DPC PROCUREM		2338		04-Jan-21 A	16-Dec-30	0
KEY MILESTONES		2279		29-Oct-21	16-Dec-30	0
LEVEL 2 PROJECT MILESTONES		2279		29-Oct-21	16-Dec-30	0
RYWR.KEY.00910	SRO Consolidation (MCDA-3no SROs become 1) (circa Oct 2021)	0	0%		29-Oct-21*	0
RYWR.KEY.01000	WRSE Outcome (Final Result Early 2022. Assume Mar 2022)	0	0%		31-Mar-22*	0
RYWR.KEY.00710	DCO Submission	0	0%		21-Nov-23	11
RYWR.KEY.00810	DPC - Tender Stage 1 (Shortlist) Complete	0	0%		08-May-24	0
RYWR.KEY.00720	DCO Decision	0	0%		22-Apr-25	19
RYWR.KEY.00820	DPC - Tender Stage 2 Contract Award	0	0%		23-Sep-25	0
RYWR.KEY.00060	Pilot Peel Common Commissioning Complete (incl Data collection up to CAP Contract Award)	0	0%		23-Oct-25*	0
RYWR.KEY.00010	SECTION 20 AGREEMENT - SRO Operational (75Mld DE-SAL @ FAWLEY OPERATIONAL)	0	0%		31-Mar-27*	0
RYWR.KEY.00040	75 Ml/d WATER RECYCLING PLANT - OPERATIONAL	0	0%		16-Dec-30	0
GOVERNANCE		505		13-Sep-23	23-Sep-25	0
OFWAT		505		13-Sep-23	23-Sep-25	0
RYWR.KEY.00300	OFWAT Control Point E Decision (Commence Procurement)	0	0%		13-Sep-23	0
RYWR.KEY.00320	OFWAT Control Point F Decision (Contract Award Enabler)	0	0%		23-Sep-25	0
SENIOR STAKEHOLDER MEETINGS		88		06-Aug-21	09-Dec-21	0
RYWR.CON.00720	Confirmation of Preferred Solutions	0	0%		06-Aug-21*	-22
RYWR.CON.00730	Evidence. Issues. Risks - Especially WRMP Impact	0	0%		13-Aug-21*	0
RYWR.CON.00740	Customer. Stakeholder. Regulator Reactions to Preferred Option	0	0%		28-Oct-21*	0
RYWR.CON.00750	Revised Programme for S20 Delivery	0	0%		09-Dec-21*	0
GATEWAYS (RAPID)		217		07-Jun-21 A	22-Jun-22	4
GATEWAY 2		76		07-Jun-21 A	22-Nov-21	4
ASSURANCE & GOVERNANCE		36		07-Jun-21 A	27-Sep-21	4
NWSR.GWY.00030	RAPID Gate 2 - SW Governance Approvals	35	0%	07-Jun-21 A	24-Sep-21	4
NWSR.GWY.00040	RAPID Gate 2 - SUBMISSION TO RAPID	1	0%	27-Sep-21	27-Sep-21	4
DETERMINATION		0		22-Nov-21	22-Nov-21	4
NWSR.GWY.00055	RAPID Gate 2 - Draft Determination	0	0%		22-Nov-21	4
GATEWAY 3		181		28-Sep-21	22-Jun-22	4
DELIVERABLES		181		28-Sep-21	22-Jun-22	4
NWSR.GWY.03010	RAPID Gate 3 - Create Submission Structure	40	0%	28-Sep-21	22-Nov-21	9
NWSR.GWY.03020	RAPID Gate 3 - Review & Incorporate Feedback from RAPID Gate2 Draft Determination	5	0%	23-Nov-21	29-Nov-21	4
NWSR.GWY.03030	RAPID Gate 3 - Sign Off by Director. Legal	10	0%	30-Nov-21	13-Dec-21	4
NWSR.GWY.03040	RAPID Gate 3 - Confirm by RAPID	1	0%	14-Dec-21	14-Dec-21	4
NWSR.GWY.03080	RAPID Gate 3 - Brief Authors	5	0%	15-Dec-21	21-Dec-21	4
NWSR.GWY.03090	RAPID Gate 3 - Create Gateway Deliverables	120	0%	22-Dec-21	22-Jun-22	4
OFWAT		1012		01-Sep-21	23-Sep-25	0
CONTROL POINT A (TO COMBINE WITH CONTROL POINT B)		0		01-Sep-21	01-Sep-21	0
NWSR.GWY.10000	Meeting with OFWAT to Agree All the Control Points Submission Dates	0	0%		01-Sep-21*	0
CONTROL POINT B (COMBINE WITH CONTROL POINT A)		4		18-Nov-21	24-Nov-21	102
NWSR.GWY.12270	SW Steering Group Review & Sign Off	0	0%		18-Nov-21	5
NWSR.GWY.12290	SW Executive Programme Board Sign off	0	0%		24-Nov-21	5
CONTROL POINT C		3		23-Jun-22	28-Jun-22	65
NWSR.GWY.13360	SW Steering Group Review & Sign Off	0	0%		23-Jun-22	4
NWSR.GWY.13380	SW Executive Programme Board Sign off	0	0%		28-Jun-22	2
CONTROL POINT D		171		22-Jun-22	27-Feb-23	14
NWSR.GWY.14160	(GET) - Project Team to Submit to Procurement Project Brief (part of RAPID Gate3 Deliverable)	0	0%		22-Jun-22	4
NWSR.GWY.14230	Prepare & Run for Market Engagement (attendees, invites, objectives)	40	0%	23-Jun-22	17-Aug-22	4
NWSR.GWY.14240	Produce Contractual Requirements (to revisit this activity once Option Selection is completed)	80	0%	18-Aug-22	08-Dec-22	4
NWSR.GWY.14250	Produce Control Point D Report (100% complete) Incorporate OFWAT Comment from Control Point C	20	0%	25-Nov-22	22-Dec-22	4
NWSR.GWY.14260	Control Point D Report Complete	0	0%		22-Dec-22	4
NWSR.GWY.14270	Procurement Team to Submit Report for Internal assurance	10	0%	23-Dec-22	13-Jan-23	4
NWSR.GWY.14280	Submit Paper to SW Steering Group	0	0%		13-Jan-23	4
NWSR.GWY.14290	SW Steering Group Review & Sign Off	0	0%		19-Jan-23	1
NWSR.GWY.14310	Submit to Executive Programme Board	0	0%		19-Jan-23	15
NWSR.GWY.14330	SW Executive Programme Board Sign off	0	0%		24-Jan-23	6
NWSR.GWY.14350	Ofwat Control Point D - SUBMISSION TO OFWAT	0	0%		30-Jan-23	14
NWSR.GWY.14340	Amend Paper incorporating comments from Programme Board	5	0%	24-Jan-23	30-Jan-23	14
NWSR.GWY.14370	Ofwat Control Point D - DETERMINED (APPROVE OF PROCUREMENT DOCUMENTATION)	0	0%		27-Feb-23	14
NWSR.GWY.14360	Ofwat Control Point D - Review Period	20	0%	31-Jan-23	27-Feb-23	14
CONTROL POINT E		127		14-Mar-23	13-Sep-23	0



🟩 Remaining Work
🟥 Critical Remaining Work
◆ ◆ Milestone

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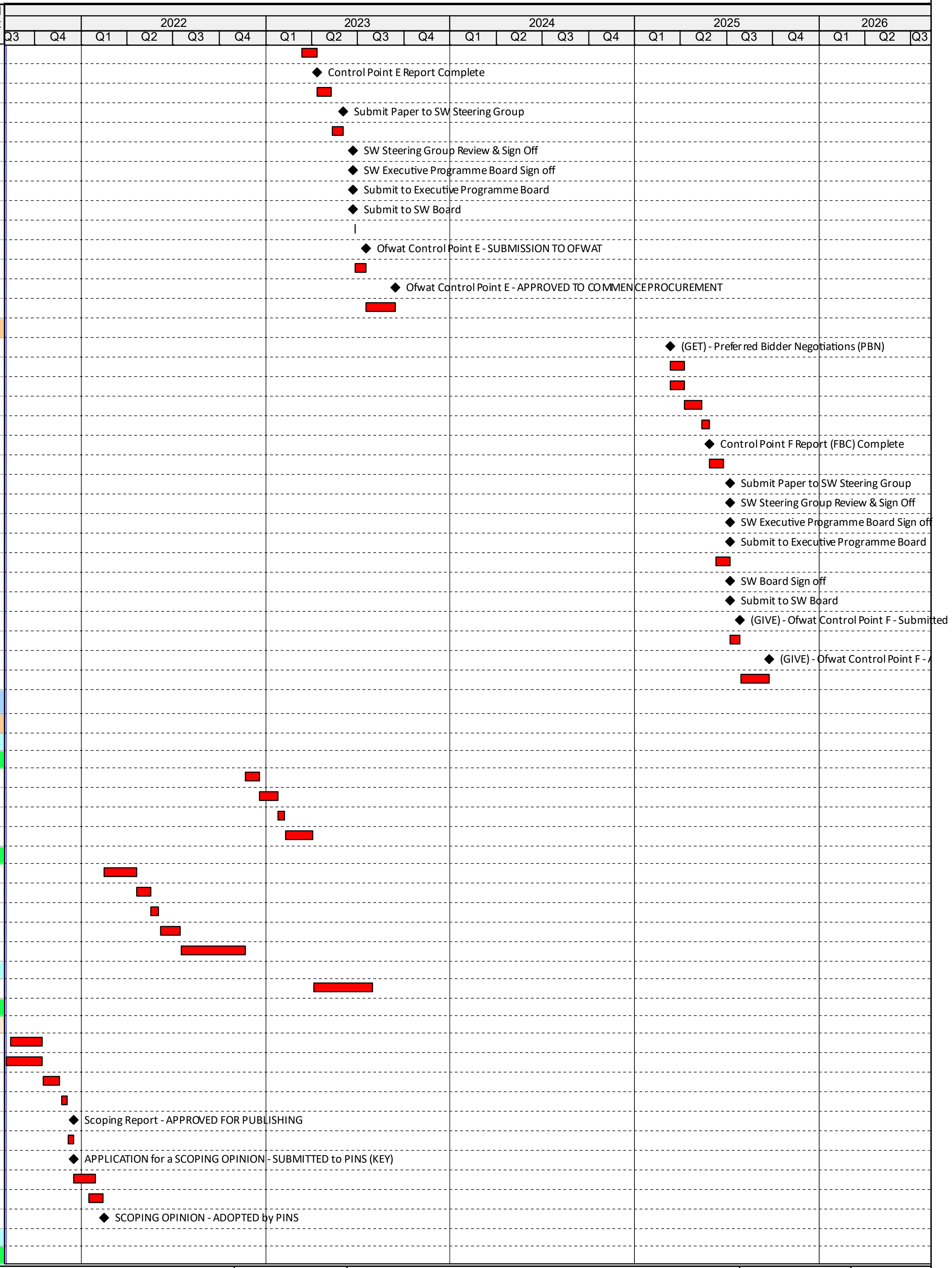
Print: 25-Aug-21

What-if 1: WATER RECYCLING PLANT - OPTION B5 (ABE STAGE 1 - DPC PROCUREMENT ROUTE)

Progressed to 06-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
NWSR.GWY.15220	Produce Control Point E Report (100% complete) Incorporate OFWAT Comment from Control Point D	20	0%	14-Mar-23	12-Apr-23	14
NWSR.GWY.15230	Control Point E Report Complete	0	0%		12-Apr-23	14
NWSR.GWY.15240	Procurement Team to Submit Report for Internal assurance	20	0%	13-Apr-23	11-May-23	14
NWSR.GWY.15260	Submit Paper to SW Steering Group	0	0%		02-Jun-23	14
NWSR.GWY.15250	External Assurance Period	15	0%	12-May-23	02-Jun-23	14
NWSR.GWY.15270	SW Steering Group Review & Sign Off	0	0%		22-Jun-23	1
NWSR.GWY.15290	SW Executive Programme Board Sign off	0	0%		22-Jun-23	3
NWSR.GWY.15280	Submit to Executive Programme Board	0	0%		22-Jun-23	3
NWSR.GWY.15300	Submit to SW Board	0	0%		22-Jun-23	3
NWSR.GWY.15310	SW Board Sign off	1	0%	27-Jun-23	27-Jun-23	0
NWSR.GWY.15330	Ofwat Control Point E - SUBMISSION TO OFWAT	0	0%		18-Jul-23	0
NWSR.GWY.15320	Amend Paper incorporating comments from SW Board	15	0%	27-Jun-23	18-Jul-23	0
NWSR.GWY.15350	Ofwat Control Point E - APPROVED TO COMMENCE PROCUREMENT	0	0%		13-Sep-23	0
NWSR.GWY.15340	Ofwat Control Point E - Review Period	40	0%	18-Jul-23	13-Sep-23	0
CONTROL POINT F		134		12-Mar-25	23-Sep-25	0
NWSR.GWY.16090	(GET) - Preferred Bidder Negotiations (PBN)	0	0%		12-Mar-25	0
NWSR.GWY.16100	Received Cost Intelligence data	20	0%	12-Mar-25	09-Apr-25	0
NWSR.GWY.16110	Produce Control Point F Report (FBC) (30% complete) (Inc Eligibility Assessment)	20	0%	12-Mar-25	09-Apr-25	0
NWSR.GWY.16120	Produce Control Point F Report (FBC) (70% complete)	20	0%	09-Apr-25	12-May-25	0
NWSR.GWY.16130	Produce Control Point F Report (FBC) (100% complete) Incorporate OFWAT Comment from Control Poi	10	0%	12-May-25	27-May-25	0
NWSR.GWY.16140	Control Point F Report (FBC) Complete	0	0%		27-May-25	0
NWSR.GWY.16180	Procurement Team to Submit Report for Internal assurance	20	0%	27-May-25	24-Jun-25	0
NWSR.GWY.16230	Submit Paper to SW Steering Group	0	0%		08-Jul-25	0
NWSR.GWY.16240	SW Steering Group Review & Sign Off	0	0%		08-Jul-25	0
NWSR.GWY.16260	SW Executive Programme Board Sign off	0	0%		08-Jul-25	0
NWSR.GWY.16250	Submit to Executive Programme Board	0	0%		08-Jul-25	0
NWSR.GWY.16190	External Assurance Period	20	0%	10-Jun-25	08-Jul-25	0
NWSR.GWY.16280	SW Board Sign off	0	0%		08-Jul-25	0
NWSR.GWY.16270	Submit to SW Board	0	0%		08-Jul-25	0
NWSR.GWY.16320	(GIVE) - Ofwat Control Point F - Submitted	0	0%		28-Jul-25	0
NWSR.GWY.16300	Amend Paper incorporating comments from Programme Board	14	0%	08-Jul-25	28-Jul-25	0
NWSR.GWY.16360	(GIVE) - Ofwat Control Point F - APPROVED TO CAP AGREEMENT	0	0%		23-Sep-25	0
NWSR.GWY.16330	Ofwat Control Point F - Review Period	40	0%	29-Jul-25	23-Sep-25	0
CONSENT & PERMIT & LICENCING		1052		04-Jan-21 A	23-Oct-25	6
CONSENT - DCO (Development Consent Order)		1052		04-Jan-21 A	23-Oct-25	6
STAKEHOLDER ENGAGEMENT		285		14-Feb-22	04-Apr-23	11
STATUTORY CONSULTATION		90		22-Nov-22	04-Apr-23	11
RYWR.CON.00510	Statutory Consultation - Literature Generation	20	0%	22-Nov-22	19-Dec-22	11
RYWR.CON.00520	Statutory Consultation - Legal Review & SWS Governance & Assurance	20	0%	20-Dec-22	24-Jan-23	11
RYWR.CON.00530	Statutory Consultation - Publishing (Hard/Virtual)	10	0%	25-Jan-23	07-Feb-23	11
RYWR.CON.00540	Statutory Consultation - Period for Consultation	40	0%	08-Feb-23	04-Apr-23	11
NON-STATUTORY CONSULTATION		195		14-Feb-22	21-Nov-22	11
RYWR.CON.00610	Non Statutory Consultation - Literature Generation	45	0%	14-Feb-22	19-Apr-22	11
RYWR.CON.00620	Non Statutory Consultation - Legal Review & SWS Governance & Assurance	20	0%	20-Apr-22	18-May-22	11
RYWR.CON.00630	Non Statutory Consultation - Publishing (Hard/Virtual)	10	0%	19-May-22	01-Jun-22	11
RYWR.CON.00640	Non Statutory Consultation - Period for Consultation	30	0%	06-Jun-22	15-Jul-22	11
RYWR.CON.00650	Non Statutory Consultation - 2m Feedback 2m. Designs. 2w float	90	0%	18-Jul-22	21-Nov-22	11
DCO APPLICATION DOCUMENTS		494		04-Jan-21 A	31-Jul-23	11
RYWR.CON.00560	Statutory Consultation - 4MO - DCO Dcoumentation Preparation Complete	80	0%	05-Apr-23	31-Jul-23	11
Environmental Reports		129		04-Jan-21 A	14-Feb-22	11
Scoping		129		04-Jan-21 A	14-Feb-22	11
RYWR.CON.08010	Scoping Report - Stakeholder Engagement	45	0%	04-Jan-21 A	15-Oct-21	6
RYWR.CON.08020	Scoping Report - Draft Scoping Report	50	0%	01-Jun-21 A	15-Oct-21	6
RYWR.CON.08030	Scoping Report - Finalise Draft Report	25	0%	18-Oct-21	19-Nov-21	6
RYWR.CON.08040	Scoping Report - Assurance Review & Update (incl Legal Input)	10	0%	22-Nov-21	03-Dec-21	6
RYWR.CON.08060	Scoping Report - APPROVED FOR PUBLISHING	0	0%		17-Dec-21	6
RYWR.CON.08050	Scoping Report - Southern Water Governance Period (incl Legal Review)	9	0%	06-Dec-21	17-Dec-21	6
RYWR.CON.08080	APPLICATION for a SCOPING OPINION - SUBMITTED to PINS (KEY)	0	0%		17-Dec-21	6
RYWR.CON.08090	Scoping Opinion - Adoption Period	42	0%	17-Dec-21	28-Jan-22	17
RYWR.CON.08100	Scoping Opinion - Statutory Consultation Period	28	0%	15-Jan-22	12-Feb-22	17
RYWR.CON.08120	SCOPING OPINION - ADOPTED by PINS	0	0%		14-Feb-22	11
DCO CONSENT PROCESS		586		22-Jun-23	23-Oct-25	6
Submission & Determination		456		22-Jun-23	21-Apr-25	6



🟩 Remaining Work
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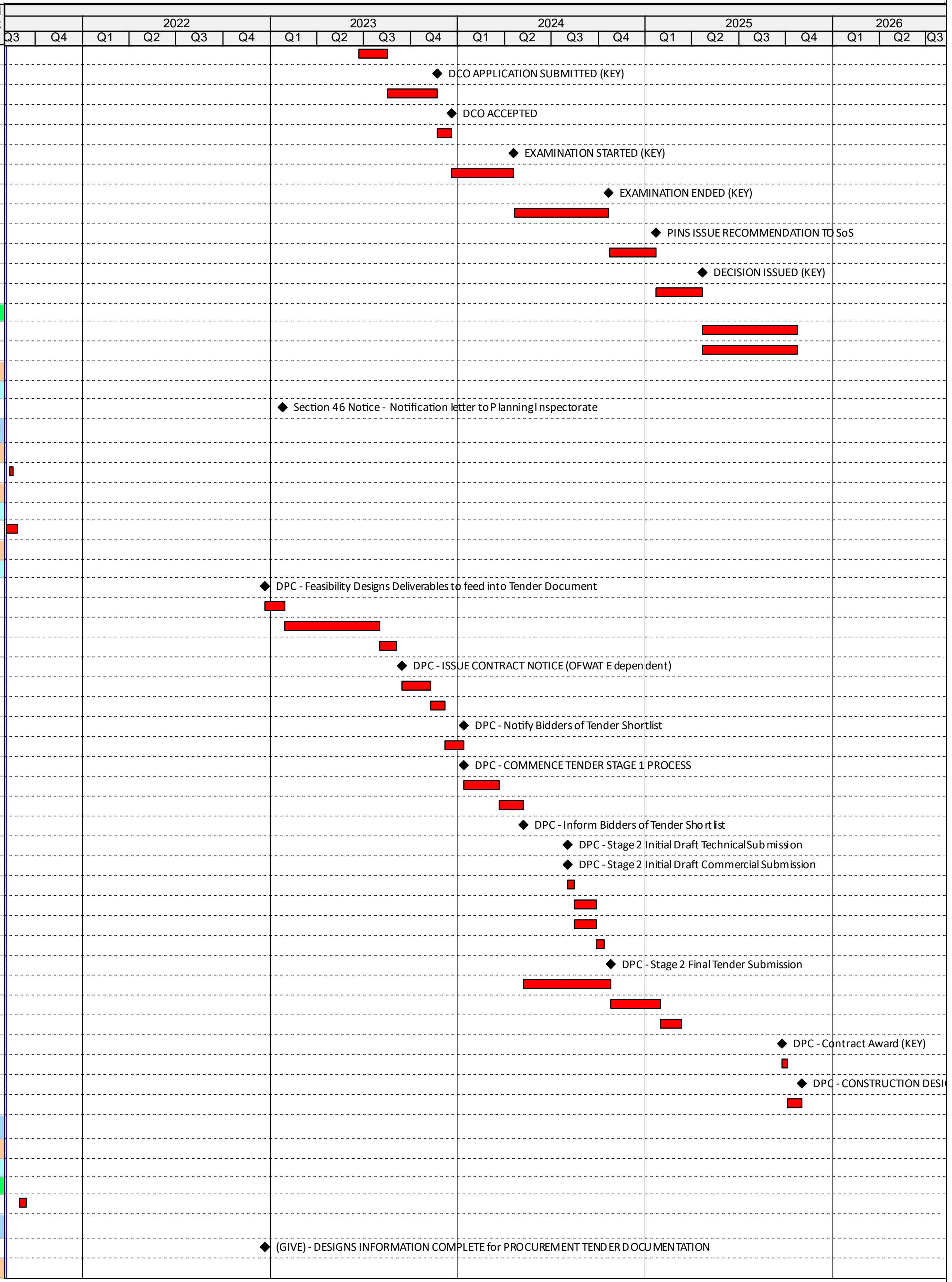
What-if 1: WATER RECYCLING PLANT - OPTION B5 (ABE STAGE 1 - DPC PROCUREMENT ROUTE)

Progressed to 06-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
RYWR.CON.06020	DCO Application - Complete Environmental Statement	40	0%	22-Jun-23	16-Aug-23	11
RYWR.CON.06090	DCO APPLICATION SUBMITTED (KEY)	0	0%		21-Nov-23	9
RYWR.CON.06060	DCO Application - Southern Water Assurance & Governance Period	68	0%	17-Aug-23	21-Nov-23	11
RYWR.CON.06140	DCO ACCEPTED	0	0%		19-Dec-23	5
RYWR.CON.06130	DCO ACCEPTANCE PERIOD (Stated Duration No Greater than 4 calendar weeks)	28	0%	22-Nov-23	19-Dec-23	15
RYWR.CON.06160	EXAMINATION STARTED (KEY)	0	0%		19-Apr-24	8
RYWR.CON.06150	PRE-EXAMINATION PERIOD (Assumed to be no more than 65 working days)	80	0%	19-Dec-23	19-Apr-24	5
RYWR.CON.06180	EXAMINATION ENDED (KEY)	0	0%		21-Oct-24	8
RYWR.CON.06170	EXAMINATION PERIOD (Stated Duration No Greater than 6 calendar months)	185	0%	20-Apr-24	21-Oct-24	8
RYWR.CON.06210	PINS ISSUE RECOMMENDATION TO SoS	0	0%		20-Jan-25	8
RYWR.CON.06190	PINS RECOMMENDATION REPORT PERIOD (Stated Duration No Greater than 3 calendar months)	91	0%	22-Oct-24	20-Jan-25	8
RYWR.CON.06230	DECISION ISSUED (KEY)	0	0%		21-Apr-25	8
RYWR.CON.06220	SoS DECISION PERIOD (Stated Duration No Greater than 3 calendar months)	91	0%	21-Jan-25	21-Apr-25	8
Discharge DCO Requirement		130		22-Apr-25	23-Oct-25	6
RYWR.CON.07120	Pumping Facilities - Discharge DCO Requirements	130	0%	22-Apr-25	23-Oct-25	6
RYWR.CON.07110	Conveyance Pipework - Discharge DCO Requirements	130	0%	22-Apr-25	23-Oct-25	6
STATUTORY PERMIT		0		24-Jan-23	24-Jan-23	0
S46		0		24-Jan-23	24-Jan-23	0
RYWR.CON.10310	Section 46 Notice - Notification letter to Planning Inspectorate	0	0%	24-Jan-23*		0
PROCUREMENT & COMMERCIAL		1058		14-Jun-21 A	31-Oct-25	0
DCO CONSULTATION SUPPORT SERVICE		5		12-Aug-21	18-Aug-21	0
RYWR.PRO.05030	SW review supplier cost, Proposal & Schedule	5	0%	12-Aug-21*	18-Aug-21	0
PROCUREMENT OF SURVEYS & DESIGNS FOR PIPELINE ROUTE. PUMPING STATION & BREAK PRESSURE T		16		14-Jun-21 A	27-Aug-21	7
INFRA		16		14-Jun-21 A	27-Aug-21	7
RYWR.PRO.04000	Agree Pre-Construction Work Packages	16	20%	14-Jun-21 A	27-Aug-21	7
CONSTRUCTIONS		712		21-Dec-22	31-Oct-25	0
DPC (Direct Procurement for Customer)		712		21-Dec-22	31-Oct-25	0
RYWR.PRO.00040	DPC - Feasibility Designs Deliverables to feed into Tender Document	0	0%		21-Dec-22	7
RYWR.PRO.00060	DPC - Procurement Assurance & Governance	22	0%	22-Dec-22	30-Jan-23	7
RYWR.PRO.00070	DPC - Refine Tender Documentation	129	0%	30-Jan-23	03-Aug-23	7
RYWR.PRO.00080	DPC - Procurement Assurance & Governance (Ready for Issue Contract Notice)	22	0%	03-Aug-23	04-Sep-23	7
RYWR.PRO.00100	DPC - ISSUE CONTRACT NOTICE (OFWAT E dependent)	0	0%		13-Sep-23	0
RYWR.PRO.00110	DPC - Pre-Qualification Questionnaire (PQQ) Period	40	0%	14-Sep-23	09-Nov-23	0
RYWR.PRO.00111	DPC - PQQ Evaluation Period	20	0%	09-Nov-23	07-Dec-23	0
RYWR.PRO.00113	DPC - Notify Bidders of Tender Shortlist	0	0%		12-Jan-24	0
RYWR.PRO.00112	DPC - Assurance and Governance	20	0%	07-Dec-23	12-Jan-24	0
RYWR.PRO.00120	DPC - COMMENCE TENDER STAGE 1 PROCESS	0	0%	12-Jan-24		0
RYWR.PRO.00130	DPC - Stage 1 Tender Period	50	0%	12-Jan-24	22-Mar-24	0
RYWR.PRO.00131	DPC - Stage 1 Assessment and Governance	30	0%	22-Mar-24	08-May-24	0
RYWR.PRO.00140	DPC - Inform Bidders of Tender Shortlist	0	0%		08-May-24	0
RYWR.PRO.00152	DPC - Stage 2 Initial Draft Technical Submission	0	0%		01-Aug-24	10
RYWR.PRO.00151	DPC - Stage 2 Initial Draft Commercial Submission	0	0%		01-Aug-24	10
RYWR.PRO.00153	DPC - Stage 2 Initial Draft Review. Feedback and Dialogue	10	0%	01-Aug-24	15-Aug-24	10
RYWR.PRO.00155	DPC - Stage 2 2nd Draft Technical Submission	30	0%	15-Aug-24	27-Sep-24	10
RYWR.PRO.00154	DPC - Stage 2 2nd Draft Commercial Submission	30	0%	15-Aug-24	27-Sep-24	10
RYWR.PRO.00156	DPC - Stage 2 2nd Draft Review. Feedback and Dialogue	10	0%	27-Sep-24	11-Oct-24	10
RYWR.PRO.00157	DPC - Stage 2 Final Tender Submission	0	0%		25-Oct-24	0
RYWR.PRO.00150	DPC - Stage 2 Tender Period	120	0%	08-May-24	25-Oct-24	0
RYWR.PRO.00158	DPC - Stage 2 Tender Assessment	60	0%	25-Oct-24	29-Jan-25	0
RYWR.PRO.00160	(GIVE) - DPC - PREFERRED BIDDER NEGOTIATION	30	0%	29-Jan-25	12-Mar-25	0
RYWR.PRO.00190	DPC - Contract Award (KEY)	0	0%		23-Sep-25	0
RYWR.PRO.00200	DPC - StandstillPeriod (10 calendar days)	10	0%	24-Sep-25	03-Oct-25	0
RYWR.PRO.00220	DPC - CONSTRUCTION DESIGN COMMENCE (KEY)	0	0%		31-Oct-25	0
RYWR.PRO.00210	DPC - Execute Contract	20	0%	03-Oct-25	31-Oct-25	0
SURVEYS		10		31-Aug-21	13-Sep-21	7
ENGINEERING SURVEYS FOR FEASIBILITY DESIGNS		10		31-Aug-21	13-Sep-21	7
PIPELINES		10		31-Aug-21	13-Sep-21	7
Walk Over Survey		10		31-Aug-21	13-Sep-21	7
RYWR.SVY.01110	Consttructibility Review . Walk Over Work Pack Scope Agreement	10	0%	31-Aug-21	13-Sep-21	7
FEASIBILITY DESIGNS		320		14-Sep-21	21-Dec-22	7
RYWR.DGN.00830	(GIVE) - DESIGNS INFORMATION COMPLETE for PROCUREMENT TENDER DOCUMENTATION	0	0%		21-Dec-22	7
BUDDS FARM TO WRP		320		14-Sep-21	21-Dec-22	7



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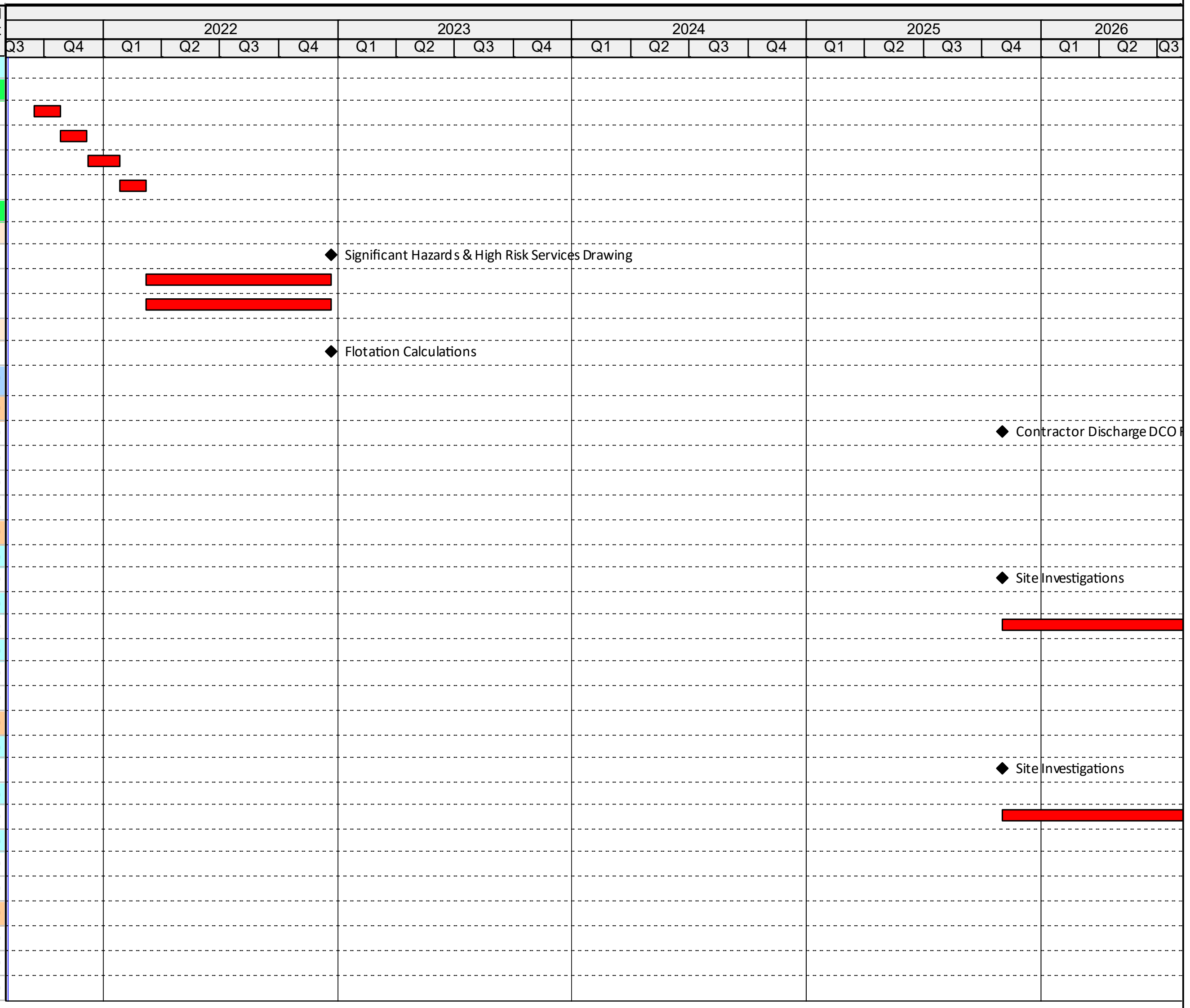
What-if 1: WATER RECYCLING PLANT - OPTION B5 (ABE STAGE 1 - DPC PROCUREMENT ROUTE)
Progressed to 06-Aug-21

Activity ID	Activity Name	Remaining Duration	Activity % Complete	Start	Finish	Total Float
INFRA		320		14-Sep-21	21-Dec-22	7
Civils Designs (more details to be developed)		120		14-Sep-21	08-Mar-22	7
RYWR.DGN.01510	Initial Buildability Review	30	0%	14-Sep-21	25-Oct-21	7
RYWR.DGN.01520	Pipeline Long Section Drawings	30	0%	26-Oct-21	06-Dec-21	7
RYWR.DGN.01530	Estimate of Civil Structure Dimensions	30	0%	07-Dec-21	25-Jan-22	7
RYWR.DGN.01540	Preliminary Pipe Routing 3D Model	30	0%	26-Jan-22	08-Mar-22	7
Other Deliverables		200		09-Mar-22	21-Dec-22	7
Pre-Construction		200		09-Mar-22	21-Dec-22	7
RYWR.DGN.00220	Significant Hazards & High Risk Services Drawing	0	0%		21-Dec-22	7
RYWR.DGN.00480	3D Model Layouts	200	0%	09-Mar-22	21-Dec-22	7
RYWR.DGN.00490	Design Drawings to support the Planning DCO Process	200	0%	09-Mar-22	21-Dec-22	7
Outline Operational Strategy		0		21-Dec-22	21-Dec-22	7
RYWR.DGN.00350	Flotation Calculations	0	0%		21-Dec-22	7
POST-CONTRACT AWARD (DPC ROUTE)		1280		31-Oct-25	16-Dec-30	0
KEY MILESTONES		1280		31-Oct-25	16-Dec-30	0
4	Contractor Discharge DCO Requirement	0	0%		31-Oct-25	0
6	Start Commissioning	0	0%	16-May-30		0
7	Water Into Supply	0	0%	09-Aug-30		0
8	Benefit Realisation Commence	0	0%	16-Dec-30		0
CONVEYANCE PIPEWORK WRP TO EBL		1130		31-Oct-25	16-May-30	0
Site Investigation		0		31-Oct-25	31-Oct-25	0
605	Site Investigations	0	0%	31-Oct-25		0
Design		260		31-Oct-25	17-Nov-26	0
607	Design (Assume reduced duration from 390d to 260d)	260	0%	31-Oct-25	17-Nov-26	0
Construction		870		17-Nov-26	16-May-30	0
610	Conveyance Pipework Construction (was 875d, now 174w)	870	0%	17-Nov-26	16-May-30	0
611	Wet Commissioning Ready	0	0%	16-May-30		0
CONVEYANCE PIPEWORK PEEL COMMON TO WRP		1130		31-Oct-25	16-May-30	0
Site Investigations		0		31-Oct-25	31-Oct-25	0
620	Site Investigations	0	0%	31-Oct-25		0
Design		260		31-Oct-25	17-Nov-26	0
622	Design (Assume reduced duration from 390d to 260d)	260	0%	31-Oct-25	17-Nov-26	0
Construction		870		17-Nov-26	16-May-30	0
625	Conveyance Pipework Construction (was 510d, now 174w)	870	0%	17-Nov-26	16-May-30	0
626	Wet Commissioning Ready	0	0%	16-May-30		0
COMMISSIONING		150		16-May-30	16-Dec-30	0
632	WRP Dry Commissioning Period	60	0%	16-May-30	09-Aug-30	0
633	Wet Commissioning Period	80	0%	09-Aug-30	02-Dec-30	0
634	Handover Period	28	0%	06-Nov-30	16-Dec-30	0



🟩 Remaining Work
🟥 Critical Remaining Work
◆ ◆ Milestone

Date	Revision	Checked	Approved
25-Aug-21	WR (B5) Schedule for G1.5 Submission	DC	BM

Appendix D – Future Opportunities

During our Gate 2 activities, we have had a rigorous focus on risk and opportunity. Where possible we have sought to include key opportunities within the optimised ABE delivery schedule. We have identified a number of opportunities that have not been incorporated into our core schedules at this stage. This is generally because, at the current level of assessment, they would clash with a wider obligation of ours (such as optimising Value for Money for Customers) or we need to engage further with market providers to understand risk appetite. We will however be exploring these opportunities further within the next phase of activity and, where relevant, will form part of our next phase of market and specialist engagement to fully quantify the risk appetite and costs.

Table 110 below details an initial appraisal that has been completed for these opportunities. We will be seeking to quantify these further within the next stage of the project, ahead of RAPID Gate 3.

Our assessment at this stage is that there could be 7 months of viable opportunity that could be realised through Opportunity 2, 3 and 4. This assessment provides the opportunity range that we are presenting at Gate 2.

Table 110 - Initial Appraisal for future opportunities

Opportunity No.	Opportunity Title	Opportunity Description	Approximate Time Saving	Opportunity cost	Reason not carried forward to main schedule at this stage	Gate activities where 3 opportunity will be explored
1	24 hr working	Contract is awarded based on an instruction for the CAP to undertake construction with extended hours 24/7 – 4 workforces Rotating three shift pattern - Day (8-hr), Swing (8-hr), Night (8-hr)	20% of overall WRP construction	C.110% CAPEX Increase (Calculation does not include higher labour rates for night-time or weekend working)	Significant concerns around: • Very high-cost impact for relatively low time benefit (poor VfM for Customers) • Ability to secure planning consent • Customer and stakeholder impact • Construction team welfare	• DPC Stage 3 development phase • DCO development and non-statutory engagement process

Opportunity No.	Opportunity Title	Opportunity Description	Approximate Time Saving	Opportunity cost	Reason not carried forward to main schedule at this stage	Gate activities where 3 opportunity will be explored
2	‘Smart construction’ Option	Contract is awarded based on an instruction for the CAP to undertake~~n~~ construction with extended hours. Double shift pattern – 10hr day shift and 5hr night shift (or 50% workforce capacity at night)	10% of overall WRP construction	C.20% CAPEX Increase (Calculation does not include higher labour rates for night-time or weekend working)	Significant concerns around: • High-cost impact for relatively low time benefit (poor VfM for Customers) • Ability to secure planning consent • Customer and stakeholder impact	• DPC Stage 3 development phase • DCO development and non-statutory engagement process
3	No Ground Investigation required post contract	SW procure suppliers to undertake the necessary investigations to ensure that the successful CAP can price the risk and not need to undertake further GI post contract award	B.2 / B.5 Approximately 6 months	3-4 m	Concerns around: • Market appetite and acceptability • Post contracts change potential • Lack of design clarity for Recycling Building limits GI scoping	• DPC Stage 3 development phase • Design development and survey activities
4	Conveyance pipe opportunities	Building on Option 3, we would undertake the conveyancing pipeline design earlier in the delivery process, possibly in the later stages of the tender process	B.2 / B.5 Approximately additional 3 months	Unquantifiable at this time	Concerns around: • Risk transfer for tunnelling operations • Market appetite and acceptability • Post contracts change potential • Requirement to purchase significant long lead items such as pipes or valves may limit schedule opportunity	• DPC Stage 3 development phase • Design development and survey activities