Water Resources Management Plan 2019

Annex 16: Water Framework Directive Assessment

Main Report

December, 2019

Version 1

from Southern Water

Contents

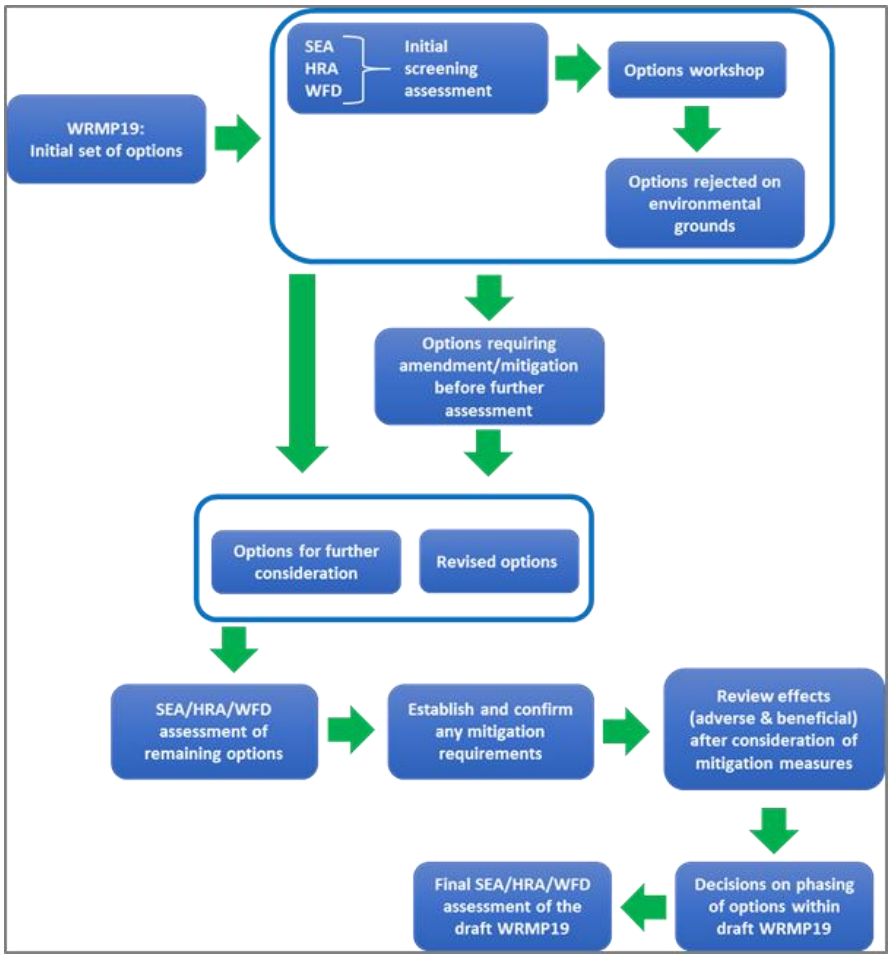
1. Introduction

1.1 Background and purpose of Water Framework Directive assessment

Water companies in England and Wales are required to produce a Water Resources Management Plan (WRMP) every five years. The plan sets out how the company intends to maintain the balance between supply and demand for water over the long-term planning horizon in order to ensure security of supply in each of the water resource zones making up its supply area.

As part of the development of this plan, this Water Framework Directive (WFD) assessment considers the potential effects of alternative options and programmes on WFD objectives. The WFD assessment has been undertaken in parallel with the Strategic Environmental Assessment (SEA) and Habitats Regulations Assessment (HRA) to ensure an integrated approach to environmental assessment and has been used to inform the development of the WRMP19 to ensure its overall compliance with relevant legislation**.** Figure 1 and Figure 2 show the overall process for integrating WFD assessment into the development of the WRMP19.

Figure 1 Integration of the WFD assessment into the WRMP process



A high-level screening process was carried out of the unconstrained list of options to rule out options with likely high risks of WFD status deterioration. For example, a Medway estuary tidal barrage option was rejected due to a high risk of WFD status deterioration to the Medway WFD transitional water body (see Annex 7). Further screening of the constrained list of options was carried out, resulting in several options being rejected due to higher risks of deterioration in WFD status (for

example, a desalination scheme in the Stour estuary and an indirect potable reuse scheme on the River Test). This process is detailed further in Annex 6 Options Appraisal and Annex 14 Strategic Environmental Assessment. All of the remaining feasible options were then subject to more detailed screening as set out in this report, and where screened in, subject to the full WFD assessment process. Findings from the feasible options WFD assessment have been used to inform decision-making on the options to be included in the WRMP19 and also informed the Strategic Environmental Assessment (Annex 14) of options and the preferred strategies for each of Southern Water's three operational areas.

In parallel to the assessment of WRMP options, Southern Water has also taken account of the risk of deterioration of WFD status of its existing water sources, including reference to the dialogue with the Environment Agency in relation to the future sustainability of existing water source abstractions in respect of the WFD 'no deterioration' objective. As well driving potential sustainability reductions to be considered within the WRMP development, Southern Water has also assessed whether any new WRMP options may be more favourable in respect of WFD objectives and/or wider environmental performance measures than existing water sources. This is detailed in Annex 14 Strategic Environmental Assessment.

This document outlines the approach adopted and reports the findings from the WFD compliance assessment of WRMP options and programmes. The assessment involves the consideration of the likely impacts of both construction and operation of each WRMP option on WFD requirements alone and in combination with other options, programmes and plans. In particular, consideration has been given in the assessments as to whether there is a risk of deterioration in water body status between the status classes of any given WFD element. The assessment methodology was issued for consultation to the Environment Agency and wider stakeholders in 2016.

Figure 2 Integration of the WFD assessment into the development of the Water Resource Management Plan.

1.2 WFD requirements for WRMP

The requirements for a WFD compliance assessment of a water company WRMP are explained in the Water Resources Planning Guideline (WRPG)[1] (Box 1).

Box 1: WRPG 2018

Water Framework Directive Assessment of a WRMP

(Section 6.11 Water Framework Directive)

*"You must take account of the **requirements of the WFD**, including the legally binding **environmental objectives in the river basin management plans**, when considering your proposed solution(s). You should consider solutions that promote the requirements of Article 7 of WFD (that seeks, as a minimum, to **prevent deterioration of water with the aim of reducing the treatment needed to produce drinking water**) and look to work in partnership with others. You should review solutions that have been identified in RBMP and this may require partnership working with others in the catchment to achieve the solution.*

*You should confirm that there is **no risk of deterioration from a potential new abstraction or from increased abstraction** at an existing source before you consider it as a **feasible option**. In addition, you should ensure that **any options do not prevent the achievement of good status (or potential)**. You should talk to the Environment Agency or Natural Resources Wales about any intended actions that may cause deterioration of status (or potential) or prevent the achievement of the water body status objectives in the river basin management plans or for new modifications the achievement of good status (or potential). You should do this as soon as possible before developing your plan and you should make a clear statement in your plan about any potential impacts.*

*Your plans should include targeted and cost-effective **implementation of restoration measures required at the catchment scale**, either working solely or in partnership with other catchment-based organisations. Given the uncertainty over the level of confidence you should consider the principles of adaptive management, with associated pre and post project monitoring."*

These WRPG requirements reflect Defra's Guiding Principles for Water Resources Planning (Defra, 2016) which state that companies should take account of the government's objectives for the environment "including the appropriate parts of the EU Water Framework Directive". Defra also expects that companies will:

- Have regard to River Basin Management Plans (RBMPs) and their objectives when making decisions that could affect the condition of the water environment
- Ensure that current abstractions and operations, as well as future plans support the achievement of environmental objectives and measures set out in RBMPs
- Ensure plans:
  - prevent deterioration in water body status
  - support the achievement of protected area and species objectives
  - support the achievement of water body status objectives

[1] Environment Agency and Natural Resources Wales (2018). Water Resources Planning Guideline: Interim update July 2018

- Continue working with the Environment Agency to take a proportionate and evidence based approach to identify the changes needed to current abstraction licences to meet environmental requirements

Both WRPG and the Defra Guiding Principles refer to ensuring 'no deterioration' of water body status. The European Court of Justice (ECJ) ruling in 2015 clarified that 'no deterioration' in relation to the WFD means a deterioration between a whole 'status class' (e.g. 'good', 'moderate', etc.) of one or more of the relevant 'quality elements' (e.g. biological, physico-chemical, etc.). This definition applies equally to Artificial Water Bodies (AWB) and Heavily Modified Water Bodies (HMWB) in respect of the relevant quality elements that relate to the defined uses of these water bodies. The ECJ ruling further states that if the quality element concerned is already in the lowest class, any deterioration of that element constitutes a deterioration of the status.

References to 'no deterioration' in this WFD assessment align to this ECJ ruling.

2. WFD assessment approach

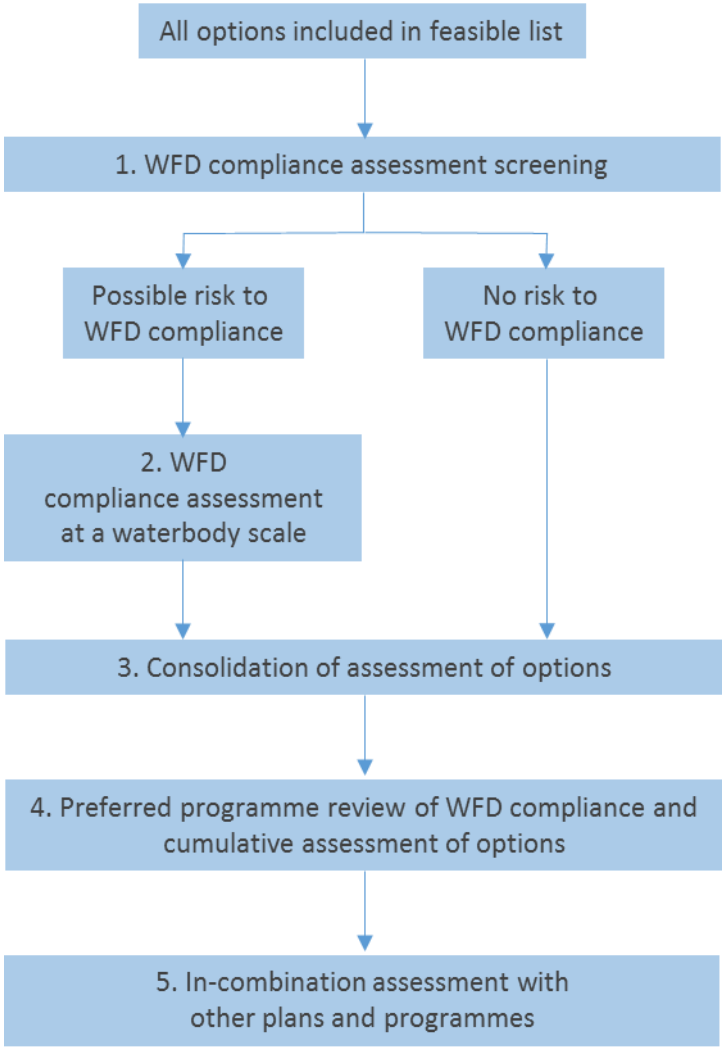
2.1 Methodology

2.1.1 Sequential process

The WFD assessment findings were actively used by Southern Water in determining the 'best value' programme of options for each water resource zone. Where options were selected for inclusion in the 'least cost' strategy for each water resource zone following programme appraisal modelling, a further review was carried out of each option, both alone and in combination with any other option, so as to ensure that the strategy was compliant with key WFD objectives.

A sequential 5-stage process for undertaking WFD compliance assessments has been applied as follows in line with the methodology published by the company in 2016, as illustrated in Figure 3. The 5 stages are numbered in Figure 3 and outlined below.

Figure 3 WRMP WFD compliance assessment steps



A sequential 5-stage process for undertaking WFD compliance assessments has been applied as follows in line with the methodology published by the company in 2016:

- WFD compliance assessment screening: involves a preliminary assessment of each option and identifies whether there may be any risk of deterioration in WFD status. This is based on expert judgement. Where an option is found to pose a potential risk of WFD deterioration,

the option is flagged for further WFD compliance assessment. This step of the assessment is reported in **Appendix A**

- WFD compliance assessment: This involves assessment of the likely changes to hydro-morphology and water quality occurring as a result of the construction or operation of the option and the possible risks to WFD status. In addition, the potential effects on WFD protected areas are assessed. This step of the assessment is reported in **Appendix B** (for options included in the preferred plan) **and Appendix C** (for feasible options not included in the preferred plan
- Option level WFD compliance assessment: This involves summarising WFD compliance assessments of each of the options on the feasible list (from Steps 1 and 2) as set out in the Section 3 of this report
- Preferred programme WFD compliance statement. This involves a statement of the compliance of the preferred programme against each of the WFD compliance objectives set out in Section 4 of this report. This involves assessment of the set of options within the programme, both alone and in combination with other options within the programme. The assessment is also used to identify where multiple options potentially impact on the same WFD water body, and potentially downstream water bodies where appropriate.
- In-combination assessment of the preferred programme with those of other water companies WRMP19 as well as other plans and projects is included in the Environmental Report of the Strategic Environmental Assessment. This step of the WFD assessment is reported in Section 5 of this report

2.1.2 WFD compliance objectives

The fundamental environmental objectives of the WFD are to attain good ecological status and prevent deterioration of the status of designated water bodies. These objectives are set down in Article 4 of the WFD. Any new development (as well as existing operations) must ensure that these WFD objectives are not compromised. Article 4 on environmental objectives has been interpreted and further developed in Environment Agency (Environment Agency, 2016a and Environment Agency 2017), Defra/Environment Agency (Defra and Environment Agency, 2009), Department of Environment Northern Ireland (Department of the Environment Northern Ireland 2012) and Environment Agency and Natural Resources Wales (2018) to give a series of objectives based on Article 4 of the WFD. These have been developed for the WFD assessment of this plan when considering options, programmes or the Plan as a whole:

- Objective 1: To prevent deterioration between status classes of any water body
- Objective 2: To prevent the introduction of impediments to the attainment of Good WFD status or potential for the water body. It is noted that for some water bodies, it is accepted that achievement of Good status or potential is currently technically infeasible or disproportionately costly. Where this is the case, the test is applied to the currently agreed objectives for that water body rather than against Good status/potential
- Objective 3: To ensure that the planned programme of measures in the RBMP to help attain the WFD objectives for the water body (or the environmental objectives in the 2015 RBMPs) are not compromised
- Objective 4: To ensure the achievement of the WFD objectives in other water bodies within the same catchment are not permanently excluded or compromised

Two further objectives were included to assess whether an option, programme or the Plan assists the meeting of WFD objectives, which is over and above a test of WFD compliance:

- Objective 5: To assist the attainment of the WFD objectives for the water body
- Objective 6: To assist the attainment of the objectives for associated WFD protected areas

Objective 5 has been added to indicate whether the option actually assists with attaining WFD water body objectives, whilst acknowledging that no water resource scheme is under any obligation to do

so. Objective 6 has been added based on the specific requirement of the WRPG. A “negative” answer to testing of Objectives 5 or 6 does not indicate that the option has an adverse WFD compliance assessment but does inform the assessment of that option relative to other options.

2.2 Supporting information and data used

Information on the design, construction and operation of the options was obtained from the relevant fact files. The WFD status and water body information has been obtained from the Environment Agency (Environment Agency, 2016b) online Catchment Data Explorer for RBMP2 for the year 2015. Water body protected areas linkages were also obtained from the Environment Agency’s online Catchment Data Explorer, these include:

- Bathing Water Directive: Bathing waters
- Drinking Water Directive: Drinking water protected area
- Conservation of Wild Birds Directive: water dependent Special Protection Areas (SPAs)
- Habitats Directive: water dependent Special area of Conservations (SACs)
- Shellfish Directive[2]: Shellfish waters
- Nitrates Directive: Nitrate Vulnerable Zones
- Urban Waste Water Treatment Directive: Nutrient sensitive area or eutrophication sensitive area

[2] The Shellfish Directive 2006/113/EC was repealed by the Water Framework Directive 2000/60/EC in 2013. The shellfish waters protected areas are waters designated by the Water Environment (Water Framework Directive) (England and Wales) Regulations 2003 as amended. The aim is to protect and improve water quality, to support the growth of healthy shellfish (bivalve and gastropod molluscs) and contribute to good quality edible shellfish.

3. Summary of WFD compliance assessment for feasible options

This section presents a summary of the option WFD compliance assessment for all options included in the feasible list, according to Steps 1 and 2 highlighted in Section 2.1.

All of the catchment management schemes and demand management options were screened out for full WFD compliance assessment as they were assessed as having no adverse effects on WFD objectives and potentially having beneficial effects on WFD objectives by improving the local water environment through land-use management and reducing the growth in demand for water.

Drought options were also screened out of WFD assessment as the potential risk of deterioration to WFD waterbodies arising as a consequence of their implementation was fully assessed as part of Southern Water's Drought Plan.

Temporary effects due to short-duration activities like construction or maintenance do not count as deterioration if the water body would recover in a short time without any restoration measures (Environment Agency, 2016a). Where an option was assessed as having the potential to adversely impact on WFD water bodies during the construction phase and it can be mitigated through the implementation of construction best-practice, the risk of deterioration between WFD status classes is considered as negligible. Therefore, options only involving temporary impacts relating to construction activities were not assessed further as part of the second stage of the WFD compliance assessment.

The majority of the screened-out options involve transfers of water by new or existing pipelines or abstractions from confined aquifers and therefore posing a negligible risk of deterioration to any WFD water bodies (**Appendix A**). A number of options screened out in Appendix A are bulk transfers from neighbouring water companies and have been screened out from further WFD assessment, this being undertaken by the donor company. The remaining supply-side options were assessed in more detail for WFD compliance (**Appendices B and C**).

Most feasible options were assessed as being compliant with WFD objectives, however, there were some uncertainties in the assessments as follows:

- Groundwater abstractions (2 schemes): the uncertainties related to understanding the level of hydraulic connectivity between the groundwater sources and potential groundwater-dependent rivers and/ or groundwater dependent terrestrial ecosystems (GWDTE). One of these schemes (West Chiltington groundwater scheme) is included in the WRMP19 strategy and is discussed further in the 'Preferred programme WFD compliance statement' section
- Desalination (6 schemes): the uncertainties related to understanding the impact on estuaries and how that may affect aquatic ecology and/ or the impact of the brine discharge. None of these schemes were selected for the WRMP19 strategy, however one is included as a strategic alternative (Tidal River Arun Desalination (10Ml/d))
- Wastewater reuse (4 schemes): the uncertainties related to the impact of increased flows in the receiving rivers during times of low flows. One of these schemes (Sandown WwTW Indirect Potable Reuse scheme) is included in the WRMP19 strategy and is discussed in the 'Preferred programme WFD compliance statement' section. Two schemes are included as strategic alternatives; Itchen Indirect Water Reuse (Portsmouth Harbour and Fareham WwTW Indirect Potable Water Reuse (90Ml/d) and Woolston and Portswood WwTW Indirect Potable Water Reuse (20.5Ml/d)

In addition, information provided by South West Water on the Bournemouth Water bulk supply transfer option for the Western Area indicated that further WFD investigations would be necessary as part of the more detailed development of the scheme, as agreed with the Environment Agency.

We are not aware that there are any other WFD risks associated with the abstraction of water in relation to other water company bulk supply transfer options considered in our plan and none have been identified by the donor companies in their draft WRMP19 assessments. The WFD risk assessment for the abstraction is the responsibility of the donor water company but we will continue to liaise with the relevant donor companies on ensuring WFD compliance for those bulk water supply transfer schemes included in our preferred programme.

4. Preferred programme and strategic alternatives WFD compliance statement

This section summarises the compliance outcomes for those strategies which were selected as part of the preferred as well as alternative programmes. Where options were identified as having a risk of WFD status deterioration, these options were discussed as part of the development of the final 'best value' plan for each water resource zone. Where feasible, options with risks of WFD status deterioration were removed from further consideration in the final programme appraisal modelling. Where, however, risks to the supply-demand balance necessitated the inclusion of the option(s) in the 'best value' plan, the WFD risks have been clearly identified and additional mitigation measures have been considered as discussed below. The WFD compliance assessment has concluded for the WRMP19 preferred programme (Table 1) that:

- With the exception of two options (set out below), none of the individual options or the preferred programmes for each operational area would lead to deterioration of water body status or prevent them from achieving good status and are therefore compliant with Objectives 1 and 2 for the WFD
- The assessment indicated uncertainty as to the magnitude of effects on WFD water bodies for two of the options included in the WRMP19 strategies, and therefore a risk of non-compliance with Objective 1 (risk of deterioration in status of the water body):
  - The West Chiltington groundwater abstraction option assessment indicated that, adopting a precautionary approach, a potential for impacts on one WFD river water body and a groundwater dependent terrestrial ecosystem (GWDTE). The historic operation of the boreholes did not result in any concerns about adverse effects on the Site of Special Scientific Interest (SSSI) or the River Chilt and for this reason, although there is insufficient objective evidence currently available, we believe the option will be compliant once the proposed investigations are completed to provide that evidence
    Further assessment of the hydrogeological connectivity between the groundwater source and these dependant ecosystems is proposed to confirm the magnitude of any potential impact during operation. These investigations will take place as part of the WINEP3 WFD no-deterioration investigations already agreed with the Environment Agency and scheduled for completion by 2022. We will work with the Environment Agency and Natural England over the coming months to agree the precise scope of these investigations, which may include groundwater modelling and/or pump test surveys.
    These investigations will support the development of any mitigation measures that may be required in the event that WFD status deterioration and/or adverse effects on the GWDTE SSSI site are identified. Mitigation measures could involve some additional volumetric and/or groundwater level constraints on the existing abstraction licence to protect surface water features or possibly some in-stream (River Chilt) or wetland (GWDTE) restoration measures to enhance the resilience of these water bodies to any identified effects of groundwater abstraction
  - Sandown WTW Indirect Potable Reuse option assessment indicated a potential for impacts on the flow regime of one WFD river water body. Further assessment is necessary in order to ascertain the magnitude of impacts on ecological receptors, as a consequence of flow regime alterations during the operation of the scheme. We will work with the Environment Agency and Natural England over the coming months to agree the specific scope of investigations and/or surveys to assess the risks in more detail, in particular in respect of the effect of changes to the low flow regime and water quality from increased flow augmentation of the River Eastern Yar. These investigations will be completed by 2021 at latest and will inform the development of any required mitigation measures – these could include operational controls to reduce the volume of discharge relative to actual river flow and possibly treatment processes to manage the temperature of the effluent relative to the ambient river water temperature if required.

- In addition, South West Water has advised that for the Bournemouth Water bulk supply transfer option it will be carrying out a WFD risk of status deterioration study as has already been discussed as part of the West Country Water Resources Group with the Environment Agency. We will liaise with South West Water on their investigations which will need to be completed by 2020 at latest. These investigations will inform the development of any mitigation measures associated with the increased abstraction (within existing licence limits).

With respect to the other WFD compliance objectives, the following assessment conclusions have been reached:

- The effect of each option individually on downstream water bodies, together with consideration of any further water bodies arising at the programme level has been included within the compliance assessment of Objectives 1-4 above
- None of the proposed options in the WRMP19 strategies (with the exception of catchment management, river restoration and demand management options) contribute to the attainment of good status or good potential objectives for any water bodies. With the inclusion of catchment management, river restoration and demand management options in the WRMP19 strategies, the plan should help assist the attainment of the WFD objectives for some water bodies (Objective 5 of the WFD assessment test)
- None of the proposed options in the WRMP19 strategies (with the exception of catchment management, river restoration and demand management options) contribute to the attainment of objectives for WFD protected areas. With the inclusion of catchment management, river restoration and demand management options in the WRMP19 strategies, the plan should help assist the attainment of the WFD objectives for some Protected Areas (Objective 6 of the WFD assessment test), for example the river restoration scheme for the River Itchen SAC

For the two schemes identified as uncertain in respect to WFD compliance, our plan includes strategic alternative schemes that could be developed should the investigations summarised above conclude there would be a risk of WFD status deterioration. For the West Chiltington source, if the volume of abstraction needed to be reduced from this source as part of any mitigation measures, the alternative option would be to develop another stage of our Pulborough winter transfer scheme (IZT-Har1 option assessed in Appendix A). For the Sandown WTW Indirect Potable Reuse option, the alternative would be the Sandown desalination scheme (DES_San9) option (assessed in Appendix B).

The WFD compliance assessment has been applied to all of the strategic alternative options included in the WRMP19. The assessment of these alternative options concluded (Table 1) that four options have a potential risk of causing WFD deterioration to one WFD waterbody:

- The Brighton WTW Indirect Potable Reuse scheme (10Ml/d) presents a potential risk of WFD deterioration to one WFD river water body, linked to increases in the flow regime and potentially water temperature and the associated potential impacts on macroinvertebrates and macrophytes within a short reach of the water body. If this alternative scheme was required to be developed, further investigations would be required to assess these potential impacts in more detail, and if necessary develop appropriate mitigation measures if a WFD status deterioration risk was confirmed. Mitigation measures could include operational controls to reduce the volume of discharge relative to actual river flow and possibly treatment processes to manage the temperature of the effluent relative to the ambient river water temperature if required.
- Tidal River Arun desalination (10Ml/d) presents a potential risk of WFD deterioration to the Arun waterbody, linked to the uncertainties regarding the abstraction regime and timings of the abstraction, and the potential impacts on fish and macroinvertebrates (not assessed as part of RBMP2) for a short reach of the intertidal waterbody. Mitigation may be available in

the form of intake screens and avoiding abstraction at low tide, however if this alternative scheme was required, further investigations would be needed to assess the potential impacts in more detail and develop appropriate mitigation.

- The two Itchen indirect water reuse schemes (Option 1:combined Portsmouth Harbour and Fareham WTWs indirect potable reuse scheme (90Ml/d), Option 2: combined Woolston and Portswood WwTWs indirect potable reuse scheme (20.5Ml/d)) present a potential risk of WFD deterioration to the River Itchen WFD river water body, linked to increases in the flow regime and potentially water temperature and the associated potential impacts on fish, macroinvertebrates and macrophytes within a short reach of the water body (depending on the final location of the discharge outfall as part of the detailed design). If either of these alternative schemes were required to be developed, further investigations would be required to assess these potential impacts in more detail, and if necessary develop appropriate mitigation measures if a WFD status deterioration risk was confirmed. Mitigation measures could include operational controls to reduce the volume of discharge relative to actual river flow and possibly treatment processes to manage the temperature of the effluent relative to the ambient river water temperature if required.
- The remaining strategic alternative options have been assessed as WFD compliant (see Table 1)

Table 1 WFD assessment summary for schemes included in the WRMP19 and strategic alternative schemes

Option name	Option ID	Operational Area	WFD Compliance	
			Assessment	Reason for option not being confirmed as compliant
Preferred programme				
SEW bulk supply near Canterbury	BS_Win	Eastern area	Compliant	
West Sandwich & Sandwich WSW licence variation	GWA_Fle	Eastern area	Compliant	
Utilise full existing transfer capacity (from Faversham)	IZT_Sel3	Eastern area	Compliant	
Medway WTW Indirect Potable Water Reuse (18Ml/d)	PWR_Ecc18	Eastern area	Compliant	
Recommission Meopham greensand groundwater source	BR_LuG	Eastern area	Compliant	
Stourmouth WSW (10Ml/d with 20Ml covered storage)	SWA_Plu10	Eastern area	Compliant	
ASR (Sussex Coast - Lower Greensand)	ASR_SCL1	Central area	Compliant	
Transfer to Midhurst WSW & Petersfield BH rehabilitation	BR_Rog	Central area	Compliant	
Scheme to bring West Chiltington back into service	BR_Smo	Central area	Uncertain	Uncertainty surrounding hydrogeological linkage with nearby river and a wetland habitat
Coastal Desalination - Shoreham Harbour (10Ml/d)	DES_Sho10	Central area	Compliant	
Pulborough groundwater licence variation	LV_Har	Central area	Compliant	

Option name	Option ID	Operational Area	WFD Compliance	
			Assessment	Reason for option not being confirmed as compliant
Winter transfer Stage 2: New main Shoreham/North Shoreham and Brighton A	IZT_Har2	Central area	Compliant	Note: this option involves no change to existing abstraction licence conditions (see also Appendix A)
Littlehampton WTW Indirect Potable Water Reuse (20Ml/d)	PWR_For20	Central area	Compliant	
Import from Bournemouth Water	BS_Kna	Western area	Compliant	
Additional import from Portsmouth Water (additional 9Ml/d)	BS_PWC1	Western area	Compliant	
Additional import from Portsmouth Water (Havant Thicket reservoir development)	BS_PWC2	Western area	Compliant	
Fawley Desalination Modular to 75Ml/d	DES_Faw75	Western area	Compliant	
WSW near Cowes - reinstate & additional treatment	GWA_Bro	Western area	Compliant	
Sandown WwTW Indirect Potable Reuse (8.5Ml/d)	PWR_SEY9	Western area	Uncertain	Uncertainty surrounding the effect of increased flows and possible temperature effects on aquatic ecology
Southampton link main (reversible link HSW-HSE)	WTW_Tot1	Western area	Compliant	
Hampshire grid (reversible link HSE-HW)	IZT_OAN1	Western area	Compliant	
Hampshire grid (reversible link HW-HA)	IZT_OAN2	Western area	Compliant	
Romsey Town and Broadlands valve (HSW-HR reversible)	IZT_Rom & IZT_Bro	Western area	Compliant	
Newbury WSW asset enhancement	AE_EWo	Western area	Compliant	
Strategic Alternative Schemes				
Sittingbourne Industrial Water Reuse	IWR_Sit8	Eastern	Compliant	
Coastal desalination – Shoreham Harbour (up to 30Ml/d)	DES_Sho	Central	Compliant	
Tidal River Arun Desalination	DES_Aru	Central	Uncertain	Uncertainty surrounding effect of abstraction on macroinvertebrates and fish
Brighton WTW Indirect Potable Reuse (10Ml/d)	PWR_WRE	Central	Uncertain	Uncertainty surrounding the effect of increased river flows and possible

Option name	Option ID	Operational Area	WFD Compliance	
			Assessment	Reason for option not being confirmed as compliant
				temperature effects on aquatic ecology
Winter transfer Stage 2: turbidity/sludge handling process improvements at Pulborough	IZT_Har1	Central	Compliant	
Fawley desalination (modular 75-100Ml/d)	DES_FawM100	Western Area	Compliant	
Sandown coastal desalination IOW (8.9Ml/d)	DES_San9	Western Area	Compliant	
Itchen indirect water reuse: Combined Portsmouth Harbour and Fareham WwTWs to River Itchen Indirect Potable Reuse (90Ml/d)	PWR_BPC90	Western Area	Uncertain	Uncertainty surrounding the effect of increased river flows and possible temperature effects on aquatic ecology
Itchen indirect water reuse: Woolston and Portswood WwTW Indirect Potable Reuse (20.5Ml/d)	PWR_WPI	Western Area	Uncertain	Uncertainty surrounding the effect of increased river flows and possible temperature effects on aquatic ecology
Test Estuary WTW Industrial reuse (9Ml/d)	IWR_SCM9	Western area	Compliant	
Woodside transfer valve (HSW to HSE)	IZT_Woo	Western Area	Compliant	

The potential for cumulative effects between each option in the preferred programme of the WRMP has also been assessed. e implemented, potential additional cumulative effects have been identified to the Southampton Water WFD transitional water body as a result of the implementation of both the Fawley desalination scheme and Test Estuary industrial reuse option. The assessment for this is summarised in Table 3. No other cumulative effects from the strategic alternatives have been identified. The Portsmouth Harbour and Fareham WwTW indirect potable reuse scheme, or Woolston and Portswood WwTW indirect potable reuse scheme, would be an alternative to the Fawley desalination scheme. The larger Fawley desalination plant would be an alternative to the Bournemouth bulk supply option or any reduced deployable output benefit from the Portsmouth Water bulk supply options.

Table 2 lists the preferred strategies which have been taken forward for further WFD assessment, and those waterbodies which they may have an impact on. This has facilitated the identification of potential in-combination impacts, where two or more strategies impact the same waterbody. The findings from this cumulative assessment are summarised Table 3.

In the event that the alternative strategic options are implemented, potential additional cumulative effects have been identified to the Southampton Water WFD transitional water body as a result of the implementation of both the Fawley desalination scheme and Test Estuary industrial reuse option. The assessment for this is summarised in Table 3. No other cumulative effects from the strategic alternatives have been identified. The Portsmouth Harbour and Fareham WwTW indirect potable reuse scheme, or Woolston and Portswood WwTW indirect potable reuse scheme, would be an alternative to the Fawley desalination scheme. The larger Fawley desalination plant would be an alternative to the Bournemouth bulk supply option or any reduced deployable output benefit from the Portsmouth Water bulk supply options.

Table 2 Summary of in-combination WFD compliance risks for the WRMP19 by WFD water body

Option name	Option ID	MEDWAY (GB530604002300)	WESTERN ROTHER (GB107041012810)	WESTERN ROTHER (GB107041012800)	LOWER GREENSAND ARUN & WESTERN STREAMS (GB40701G503100)	CHILT (GB107041012140)	ARUN (GB540704105000)	WORTHING CHALK (GB40701G505300)	SUSSEX COASTAL (GB640704540003)	SOUTHHAMPTON WATER (GB520704202800)	SOLENT COASTAL (GB650705150000)	EASTERN YAR (LOWER) (GB107101005971)	EAST KENT CHALK – STOUR (GB40701G501500)	BEWL WATER (GB30644398)	OUSE BETWEEN ISFIELD AND COAST (GB107041012560)	STOUR (KENT) (GB520704004700)	NORTH KENT MEDWAY CHALK (GB40601G500300)
ASR (Sussex Coast - Lower Greensand)	ASR_SCL1							Green									
Medway Reuse scheme	PWR_Ecc18	Green															
Coastal desalination at Shoreham (preferred programme and strategic alternative)	DES_Sho10								Green								
Fawley Desalination	DES_FawM75									Grey	Green						
West Sandwich and Sandwich WSW licence variation	GWA_Fle												Green				
Littlehampton Water Reuse Scheme	PWR_For20		Grey														
Transfer to Midhurst WSW & Petersfield BH rehabilitation	BR_Rog			Green	Grey												
Rehabilitate West Chiltington	BR_Smo				Grey	Green											
Recommission Meopham groundwater source	BR_LuG																Green
Sandown water reuse	PWR_SEY9											Green					
Test Estuary WTW industrial reuse (strategic alternative)	IWR_SCM9									Grey							
Pulborough Groundwater Licence Variation	LV_Har		Grey		Grey												
Stourmouth WSW	SWA_Plu10															Green	

Key: Green: no in-combination impacts; Grey: potential for in-combination impact identified

Table 3 In-combination WFD compliance assessment between options included in the WRMP19 preferred programme and strategic alternatives

Water Body Receptor	Option	Assessment of Potential for Cumulative Effects	Risk Rating (RAG)
Southampton Water GB520704202800	Test Estuary WTW industrial reuse (9Ml/d): In use 2065 Fawley Desalination (75Ml/d): In use 2027	***Identifying sources:*** Test Estuary WTW industrial reuse involves the re-direction of 9Ml/d of treated effluent discharge from the Test Estuary (part of Southampton Water transitional water body) to provide 9Ml/d of industrial water supply. The proposed discharge point of the Fawley Desalination scheme to the Solent is situated approximately 1.5km to the west of the mouth of Southampton Water. ***Potential environmental change and predicted response to change:*** As identified by the WFD assessment, the Test Estuary WTW industrial reuse scheme has a low risk of adverse impacts to flows in Southampton Water, as a consequence of a 9M/d reduction in treated effluent discharge and is likely to have a small beneficial effect on nutrient loading to the Test Estuary/Southampton Water. The reduction in flow occurs in a narrow stretch of the Test Estuary: whilst there is the potential for a very small localised impact on invertebrates and fish, this would not extend beyond this local area into the wider Southampton Water transitional water body and not in any proximity to any effects arising from the Fawley Desalination discharge. The results of far field salinity modelling of the Fawley Desalination discharge indicated that it is highly unlikely that a hypersaline plume originating in The Solent would lead to any elevated salinity concentrations in Southampton Water of a magnitude that might lead to any adverse effects on WFD ecological status. ***Overall rating of cumulative effects:*** Negligible risk of cumulative adverse effects on the Southampton Water WFD transitional water body.	Negligible

Water Body Receptor	Option	Assessment of Potential for Cumulative Effects	Risk Rating (RAG)
Western Rother (GB107041012810)	Pulborough Groundwater Licence Variation: In Use 2021 Littlehampton Water Reuse Scheme: In Use 2027	***Identifying sources:*** The Pulborough Groundwater Licence Variation targets the removal of the MRF condition on the groundwater source (and de-coupling from the surface water licence) in order to increase abstraction. The Littlehampton Water Re-use Scheme targets a 20Ml/d effluent transfer to the Western Rother, to be re-abstracted further downstream within the same waterbody. ***Potential environmental change and predicted response to change:*** As identified by the WFD assessment, the Pulborough Groundwater Licence Variation has been assessed as provisionally compliant, pending further assessment to confirm that the increased groundwater abstraction will not lead to WFD deterioration for the Western Rother, as a consequence of flow regime alterations. The Littlehampton Water Reuse Scheme has also been assessed as compliant, since the effluent will be highly treated and not expected to have detrimental impacts on the river's water quality or flow regime. ***Overall rating of cumulative effects:*** Negligible risk of cumulative adverse effects on the Southampton Water WFD transitional water body.	Negligible

Water Body Receptor	Option	Assessment of Potential for Cumulative Effects	Risk Rating (RAG)
Lower Greensand Arun & Western Streams GB40701G503100	Transfer to Midhurst WSW & Petersfield BH rehabilitation (1.96Ml/d): In Use 2025 Scheme to bring West Chiltington back into service (3.1Ml/d): In Use 2024 Pulborough Groundwater Licence Variation	***Identifying sources:*** The three schemes involve groundwater abstraction within the Lower Greensand Arun & Western Streams groundwater body. ***Potential environmental change and predicted response to change:*** Both schemes involve the rehabilitation of boreholes. The Petersfield Borehole abstraction and the Pulborough Groundwater abstraction are unlikely to impact the groundwater body or any groundwater dependent ecosystems. There is some uncertainty regarding the impact of the West Chiltington borehole abstraction on a groundwater-dependent surface water body (River Chilt (GB107041012140) and a GWDTE. Further assessment is necessary to confirm the compliance outcome for two of the abstraction and therefore, there is a low risk of in-combination impacts on the groundwater body. ***Overall rating of cumulative effects:*** Low risk of cumulative adverse effects on the Lower Greensand Arun & Western Streams WFD groundwater body.	Low

5. In-combination effects with other water company WRMPs

Assessment of the potential cumulative effects with water resources management options proposed in neighbouring water companies' revised draft and final WRMP19s has been undertaken. The assessment utilised outputs from a Water Resources South East Group (WRSE)[3] project. The WRSE group includes six south east water companies (Affinity Water, Portsmouth Water, South East Water, Southern Water, SES Water and Thames Water). The purpose of the project was to input to the development of long-term best value plans for securing water supplies in the south east. Since 2016 the WRSE group has been working to improve the approach to undertaking cumulative effects assessment for WRMP options developed by neighbouring water companies in the South East of England. The latest piece of work aimed to identify the potential for cumulative effects between the six WRSE water companies, to support their WRMP19 and related SEAs in a regional context. It provided a unique opportunity for communication between the six water companies and sharing of respective WRMP19 geographical information.

Table 4 provides the results of the assessment of the potential for cumulative effects with other water companies' WRMP19 based on information available in November 2019. As identified in Table 4, the cumulative effect assessment has not identified any cumulative WFD impacts between Southern Water's WRMP19 and that of other neighbouring water companies within the WRSE group. There could however be alterations to the options at the project stage, that were not identified when carrying out this cumulative assessment and therefore the cumulative effects will need to be reviewed as part of future scheme development.

In-combination WFD impact assessment with other water companies outside of the WRSE group but neighbouring Southern Water (Bournemouth Water/South West Water, Cholderton and District Water and Wessex Water) has also been undertaken. As at November 2018, none of these companies had options in their WRMP19s that would interact with Southern Water's preferred programme and give rise to cumulative impacts on WFD waterbodies.

[3] Water Resources South East Group (WRSE) project is an alliance of the six south east water companies (Affinity Water, Portsmouth Water, South East Water, Southern Water, SES Water and Thames Water), the Environment Agency, Natural England, Ofwat, Consumer Council for Water and Defra.

Table 4 Cumulative effects assessment of options between the Southern Water WRMP19 options and other water company WRMP19 options

Surface water catchment	Water Company	Water resources management option	
North Kent Medway Chalk groundwater body	Southern	Recommission Meopham Greensand groundwater source (BR_Lug)	The overall increase in abstraction from these three groundwater sources could adversely affect the groundwater body's quantitative status (which is poor status in 2016). Southfleet/Greenhithe disaggregation scheme will provide an average deployable output benefit of 8.0Ml/d, with a peak of 9Ml/d, whilst BR_Lug groundwater recommissioning scheme has an overall low risk of deterioration in WFD status. The cumulative effects of these two options are not expected to lead to a deterioration of WFD status to the chalk groundwater body given the volumes of abstraction involved within existing licence limits.
	Thames Water	Southfleet/Greenhithe disaggregation scheme	
East Kent Chalk - Stour groundwater body	Southern Water	West Sandwich & Sandwich WSW licence variation	The Affinity Water schemes could result in cumulative effects with the Southern Water scheme West Sandwich & Sandwich WSW licence variation. This could adversely affect the groundwater body's quantitative status (which was assessed as being at Poor status in 2016). Further work undertaken for Affinity Water's draft final WRMP has concluded that there would be a low risk of cumulative impacts. The Tappington South does not involve an increase in overall abstracted volumes, and impacts from Lye Oak would be localised and temporary. Further consideration will be given to the potential cumulative effects as the schemes progress to detailed design.
	Affinity Water	Lye Oak Licence Variation	
		Tappington South - Licence Variation	
Stour (Kent) Transitional Water Body	Affinity Water	Dover Docks Reservoir - Broomfield Banks Effluent Reuse	Southern Water's SWA_Plu Stourmouth abstraction scheme involves recommissioning an existing abstraction from the Stour transitional water body but abstraction is constrained by an MRF to protect flow to the Stour estuary. The proposed South East Water Broad Oak Reservoir option will abstract water from the Great Stour upstream but the abstraction licence will contain MRF or hands-off flow provisions to protect Southern Water's
	South East	Broad Oak - larger reservoir size - 5,126 Ml (36m AOD)	

Surface water catchment	Water Company	Water resources management option	
	Southern	Stourmouth WSW (10Ml/d)	existing Stourmouth abstraction. The Affinity Water scheme involves indirect effluent reuse which will reduce freshwater input to the estuary. With the MRF conditions in place for the South East Water and Southern Water schemes to protect flows to the Stour estuary, no adverse effects on the WFD status of the transitional water body are anticipated and there is therefore no risk of WFD status deterioration.

6. Summary of WRMP19 WFD compliance

For the vast majority of the options included in our WRMP19, the WFD assessment has demonstrated overall compliance with WFD objectives and statutory requirements. There are two options in the preferred programme where further investigations are required to confirm WFD compliance: Sandown WTW indirect potable reuse scheme and the West Chiltington groundwater abstraction scheme. We will work closely with the Environment Agency and Natural England over the coming months to agree the scope of the further investigations (and how these dovetail with the WINEP3 investigations required for the West Chiltington abstraction). These investigations will determine if there is a need for any mitigation measures to be developed to avoid WFD status deterioration.

For the Bournemouth Water bulk supply transfer option, South West Water has advised Southern Water that it will be carrying out a WFD risk of status deterioration study as already discussed as part of the West Country Water Resources Group with the Environment Agency. We will liaise with South West Water on their investigations which will need to be completed by 2020 at latest. These investigations will inform the development of any mitigation measures associated with the increased abstraction (within existing licence limits).

Uncertainties were identified for four of the strategic alternatives; Tidal River Arun desalination (10Ml/d), Brighton WTW Indirect Potable Reuse (10Ml/d), and the two Itchen Indirect Water Reuse options; Portsmouth Harbour and Fareham WwTW Indirect Potable Reuse 90Ml/d, and Woolston and Portswood WwTW Indirect Potable Reuse 20.5Ml/d. If any of these schemes are required further investigations will be needed and mitigation measures developed to avoid WF status deterioration.

The potential for in-combination effects on WFD waterbodies arising from options in the preferred programme has been identified with respect to three water bodies, and the risk of impact has been assessed as negligible for two water bodies and low for the other water body. The cumulative effect assessment has also not identified any cumulative impacts between Southern Water's WRMP19 and that of other neighbouring water companies.

7. References

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- Defra, 2016, “Guiding Principles for Water Resources Planning”.
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- Environment Agency, 2016a, “Protecting and improving the water environment – Water Framework Directive compliance of physical works in rivers”, Doc No. 488_10.
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Appendix A: Option WFD Compliance Assessment Screening Outcomes

December, 2019

Version 1

from Southern Water

This Appendix presents the results of the WFD compliance assessment screening outcomes for those options within the feasible list that were screened out of further assessment based on the potential risk of deterioration of WFD status. The WFD compliance assessment for those options that were screened in for assessment are presented in Appendices B and C.

Option_ID	Unique Option ID	Option Name	Water Body Name	Water Body Code	Water Body Type	Reason for screening out
AE_EWo	AE_EWo	Newbury WSW asset enhancement	N/A	N/A	Groundwater (confined - non WFD)	The scheme will increase the yield of the Newbury source within the existing licence by removing the present constraint imposed by mains leaving the site. The abstraction is from the confined chalk aquifer and therefore there is low risk of impacting surface water features and GWDTEs. Therefore, there is negligible risk of WFD deterioration.
ASR_SCL	ASR_SCL1	ASR (Sussex Coast - Lower Greensand)	N/A	N/A	Groundwater (confined - non WFD)	This option is using spare water available from the Pulborough abstraction licence in order to store it within the Upper Greensand formation underlying the Worthing Chalk. The Upper Greensand is confined by Gault Clays and is not a WFD waterbody, therefore there are no WFD deterioration risks associated with this option.
Br_LuG	Br_LuG	Recommission Meopham Greensand groundwater Source	N/A	N/A	Groundwater (confined - non WFD)	The scheme is to recommission a disused groundwater source abstracting from the Upper Greensand formation which is confined by the gault formation and overlain by a chalk aquifer. Since this is not a WFD waterbody, there is no risk of deterioration.
BS_ABO	BS_ABO1 BS_ABO2	South East Strategic Reservoir – Basingstoke–Lower Itchen WSW	Various crossings of water bodies	Various WFD water bodies	River	This option proposes a transfer of potable water from Thames Water to Lower Itchen WSW. Option is dependent on Thames Water's development of the South East Strategic Reservoir. Thames Water has assessed the WFD risk associated with this water source as

Option_ID	Unique Option ID	Option Name	Water Body Name	Water Body Code	Water Body Type	Reason for screening out
						part of its revised draft WRMP19 which demonstrated there are no risks to WFD compliance. This option takes extra raw water by pipeline to South East Water at Basingstoke and then carrying on to the Southern Water Lower Itchen WSW. No likely impact on WFD water bodies during construction subject to good practice construction methods for river crossings.
BS_Hon	BS_Hon1	Honor Oak (London Water Ring Main) to Burham WSW	Various crossings of water bodies	Various WFD water bodies	River	This option proposes a transfer from the Thames Water London Ring Main to Burham WSW. Thames Water has concluded that this option would not have any risks to WFD compliance in its revised draft WRMP19. No likely impact on WFD water bodies during construction subject to good practice construction methods for river crossings.
BS_Hon	BS_Hon2	Honor Oak (London Water Ring Main) to Burham WSW				
BS_Hon	BS_Hon3	Honor Oak (London Water Ring Main) to Burham WSW				
BS_Hon	BS_Hon4	Honor Oak (London Water Ring Main) to Burham WSW	Various crossings of water bodies	Various WFD water bodies	River	
BS_Hon	BS_Hon5	Honor Oak (London Water Ring Main) to Burham WSW				
BS_Ott	BS_Ott1 BS_Ott2	Transfer from South East Strategic Reservoir to Lower Itchen WSW	Various crossings of water bodies	Various WFD water bodies	River	This option proposes a transfer of raw water from Thames Water to the Southern Water Lower Itchen WSW. Option is dependent on Thames Water's development of the South East Strategic Reservoir. Thames Water has assessed the WFD risk associated with this water source as part of its revised draft WRMP19 which demonstrated there are no risks

Option_ID	Unique Option ID	Option Name	Water Body Name	Water Body Code	Water Body Type	Reason for screening out
						to WFD compliance. No likely impact on WFD water bodies during construction subject to good practice construction methods for river crossings.
BS_Kna	BS_Kna	Import from Bournemouth Water	Various crossings of water bodies	Various WFD water bodies	River	This option proposes a transfer to Hampshire South WRZ from existing licensed sources in the River Avon catchment with no increase to abstraction licence limits. South West Water has advised that for the Bournemouth Water bulk supply transfer option it will be carrying out a WFD risk of status deterioration study as has already been discussed as part of the West Country Water Resources Group with the Environment Agency. We will liaise with South West Water on their investigations which will need to be completed by 2020 at latest. These investigations will inform the development of any mitigation measures associated with the increased abstraction (within existing licence limits). Potential construction impacts related to pipeline crossings but no likely impact on WFD water bodies during construction subject to good practice construction methods for river crossings.
BS_PWC	BS_PWC1	Additional import from Portsmouth Water (additional 9Ml/d)	Various crossings of water bodies	Various WFD water bodies	River	Bulk import from PWC to the Hampshire Southampton East WRZ distribution network using spare capacity of an existing water main. The option is dependent on resource development (World's End) by PWC.

Option_ID	Unique Option ID	Option Name	Water Body Name	Water Body Code	Water Body Type	Reason for screening out
						The WFD risks associated with the source development have been assessed by PWC as part of developing its revised draft WRMP. Potential construction impacts related to pipeline crossings but no likely impact on WFD water bodies during construction subject to good practice construction methods for river crossings.
BS_PWC	BS_PWC2	Additional import from Portsmouth Water (Havant Thicket reservoir development)	Various crossings of water bodies	Various WFD water bodies	River	Bulk import from PWC to the Hampshire Southampton East WRZ distribution network. The option is dependent on resource development (Havant Thicket reservoir) by PWC. The reservoir would be filled from surplus water available for a series of groundwater-fed springs. Potential construction impacts related to pipeline crossings but no likely impact on WFD water bodies during construction subject to good practice construction methods for river crossings. Portsmouth Water will confirm this WFD assessment as part of its WRMP19.
BS_Win	BS_Win	SEW bulk supply near Canterbury	Various crossings of water bodies	Various WFD water bodies	River	This option proposes a transfer of water from South East Water to Birchington WSW. South East Water has spare capacity to enable the transfer of 2Ml/d through the construction of a new pipeline and associated pumping stations. South East Water has assessed the WFD risks associated with the resource element as part of its WRMP.

Option_ID	Unique Option ID	Option Name	Water Body Name	Water Body Code	Water Body Type	Reason for screening out
						Potential construction impacts related to pipeline crossings but no likely impact on WFD water bodies during construction subject to good practice construction methods for river crossings.
GWA_Bro	GWA_Bro	WSW near Cowes - reinstate & additional treatment	N/A	N/A	Groundwater (confined - non WFD)	This option is to reinstate a deep well and borehole source. The groundwater would be abstracted from a confined aquifer that is not designated under WFD. Consequently, there would be a negligible risk to any WFD surface water bodies and any GWDTEs.
IZT_Bro IZT_Rom	IZT_Bro IZT_Rom	Romsey Town and Broadlands valve (HSW-HR reversible)	N/A	N/A	N/A	This is an existing transfer that requires a booster pumping station to be added and therefore there are no WFD deterioration risks.
IZT_Har	IZT_Har1	Winter transfer Stage 2: turbidity/sludge handling process improvements at Pulborough	Western Rother	GB107041012810	River	This option considers the potential for excess surface water that is often available within the River Rother during the winter to be used to rest groundwater abstraction at Pulborough. The additional water will be abstracted within the existing licence conditions that applies to the Pulborough surface water intake to supply the Sussex Coast. The river Western Rother water body continues to be protected by the abstraction licence conditions and MRF constraint and therefore the risk of deterioration in WFD status is negligible.
IZT_Har	IZT_Har2	Winter transfer Stage 2: New main Shoreham/North Shoreham and Brighton A	Western Rother	GB107041012810	River	
IZT_OAN	IZT_OAN1	Hampshire grid (reversible link HSE-HW)	Various crossings of water bodies	Various WFD water bodies	River	These options are designed to support network flexibility and resilience improvements as well as to facilitate

Option_ID	Unique Option ID	Option Name	Water Body Name	Water Body Code	Water Body Type	Reason for screening out
IZT_OAN	IZT_OAN2	Hampshire grid (reversible link HW-HA)				water transfers within Hampshire from new strategic supply schemes (assessed separately in this WFD report). Potential construction impacts related to pipeline crossings but no likely impact on WFD water bodies during construction subject to good practice construction methods for river crossings.
IZT_OAN	IZT_OAN3	Hampshire grid (reversible link HSE-HW-HA)				
IZT_Sel	IZT_Sel1	Utilise full existing transfer capacity (from Faversham)	N/A	N/A	N/A	The option proposes to upgrade existing infrastructure only and therefore there are no WFD deterioration risks.
IZT_Sel	IZT_Sel3	Utilise full existing transfer capacity (from Faversham)	N/A	N/A	N/A	
IZT_TCS	IZT_TCS	Triplicate Cross Solent Main	Solent	GB650705150000	Coastal Water	This option proposes the construction of a new pipeline under the Solent sea bed. No additional abstraction or discharge associated with this option is proposed, therefore there are no WFD deterioration risks. No likely impact on WFD water bodies during construction subject to good practice construction methods being employed to protect the coastal water body.
IZT_Woo	IZT_Woo	Woodside transfer valve (HSW to HR)	N/A	N/A	N/A	This is an existing transfer that requires a booster pumping station to be added and therefore there are no WFD deterioration risks.
RES_BrL	RES_BrL1	Convert Test Lake into a surface water storage site	N/A	N/A	N/A	The “lake” is not a WFD water body and therefore, there is no risk of deterioration to WFD status
RES_BrL	RES_BrL2	Convert Test Lake into a surface water storage site	N/A	N/A	N/A	The “lake” is not a WFD water body and therefore, there is no risk of deterioration to WFD status

Option_ID	Unique Option ID	Option Name	Water Body Name	Water Body Code	Water Body Type	Reason for screening out
WTW_Bur	WTW_BuT	Increase turbidity capability at Burham WSW	N/A	N/A	N/A	This option proposes process recovery at an existing WSW and there are no WFD deterioration risks.
WTW_TOt	WTW_TOt1	Southampton link main (reversible link HSW-HSE)	Various crossings of water bodies	Various WFD water bodies	River	This option transfers water provided by new strategic schemes (assessed elsewhere in this WFD report) in either Hampshire Southampton West or Hampshire Southampton East to the other Southampton WRZ. There are no abstractions or discharges associated with this option directly – it is just a reversible water supply pipeline connecting the two WRZs. Consequently, there are no WFD deterioration risks. Potential construction impacts related to pipeline crossings but no likely impact on WFD water bodies during construction subject to good practice construction methods for river crossings.

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Appendix B: WFD Compliance Assessment for Options within the WRMP19

December, 2019

Version 1

from Southern Water

Contents

Appendix B presents the outcome of the WFD compliance assessment for those options included in the WRMP19 (and strategic alternative options) that were screened in for further WFD assessment. A WFD compliance assessment table is provided below for each WFD water body that may be affected by these options.

1. Options within the WRMP19 preferred programme

1.1 Medway WTW Indirect Potable Water Reuse (18Ml/d) (PWR_Ecc18)

<table>
<tr><td rowspan="19">Water body

WFD assessment (scoping)</td><td colspan="2">WFD water body name</td><td colspan="5">MEDWAY</td></tr>
<tr><td colspan="2">WFD water body type</td><td colspan="5">Transitional Water</td></tr>
<tr><td colspan="2">WFD management catchment</td><td colspan="2">Thames TraC</td><td>WFD water body ID</td><td colspan="2">GB530604002300</td></tr>
<tr><td colspan="2">River Basin District</td><td colspan="2">Thames</td><td colspan="2"></td></tr>
<tr><td colspan="7">WFD Designations, Objectives and Mitigation</td></tr>
<tr><td rowspan="2">WFD Status and Objectives</td><td>RBMP2 Overall Status</td><td colspan="2">Objective (2021)</td><td colspan="3">Objective (2027)</td></tr>
<tr><td>Moderate</td><td colspan="2">-</td><td colspan="3">-</td></tr>
<tr><td colspan="2">Hydromorphological designation</td><td colspan="5">Heavily modified</td></tr>
<tr><td colspan="2">Water Body Mitigation Measure</td><td colspan="5">No published mitigation measures</td></tr>
<tr><td colspan="7">WFD Protected Areas</td></tr>
<tr><td>Bathing Water Directive</td><td>Drinking Water Directive</td><td>Conservation of Wild Birds Directive</td><td>Habitats Directive</td><td>Nitrates Directive</td><td>Shellfish Directive</td><td>Urban Waste Water Treatment Directive</td></tr>
<tr><td>YES</td><td>NO</td><td>YES</td><td>NO</td><td>YES</td><td>YES</td><td>NO</td></tr>
<tr><td colspan="2" rowspan="2">Scheme components potentially affecting water body</td><td colspan="5">Construction: N/A</td></tr>
<tr><td colspan="5">Operation: Transfer of highly treated effluent from Medway WTW to Medway offline storage lake [non-WFD water body] - 18 Ml/d assumed loss of effluent discharge to transitional water body</td></tr>
<tr><td colspan="2">WFD element</td><td>RBMP2 (2015) status</td><td colspan="4">Assessed status (construction and operation)</td></tr>
<tr><td colspan="2">· Fish</td><td>Not assessed</td><td>Not assessed</td><td colspan="3" rowspan="4">Based on flow statistics derived from Teston GS and operating rules for the River Medway Scheme, the transfer of effluent will result in a reduction in Q95 flow that could be up to 10.2% of the total flow entering the estuary. Some freshwater invertebrate taxa are more responsive to changes in flow than others. Relative abundance of certain groups may change in response to decreased flow and community richness may decrease in response to increased sedimentation and associated changes in hydrodynamics. Phytoplankton and macroalgae are predicted to maintain their current status since there are less sensitive to flow changes. Overall, the scheme should not significantly impact the WFD elements but will be confirmed by detailed WFD assessment to be carried out as part of the detailed design of the option and the application for environmental permits.</td></tr>
<tr><td colspan="2">· Invertebrates</td><td>High</td><td>High</td></tr>
<tr><td colspan="2">· Macroalgae</td><td>Good</td><td>Good</td></tr>
<tr><td colspan="2">· Phytoplankton</td><td>High</td><td>High</td></tr>
<tr><td colspan="2">· Angiosperms</td><td>Not assessed</td><td>Not assessed</td></tr>
<tr><td colspan="2">Chemical (Overall)</td><td>Good</td><td>Good</td><td colspan="3">A change in the chemical status is assessed as unlikely as the buffering capacity of the estuary will remain largely the same and there will be a reduction in nutrient loading from the WWTW to the estuary. Salinity levels in the estuary are very low at the WWTW and the reduction in effluent discharge is unlikely to lead to any material changes to the salinity regime in the upper estuary.</td></tr>
<tr><td colspan="2">Protected Area Details</td><td colspan="5">Bathing Waters: The water body is associated with the Sheerness Bathing Water. However, these bathing waters are situated at a considerable distance downstream of the WTW and therefore, the operation of the</td></tr>
</table>

	scheme and its associated construction activities are not expected to have any adverse impacts. Nutrient Sensitive Areas: The water body is associated with a nutrient sensitive area under the Nitrates Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected; there may be a slight improvement to nutrient levels with the reduction in discharge from the WTW. Shellfish Waters: The water body is associated with two designated shellfish waters (Sheppey and Southend Shellfish Waters). However, these shellfish waters are a significant distance downstream and therefore, the operation of the scheme and any associated construction activities are not expected to have any adverse impacts. SPA and Ramsar sites: The HRA has identified no potential for Likely Significant Effects (LSE) on the Thames Estuary and Marshes SPA/Ramsar and the Medway Estuary and Marshes SPA/Ramsar sites.
Does the component comply with WFD Objective	
1. No deterioration between status classes	Yes; no deterioration between status classes.
2. No impediments to GES/GEP	Yes; no impediments to GEP
3. No compromises to water body objectives	Yes; no compromises to water body objectives.
4. No effects on other water bodies	Yes; no effects on other water bodies.
5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.
6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.

1.2 West Sandwich and Sandwich WSW licence variation (GWA_Fle)

Water body

WFD water body name	East Kent Chalk - Stour	**WFD water body ID**	GB40701G501500
WFD water body type	Groundwater	**River Basin District**	South East
WFD management catchment	South East GW		

WFD Designations, Objectives and Mitigation

WFD Status and Objectives	RBMP2 Overall Status	Objective (2021)	Objective (2027)
	Poor	-	-
Water Body Mitigation Measure	River Restoration		

WFD Protected Areas

Bathing Water Directive	Drinking Water Directive	Conservation of Wild Birds Directive	Habitats Directive	Nitrates Directive	Shellfish Directive	Urban Waste Water Treatment Directive
NO	YES	NO	NO	YES	NO	NO

WFD assessment

Scheme components potentially affecting water body	**Construction:** N/A	
	Operation: Aggregation of licences at West Sandwich and Sandwich boreholes – 10 Ml/d assumed output providing deployable output increase of 0.95 Ml/d ADO/MDO in drought by allowing increased abstraction from the Sandwich borehole in preference to the West Sandwich borehole but with no change to the existing aggregate licence volumes.	
WFD Status Test	**RBMP2 (2015) status**	**Assessed status (construction and operation)**

Quantitative (Overall)	Poor		
Dependent Surface Water Body Status	Poor	Poor	There is one dependent surface water body which may be impacted by this abstraction: Birchington and Little Stour (GB107040019570). A separate assessment is provided below.
GWDTEs test	Good	Good	There are no known SSSI or Natura 2000 GWDTE sites in the proximity of this abstraction.
Saline Intrusion	Good	Good	There is no risk of saline intrusion.
Water Balance	Poor	Poor	The abstraction is unlikely to affect the water balance on a groundwater body scale.
Chemical (Overall)	Poor	Poor	Negligible risk of deterioration in chemical status at a groundwater body scale.
Protected Area Details	Drinking Water Protected Area: the water body (East Kent Chalk – Stour) is a Drinking Water Protected Area but there is negligible risk of adversely affecting the chemical status at the groundwater body scale. Furthermore, Southern Water will want to ensure no risks to its drinking water supplies. Nutrient Sensitive Areas: The water body is associated with a groundwater nitrate vulnerable zone under the Nitrates Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected.		

Does the component comply with WFD Objective	
1. No deterioration between status classes	Yes; no deterioration between status classes.
2. No impediments to Good Status	Yes; no impediments to Good Status.
3. No compromises to water body objectives	Yes; no compromises to water body objectives.
4. No effects on other water bodies	Yes; may impact on Birchington and Little Stour surface water body (GB107040019570) as assessed separately below – but unlikely to have an adverse impact on WFD status of this surface water body.
5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.
6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.

Water body

WFD water body name	Birchington and Little Stour		
WFD water body type	River		
WFD management catchment	Stour	**WFD water body ID**	GB107040019570
River Basin District	South East		

WFD Designations, Objectives and Mitigation

WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**
	Poor	-	Moderate
Hydromorphological designation	Not designated artificial or heavily modified		
Water Body Mitigation Measure	Restoring sustainable abstraction project		

WFD Protected Areas

Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
NO	NO	NO	NO	YES	NO	YES

WFD

Scheme components potentially affecting water body	**Construction:** N/A
	Operation: Aggregation of licences at West Sandwich and Sandwich boreholes – 10 Ml/d assumed output providing deployable output increase of 0.95 Ml/d ADO/MDO in drought by allowing increased abstraction from the Sandwich borehole in preference to the West Sandwich borehole but with no change to the existing aggregate licence volumes.

WFD element	RBMP2 (2015) status	Assessed status (construction and operation)	
· Fish	Poor	Poor	There is a potential for adverse impacts on the flows in the Birchington and Little Stour River, due to the small increase in abstraction that would be authorised from the Sandwich borehole. It is considered unlikely that the flow in the surface water body would be affected sufficiently to lead to a deterioration in ecological status. Further detailed assessment of the hydrogeological linkages would be required to confirm this understanding which will be carried out as part of the planned WINEP groundwater investigations for this water body and to support the abstraction licence variation application.
· Macro-invertebrates	Moderate	Moderate	
· Macrophytes & Phytobentos	Not assessed	Not assessed	
Chemical (Overall)	Good	Good	There is negligible risk of deterioration between chemical status classes.
Protected Area Details		Nutrient Sensitive Areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. Birchington and Little Stour is a nutrient sensitive area under the Urban Waste Water Treatment Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected.	
Does the component comply with WFD Objective			
1. No deterioration between status classes		Yes; no deterioration between status classes, but further detailed assessment is required to confirm this conclusion as part of the WINEP3 investigations.	
2. No impediments to GES/GEP			
3. No compromises to water body objectives		Yes; no compromises to water body objectives.	
4. No effects on other water bodies		Yes; no impacts on other water bodies.	
5. Assists attainment of water body objectives		No; does not assist with the attainment of water body objectives.	
6. Assists attainment of protected area objectives		No; does not assist with the attainment of protected area objectives.	

1.3 Littlehampton WTW Indirect Potable Water Reuse (20Ml/d) (PWR_For20)

Water body	**WFD water body name**	Western Rother					
	WFD water body type	River					
	WFD management catchment	Arun and Western Streams	**WFD water body ID**	GB107041012810			
	River Basin District	South East					
	WFD Designations, Objectives and Mitigation						
	WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**			
		Moderate	-	Good			
	Hydromorphological designation	Not designated artificial or heavily modified					
	Water Body Mitigation Measure	No published mitigation measures					
	WFD Protected Areas						
	Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
	NO	YES	NO	NO	YES	NO	YES
WFD assessm	**Scheme components potentially affecting water body**	**Construction:** New discharge outfall					
		Operation: Transfer of highly treated effluent from Littlehampton WTW to the Western River Rother (20 Ml/d) for subsequent re-abstraction for treatment to potable standards.					

WFD element	RBMP2 (2015) status	Assessed status (construction and operation)	
· Fish	Moderate	Moderate	Construction of the new discharge outfall will be managed by good practice construction methods such that any risk to the water body is low. Temporary effects due to construction are unlikely to cause deterioration of the water body. The discharge will be treated to high tertiary standards for ammonia, phosphate and BOD, potentially generating an improvement for the phosphate status (currently moderate). Therefore, there will be negligible risk of impacting the physico-chemical quality elements of this water body. The proposed treatment will also include a process (either UV AOP or reverse osmosis) to remove the majority organic chemical contaminants. Therefore, there will be a low risk of organic chemicals such as endocrine disruptors causing deterioration to fish status. Based on the Q95 exceedance river flow and proposed scheme output, the river would contain up to approximately 18% of highly treated effluent during operation at low flows. Therefore, the potential for localised increase in flows relative to background levels is low; this is considered unlikely to have a negative impact on river ecology (and invertebrates in particular) in a water body of this size. Resident invertebrate communities (and other biological elements) in wide, deep rivers tend to associate with slower moving marginal areas, where more complex habitat structure and conditions would be expected to buffer or mitigate any increases in flows of this nature. The discharge may lead to a small increase in river water temperature at the outfall location but mixing within the river should dissipate this effect quickly downstream. For this reason, whilst the scheme may exert a minor influence on hydro-ecological processes, it is not expected to significantly impact the WFD status of the stated biological WFD elements.
· Macro-invertebrates	High	High	
· Macrophytes & Phytobentos	Moderate	Moderate	
Chemical (Overall)	Good	Good	The discharge will be tertiary treated with RO or UV AOP and would be permitted through the EA discharge permit controls. The risk of deterioration in chemical status is therefore assessed as negligible.
Protected Area Details	Drinking Water Protected Area: the water body (Western Rother) is a Drinking Water Protected Area but there is no risk of adversely affecting the chemical status at the water body scale. Furthermore, Southern Water will want to ensure no risks to its drinking water supplies and therefore the standards of effluent treatment will meet Drinking Water Protected Area requirements and Drinking Water Safety Plan targets. Nutrient Sensitive Areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. Western Rother is a nutrient sensitive area under the Urban Waste Water Treatment Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected; the discharge would be permitted through the EA discharge permit controls which would set standards for the nutrient concentration of the effluent compliant with the Nitrate Sensitive Area requirements.	

Does the component comply with WFD Objective	
1. No deterioration between status classes	Yes; no deterioration between status classes.
2. No impediments to GES/GEP	Yes; no impediments to GES.
3. No compromises to water body objectives	Yes; no compromises to water body objectives.
4. No effects on other water bodies	Yes; no effects on other water bodies.
5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.

	6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.

1.4 Transfer to Midhurst WSW & Petersfield BH rehabilitation (BR_Rog)

Water body

WFD water body name	Lower Greensand Arun & Western Streams	**WFD water body ID**	GB40701G503100
WFD water body type	Groundwater	**River Basin District**	South East
WFD management catchment	South East GW		

WFD Designations, Objectives and Mitigation

WFD Status and Objectives	RBMP2 Overall Status	Objective (2021)	Objective (2027)
	Poor	-	Good
Water Body Mitigation Measure	No published mitigation measures		

WFD Protected Areas

Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
NO	YES	NO	NO	YES	NO	NO

WFD assessment (scoping)

Scheme components potentially affecting water body	**Construction:** N/A		
	Operation: Refurbishment of Petersfield boreholes - 1.96 Ml/d output in critical period (1.6 Ml/d ADO/MDO) within existing abstraction licence limits		
WFD Status Test	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
Quantitative (Overall)	Good		
Dependent Surface Water Body Status	Good	Good	There is one dependent surface water body which may be impacted by this abstraction: Western Rother Durford (GB107041012800). A separate assessment is provided below.
GWDTEs test	Good	Good	There are no known SSSI or Natura 2000 GWDTE sites in the proximity of this abstraction.
Saline Intrusion	Good	Good	There is no risk of saline intrusion.
Water Balance	Good	Good	The abstraction is unlikely to affect the water balance on a groundwater body scale.
Chemical (Overall)	Poor	Poor	No risk of deterioration in chemical status at a groundwater body scale.
Protected Area Details			

	Drinking Water Protected Area: the water body (Lower Greensand Arun & Western Streams) is a Drinking Water Protected Area but there is negligible risk of adversely affecting the chemical status at the groundwater body scale. Nutrient Sensitive Areas: The water body is associated with a groundwater nitrate vulnerable zone under the Nitrates Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected.
Does the component comply with WFD Objective	
1. No deterioration between status classes	Yes; no deterioration between status classes.
2. No impediments to Good Status.	Yes; no impediments to Good Status.
3. No compromises to water body objectives	Yes; no compromises to water body objectives.
4. No effects on other water bodies	Yes; the abstraction has the potential to impact on Western Rother Durford (GB107041012800), but this is assessed separately below as being unlikely.
5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.
6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.

Water body

WFD water body name	Western Rother Durford					
WFD water body type	River					
WFD management catchment	Arun and Western Streams			**WFD water body ID**	GB107041012800	
River Basin District	South East					
WFD Designations, Objectives and Mitigation						
WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**			
	Moderate	-	Good			
Hydromorphological designation	Not designated artificial or heavily modified					
Water Body Mitigation Measure	No published mitigation measures					
WFD Protected Areas						
Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
NO	NO	NO	NO	NO	NO	YES

WFD assessment (scoping)

Scheme components potentially affecting water body	**Construction:** N/A		
	Operation: Refurbishment of Petersfield boreholes - 1.96 Ml/d output in critical period (1.6 Ml/d ADO/MDO) within existing abstraction licence limits		
WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
· Fish	Moderate	Moderate	There is a risk of adverse impacts on the flows in the River Rother Durford, however given the proximity of the river and the local hydrogeological conditions it is unlikely that the flow would be affected and therefore unlikely that there would be a deterioration in ecological status. This will need to be confirmed as part of the detailed WINEP3 investigations for this borehole source.
· Macro-invertebrates	Good	Good	
· Macrophytes & Phytobentos	Moderate	Moderate	
Chemical (Overall)	Good	Good	There is negligible risk of deterioration between chemical status classes.

Protected Area Details	Western Rother Durford is a Nutrient Sensitive Area under the Urban Waste Water Treatment Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected.

Does the component comply with WFD Objective	
1. No deterioration between status classes	Yes; no deterioration between status classes. This will need to be confirmed as part of the WINEP3 investigations for this borehole source.
2. No impediments to GES/GEP	Yes; no impediments to GES.
3. No compromises to water body objectives	Yes; no compromises to water body objectives.
4. No effects on other water bodies	Yes; no impacts on other water bodies.
5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.
6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.

1.5 Scheme to bring West Chiltington back into service (BR_Smo): Lower Greensand Arun & Western Streams

Water body

WFD water body name	Lower Greensand Arun & Western Streams	**WFD water body ID**	GB40701G503100
WFD water body type	Groundwater	**River Basin District**	South East
WFD management catchment	South East GW		

WFD Designations, Objectives and Mitigation			
WFD Status and Objectives	RBMP2 Overall Status	Objective (2021)	Objective (2027)
	Poor	-	Good
Water Body Mitigation Measure	No published mitigation measures		

WFD Protected Areas						
Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
NO	YES	NO	NO	YES	NO	NO

WFD assessment (scoping)

Scheme components potentially affecting water body	**Construction:** N/A		
	Operation: Recommissioning of West Chiltington boreholes - 3.12 Ml/d deployable output benefit		
WFD Status Test	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
Quantitative (Overall)	Good		
Dependent Surface Water Body Status	Good	Uncertain	There is one dependent surface water body which may be impacted by this abstraction: River Chilt (GB107041012140). A separate assessment is provided below.
GWDTEs test	Good	Uncertain	Hurston Warren SSSI is located in proximity to the abstraction. It contains habitats that are groundwater dependent such as fens and bogs. Given the proximity there is a risk that the abstraction may impact this GWDTE and further assessment is required. WFD No deterioration

			investigations are already scheduled for delivery by 2022 as part of WINEP3.
Saline Intrusion	Good	Good	There is no risk of saline intrusion.
Water Balance	Good	Good	The abstraction is unlikely to affect the water balance on a groundwater body scale.
Chemical (Overall)	Poor	Poor	Negligible risk of deterioration in chemical status at a groundwater body scale.
Protected Area Details	Drinking Water Protected Area: the water body (Lower Greensand Arun & Western Streams) is a Drinking Water Protected Area but there is negligible risk of adversely affecting the chemical status at the groundwater body scale. Furthermore, Southern Water will want to ensure no risks to its drinking water supplies. Nutrient Sensitive Areas: The water body is associated with a groundwater nitrate vulnerable zone under the Nitrates Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected.		

Does the component comply with WFD Objective	
1. No deterioration between status classes	Uncertain; there is a potential risk of deterioration between status classes, further assessment needed as part of the WINEP3 investigations for this borehole source.
2. No impediments to Good Status	
3. No compromises to water body objectives	Yes; no compromises to water body objectives.
4. No effects on other water bodies	No; may impact on River Chilt (GB107041012140), assessed separately below, and a GWDTE (Hurston Warren SSSI)
5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.
6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.

1.6 Scheme to bring West Chiltington back into service (BR_Smo): Chilt

Water body

WFD water body name	Chilt		
WFD water body type	River		
WFD management catchment	Arun and Western Streams	**WFD water body ID**	GB107041012140
River Basin District	South East		

WFD Designations, Objectives and Mitigation

WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**
	Moderate	-	Good
Hydromorphological designation	Not designated artificial or heavily modified		
Water Body Mitigation Measure	No published mitigation measures		

WFD Protected Areas

Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
NO	NO	NO	NO	YES	NO	NO

WFD

Scheme components potentially affecting water body	**Construction:** N/A
	Operation: Recommissioning of West Chiltington boreholes - 3.12 Ml/d deployable output benefit

WFD element	RBMP2 (2015) status	Assessed status (construction and operation)	
· Fish	Good	Uncertain	There is a risk of adverse impacts on the flows in the River Chilt, due to its close proximity of the proposed abstraction. Therefore, there is a risk of deterioration in ecological status and further assessment is required on the hydrogeological linkage to the river.
· Macro-invertebrates	High	Uncertain	
· Macrophytes & Phytobentos	Good	Uncertain	
Chemical (Overall)	Good	Good	There is negligible risk of deterioration between chemical status classes.
Protected Area Details		Nutrient Sensitive Areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected	
Does the component comply with WFD Objective			
1. No deterioration between status classes		Uncertain; there is a potential risk of deterioration between status classes, further assessment is required as part of the WINEP3 investigations for this borehole source	
2. No impediments to GES/GEP			
3. No compromises to water body objectives		Yes; no compromises to water body objectives.	
4. No effects on other water bodies		Yes; no impacts on other water bodies.	
5. Assists attainment of water body objectives		No; does not assist with the attainment of water body objectives.	
6. Assists attainment of protected area objectives		No; does not assist with the attainment of protected area objectives.	

1.7 Coastal Desalination - Shoreham Harbour (10Ml/d) (DES_Sho10)

Water body							
WFD water body name	Sussex						
WFD water body type	Coastal Water						
WFD management catchment	South East TraC			**WFD water body ID**	GB640704540003		
River Basin District	South East						
WFD Designations, Objectives and Mitigation							
WFD Status and Objectives	**RBMP2 Overall Status**		**Objective (2021)**		**Objective (2027)**		
	Moderate		-		Good		
Hydromorphological designation	Heavily modified						
Water Body Mitigation Measure	No published mitigation measures						
WFD Protected Areas							
Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**	
YES	NO	YES	NO	NO	NO	NO	
WF		**Construction:** N/A – existing intake and outfall					

<table>
<tr><td colspan="2">Scheme components potentially affecting water body</td><td colspan="3">Operation: Increased abstraction from Shoreham Harbour and discharge of briny waters to Sussex coastal waters – 10 Ml/d assumed DO</td></tr>
<tr><td colspan="2">WFD element</td><td>RBMP2 (2015) status</td><td colspan="2">Assessed status (construction and operation)</td></tr>
<tr><td colspan="2">· Fish</td><td>Not assessed</td><td>Not assessed</td><td rowspan="5">There is anticipated to be no major adverse impact on WFD status as a result of abstracting water from the Sussex coastal water body. Fish could be entrained in the proposed abstraction intake but this would be mitigated with appropriate screening of the intake structure in accordance with best practice guidance and regulatory requirements.

There is potential for the new discharge of briny waters to impact the aquatic ecology of the Sussex water body. This is most likely to affect invertebrates and to be restricted to an area of less than 0.5ha near to the discharge (see near field modelling below). Currently only invertebrates are assessed within this water body and other ecological receptors will probably respond differently to the new discharge. The impacts are expected to be proportional to the discharge volumes and will ultimately depend on the option variant that will be implemented.

Near field modelling indicates that the plume would reach equilibrium with surrounding water (10% above ambient salinity) at 20.5m for the minimum sized plant of 10Ml/d. This was the maximum distance yielded by the model at any discharge volume, corresponding in this case with spring tide at high water slack conditions. 20.5.2m, equates to the radius of a circular area of <0.3ha in surface area. Given discharge velocity and tidal movement etc, the saline plume would not be expected to disperse in a circular pattern. This is less than 0.0015% of the surface area of the WB.

A wider area would be subject to raised salinity levels of <10% above ambient and therefore less than the EC threshold for salinity discharges to shellfish waters. Further assessment would be needed to determine the chronic effect of slightly raised salinity levels over time on ecology and WFD status.

Given these data, it is thought highly unlikely that a hypersaline plume originating from the discharge would raise salinity levels within the water body to the point where any local impact on ecology caused a WFD deterioration. Any slight risk would generally be expected to reduce according to the volume of brine discharged, with lower discharge rates resulting in lower risk. If the brine is blended with existing power station effluent, then any localised adverse impact would be further mitigated. The power station cooling water is understood to be currently discharged back into the English Channel through the refurbished outfall at Southwick Beach.</td></tr>
<tr><td colspan="2">· Invertebrates</td><td>Good</td><td>Good</td></tr>
<tr><td colspan="2">· Macroalgae</td><td>Not assessed</td><td>Not assessed</td></tr>
<tr><td colspan="2">· Phytoplankton</td><td>Not assessed</td><td>Not assessed</td></tr>
<tr><td colspan="2">· Angiosperms</td><td>Not assessed</td><td>Not assessed</td></tr>
<tr><td colspan="2">Chemical (Overall)</td><td>Good</td><td>Good</td><td>The risk of deterioration in chemical status is assessed as negligible.</td></tr>
<tr><td colspan="2">Protected Area Details</td><td colspan="3">Bathing Waters: there are two bathing waters located near Shoreham, including Southwick and Shoreham Beach. The existing Power Station discharge outfall is situated a significant distance from the shore where it will not impact upon bathing water quality. Construction of the intake is also not considered to lead to any adverse effects on bathing water quality assuming best practice construction methods are applied.

Nutrient sensitive areas (Nitrate vulnerable zones): The coastal water body is associated with a nutrient sensitive area under the Nitrates Directive; however, the scheme will not affect the management of the protected area and no significant changes in water quality are expected.</td></tr>
<tr><td colspan="5">Does the component comply with WFD Objective</td></tr>
</table>

1. No deterioration between status classes	Yes; no deterioration between status classes.
2. No impediments to GES/GEP	Yes; no impediments to achieving GES.
3. No compromises to water body objectives	Yes; no compromises to water body objectives.
4. No effects on other water bodies	Yes; no impact on other water bodies.
5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.
6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives

1.8 Fawley Desalination (modular to 75 Ml/d) (DES_FawM75): Southampton Water

Water body

WFD water body name	Southampton Water		
WFD water body type	Transitional Water		
WFD management catchment	South East TraC	**WFD water body ID**	GB520704202800
River Basin District	South East		

WFD Designations, Objectives and Mitigation

WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**
	Moderate	-	-
Hydromorphological designation		Heavily modified	
Water Body Mitigation Measure	No published mitigation measures		

WFD Protected Areas

Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
NO	NO	YES	YES	YES	YES	YES

Scheme components potentially affecting water body	**Construction:** New abstraction intake
	Operation: New abstraction from the Solent coastal water body at 75 Ml/d capacity with discharge of brine back to the Solent coastal water body – see below). Other chemicals from the desalination waste stream will be treated on site to neutralise them prior to discharge via an existing wastewater treatment works.

WFD assessment (scoping)

WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
· Fish	Good	Good	Construction of the abstraction intake will be managed by good practice construction methods and any residual temporary risks to the water body are assessed as low. Temporary effects due to construction will not cause deterioration of the water body. Fish could be entrained in the proposed abstraction intake but this would be mitigated with appropriate screening of the intake structure in accordance with best practice guidance and regulatory requirements. There is a very low risk of adverse impacts on water quality within Southampton Water due to the new abstraction. The abstraction is situated in the Solent (Calshot) to the south-west of the mouth of the estuary and therefore the abstraction is not expected to prompt any deterioration in
· Invertebrates	Good	Good	
· Macroalgae	Good	Good	

· Phytoplankton	High	High	dissolved inorganic nitrogen (DIN) status in Southampton Water. The abstraction in the Solent is unlikely to lead to any changes in flow/level/velocity regimes within Southampton Water and therefore no adverse effects are anticipated in respect of biological elements. The brine discharge back to the Solent at Calshot may lead to a very minor increase in salinity in the lower reaches of Southampton Water: Far Field dispersion modelling shows a very minor increase above ambient salinity levels for a 200 Ml/d capacity desalination plant – i.e. a worst case scenario – in Southampton Water in the area downstream of the Hamble Estuary. This change in salinity is unlikely to lead to any material impacts on biological elements given the hydrographic regime and ambient salinity of this part of Southampton Water. The discharge would not lead to a deterioration of WFD biological status of the Southampton Water transitional water body.
· Angiosperms	Good	Good	
Chemical (Overall)	Fail	Fail	The risk of deterioration of chemical status is assessed as negligible although the water body already fails to achieve good chemical status. The abstraction will not alter the chemical status of the water body. No noxious chemicals will be included with the brine discharge to the Solent and instead these will be treated on site to neutralise them prior to discharge via an existing wastewater treatment works. The brine discharge will not lead to any deterioration of chemical status of the water body.
Protected Area Details			Nutrient Sensitive Areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. Southampton Water is a nutrient sensitive area under the Urban Waste Water Treatment Directive. However, the scheme will not affect the management of the protected area and no changes in the nutrient balance are expected. Shellfish Waters: The scheme is located near to the Approaches to Southampton Water Shellfish Water in the lower part of Southampton Water. Subject to careful construction and pollution control mitigation measures, there will be no adverse effects on these shellfish waters due to construction. The operation of the intake and the brine discharge is unlikely to lead to any adverse effects on this Shellfish Water. No noxious chemicals will be included with the brine discharge to the Solent and instead these will be treated on site to neutralise them prior to discharge via an existing wastewater treatment works. The brine discharge will not lead to any deterioration to the shellfish population in this Shellfish Water. SPA, Ramsar and SAC sites: The HRA Stage 1 screening identified the potential for LSEs on the Solent Maritime SAC and the Solent and Southampton Water SPA and Ramsar sites. The HRA Appropriate Assessment concluded that any minor potential increase in salinity due to the scheme operation are of small magnitude given the overall salinity regime and hydrography of Southampton Water and therefore unlikely to have any adverse effect upon designated habitats, flora and invertebrate species or wintering and breeding bird species associated with these European sites. It is therefore considered that the desalination plant would not have any adverse effect upon the favourable conservation status of these European sites. Further details are provided in the HRA Report.
Does the component comply with WFD Objective			
1. No deterioration between status classes			Yes; no deterioration between status classes.
2. No impediments to GES/GEP			Yes; no impediments to achieving GEP.
3. No compromises to water body objectives			Yes; no compromises to water body objectives.
4. No effects on other water bodies			Yes; no impact on other water bodies.
5. Assists attainment of water body objectives			No; does not assist with the attainment of any mitigation water body objectives.

6. Assists attainment of protected area objectives	No; does not assist with the attainment of any mitigation measures required for the protected areas.

1.9 Fawley Desalination (modular to 75Ml/d) (DES_FawM75): Solent

Water body

WFD water body name	Solent		
WFD water body type	Coastal Water		
WFD management catchment	South East TraC	**WFD water body ID**	GB650705150000
River Basin District	South East		

WFD Designations, Objectives and Mitigation

WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**
	Moderate	-	-

Hydromorphological designation	Heavily modified
Water Body Mitigation Measure	No published mitigation measures

WFD Protected Areas

Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
YES	NO	YES	YES	YES	YES	YES

Scheme components potentially affecting water body	**Construction:** New discharge outfall
	Operation: New abstraction from the Solent coastal water body at 75 Ml/d capacity with discharge of brine back to the Solent coastal water body. Other chemicals from the desalination waste stream will be treated on site to neutralise them prior to discharge via an existing wastewater treatment works.

WFD assessment (scoping)

WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
· Fish	Not assessed	Not assessed	Construction of the abstraction intake and discharge outfall will be managed by good practice construction methods and any temporary construction risks to the water body are assessed as low. With the application of best practice construction mitigation measures, temporary construction effects will not cause deterioration of the water body. Brine will be discharged via a pipeline slip-lined through the existing but disused Fawley Power Station long-sea outfall with the pipeline extending a further 500m into the Solent from the end of the long sea outfall into a deeper channel. Other chemicals from the desalination waste stream will be treated on site to neutralise them prior to discharge via an existing wastewater treatment works. There is potential for the brine discharge to cause a localised impact on the aquatic ecology near to the discharge point within the Solent coastal water body. Near field brine dispersion modelling indicates that the maximum brine discharge rate for a 150 Ml/d plant (as a worst case scenario) would reach equilibrium with the surrounding water (10% above ambient salinity) at 55.38m from the outfall pipe. This was the maximum distance yielded by the model at this discharge volume, corresponding with spring tide at low water slack conditions. 55.38m equates to the radius of a circular area of <1ha in
· Invertebrates	Good	Good	
· Macroalgae	Not assessed	Not assessed	
· Phytoplankton	Not assessed	Not assessed	
· Angiosperms	Not assessed	Not assessed	

			surface area. Given discharge velocity and tidal movement etc, the saline plume would not be expected to disperse in a circular pattern. Therefore, the figure of 1ha provides an over-estimate of the worst-case scenario for the area that could be subject to salinity levels of 10% above ambient. This is less than 0.004% of the surface area of the WB (25,598ha). The results of far field salinity modelling for a 200 Ml/d capacity desalination plant – i.e. a worst case scenario - indicate that the maximum salinity uplift above ambient levels within the proximity of the discharge (at proposed maximum discharge rate) is 1.15 PSU (Practical Salinity Units). This would equate to a salinity uplift above ambient of 3.4%. This value drops by more than half within 500m. The EC Directive threshold for discharges affecting shellfish waters is 10%. The new discharge might affect the localised distribution of invertebrate communities but this is unlikely to have a major effect on fauna across the vast majority of this large coastal water body sufficient to lead to WFD status deterioration. The WFD habitat intertidal seagrass beds would be located approximately 140m from discharge. The saline discharge is likely to be at less than 10% above ambient salinity at this location. Given these brine dispersion modelling data, it is highly unlikely that a hypersaline plume would raise salinity levels to the point where WFD status deterioration for the Solent water body would arise due to impacted ecology elements.
	Chemical (Overall)	Fail	Fail	The risk of deterioration of chemical status is assessed as negligible and although the water body already fails to achieve good chemical status the desalination plant abstraction and discharge will not affect the overall chemical status of this large coastal water body. No noxious chemicals will be included with the brine discharge to the Solent and instead these will be treated on site to neutralise them prior to discharge via an existing wastewater treatment works. The brine discharge will not lead to any deterioration of chemical status of the water body.
	Protected Area Details			Nutrient sensitive areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. The Solent is a Nutrient Sensitive Area under the Urban Waste Water Treatment Directive. However, the scheme will not affect the management of the protected area and no changes in the nutrient balance are expected. Shellfish Waters: The abstraction intake and brine discharge point are located within the Stanswood Bay designated Shellfish Water, located in the Solent WFD coastal water body. It is estimated from the near field modelling at 150 Ml/d (and therefore a worst case scenario) that the discharge plume would equate to an area <0.2% of the surface area of the Stanswood Bay Shellfish Water. The results of far field salinity modelling (carried out for a 200 Ml/d scheme, so presenting a worst case scenario) indicate that the maximum salinity uplift above ambient levels within the proximity of the discharge (at proposed maximum discharge rate) is 1.15 PSU (Practical Salinity Units). This would equate to a salinity uplift above ambient of 3.4%. This value drops by more than half within 500m. The EC Directive threshold for discharges affecting shellfish waters is 10%. Discharge permit standards will be set to protect these Shellfish Waters and therefore adverse effects on shellfish will not arise. Bathing Waters: there is one designated Bathing Water located near Fawley at Calshot. The abstraction and discharge outfall will be a significant distance from the shore and will not impact upon bathing water quality. Application of best practice construction methods and appropriate pollution control mitigation measures will ensure no adverse effects on bathing water quality during construction of the intake and outfall infrastructure.

	SPA, Ramsar and SAC sites: The HRA Stage 1 screening identified the potential for LSEs on the Solent Maritime SAC and the Solent and Southampton Water SPA and Ramsar sites. The HRA Appropriate Assessment concluded that any minor potential increases in salinity due to the scheme operation are of small magnitude given the overall salinity regime and hydrography of the Solent and therefore unlikely to have any adverse effect upon designated habitats, flora and invertebrate species or wintering and breeding bird species associated with these European sites. It is therefore considered that the desalination plant would not have any adverse effect upon the favourable conservation status of these European sites. Further details are provided in the HRA Report.
Does the component comply with WFD Objective	
1. No deterioration between status classes	Yes; no deterioration between status classes
2. No impediments to GES/GEP	Yes; no impediments to achieving GEP.
3. No compromises to water body objectives	Yes; no compromises to water body objectives.
4. No effects on other water bodies	Yes; no impact on other water bodies.
5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.
6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.

1.10 Sandown WwTW Indirect Potable Reuse (8.5Ml/d) (PWR_SEY9)

Water body	**WFD water body name**	Eastern Yar (Lower)					
	WFD water body type	River					
	WFD management catchment	Isle of Wight		**WFD water body ID**	GB107101005971		
	River Basin District	South East					
	WFD Designations, Objectives and Mitigation						
	WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**			
		Poor	-	Good			
	Hydromorphological designation	Heavily modified					
	Water Body Mitigation Measure	No published mitigation measures					
	WFD Protected Areas						
	Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
	NO	YES	YES	YES	YES	NO	NO
WFD assessment (scoping)	**Scheme components potentially affecting water body**	**Construction:** New discharge outfall					
		Operation: New 8.5 Ml/d discharge of treated effluent into the Lower Eastern Yar River to augment river flows for subsequent downstream re-abstraction from existing Sandown abstraction intake					
	WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**				

· Fish	High	High	Construction of the outfall will be managed by good practice construction methods such that any risk to the water body is low. Temporary effects due to construction are unlikely to cause deterioration of the water body with the application of mitigation measures. The discharge will be treated to high tertiary standards for ammonia, phosphate and BOD, and therefore, there will be a low risk of impacting the physico-chemical quality elements of this water body (currently at high status). The proposed treatment will also include a process (either UV AOP or reverse osmosis) to remove the majority organic chemical contaminants. Therefore, there will be a low risk of organic chemicals such as endocrine disruptors causing deterioration to fish status. Based on measured Q95 statistics (which include the effect of the existing Sandown Augmentation Scheme), the discharge will prompt a near doubling in low flow under worst case conditions (assuming the existing augmentation scheme is operating at the MDO output of 8 Ml/d), which may disrupt normal patterns of velocity and depth and impact upon resident biological elements such as macroinvertebrates, fish and macrophytes. There may also be local increases in water temperature at low flows but this requires further investigations as to the baseline temperature conditions at low flows and the temperature of the treated effluent. Although the hydrological processes are already substantially altered in this water body by the existing augmentation scheme and the river is a designated HMWB, it is possible that the augmentation by the highly treated effluent may be detrimental to the ecology. Further assessment is required to ascertain the magnitude of impact on ecological receptors.
· Macro-invertebrates	High	High	
· Macrophytes & Phytobentos	Poor	Poor	
Chemical (Overall)	Good	Good	The discharge will be tertiary treated with RO or UV AOP and would be permitted through the EA discharge permit controls. The risk of deterioration in chemical status is therefore assessed as negligible.
Protected Area Details			Drinking Water Protected Area: the water body (Lower Eastern Yar) is a Drinking Water Protected Area but there is a low risk of adversely affecting the chemical status at the water body scale. Furthermore, Southern Water will want to ensure no risks to its drinking water supplies and will ensure the treated effluent meets Drinking Water Safety Plan requirements. Nutrient Sensitive Areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected; the discharge would be permitted through the EA discharge permit controls with the permit conditions set to meet the Nutrient Sensitive Area standards. SPA and SAC: The HRA has identified no potential LSEs on the Solent & Isle of Wight Lagoons SAC or Solent & Southampton Water SPA.
Does the component comply with WFD Objective			
1. No deterioration between status classes			Uncertain; potential risk of deterioration between status classes. Further investigation is required to assess these risks and if necessary to develop mitigation measures to avoid WFD deterioration in dialogue with the EA.
2. No impediments to GES/GEP			
3. No compromises to water body objectives			Yes; no compromises to water body objectives.
4. No effects on other water bodies			Yes; no effects on other water bodies.
5. Assists attainment of water body objectives			No; does not assist with the attainment of water body objectives.
6. Assists attainment of protected area objectives			No; does not assist with the attainment of protected area objectives.

1.11 Stourmouth WSW (10Ml/d with 20Ml covered storage (SWA_Plu10)

Water body

WFD water body name	Stour (Kent)		
WFD water body type	Transitional Water		
WFD management catchment	South East TraC	**WFD water body ID**	GB520704004700
River Basin District	South East		

WFD Designations, Objectives and Mitigation

WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**
	Poor	-	Moderate
Hydromorphological designation		Heavily modified	
Water Body Mitigation Measure	No published mitigation measures		

WFD Protected Areas

Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
NO	YES	YES	YES	YES	NO	YES

WFD assessment (scoping)

Scheme components potentially affecting water body	**Construction:** New abstraction intake, pipework, WSW and covered treated water reservoir. **Operation:** New 10 Ml/d abstraction from the tidal River Stour

WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**
· Fish	Not assessed	Not assessed
· Invertebrates	Not assessed	Not assessed
· Macroalgae	High	High
· Phytoplankton	Poor	Poor
· Angiosperms	Not assessed	Not assessed
Chemical (Overall)	Good	Good

Construction of the required new infrastructure will be managed by good practice construction methods such that any risk to the water body is low. Temporary effects due to construction are unlikely to cause deterioration of the water body. Fish could be entrained in the proposed abstraction intake but this would be mitigated with appropriate screening of the intake structure in accordance with best practice guidance and regulatory requirements.

There is a potential risk of adverse impacts on the aquatic ecology of the tidal Great Stour as a consequence of the new abstraction near Stourmouth. The increased abstraction may reduce the proportion of freshwater flow and lead to a small change to the upstream saline wedge. However, the abstraction at 10 Ml/d is small relative to the total freshwater flow entering the estuary (7% reduction in calculated Q95 flow at Plucks Gutter of 134.3 Ml/d) and therefore there is unlikely to be deterioration in WFD ecological status.

There is a negligible risk of deterioration between chemical status classes.

Protected Area Details	Drinking Water Protected Area: the water body (Great Stour) is a Drinking Water Protected Area but there is negligible risk of adversely affecting the chemical status at the water body scale and Southern Water will ensure there is no adverse effect on meeting its Drinking Water Safety Plan raw water quality standards. Nutrient Sensitive Areas: The water body is associated with a surface water Nitrate Vulnerable Zone under the Nitrates Directive. Great Stour River is a nutrient sensitive area under the Urban Waste Water Treatment Directive. However, the scheme will not affect the management of the protected area and material changes in water quality are expected.

	SPA, Ramsar and SAC: The HRA has identified no potential LSEs on the Thanet Coast SAC. However, the HRA identified the potential for LSEs on the Sandwich Bay SAC, the Stodmarsh SAC and SPA & Ramsar and the Thanet Coast & Sandwich Bay SPA during construction. The Appropriate Assessment concluded that there would be no adverse effects on site integrity of any of these European sites with the application of mitigation measures. Further details are provided in the HRA Report.
Does the component comply with WFD Objective	
1. No deterioration between status classes	Yes; no deterioration between status classes.
2. No impediments to GES/GEP	Yes; no impediments to GEP.
3. No compromises to water body objectives	Yes; no compromises to water body objectives.
4. No effects on other water bodies	Yes; no effects on other water bodies.
5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.
6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.

1.12 Pulborough groundwater licence variation (LV_Har)

Waterbody

WFD waterbody name	Lower Greensand Arun & Western Streams	**WFD waterbody ID**	GB40701G 503100
WFD waterbody type	Groundwater	**River Basin District**	South East
WFD management catchment	South East GW		

WFD Designations, Objectives and Mitigation			
WFD Status and Objectives	RBMP2 Overall Status	Objective (2021)	Objective (2027)
	Poor	-	Good
Water Body Mitigation Measure	No published mitigation measures		

WFD Protected Areas						
Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
NO	YES	NO	NO	YES	NO	NO

WFD assessment (scoping)

Scheme components potentially affecting waterbody	**Construction:** N/A		
	Operation: Decoupling of the MRF condition for groundwater abstraction in the abstraction licence to allow increased abstraction to provide a deployable output benefit of 27 Ml/d (extreme drought critical period) and 20 Ml/d (MDO in extreme drought).		
WFD Status Test	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
Quantitative (Overall)	Good		
Dependent Surface Water Body Status	Good	Good	There is negligible risk of impacting the WFD status of the dependent waterbody Western Rother (GB107041012810), assessed separately below.
GWDTEs test	Good	Good	There are no known SSSI or Natura 2000 GWDTE sites in the proximity of this abstraction.
Saline Intrusion	Good	Good	There is negligible risk of saline intrusion.
Water Balance	Good	Good	The abstraction is unlikely to affect the water balance on a groundwater body scale

Chemical (Overall)	Poor	Poor	Negligible risk of deterioration in chemical status at a groundwater body scale.
Protected Area Details	Drinking Water Protected Area: the groundwater body (Lower Greensand Arun & Western Streams) is a Drinking Water Protected Area but there is negligible risk of adversely affecting the chemical status at the groundwater body scale. Furthermore, Southern Water will want to ensure no risks to its drinking water supplies. Nutrient Sensitive Areas: The water body is associated with a groundwater nitrate vulnerable zone under the Nitrates Directive. However, the scheme will not affect the management of the protected area		
Does the component comply with WFD Objective			
1. No deterioration between status classes	Yes; no deterioration between status classes.		
2. No impediments to GES/GEP	Yes; no impediments to Good Status.		
3. No compromises to water body objectives	Yes; no compromises to water body objectives.		
4. No effects on other water bodies	Yes; no effects on other water bodies.		
5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.		
6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.		

Waterbody

WFD water body name	Western Rother		
WFD water body type	River		
WFD management catchment	Arun and Western Streams	**WFD waterbody ID**	GB107041012810
River Basin District	South East		

WFD Designations, Objectives and Mitigation

WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**
	Moderate	-	Good
Hydromorphological designation	not designated artificial or heavily modified		
Water Body Mitigation Measure	No published mitigation measures		

WFD Protected Areas

Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
NO	YES	NO	NO	YES	NO	YES

WFD assessment (scoping)

Scheme components potentially affecting waterbody	**Construction:** N/A
	Operation: Decoupling of the MRF condition for groundwater abstraction in the abstraction licence to allow increased abstraction to provide a deployable output benefit of 27 Ml/d (extreme drought critical period) and 20 Ml/d (MDO in extreme drought).

WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
· Fish	Moderate	Moderate	The scheme is unlikely to have adverse effects on the flows and ecology of the Western Rother given the overall groundwater balance of this water body and previous investigations as to the linkage between the Greensand aquifer and flows in the River Western Rother.
· Macro-invertebrates	High	High	
· Macrophytes & Phytobentos	Moderate	Moderate	

Chemical (Overall)	Good	Good	There is negligible risk of deterioration between chemical status classes.
Protected Area Details	Drinking Water Protected Area: the water body (Western Rother) is a Drinking Water Protected Area but there is no risk of adversely affecting the chemical status at the water body scale. Furthermore, Southern Water will want to ensure no risks to its drinking water supplies. Nutrient Sensitive Areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. Western Rother is a nutrient sensitive area under the Urban Waste Water Treatment Directive. However, the scheme will not affect the management of the protected area and no changes in surface water quality are expected.		
Does the component comply with WFD Objective			
1. No deterioration between status classes	Yes; no deterioration between status classes.		
2. No impediments to GES/GEP	Yes; no impediments to GES.		
3. No compromises to water body objectives	Yes; no compromises to water body objectives.		
4. No effects on other water bodies	Yes; no effects on other water bodies.		
5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.		
6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.		

2. Strategic alternatives

2.1 Sittingbourne Industrial Water Reuse (7.5Ml/d) (IWR_Sit8)

Water body

WFD water body name	Swale		
WFD water body type	Transitional Water		
WFD management catchment	Thames TraC	**WFD water body ID**	GB530604011500
River Basin District	Thames		

WFD Designations, Objectives and Mitigation

WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**
	Moderate	-	-

Hydromorphological designation	Heavily modified
Water Body Mitigation Measure	No published mitigation measures

WFD Protected Areas

Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
NO	NO	YES	NO	NO	YES	NO

WFD assessment (scoping)

Scheme components potentially affecting water body		**Construction:** N/A	
		Operation: 7.5Ml/d reduction in treated effluent inputs to the Swale with the water redirected for treatment to meet industrial water supply requirements.	
WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
· Fish	Not assessed	Not assessed	There is a negligible risk of adverse impacts to flows, as a consequence of 7.5Ml/d of treated effluent being re-directed for industrial use. Some freshwater invertebrate taxa are more responsive to changes in flow than others. Relative abundance of certain groups may change locally in response to decreased freshwater flow. However, the nature of the invertebrate community in this part of the estuary is likely to be strongly linked to the ambient salinity profile and tidal influence. It is unlikely that the reduction in freshwater discharge (worst case from 13.3 Ml/d to 5.8 Ml/d dry weather flow change) will be significant enough to lead to a deterioration in status class for the biological elements of The Swale water body as a whole given the tidal nature of the water body and the other freshwater inputs to the water body that will remain unchanged.
· Invertebrates	High	High	
· Macroalgae	Good	Good	
· Phytoplankton	High	High	
· Angiosperms	Not assessed	Not assessed	
Chemical (Overall)	Good	Good	There is no risk of chemical status deterioration as a consequence of the reduced effluent inputs to the estuary.
Protected Area Details		Shellfish Waters: The water body is associated with two designated shellfish waters (Swale Central and Swale East Shellfish Waters). However, the small reduction in freshwater flows to The Swale is not likely to cause any adverse impacts on these shellfish waters and there may be some benefit arising from reduced effluent discharges from the WTW. SPA and Ramsar: The HRA has identified no potential LSEs on the Medway Estuary and Marshes SPA and Ramsar sites. The Appropriate Assessment of this option concluded that there would be no adverse effects on the Swale SPA & Ramsar sites. Further details are provided in the HRA Report.	

Does the component comply with WFD Objective	
1. No deterioration between status classes	Yes; no deterioration between status classes
2. No impediments to GES/GEP	Yes; no impediments to achieving GEP.

	3. No compromises to water body objectives	Yes; no compromises to water body objectives.
	4. No effects on other water bodies	Yes; no impact on other water bodies.
	5. Assists attainment of water body objectives	No; does not assist with the attainment of any mitigation water body objectives.
	6. Assists attainment of protected area objectives	No; does not assist with the attainment of any mitigation measures required for the protected areas.

2.2 Brighton WTW Indirect Potable Reuse (joint scheme with SEW, 10Ml/d scheme for SWS) (PWR_WREAlt)

Water body

WFD water body name	Ouse between Isfield and Coast					
WFD water body type	River					
WFD management catchment	Adur and Ouse			**WFD water body ID**	GB107041012560	
River Basin District	South East					
WFD Designations, Objectives and Mitigation						
WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**			
	Poor	-	-			
Hydromorphological designation	Heavily modified					
Water Body Mitigation Measure	No published mitigation measures					
WFD Protected Areas						
Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
NO	YES	NO	NO	NO	NO	YES

WFD assessment (scoping)

Scheme components potentially affecting water body	**Construction:** New discharge outfall		
	Operation: New 10 Ml/d indirect potable water reuse scheme with highly treated effluent from Brighton WTW discharged to the River Ouse upstream of the SWS River Ouse abstraction intake prior to re-abstraction at the intake for treatment to potable standards.		
WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
· Fish	Bad	Bad	Construction of the discharge outfall will be managed by good practice construction methods such that any risk to the water body is low. Temporary effects due to construction are unlikely to cause deterioration of the water body.

· Macro-invertebrates	High	Uncertain	The discharge will be treated to tertiary standards for ammonia, phosphate and BOD. Therefore, there will be a low risk of impacting the physico-chemical quality elements of this water body (currently at moderate status) and the discharge permit will not be granted by the EA unless it is WFD compliant. The proposed tertiary effluent treatment will also include a process (either UV AOP or reverse osmosis) to remove the majority organic chemical contaminants. Therefore, there will be a low risk of organic chemicals such as endocrine disruptors causing deterioration to fish status. Based on the measured Q95 river flow and proposed scheme output, the river could contain approximately 40% of highly treated effluent during operation at Q95 flows between the discharge outfall and the abstraction intake. There is a high potential for localised increase to low flow conditions and the possibility of changes to the river temperature regime for a short distance down to the abstraction intake. Further assessment is needed in order to assess the impact upon the hydraulic and temperature regime in detail, although noting that the river is already heavily regulated by releases from Ardingly reservoir and therefore the discharge may counteract any temperature cooling effects arising from the reservoir releases. Increases in flow can disrupt normal patterns of velocity and depth and impact upon resident biological elements such as macroinvertebrates, fish and macrophytes. In this case, where hydrological processes are already substantially altered and where the river is a designated HMWB, further modelling of the potential impact of the change in river flow and possibly temperature on the biology elements is necessary. More detailed assessment will therefore be required to better understand the potential magnitude of the impact on these receptors particularly during times of low flow as part of the required environmental permitting applications.
· Macrophytes & Phytobentos	Poor	Uncertain	
Chemical (Overall)	Good	Good	The discharge will be tertiary treated with RO or UV AOP and would be only permitted through the EA discharge permit controls that will ensure WFD compliance. The risk of deterioration in chemical status is therefore assessed as negligible.
Protected Area Details			Drinking Water Protected Area: the water body (River Ouse) is a Drinking Water Protected Area but there is no risk of adversely affecting the chemical status at the water body scale. Furthermore, Southern Water will want to ensure no risks to its drinking water supplies and therefore the standards of effluent treatment will meet Drinking Water Protected Area requirements and Drinking Water Safety Plan targets. Nutrient Sensitive Areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. River Ouse is a nutrient sensitive area under the Urban Waste Water Treatment Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected; the discharge would be permitted through the EA discharge permit controls which would set standards for the nutrient concentration of the effluent compliant with the Nitrate Sensitive Area requirements.
Does the component comply with WFD Objective			
1. No deterioration between status classes			Uncertain; further investigation is required into potential effects on river flow regime and water temperature as part of the detailed design of the scheme.
2. No impediments to GES/GEP			
3. No compromises to water body objectives			Yes; no compromises to water body objectives.
4. No effects on other water bodies			Yes; no effects on other water bodies.
5. Assists attainment of water body objectives			No; does not assist with the attainment of water body objectives.
6. Assists attainment of protected area objectives			No; does not assist with the attainment of protected area objectives.

2.3 Coastal Desalination - Shoreham Harbour (DES_ShoM20 and DES_ShoM30)

Water body

WFD water body name	Sussex		
WFD water body type	Coastal Water		
WFD management catchment	South East TraC	**WFD water body ID**	GB640704540003
River Basin District	South East		

WFD Designations, Objectives and Mitigation

WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**
	Moderate	-	Good
Hydromorphological designation		Heavily modified	
Water Body Mitigation Measure	No published mitigation measures		

WFD Protected Areas

Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
YES	NO	YES	NO	NO	NO	NO

Scheme components potentially affecting water body	**Construction:** N/A – existing intake and outfall
	Operation: Increased abstraction from Shoreham Harbour and discharge of briny waters to Sussex coastal waters – 20 - 30Ml/d assumed DO

WFD assessment (scoping)

WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
· Fish	Not assessed	Not assessed	There is anticipated to be no major adverse impact on WFD status as a result of abstracting water from the Sussex coastal water body. Fish could be entrained in the proposed abstraction intake but this would be mitigated with appropriate screening of the intake structure in accordance with best practice guidance and regulatory requirements. There is potential for the new discharge of briny waters to impact the aquatic ecology of the Sussex water body. This is most likely to affect invertebrates and to be restricted to an area of less than 0.5ha near to the discharge (see near field modelling below). Currently only invertebrates are assessed within this water body and other ecological receptors will probably respond differently to the new discharge. The impacts are expected to be proportional to the discharge volumes and will ultimately depend on the option variant that will be implemented. Near field modelling indicates that at a maximum discharge rate would reach equilibrium with surrounding water (10% above ambient salinity) at 29.2m from the outfall pipe. This was the maximum distance yielded by the model at any discharge volume, corresponding in this case with spring tide at high water slack conditions. 29.2m, equates to the radius of a circular area of <0.3ha in surface area. Given discharge velocity and tidal movement etc, the saline plume would not be expected to disperse in a circular pattern. This is less than 0.0015% of the surface area of the WB.
· Invertebrates	Good	Good	
· Macroalgae	Not assessed	Not assessed	
· Phytoplankton	Not assessed	Not assessed	
· Angiosperms	Not assessed	Not assessed	

			A wider area would be subject to raised salinity levels of <10% above ambient and therefore less than the EC threshold for salinity discharges to shellfish waters. Further assessment would be needed to determine the chronic effect of slightly raised salinity levels over time on ecology and WFD status. Given these data, it is thought highly unlikely that a hypersaline plume originating from the discharge would raise salinity levels within the water body to the point where any local impact on ecology caused a WFD deterioration. Any slight risk would generally be expected to reduce according to the volume of brine discharged, with lower discharge rates resulting in lower risk. If the brine is blended with existing power station effluent, then any localised adverse impact would be further mitigated. The power station cooling water is understood to be currently discharged back into the English Channel through the refurbished outfall at Southwick Beach.
Chemical (Overall)	Good	Good	The risk of deterioration in chemical status is assessed as negligible.
Protected Area Details	Bathing Waters: there are two bathing waters located near Shoreham, including Southwick and Shoreham Beach. The existing Power Station discharge outfall is situated a significant distance from the shore where it will not impact upon bathing water quality. Construction of the intake is also not considered to lead to any adverse effects on bathing water quality assuming best practice construction methods are applied. Nutrient sensitive areas (Nitrate vulnerable zones): The coastal water body is associated with a nutrient sensitive area under the Nitrates Directive; however, the scheme will not affect the management of the protected area and no significant changes in water quality are expected.		
Does the component comply with WFD Objective			
1. No deterioration between status classes	Yes; no deterioration between status classes.		
2. No impediments to GES/GEP	Yes; no impediments to achieving GES.		
3. No compromises to water body objectives	Yes; no compromises to water body objectives.		
4. No effects on other water bodies	Yes; no impact on other water bodies.		
5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.		
6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives		

2.4 Tidal River Arun Desalination (DES_Aru10): Arun

Water body	**WFD water body name**	ARUN		
	WFD water body type	Transitional Water		
	WFD management catchment	South East TraC	**WFD water body ID**	GB540704105000
	River Basin District	South East		
	WFD Designations, Objectives and Mitigation			
	WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**
		Moderate	-	Good
	Hydromorphological designation	Heavily modified		
	Water Body Mitigation Measure	No published mitigation measures		
	WFD Protected Areas			

	Bathing Water Directive	Drinking Water Directive	Conservation of Wild Birds Directive	Habitats Directive	Nitrates Directive	Shellfish Directive	Urban Waste Water Treatment Directive
	NO	YES	YES	YES	NO	NO	NO

WFD assessment (scoping)				
	Scheme components potentially affecting water body		**Construction:** Desalination plant and new abstraction intake	
			Operation: New abstraction from tidal River Arun – 10Ml/d assumed output	
	WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation**	
	· Fish	Not assessed	Not assessed	Construction of the abstraction intake will be managed by good practice construction methods and any temporary risks to the water body are assessed as low. Temporary effects due to construction will not cause deterioration of the water body. Fish could be entrained in the proposed abstraction intake but this would be mitigated with appropriate screening of the intake structure in accordance with best practice guidance and regulatory requirements. There is a low risk of adverse impacts on water quality within the tidal River Arun due to the new abstraction. The water quality in the tidal Arun is already heavily influenced by effluent returns from various WwTWs. The abstraction may have a local impact on the river's capacity to buffer inorganic inputs. However, this is deemed insufficient to prompt a deterioration in dissolved inorganic nitrogen (DIN) status. The reduction in flows is likely to impact most upon fish and invertebrates, which are not currently assessed. The potential for between class deterioration in macroalgae is expected to be minimal. The macroalgal community in this transitional water body will be adapted to a cycle of exposure and submersion. Timing the abstraction to avoid low tides would further mitigate any possibility of impact.
	· Invertebrates	Not assessed	Not assessed	
	· Macroalgae	High	High	
	· Phytoplankton	Not assessed	Not assessed	
	· Angiosperms	Not assessed	Not assessed	
	Chemical (Overall)	Good	Good	The risk of deterioration of chemical status is assessed as negligible.
	Protected Area Details		Drinking water protected area: the water body (Arun) is a Drinking Water Protected Area but there is no risk of adversely affecting the chemical status at the water body scale. SAC: The HRA has identified no potential for LSEs on the Arun Valley SAC.	
	Does the component comply with WFD Objective			
	1. No deterioration between status classes		Yes; no deterioration between classes, further assessment is needed (eg timing abstraction)	
	2. No impediments to GES/GEP		Yes; no impediment to achieving GEP	
	3. No compromises to water body objectives		Yes; no compromises to water body objectives.	
	4. No effects on other water bodies		Yes; no impact on other water bodies.	
	5. Assists attainment of water body objectives		No; does not assist with the attainment of water body objectives.	
	6. Assists attainment of protected area objectives		No; does not assist with the attainment of protected area objectives.	

2.5 Fawley Desalination (modular 75-100 Ml/d) (DES_FawM100): Southampton Water

Water body

WFD water body name	Southampton Water		
WFD water body type	Transitional Water		
WFD management catchment	South East TraC	**WFD water body ID**	GB520704202800
River Basin District	South East		

WFD Designations, Objectives and Mitigation

WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**
	Moderate	-	-
Hydromorphological designation	Heavily modified		
Water Body Mitigation Measure	No published mitigation measures		

WFD Protected Areas

Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
NO	NO	YES	YES	YES	YES	YES

Scheme components potentially affecting water body	**Construction:** New abstraction intake
	Operation: New abstraction from the Solent coastal water body at 100 Ml/d capacity with discharge of brine back to the Solent coastal water body – see below). Other chemicals from the desalination waste stream will be treated on site to neutralise them prior to discharge via an existing wastewater treatment works.

WFD assessment (scoping)

WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
· Fish	Good	Good	Construction of the abstraction intake will be managed by good practice construction methods and any residual temporary risks to the water body are assessed as low. Temporary effects due to construction will not cause deterioration of the water body. Fish could be entrained in the proposed abstraction intake but this would be mitigated with appropriate screening of the intake structure in accordance with best practice guidance and regulatory requirements. There is a very low risk of adverse impacts on water quality within Southampton Water due to the new abstraction. The abstraction is situated in the Solent (Calshot) to the south-west of the mouth of the estuary and therefore the abstraction is not expected to prompt any deterioration in dissolved inorganic nitrogen (DIN) status in Southampton Water. The abstraction in the Solent is unlikely to lead to any changes in flow/level/velocity regimes within Southampton Water and therefore no adverse effects are anticipated in respect of biological elements. The brine discharge back to the Solent at Calshot may lead to a very minor increase in salinity in the lower reaches of Southampton Water: Far Field dispersion modelling shows a very minor increase above ambient salinity levels for a 200 Ml/d capacity desalination plant – i.e. a worst case scenario
· Invertebrates	Good	Good	
· Macroalgae	Good	Good	
· Phytoplankton	High	High	
· Angiosperms	Good	Good	

			– in Southampton Water in the area downstream of the Hamble Estuary. This change in salinity is unlikely to lead to any material impacts on biological elements given the hydrographic regime and ambient salinity of this part of Southampton Water. The discharge would not lead to a deterioration of WFD biological status of the Southampton Water transitional water body.
Chemical (Overall)	Fail	Fail	The risk of deterioration of chemical status is assessed as negligible although the water body already fails to achieve good chemical status. The abstraction will not alter the chemical status of the water body. No noxious chemicals will be included with the brine discharge to the Solent and instead these will be treated on site to neutralise them prior to discharge via an existing wastewater treatment works. The brine discharge will not lead to any deterioration of chemical status of the water body.

Protected Area Details	Nutrient Sensitive Areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. Southampton Water is a nutrient sensitive area under the Urban Waste Water Treatment Directive. However, the scheme will not affect the management of the protected area and no changes in the nutrient balance are expected. Shellfish Waters: The scheme is located near to the Approaches to Southampton Water Shellfish Water in the lower part of Southampton Water. Subject to careful construction and pollution control mitigation measures, there will be no adverse effects on these shellfish waters due to construction. The operation of the intake and the brine discharge is unlikely to lead to any adverse effects on this Shellfish Water. No noxious chemicals will be included with the brine discharge to the Solent and instead these will be treated on site to neutralise them prior to discharge via an existing wastewater treatment works. The brine discharge will not lead to any deterioration to the shellfish population in this Shellfish Water. SPA, Ramsar and SAC sites: The HRA Stage 1 screening identified the potential for LSEs on the Solent Maritime SAC and the Solent and Southampton Water SPA and Ramsar sites. The HRA Appropriate Assessment concluded that any minor potential increase in salinity due to the scheme operation are of small magnitude given the overall salinity regime and hydrography of Southampton Water and therefore unlikely to have any adverse effect upon designated habitats, flora and invertebrate species or wintering and breeding bird species associated with these European sites. It is therefore considered that the desalination plant would not have any adverse effect upon the favourable conservation status of these European sites. Further details are provided in the HRA Report.

Does the component comply with WFD Objective	
1. No deterioration between status classes	Yes; no deterioration between status classes.
2. No impediments to GES/GEP	Yes; no impediments to achieving GEP.
3. No compromises to water body objectives	Yes; no compromises to water body objectives.
4. No effects on other water bodies	Yes; no impact on other water bodies.
5. Assists attainment of water body objectives	No; does not assist with the attainment of any mitigation water body objectives.
6. Assists attainment of protected area objectives	No; does not assist with the attainment of any mitigation measures required for the protected areas.

2.6 Fawley Desalination (modular 75-100 Ml/d) (DES_FawM100): Solent

Water body	**WFD water body name**	Solent		
	WFD water body type	Coastal Water		
	WFD management catchment	South East TraC	**WFD water body ID**	GB650705150000
	River Basin District	South East		

	WFD Designations, Objectives and Mitigation						
	WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**			
		Moderate	-	-			
	Hydromorphological designation	Heavily modified					
	Water Body Mitigation Measure	No published mitigation measures					
	WFD Protected Areas						
	Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
	YES	NO	YES	YES	YES	YES	YES
WFD assessment (scoping)	**Scheme components potentially affecting water body**	**Construction:** New discharge outfall **Operation:** New abstraction from the Solent coastal water body at 100 Ml/d capacity with discharge of brine back to the Solent coastal water body. Other chemicals from the desalination waste stream will be treated on site to neutralise them prior to discharge via an existing wastewater treatment works.					
	WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**				
	· Fish	Not assessed	Not assessed	Construction of the abstraction intake and discharge outfall will be managed by good practice construction methods and any temporary construction risks to the water body are assessed as low. With the application of best practice construction mitigation measures, temporary construction effects will not cause deterioration of the water body. Brine will be discharged via a pipeline slip-lined through the existing but disused Fawley Power Station long-sea outfall with the pipeline extending a further 500m into the Solent from the end of the long sea outfall into a deeper channel. Other chemicals from the desalination waste stream will be treated on site to neutralise them prior to discharge via an existing wastewater treatment works. There is potential for the brine discharge to cause a localised impact on the aquatic ecology near to the discharge point within the Solent coastal water body. Near field brine dispersion modelling indicates that the maximum brine discharge rate for a 150 Ml/d plant (as a worst case scenario) would reach equilibrium with the surrounding water (10% above ambient salinity) at 55.38m from the outfall pipe. This was the maximum distance yielded by the model at this discharge volume, corresponding with spring tide at low water slack conditions. 55.38m equates to the radius of a circular area of <1ha in surface area. Given discharge velocity and tidal movement etc, the saline plume would not be expected to disperse in a circular pattern. Therefore, the figure of 1ha provides an over-estimate of the worst-case scenario for the area that could be subject to salinity levels of 10% above ambient. This is less than 0.004% of the surface area of the WB (25,598ha). The results of far field salinity modelling for a 200 Ml/d capacity desalination plant – i.e. a worst case scenario - indicate that the maximum salinity uplift above ambient levels within the proximity of the discharge (at proposed maximum discharge rate) is 1.15 PSU (Practical Salinity Units). This would equate to a salinity uplift above ambient of 3.4%. This value drops by more			
	· Invertebrates	Good	Good				
	· Macroalgae	Not assessed	Not assessed				
	· Phytoplankton	Not assessed	Not assessed				
	· Angiosperms	Not assessed	Not assessed				

			than half within 500m. The EC Directive threshold for discharges affecting shellfish waters is 10%. The new discharge might affect the localised distribution of invertebrate communities but this is unlikely to have a major effect on fauna across the vast majority of this large coastal water body sufficient to lead to WFD status deterioration. The WFD habitat intertidal seagrass beds would be located approximately 140m from discharge. The saline discharge is likely to be at less than 10% above ambient salinity at this location. Given these brine dispersion modelling data, it is highly unlikely that a hypersaline plume would raise salinity levels to the point where WFD status deterioration for the Solent water body would arise due to impacted ecology elements.
Chemical (Overall)	Fail	Fail	The risk of deterioration of chemical status is assessed as negligible and although the water body already fails to achieve good chemical status the desalination plant abstraction and discharge will not affect the overall chemical status of this large coastal water body. No noxious chemicals will be included with the brine discharge to the Solent and instead these will be treated on site to neutralise them prior to discharge via an existing wastewater treatment works. The brine discharge will not lead to any deterioration of chemical status of the water body.
Protected Area Details			Nutrient sensitive areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. The Solent is a Nutrient Sensitive Area under the Urban Waste Water Treatment Directive. However, the scheme will not affect the management of the protected area and no changes in the nutrient balance are expected. Shellfish Waters: The abstraction intake and brine discharge point are located within the Stanswood Bay designated Shellfish Water, located in the Solent WFD coastal water body. It is estimated from the near field modelling at 150 Ml/d (and therefore a worst-case scenario) that the discharge plume would equate to an area <0.2% of the surface area of the Stanswood Bay Shellfish Water. The results of far field salinity modelling (carried out for a 200 Ml/d scheme, so presenting a worst-case scenario) indicate that the maximum salinity uplift above ambient levels within the proximity of the discharge (at proposed maximum discharge rate) is 1.15 PSU (Practical Salinity Units). This would equate to a salinity uplift above ambient of 3.4%. This value drops by more than half within 500m. The EC Directive threshold for discharges affecting shellfish waters is 10%. Discharge permit standards will be set to protect these Shellfish Waters and therefore adverse effects on shellfish will not arise. Bathing Waters: there is one designated Bathing Water located near Fawley at Calshot. The abstraction and discharge outfall will be a significant distance from the shore and will not impact upon bathing water quality. Application of best practice construction methods and appropriate pollution control mitigation measures will ensure no adverse effects on bathing water quality during construction of the intake and outfall infrastructure. SPA, Ramsar and SAC sites: The HRA Stage 1 screening identified the potential for LSEs on the Solent Maritime SAC and the Solent and Southampton Water SPA and Ramsar sites. The HRA Appropriate Assessment concluded that any minor potential increases in salinity due to the scheme operation are of small magnitude given the overall salinity regime and hydrography of the Solent and therefore unlikely to have any adverse effect upon designated habitats, flora and invertebrate species or wintering and breeding bird species associated with these European sites. It is therefore considered that the desalination plant would not have any adverse effect upon the favourable conservation status of these European sites. Further details are provided in the HRA Report.
Does the component comply with WFD Objective			
1. No deterioration between status classes			Yes; no deterioration between status classes

2. No impediments to GES/GEP	Yes; no impediments to achieving GEP.
3. No compromises to water body objectives	Yes; no compromises to water body objectives.
4. No effects on other water bodies	Yes; no impact on other water bodies.
5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.
6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.

2.7 Test Estuary WTW Industrial Reuse (IWR_SCM9)

Water body

WFD water body name	Southampton Water			
WFD water body type	Transitional Water			
WFD management catchment	South East TraC	**WFD water body ID**	GB520704202800	
River Basin District	South East			
WFD Designations, Objectives and Mitigation				
WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**	
	Moderate	-	-	
Hydromorphological designation	Heavily modified			
Water Body Mitigation Measure	No published mitigation measures			

WFD Protected Areas						
Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
NO	NO	YES	YES	YES	YES	YES

Scheme components potentially affecting water body	**Construction**: N/A
	Operation: 9 Ml/d reduction of treated effluent flow inputs to the Test Estuary (part of the Southampton Water transitional water body) from the Test Estuary WTW with the effluent treated instead for industrial water supply requirements

WFD assessment (scoping)

WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
· Fish	Good	Good	There is a risk of adverse impacts to flows in the Test Estuary (part of Southampton Water transitional water body), as a consequence of 9M/d effluent being re-directed for industrial water supply. Although the reduction in flow is relatively small, the WTW discharge occurs into a narrow stretch part of the Test Estuary and therefore, could have a local impact on invertebrates and fish. Some freshwater invertebrate taxa are more responsive to changes in flow than others. Relative abundance of certain groups may change locally in response to decreased freshwater flow inputs. However, the nature of the invertebrate community in this part of the tidal water body is likely to be strongly linked to the ambient salinity profile and double high tide influence of Southampton Water. It is unlikely that the absence of the freshwater discharge will be significant enough to lead to a change in status class for the aquatic ecology of the much larger Southampton Water transitional water body.
· Invertebrates	Good	Good	
· Macroalgae	Good	Good	
· Phytoplankton	High	High	
· Angiosperms	Good	Good	
Chemical (Overall)	Fail	Fail	There is negligible risk of chemical status deterioration as a consequence of the cessation of effluent inputs to the estuary.
Protected Area Details			Nutrient Sensitive Areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. Southampton Water is a nutrient sensitive area under the Urban Waste Water Treatment Directive. However, the scheme will not affect the management of the protected area and

		no significant changes in water quality are expected although locally there will be a small reduction in nutrient inputs from this WTW. Shellfish Waters: The water body is associated with the Southampton Water and Approaches to Southampton Water designated Shellfish Waters. However, the small reduction in freshwater flows to Southampton Water is not likely to cause any adverse impacts on these shellfish waters and there may be a small benefit arising from reduced discharge of treated sewage effluent to the estuary. SAC: The HRA has identified no potential LSEs on the Solent Maritime SAC or the Solent and Southampton Water SPA and Ramsar sites.
	Does the component comply with WFD Objective	
	1. No deterioration between status classes	Yes; no deterioration between status classes.
	2. No impediments to GES/GEP	Yes; no impediment to GEP.
	3. No compromises to water body objectives	Yes; no compromises to water body objectives.
	4. No effects on other water bodies	Yes; no impact on other water bodies.
	5. Assists attainment of water body objectives	No; does not assist with the attainment of any mitigation water body objectives.
	6. Assists attainment of protected area objectives	No; does not assist with the attainment of any mitigation measures required for the protected areas.

2.8 Portsmouth Harbour WTW & Peel Common WTW Indirect Potable Reuse (90Ml/d) (PWR_BPC)

Water body	**WFD water body name**	Itchen					
	WFD water body type	River					
	WFD management catchment	Test and Itchen		**WFD water body ID**	GB107042022580		
	River Basin District	South East					
	WFD Designations, Objectives and Mitigation						
	WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**			
		Good	-	-			
	Hydromorphological designation	Not designated artificial or heavily modified					
	Water Body Mitigation Measure	No published mitigation measures					
	WFD Protected Areas						
	Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
	NO	YES	NO	YES	YES	NO	YES
WFD assessment (scoping)	**Scheme components potentially affecting water body**		**Construction:** New discharge outfall immediately downstream of a new abstraction intake close to existing Portsmouth Water Lower Itchen abstraction intake.				
			Operation: New 90Ml/d discharge of highly treated tertiary effluent to River Itchen near to the tidal limit with abstraction of the same volume immediately upstream of this discharge from a new abstraction intake.				
	WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**				

· Fish	High	High	Construction of the new abstraction intake and discharge outfall will be managed by good practice construction methods such that any risk to the water body is low. Temporary effects due to construction are unlikely to cause deterioration of the water body. These structures may lead to the risk of fish entrainment and mitigation measures in the form of fish screens will be incorporated into the design in accordance with best practice guidance and regulatory requirements. The discharge will be treated to very high tertiary standards for ammonia, phosphate and BOD, and therefore, there will be a low risk of impacting the physico-chemical quality elements of this water body (currently at high status). Measures to ensure no adverse effects to water temperature will also be developed as part of the detailed design taking account of ambient temperature data in the river under different flow conditions. The water quality standards will be set to mirror as closely as possible the ambient water quality regime of the final 1.5km of the River Itchen to the tidal limit. The proposed treatment will also include a process (either UV AOP or reverse osmosis) to remove the majority organic chemical contaminants. Therefore, there will be a low risk of organic chemicals such as endocrine disruptors causing deterioration to fish status. Based on the Q95 exceedance river flow, the proposed scheme output of up to 90 Ml/d would represent 36.6% of the Q95 flow at Riverside Park but this would be offset by a commensurate abstraction immediately upstream of the discharge from the new abstraction intake, thereby ensuring no change to the flow regime in final reaches of the river to the tidal limit (Itchen estuary). However if for water quality reasons the discharge location were to be sited at the tidal limit there would be a flow depletion of up to 90 Ml/d in the last 1.5km of the River Itchen. Given this impact on flow that may adversely fish migration and other aquatic ecology, Southern Water plans to locate the discharge immediately downstream of the new abstraction intake and manage water quality impacts through treatment. This will be examined further through the detailed design stage in close consultation with the EA and Natural England should this Strategic Alternative option be required to be developed.
· Macro-invertebrates	High	High	
· Macrophytes & Phytobentos	High	High	
Chemical (Overall)	Good	Good	The discharge will be tertiary treated with RO or UV AOP and would be permitted through the EA discharge permit controls. The risk of deterioration in chemical status is therefore assessed as negligible with the discharge permit conditions being set to protect the chemical status of the river.
Protected Area Details			Drinking Water Protected Area: the water body (River Itchen) is a Drinking Water Protected Area but there is no risk of adversely affecting the chemical status at the water body scale. The discharge will be made downstream of all of the drinking water abstraction intakes on the River Itchen to avoid any adverse effects on drinking water quality. Nutrient Sensitive Areas: The water body is associated with a surface water Nitrate Vulnerable Zone under the Nitrates Directive. River Itchen is a nutrient sensitive area under the Urban Waste Water Treatment Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected with the highly treated effluent which will need to comply with discharge permit conditions set by the EA to protect against nutrient enrichment. SPA, Ramsar and SAC: The HRA stage 1 screening identified the potential for LSEs on the River Itchen SAC but no LSEs on the SAC, SPA and Ramsar sites associated with Southampton Water downstream of the River Itchen. The Appropriate Assessment concluded that there would be no adverse effects on the River Itchen SAC subject to inclusion of agreed mitigation measures which

	will need to be developed in further detail in close dialogue with Natural England and the EA should this Strategic Alternative option need to be developed.

Does the component comply with WFD Objective	
1. No deterioration between status classes	Yes; no deterioration between classes, however further assessment is required as to the specific water quality standards and mitigation required to be met in respect of water temperature and other parameters to best mirror the ambient water quality regime of the last 1.5km of the River Itchen.
2. No impediments to GES/GEP	Yes; no impediments to GES
3. No compromises to water body objectives	Yes; no compromises to water body objectives.
4. No effects on other water bodies	Yes; no effects on other water bodies.
5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.
6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.

Water body

WFD water body name	Southampton Water		
WFD water body type	Transitional Water		
WFD management catchment	South East TraC	**WFD water body ID**	GB520704202800
River Basin District	South East		

WFD Designations, Objectives and Mitigation			
WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**
	Moderate	-	-
Hydromorphological designation		Heavily modified	
Water Body Mitigation Measure	No published mitigation measures		

WFD Protected Areas						
Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
NO	NO	YES	YES	YES	YES	YES

WFD assessment (scoping)

Scheme components potentially affecting water body	**Construction:** New discharge outfall immediately downstream of a new abstraction intake close to existing Portsmouth Water Lower Itchen abstraction intake.
	Operation: New 90Ml/d discharge of highly treated tertiary effluent to River Itchen near to the tidal limit with abstraction of the same volume immediately upstream of this discharge from a new abstraction intake.

WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
· Fish	Good	Good	There is a low risk of adverse impacts on water quality within the Southampton Water transitional water body due to the new discharge which will be situated just downstream of the new abstraction intake near the existing Portsmouth Water lower Itchen intake. The discharge will be treated to very high tertiary standards for ammonia, phosphate and BOD, and therefore, there will be a low risk of impacting the physico-chemical quality elements of this water body.
· Invertebrates	Good	Good	

· Macroalgae	Good	Good	The proposed treatment will also include a process (either UV AOP or reverse osmosis) to remove the majority organic chemical contaminants. Therefore, there will be a low risk of organic chemicals such as endocrine disruptors causing deterioration to fish status. Consequently, there will be a low risk of impacting the physico-chemical quality elements of this water body (especially dissolved inorganic nitrogen). Considering the size of the discharge, there is the potential for some localised impacts on water temperature in the uppermost reaches of the Itchen estuary only. Measures to ensure no adverse effects to water temperature will be developed as part of the detailed design taking account of ambient temperature data in the upstream River Itchen under different flow conditions. Given the size of the Southampton Water transitional waterbody, any changes will not be sufficient to prompt water body deterioration between status classes for fish and macroinvertebrates.
· Phytoplankton	High	High	
· Angiosperms	Good	Good	
Chemical (Overall)	Fail	Fail	The risk of deterioration of chemical status is assessed as negligible and although the water body already fails to achieve good chemical status the scheme will be designed to ensure no adverse effects on chemical status, and quality standards will be set as part of the discharge permit.
Protected Area Details			Nutrient Sensitive Areas: The water body is associated with a surface water Nitrate Vulnerable Zone under the Nitrates Directive. Southampton Water is a nutrient sensitive area under the Urban Waste Water Treatment Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected with the tertiary treatment applied to the effluent prior to discharge. Shellfish Waters: Measures to ensure no adverse effects to water temperature will be developed as part of the detailed design taking account of ambient temperature data in the upstream River Itchen under different flow conditions. Given the mixing in the river prior to the estuary and further mixing in the Itchen estuary, no adverse temperature effects are anticipated on the Southampton Water Shellfish Waters. Risks of chemical or nutrient impacts on shellfish will be avoided by the tertiary treatment applied to the effluent prior to discharge to the River Itchen. SPA, Ramsar and SAC: The HRA Stage 1 screening concluded that there would be no LSEs on the SAC, SPA and Ramsar sites associated with Southampton Water.

Does the component comply with WFD Objective	
1. No deterioration between status classes	Yes; no deterioration between status classes.
2. No impediments to GES/GEP	Yes; no impediments to achieving GEP.
3. No compromises to water body objectives	Yes; no compromises to water body objectives.
4. No effects on other water bodies	Yes; no impact on other water bodies.
5. Assists attainment of water body objectives	No; does not assist with the attainment of any mitigation water body objectives.
6. Assists attainment of protected area objectives	No; does not assist with the attainment of any mitigation measures required for the protected areas.

2.9 Combined Woolston and Portswood WwTW Indirect Potable Reuse (PWR_WPI21)

Water body	**WFD water body name**	Itchen		
	WFD water body type	River		
	WFD management catchment	Test and Itchen	**WFD water body ID**	GB107042022580

	River Basin District	South East					
	WFD Designations, Objectives and Mitigation						
	WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**			
		Good	-	-			
	Hydromorphological designation	Not designated artificial or heavily modified					
	Water Body Mitigation Measure	No published mitigation measures					
	WFD Protected Areas						
	Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
	NO	YES	NO	YES	YES	NO	YES
WFD assessment (scoping)	**Scheme components potentially affecting water body**		**Construction:** New discharge outfall				
			Operation: New 20.5Ml/d discharge of treated effluent from Woolston WwTW and Portswood WwTW to River Itchen, to support Lower Itchen abstraction				
	WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**				
	· Fish	High	High	Construction of the outfall will be managed by good practice construction methods such that any risk to the water body is low. Temporary effects due to construction are unlikely to cause deterioration of the water body. The discharge will be treated to tertiary standards for ammonia, phosphate and BOD. The proposed ammonia levels in the treated effluent would allow ammonia to remain at high status. Therefore, there will be negligible risk of impacting the physico-chemical quality elements of this water body (currently at good status). Measures to ensure no adverse effects to water temperature will also be developed as part of the detailed design taking account of ambient temperature data in the river under different flow conditions. The water quality standards will be set to mirror as closely as possible the ambient water quality regime of the final 1.5km of the River Itchen to the tidal limit. The proposed treatment will also include a process (either UV AOP or reverse osmosis) to remove the majority organic chemical contaminants. Therefore, there will be a low risk of organic chemicals such as endocrine disruptors causing deterioration to fish status. Discharges will be used to offset abstraction at Lower Itchen during low flows and therefore. Southern Water plans to locate the discharge immediately upstream of the tidal limit and manage water quality impacts through treatment. This will be examined further through the detailed design stage in close consultation with the EA and Natural England should this Strategic Alternative option be required to be developed.			
	· Macro-invertebrates	High	High				
	· Macrophytes & Phytobentos	High	High				
	Chemical (Overall)	Good	Good	The discharge will be tertiary treated with RO or UV AOP and would be permitted through the EA discharge permit controls. The risk of deterioration in chemical status is therefore assessed as low.			
	Protected Area Details		Drinking water protected area: the water body (River Itchen) is a Drinking Water Protected Area but there is no risk of adversely affecting the chemical status at the water body scale. Furthermore, Southern Water will want to ensure no risks to its drinking water supplies.				

		Nutrient sensitive areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. River Itchen is a nutrient sensitive area under the Urban Waste Water Treatment Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected; the discharge would be permitted through the EA discharge permit controls. SAC: HRA stage 1 screening identified the potential for LSEs on the River Itchen SAC, see the HRA screening report for further information.
	Does the component comply with WFD Objective	
	1. No deterioration between status classes	Yes; no deterioration between classes, however further assessment is required as to the specific water quality standards and mitigation required to be met in respect of water temperature and other parameters to best mirror the ambient water quality regime of the last 1.5km of the River Itchen.
	2. No impediments to GES/GEP	Yes; no impediments to GES
	3. No compromises to water body objectives	Yes; no compromises to water body objectives.
	4. No effects on other water bodies	Yes; no effects on other water bodies.
	5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.
	6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.

2.10 Sandown Coastal Desalination IOW (8.9Ml/d) (DES_San9)

Water body

WFD water body name	Isle of Wight East			
WFD water body type	Coastal Water			
WFD management catchment	South East TraC	**WFD water body ID**	GB650705530000	
River Basin District	South East			

WFD Designations, Objectives and Mitigation			
WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**
	Good	-	-
Hydromorphological designation		Heavily modified	
Water Body Mitigation Measure	Flood protection use	26.Sediment management	
	Flood protection use	27. Dredge disposal site selection	
	Flood protection use	28.Manage disturbance	
	Coast protection use	26.Sediment management	
	Coast protection use	27. Dredge disposal site selection	
	Coast protection use	28.Manage disturbance	
	Flood protection use	2.Remove obsolete structure	
	Flood protection use	7.Bank rehabilitation	
	Coast protection use	2.Remove obsolete structure	
	Coast protection use	7.Bank rehabilitation	

WFD Protected Areas						
Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
YES	NO	YES	YES	YES	YES	YES

WFD assessment (potential)

Scheme components potentially affecting water body	**Construction:** New desalination plant, intake and modifications to dispersion facilities of existing long sea outfall	
	Operation: New 8.5 Ml/d abstraction from Isle of Wight East coastal water body and discharge of brine to the same water body. Other waste stream chemicals will be treated on site and then discharged via the Sandown WTW and existing long sea outfall with the brine discharge.	
WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**

· Fish	Not assessed	Not assessed	Construction of the intake and outfall will be managed by good practice construction methods and any temporary risks to the water body are assessed as low. Temporary effects due to construction will not cause deterioration of the water body. Fish could be entrained in the proposed abstraction intake but this would be mitigated with appropriate screening of the intake structure in accordance with best practice guidance and regulatory requirements. The hyper-saline discharge point will be the existing wastewater treatment works (WTW) long sea outfall discharge. The intake will be constructed to avoid any WFD higher sensitivity habitat (notably chalk reef located some 2km away). There is no risk of hydro-morphological changes at a habitat scale. Near field modelling indicates that at a discharge rate of 20Ml/d (representing a worst case scenario), equilibrium with surrounding water (up to 10% above ambient salinity and therefore less than the EC threshold for salinity discharges to shellfish waters) would be reached at 8.7m from the outfall pipe. This was the maximum distance yielded by the model at this discharge volume, corresponding with spring tide at mid-water conditions (the option for 200Ml/d was not modelled). It is estimated that a surface area of 0.025ha could be subject to salinity levels of 10% above ambient. This is less than 0.0001% of the surface area of the WB (26,369ha). A wider area would be subject to raised salinity levels of <10% above ambient and therefore less than the EC threshold for salinity discharges to shellfish waters. Further investigation would be needed to determine the final salinity concentrations chronic effect of slightly raised salinity levels over time on ecology and WFD status. The hyper-saline discharge is likely to have a localised impact on benthic habitats but these impacts are unlikely to extend to sensitive features of the water body due to the high mixing and dispersion characteristics as evidenced from the long sea outfall design work carried out prior to its construction. The risk of deterioration in ecological status of the coastal water body is assessed as negligible.
· Invertebrates	Good	Good	
· Macroalgae	Not assessed	Not assessed	
· Phytoplankton	Not assessed	Not assessed	
· Angiosperms	Not assessed	Not assessed	
Chemical (Overall)	Good	Good	The risk of deterioration of chemical status is assessed as negligible. Desalination process waste stream chemicals will be treated on site and then discharged via the Sandown WTW and existing long sea outfall with the brine discharge.
Protected Area Details			SAC: The HRA has identified no potential LSEs on the South Wight Maritime SAC. Bathing Waters: There are two bathing waters located near Sandown: Yaverland and Sandown. The discharge outfall will be a significant distance from the shore and will not impact upon bathing water quality. Construction of the intake will not lead to any adverse effects on bathing water quality assuming best practice construction methods are applied to control the risks of pollution. Shellfish Waters: The water body is large and therefore associated with the Chichester Harbour Shellfish Waters. However, these Shellfish Waters are a significant distance from Sandown Bay and therefore there will be no impact from construction or operation of this scheme. Nutrient Sensitive Areas (Nitrate Vulnerable Zones): The coastal water body is associated with a Nutrient Sensitive Area; however, the scheme will not affect nitrate concentrations or the management of this protected area.
Does the component comply with WFD Objective			
1. No deterioration between status classes			Yes; no deterioration between status classes.
2. No impediments to GES/GEP			Yes; no impediments to GEP.

	3. No compromises to water body objectives	Yes; no compromises to water body objectives.
	4. No effects on other water bodies	Yes; no effects on other water bodies.
	5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.
	6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.

Water Resources Management Plan 2019

Annex 16: Water Framework Directive Assessment Main Report

Appendix C: WFD Compliance Assessment for options on the feasible list but not included in the WRMP19

December, 2019

Version 1

from Southern Water

Contents

Appendix C presents the outcomes of the WFD compliance assessment for those options in the feasible list screened in for further assessment but which **do not** form part of the preferred programme of the WRMP19 or which are not included in the plan as strategic alternative options. A WFD compliance assessment table is provided in this Appendix for each WFD water body that may be affected by these options.

1. Options on feasible list but not included in the WRMP19

1.1 Medway WTW Indirect Potable Water Reuse – Medway (PWR_Ayl18): Medway at Maidstone

Water body

WFD water body name	Medway at Maidstone					
WFD water body type	River					
WFD management catchment	Medway		**WFD water body ID**	GB106040018440		
River Basin District	Thames					
WFD Designations, Objectives and Mitigation						
WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**			
	Moderate	-	-			
Hydromorphological designation	Heavily modified					
Water Body Mitigation Measure	No published mitigation measures					
WFD Protected Areas						
Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
NO	YES	NO	NO	YES	NO	NO
Scheme components potentially affecting water body	**Construction:** New discharge outfall					
	Operation: Transfer of 18Ml/d of treated effluent from Medway WwTW to the River Medway					

WFD assessment (scoping)

WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
· Fish	Poor	Poor	Construction of the discharge outfall will be managed by good practice construction methods such that any risk to the water body is low. Temporary effects due to construction are unlikely to cause deterioration of the water body. The discharge will be treated to tertiary standards for ammonia, phosphate and BOD. The proposed ammonia levels in the treated effluent would allow ammonia to remain at high status. Therefore, there will be negligible risk of impacting the physico-chemical quality elements of this water body (currently at moderate status). The proposed treatment will also include a process (either UV AOP or reverse osmosis) to remove the majority organic chemical contaminants. Therefore, there will be a low risk of organic chemicals such as endocrine disruptors causing deterioration to fish status. Based on the Q95 exceedance river flow and proposed scheme output, the river would contain 12% effluent during operation at low flows. There is potential for localised increase in flows however this is considered unlikely to have a negative impact on river ecology (and invertebrates in particular) in a water body of this size. Resident invertebrate communities in wide, deep rivers tend to associate with slower moving marginal areas, where more complex
· Macro-invertebrates	Good	Good	
· Macrophytes & Phytobentos	Not assessed	Not assessed	

			habitat structure and ambient conditions would be expected to mitigate any small increases in flows. Overall, the scheme should not significantly impact the WFD elements.
Chemical (Overall)	Good	Good	The discharge will be tertiary treated with RO or UV AOP and would be permitted through the EA discharge permit controls. The risk of deterioration in chemical status is therefore assessed as low.
Protected Area Details			Drinking water protected area: the water body (Medway at Maidstone) is a Drinking Water Protected Area but there is a low risk of adversely affecting the chemical status. Furthermore, Southern Water will want to ensure no risks to its drinking water supplies. Nutrient sensitive areas: The water body is associated with a nutrient sensitive area under the Nitrates Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected; the discharge would be permitted through the EA discharge permit controls.

Does the component comply with WFD Objective	
1.No deterioration between status classes	Yes; no deterioration between status classes.
2. No impediments to GES/GEP	Yes; no impediments to GEP.
3. No compromises to water body objectives	Yes; no compromises to water body objectives.
4. No effects on other water bodies	Yes; no effects on other water bodies.
5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.
6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.

1.2 Medway WTW Indirect Potable Water Reuse – Medway (PWR_Ayl18): Medway (transitional water)

Water body

WFD water body name	MEDWAY					
WFD water body type	Transitional Water					
WFD management catchment	Thames TraC			**WFD water body ID**	GB530604002300	
River Basin District	Thames					
WFD Designations, Objectives and Mitigation						
WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**			
	Moderate	-	-			
Hydromorphological designation	Heavily modified					
Water Body Mitigation Measure	No published mitigation measures					
WFD Protected Areas						
Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
YES	NO	YES	NO	YES	YES	NO

WFD assessment (scoping)

Scheme components potentially affecting water body		**Construction:** N/A
		Operation: Transfer of effluent from Medway WwTW - 18Ml/d assumed output
WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**

	· Fish	Not assessed	Not assessed	The transfer of effluent to normally discharging into the Medway Estuary may result in a reduction in flow that could be up to 14% of the Q95 river flow and 5% at Q50. Some freshwater invertebrate taxa are more responsive to changes in flow than others. Relative abundance of certain groups may change in response to decreased flow and community richness may decrease in response to increased sedimentation and associated changes in hydrodynamics. Phytoplankton and macroalgae are predicted to maintain their current status since there are less sensitive to flow changes. Overall, the scheme should not significantly impact the WFD elements but further assessment is required to understand the impact of reduced flow during times of low flow.
	· Invertebrates	High	High	
	· Macroalgae	Good	Good	
	· Phytoplankton	High	High	
	· Angiosperms	Not assessed	Not assessed	
	Chemical (Overall)	Good	Good	It is unlikely to be a change in the chemical status as the EA licence conditions, such that the buffering capacity of the river will remain largely the same.
	Protected Area Details			Bathing Waters: The water body is associated with the Sheerness Bathing Water. However, these bathing waters are situated at a considerable distance from Medway and therefore, the operation of the scheme and its associated construction activities are not expected to have any adverse impacts. Nutrient sensitive areas: The water body is associated with a nutrient sensitive area under the Nitrates Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected; the discharge would be permitted through the EA discharge permit controls. Shellfish Waters: The water body is associated with two designated shellfish waters (Sheppey and Southend Shellfish Waters). However, these shellfish waters are a significant distance from Medway and therefore, the operation of the scheme and any associated construction activities are not expected to have any adverse impacts. SPA: The HRA has identified no potential for LSEs on the Medway Estuary and Marshes SPA or the Thames Estuary and Marshes SPA.

Does the component comply with WFD Objective	
1. No deterioration between status classes	Yes; no deterioration between status classes but further assessment is required.
2. No impediments to GES/GEP	Yes; no impediments to GEP
3. No compromises to water body objectives	Yes; no compromises to water body objectives.
4. No effects on other water bodies	Yes; no effects on other water bodies.
5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.
6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.

1.3 Hastings WTW scheme (PWR_Dar1, PWR_Dar3)

Water body				
	WFD water body name	Darwell Reservoir		
	WFD water body type	Lake		
	WFD management catchment	Rother	**WFD water body ID**	GB30744955
	River Basin District	South East		
	WFD Designations, Objectives and Mitigation			
	WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**
		Moderate	-	Good
	Hydromorphological designation		Heavily modified	
		No published mitigation measures		

	Water Body Mitigation Measure						
	WFD Protected Areas						
	Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
	NO	YES	NO	NO	NO	NO	YES

WFD assessment (scoping)	**Scheme components potentially affecting water body**		**Construction:** New discharge outfall	
			Operation: New 10Ml/d transfer of treated effluent from Hastings WwTW to augment Darwell Reservoir	
	WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
	· Fish	Not assessed	Not assessed	Construction of the outfall will be managed by good practice construction methods such that any risk to the water body is low. Temporary effects due to construction are unlikely to cause deterioration of the water body. The discharge will be treated to tertiary standards for ammonia, phosphate and BOD. Therefore, there will be negligible risk of impacting the physico-chemical and biological quality elements of this water body (currently at good status). The proposed treatment will also include a process (either UV AOP or reverse osmosis) to remove the majority organic chemical contaminants. Therefore, there will be a low risk of organic chemicals such as endocrine disruptors causing deterioration to fish status.
	· Invertebrates	Not assessed	Not assessed	
	· Macroalgae	Not assessed	Not assessed	
	· Phytoplankton	High	High	
	· Angiosperms	Not assessed	Not assessed	
	Chemical (Overall)	Good	Good	The discharge will be tertiary treated and would be permitted through the EA discharge permit controls. The risk of deterioration in chemical status is therefore assessed as negligible.
	Protected Area Details		Drinking water protected area: the water body (Darwell Reservoir) is a Drinking Water Protected Area but there is negligible risk of adversely affecting the chemical status at the water body scale. Furthermore, Southern Water will want to ensure no risks to its drinking water supplies. Darwell Reservoir is a nutrient sensitive area under the Urban Waste Water Treatment Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected; the discharge would be permitted through the EA discharge permit controls.	

Does the component comply with WFD Objective	
1. No deterioration between status classes	Yes; no deterioration between status classes.
2. No impediments to GES/GEP	Yes; no impediments to Good Ecological Potential
3. No compromises to water body objectives	Yes; no compromises to water body objectives.
4. No effects on other water bodies	Yes; no effects on other water bodies.
5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.
6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.

1.4 Littlehampton WTW Indirect Potable Water Reuse (PWR_For10 and PWR_For20)

Water body

WFD water body name	Western Rother		
WFD water body type	River		
WFD management catchment	Arun and Western Streams	**WFD water body ID**	GB107041012810
River Basin District	South East		

WFD Designations, Objectives and Mitigation

WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**
	Moderate	-	Good
Hydromorphological designation	Not designated artificial or heavily modified		
Water Body Mitigation Measure	No published mitigation measures		

WFD Protected Areas

Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
NO	YES	NO	NO	YES	NO	YES

WFD assessment (scoping)

Scheme components potentially affecting water body	**Construction:** New discharge outfall		
	Operation: Transfer of treated effluent from Littlehampton WwTW to the Western River Rother – 10 – 20 Ml/d assumed output		
WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
· Fish	Moderate	Moderate	Construction of the discharge outfall will be managed by good practice construction methods such that any risk to the water body is low. Temporary effects due to construction are unlikely to cause deterioration of the water body. The discharge will be treated to tertiary standards for ammonia, phosphate and BOD, potentially generating an improvement for the phosphate status (currently moderate). Therefore, there will be negligible risk of impacting the physico-chemical quality elements of this water body. The proposed treatment will also include a process (either UV AOP or reverse osmosis) to remove the majority organic chemical contaminants. Therefore, there will be a low risk of organic chemicals such as endocrine disruptors causing deterioration to fish status. Based on the Q95 exceedance river flow and proposed scheme output, the river would contain 10 – 20 % effluent during operation at low flows. Therefore, the potential for localised increase in flows relative to background levels is low; this is considered unlikely to have a negative impact on river ecology (and invertebrates in particular) in a water body of this size. Resident invertebrate communities (and other biological elements) in wide, deep rivers tend to associate with slower moving marginal areas, where more complex habitat structure and conditions would be expected to buffer or mitigate any such moderate increases in flows. For this reason, whilst the scheme may exert a minor influence on hydro-ecological processes, it
· Macro-invertebrates	High	High	
· Macrophytes & Phytobentos	Moderate	Moderate	

			should not significantly impact the WFD status of biological elements.
Chemical (Overall)	Good	Good	The discharge will be tertiary treated with RO or UV AOP and would be permitted through the EA discharge permit controls. The risk of deterioration in chemical status is therefore assessed as negligible.
Protected Area Details	Drinking water protected area: the water body (Western Rother) is a Drinking Water Protected Area but there is no risk of adversely affecting the chemical status at the water body scale. Furthermore, Southern Water will want to ensure no risks to its drinking water supplies. Nutrient sensitive areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. Western Rother is a nutrient sensitive area under the Urban Waste Water Treatment Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected; the discharge would be permitted through the EA discharge permit controls.		

Does the component comply with WFD Objective	
1. No deterioration between status classes	Yes; no deterioration between status classes
2. No impediments to GES/GEP	Yes; no impediments to GES.
3. No compromises to water body objectives	Yes; no compromises to water body objectives.
4. No effects on other water bodies	Yes; no effects on other water bodies.
5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.
6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.

1.5 Portswood WwTW Indirect Potable Water Reuse (PWR_Por9)

Water body

WFD water body name	Itchen		
WFD water body type	River		
WFD management catchment	Test and Itchen	**WFD water body ID**	GB107042022580
River Basin District	South East		

WFD Designations, Objectives and Mitigation			
WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**
	Good	-	-
Hydromorphological designation	Not designated artificial or heavily modified		
Water Body Mitigation Measure	No published mitigation measures		

WFD Protected Areas						
Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
NO	YES	NO	YES	YES	NO	YES

WFD

	Construction: New discharge outfall

Scheme components potentially affecting water body		**Operation:** New 8.5Ml/d discharge of treated effluent from Gaters Mill WwTW to the River Itchen, downstream of Lower Itchen to offset abstraction during low flows.	
WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
· Fish	High	High	Construction of the outfall will be managed by good practice construction methods such that any risk to the water body is low. Temporary effects due to construction are unlikely to cause deterioration of the water body. The discharge will be treated to tertiary standards for ammonia, phosphate and BOD. The proposed ammonia levels in the treated effluent would allow ammonia to remain at high status. Therefore, there will be negligible risk of impacting the physico-chemical quality elements of this water body (currently at good status). The proposed treatment will also include a process (either UV AOP or reverse osmosis) to remove the majority organic chemical contaminants. Therefore, there will be a low risk of organic chemicals such as endocrine disruptors causing deterioration to fish status. The effluent input will offset abstraction from Lower Itchen at low flows and therefore, the scheme is considered unlikely to have a negative impact on river ecology (and invertebrates in particular). Overall, the scheme will not pose any risk of deterioration to WFD elements.
· Macro-invertebrates	High	High	
· Macrophytes & Phytobentos	High	High	
Chemical (Overall)	Good	Good	The discharge will be tertiary treated with RO or UV AOP and would be permitted through the EA discharge permit controls. The risk of deterioration in chemical status is therefore assessed as low.
Protected Area Details		Drinking water protected area: the water body (River Itchen) is a Drinking Water Protected Area but there is no risk of adversely affecting the chemical status at the water body scale. Furthermore, Southern Water will want to ensure no risks to its drinking water supplies. Nutrient sensitive areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. River Itchen is a nutrient sensitive area under the Urban Waste Water Treatment Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected; the discharge would be permitted through the EA discharge permit controls. SAC: The HRA stage 1 screening identified the potential for LSEs on the River Itchen SAC, see the HRA screening report for further information	
Does the component comply with WFD Objective			
1. No deterioration between status classes		Yes; no deterioration between status classes.	
2. No impediments to GES/GEP		Yes; no impediments to GES	
3. No compromises to water body objectives		Yes; no compromises to water body objectives.	
4. No effects on other water bodies		Yes; no effects on other water bodies.	
5. Assists attainment of water body objectives		No; does not assist with the attainment of water body objectives.	
6. Assists attainment of protected area objectives		No; does not assist with the attainment of protected area objectives.	

1.6 Portswood WwTW Indirect Potable Water Reuse (PWR_Por13)

Water body

WFD water body name	Itchen		
WFD water body type	River		
WFD management catchment	Test and Itchen	**WFD water body ID**	GB107042022580
River Basin District	South East		

WFD Designations, Objectives and Mitigation

WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**
	Good	-	-
Hydromorphological designation	Not designated artificial or heavily modified		
Water Body Mitigation Measure	No published mitigation measures		

WFD Protected Areas

Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
NO	YES	NO	YES	YES	NO	YES

WFD assessment (scoping)

Scheme components potentially affecting water body	**Construction:** New discharge outfall		
	Operation: New 13Ml/d discharge of treated effluent from Portswood WwTW to the River Itchen, upstream of Gaters Mill to allow increased abstraction		
WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
· Fish	High	High	Construction of the outfall will be managed by good practice construction methods such that any risk to the water body is low. Temporary effects due to construction are unlikely to cause deterioration of the water body. The discharge will be treated to tertiary standards for ammonia, phosphate and BOD. The proposed ammonia levels in the treated effluent would allow ammonia to remain at high status. Therefore, there will be negligible risk of impacting the physico-chemical quality elements of this water body (currently at good status). The proposed treatment will also include a process (either UV AOP or reverse osmosis) to remove the majority organic chemical contaminants. Therefore, there will be a low risk of organic chemicals such as endocrine disruptors causing deterioration to fish status. Discharges will be used when abstraction would otherwise be limited due to low flow. The scheme will not decrease the flows in the river and it is considered unlikely to have a negative impact on river ecology (and invertebrates in particular). Overall, the scheme will not pose any risk of deterioration to WFD elements.
· Macro-invertebrates	High	High	
· Macrophytes & Phytobentos	High	High	
Chemical (Overall)	Good	Good	The discharge will be tertiary treated with RO or UV AOP and would be permitted through the EA discharge permit controls. The risk of deterioration in chemical status is therefore assessed as low.
Protected Area Details	Drinking water protected area: the water body (River Itchen) is a Drinking Water Protected Area but there is no risk of adversely affecting the chemical		

	status at the water body scale. Furthermore, Southern Water will want to ensure no risks to its drinking water supplies. Nutrient sensitive areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. River Itchen is a nutrient sensitive area under the Urban Waste Water Treatment Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected; the discharge would be permitted through the EA discharge permit controls. SAC: The HRA stage 1 screening identified the potential for LSEs on the River Itchen SAC, see the HRA screening report for further information
Does the component comply with WFD Objective	
1. No deterioration between status classes	Yes; no deterioration between status classes.
2. No impediments to GES/GEP	Yes; no impediments to GES
3. No compromises to water body objectives	Yes; no compromises to water body objectives.
4. No effects on other water bodies	Yes; no effects on other water bodies.
5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.
6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.

1.7 Woolston WwTW Indirect Potable Reuse (PWR_Wol8)

Water body	**WFD water body name**	Itchen					
	WFD water body type	River					
	WFD management catchment	Test and Itchen		**WFD water body ID**	GB107042022580		
	River Basin District	South East					
	WFD Designations, Objectives and Mitigation						
	WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**			
		Good	-	-			
	Hydromorphological designation	Not designated artificial or heavily modified					
	Water Body Mitigation Measure	No published mitigation measures					
	WFD Protected Areas						
	Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
	NO	YES	NO	YES	YES	NO	YES
WFD assessment	**Scheme components potentially affecting water body**	**Construction:** New discharge outfall					
		Operation: New 7.5Ml/d discharge of treated effluent from Woolston WwTW to R Itchen to support abstraction at Lower Itchen					
	WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**				

· Fish	High	High	Construction of the discharge outfall will be managed by good practice construction methods such that any risk to the water body is low. Temporary effects due to construction are unlikely to cause deterioration of the water body. The discharge will be treated to tertiary standards for ammonia, phosphate and BOD. The proposed ammonia levels in the treated effluent would allow ammonia to remain at high status. Therefore, there will be negligible risk of impacting the physico-chemical quality elements of this water body (currently at good status). The proposed treatment will also include a process (either UV AOP or reverse osmosis) to remove the majority organic chemical contaminants. Therefore, there will be a low risk of organic chemicals such as endocrine disruptors causing deterioration to fish status. Discharges will be used to offset abstraction at Lower Itchen during low flows and therefore, the scheme is considered unlikely to have a negative impact on river ecology (and invertebrates in particular). Overall, the scheme will not pose any risk of deterioration to WFD elements.
· Macro-invertebrates	High	High	
· Macrophytes & Phytobentos	High	High	
Chemical (Overall)	Good	Good	The discharge will be tertiary treated with RO or UV AOP and would be permitted through the EA discharge permit controls. The risk of deterioration in chemical status is therefore assessed as low.
Protected Area Details			Drinking water protected area: the water body (River Itchen) is a Drinking Water Protected Area but there is no risk of adversely affecting the chemical status at the water body scale. Furthermore, Southern Water will want to ensure no risks to its drinking water supplies. Nutrient sensitive areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. River Itchen is a nutrient sensitive area under the Urban Waste Water Treatment Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected; the discharge would be permitted through the EA discharge permit controls. SAC: HRA stage 1 screening identified the potential for LSEs on the River Itchen SAC, see the HRA screening report for further information.

Does the component comply with WFD Objective	
1. No deterioration between status classes	Yes; no deterioration between status classes.
2. No impediments to GES/GEP	Yes; no impediments to GES
3. No compromises to water body objectives	Yes; no compromises to water body objectives.
4. No effects on other water bodies	Yes; no effects on other water bodies.
5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.
6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.

1.8 Combined Woolston and Portswood WwTW Indirect Potable Reuse (PWR_WPI14)

Water body

WFD water body name	Itchen		
WFD water body type	River		
WFD management catchment	Test and Itchen	**WFD water body ID**	GB107042022580
River Basin District	South East		

WFD Designations, Objectives and Mitigation

WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**
	Good	-	-

Hydromorphological designation	Not designated artificial or heavily modified
Water Body Mitigation Measure	No published mitigation measures

WFD Protected Areas

Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
NO	YES	NO	YES	YES	NO	YES

Scheme components potentially affecting water body	**Construction:** New discharge outfall
	Operation: New 13.5Ml/d discharge of treated effluent from Woolston WwTW and Portswood WwTW to River Itchen, to support Lower Itchen abstraction

WFD assessment (scoping)

WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
· Fish	High	High	Construction of the outfall will be managed by good practice construction methods such that any risk to the water body is low. Temporary effects due to construction are unlikely to cause deterioration of the water body. The discharge will be treated to tertiary standards for ammonia, phosphate and BOD. The proposed ammonia levels in the treated effluent would allow ammonia to remain at high status. Therefore, there will be negligible risk of impacting the physico-chemical quality elements of this water body (currently at good status). The proposed treatment will also include a process (either UV AOP or reverse osmosis) to remove the majority organic chemical contaminants. Therefore, there will be a low risk of organic chemicals such as endocrine disruptors causing deterioration to fish status. Discharges will be used to offset abstraction at Lower Itchen during low flows and therefore, the scheme is considered unlikely to have a negative impact on river ecology (and invertebrates in particular). Overall, the scheme will not pose any risk of deterioration to WFD elements.
· Macro-invertebrates	High	High	
· Macrophytes & Phytobentos	High	High	
Chemical (Overall)	Good	Good	The discharge will be tertiary treated with RO or UV AOP and would be permitted through the EA discharge permit controls. The risk of deterioration in chemical status is therefore assessed as low.

Protected Area Details	Drinking water protected area: the water body (River Itchen) is a Drinking Water Protected Area but there is no risk of adversely affecting the chemical status at the water body scale. Furthermore, Southern Water will want to ensure no risks to its drinking water supplies. Nutrient sensitive areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. River Itchen is a nutrient sensitive area under the Urban Waste Water Treatment Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected; the discharge would be permitted through the EA discharge permit controls. SAC: HRA stage 1 screening identified the potential for LSEs on the River Itchen SAC, see the HRA screening report for further information.
Does the component comply with WFD Objective	
1. No deterioration between status classes	Yes; no deterioration between status classes.
2. No impediments to GES/GEP	Yes; no impediments to GES
3. No compromises to water body objectives	Yes; no compromises to water body objectives.
4. No effects on other water bodies	Yes; no effects on other water bodies.
5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.
6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.

1.9 Brighton WTW Indirect Potable Reuse (PWR_WRE50alt)

Water body

WFD water body name	Ouse between Isfield and Coast						
WFD water body type	River						
WFD management catchment	Adur and Ouse			**WFD water body ID**	GB107041012560		
River Basin District	South East						
WFD Designations, Objectives and Mitigation							
WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**				
	Poor	-	-				
Hydromorphological designation	Heavily modified						
Water Body Mitigation Measure	No published mitigation measures						
WFD Protected Areas							
Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**	
NO	YES	NO	NO	NO	NO	YES	
Scheme components potentially affecting water body	**Construction:** New discharge outfall						
	Operation: New 78Ml/d discharge of treated effluent to River Ouse						

WFD assessment (scoping)

WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
· Fish	Bad	Bad	Construction of the outfall will be managed by good practice construction methods such that any risk to the water body is low. Temporary effects due to construction are unlikely to cause deterioration of the water body. The discharge will be treated to tertiary standards for ammonia, phosphate and BOD, and therefore, there will be a low risk of impacting the physico-chemical quality elements of this water body (currently at high status). The proposed treatment will also include a process (either UV AOP or reverse osmosis) to remove the majority organic chemical contaminants. Therefore, there will be a low risk of organic chemicals such as endocrine disruptors causing deterioration to fish status. Based on the Q95 exceedance river flow and proposed scheme output, the river would contain 55% effluent during operation at low flows. There is a potential for localised increase in flows and further assessment is needed in order to understand the impact upon the hydraulic regime, which is already heavily regulated by releases from Ardingly reservoir. Major increases in flow can disrupt normal patterns of velocity and depth and impact upon resident biological elements such as macroinvertebrates, fish and macrophytes. In this case, where hydrological processes are already substantially altered and where the river is a designated HMWB, it is difficult to predict the potential impact of the major change in flow on the biology elements with a high degree of certainty. Further investigation is required to better understand the potential magnitude of the impact on these receptors, particularly during times of low flow.
· Macro-invertebrates	High	Uncertain	
· Macrophytes & Phytobentos	Poor	Uncertain	
Chemical (Overall)	Good	Good	The discharge will be tertiary treated with RO or UV AOP and would be permitted through the EA discharge permit controls. The risk of deterioration in chemical status is therefore assessed as negligible.

	Protected Area Details	Drinking water protected area: the water body (River Ouse) is a Drinking Water Protected Area but there is no risk of adversely affecting the chemical status at the water body scale. Furthermore, Southern Water will want to ensure no risks to its drinking water supplies Nutrient sensitive areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. River Ouse is a nutrient sensitive area under the Urban Waste Water Treatment Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected; the discharge would be permitted through the EA discharge permit controls.
	Does the component comply with WFD Objective	
	1. No deterioration between status classes	Uncertain; there is a potential risk of deterioration between status classes, further investigation is required.
	2. No impediments to GES/GEP	
	3. No compromises to water body objectives	Yes; no compromises to water body objectives.
	4. No effects on other water bodies	Yes; no effects on other water bodies.
	5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.
	6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.

1.10 Sittingbourne Industrial Water Reuse (IWR_Sit1)

Water body	**WFD water body name**	SWALE					
	WFD water body type	Transitional Water					
	WFD management catchment	Thames TraC		**WFD water body ID**	GB530604011500		
	River Basin District	Thames					
	WFD Designations, Objectives and Mitigation						
	WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**			
		Moderate	-	-			
	Hydromorphological designation	Heavily modified					
	Water Body Mitigation Measure	No published mitigation measures					
	WFD Protected Areas						
	Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
	NO	NO	YES	NO	NO	YES	NO
WFD assessment (scoping)	**Scheme components potentially affecting water body**		**Construction:** N/A				
			Operation: 7.5Ml/d reduction in treated effluent inputs to the Swale				
	WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**				
	· Fish	Not assessed	Not assessed	There is a negligible risk of adverse impacts to flows, as a consequence of 7.5Ml/d effluent being re-directed for industrial use. Some freshwater invertebrate taxa are more responsive to changes in flow than others. Relative abundance of certain groups may change locally in response to decreased freshwater flow. However, the nature of the invertebrate community in this part of the tidal river is assumed to be strongly linked to the ambient salinity profile and tidal influence. It is unlikely that the absence of the freshwater			
	· Invertebrates	High	High				
	· Macroalgae	Good	Good				
	· Phytoplankton	High	High				
	· Angiosperms	Not assessed	Not assessed				

			discharge will be significant enough to lead to a deterioration in status class for the biology of The Swale
Chemical (Overall)	Good	Good	There is no risk of chemical status deterioration as a consequence of the cessation of effluent inputs to the estuary.
Protected Area Details			Shellfish Waters: The water body is associated with two designated shellfish waters (Swale Central and Swale East Shellfish Waters). However, the small reduction in freshwater flows to The Swale is not likely to cause any adverse impacts on these shellfish waters. SPA: The HRA has identified no potential LSEs on the Medway Estuary and Marshes SPA & RAMSAR. However, the HRA identified the potential for LSEs on the Swale SPA & RAMSAR, see the HRA screening report for further information.

Does the component comply with WFD Objective	
1. No deterioration between status classes	Yes; no deterioration between status classes
2. No impediments to GES/GEP	Yes; no impediments to achieving GEP.
3. No compromises to water body objectives	Yes; no compromises to water body objectives.
4. No effects on other water bodies	Yes; no impact on other water bodies.
5. Assists attainment of water body objectives	No; does not assist with the attainment of any mitigation water body objectives.
6. Assists attainment of protected area objectives	No; does not assist with the attainment of any mitigation measures required for the protected areas.

1.11 Sittingbourne Industrial Water Reuse (IWR_Sit2)

Water body

WFD water body name	SWALE		
WFD water body type	Transitional Water		
WFD management catchment	Thames TraC	**WFD water body ID**	GB530604011500
River Basin District	Thames		

WFD Designations, Objectives and Mitigation			
WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**
	Moderate	-	-
Hydromorphological designation		Heavily modified	
Water Body Mitigation Measure	No published mitigation measures		

WFD Protected Areas						
Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
NO	NO	YES	NO	NO	YES	NO

WFD assessment (scoping)

Scheme components potentially affecting water body		**Construction:** N/A	
		Operation: 17.5Ml/d reduction in treated effluent inputs to the Swale	
WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
· Fish	Not assessed	Not assessed	There is a low risk of adverse impacts to flows, as a consequence of 17.5Ml/d effluent being re-directed for industrial use. Some freshwater invertebrate taxa are more responsive to changes in flow than others. Relative abundance of certain groups may change locally in response to decreased freshwater flow. However, the nature of the invertebrate community in this part of the tidal river is assumed to be strongly linked to the
· Invertebrates	High	High	
· Macroalgae	Good	Good	
· Phytoplankton	High	High	
· Angiosperms	Not assessed	Not assessed	

			ambient salinity profile and tidal influence. It is unlikely that the absence of the freshwater discharge will be significant enough to lead to a deterioration in status class for the biology of the Swale.
Chemical (Overall)	Good	Good	There is no risk of chemical status deterioration as a consequence of the cessation of effluent inputs to the estuary.
Protected Area Details			Shellfish Waters: The water body is associated with two designated shellfish waters (Swale Central and Swale East Shellfish Waters). However, the small reduction in freshwater flows to The Swale is not likely to cause any adverse impacts on these shellfish waters. SPA: SAC and RAMSAR: The HRA has identified no potential LSEs on the Medway Estuary and Marshes SPA & RAMSAR. However, the HRA identified the potential for LSEs on the Swale SPA & RAMSAR, see the HRA screening report for further information.

Does the component comply with WFD Objective	
1. No deterioration between status classes	Yes; no deterioration between status classes
2. No impediments to GES/GEP	Yes; no impediments to achieving GEP.
3. No compromises to water body objectives	Yes; no compromises to water body objectives.
4. No effects on other water bodies	Yes; no impact on other water bodies.
5. Assists attainment of water body objectives	No; does not assist with the attainment of any mitigation water body objectives.
6. Assists attainment of protected area objectives	No; does not assist with the attainment of any mitigation measures required for the protected areas.

1.12 Reservoir at Pulborough (RES_Har): Western Rother

Water body

WFD water body name	Western Rother		
WFD water body type	River		
WFD management catchment	Arun and Western Streams	**WFD water body ID**	GB107041012810
River Basin District	South East		

WFD Designations, Objectives and Mitigation			
WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**
	Moderate	-	Good
Hydromorphological designation	Not designated artificial or heavily modified		
Water Body Mitigation Measure	No published mitigation measures		

WFD Protected Areas						
Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
NO	YES	NO	NO	YES	NO	YES

WFD

Scheme components potentially affecting water body	**Construction:** New abstraction intake	
	Operation: New 30Ml/d abstraction in the River Rother to support Pulborough Reservoir	
WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**

	· Fish	Moderate	Moderate	Construction of the abstraction intake will be managed by good practice construction methods and any temporary risks to the water body are assessed as low. Temporary effects due to construction will not cause deterioration of the water body. Fish could be entrained in the proposed abstraction intake but this would be mitigated with appropriate screening of the intake structure in accordance with best practice guidance and regulatory requirements. There is water available for abstraction for part of the year. Reduction in flow downstream of abstraction intake would be protected by the Hands-off Flow (HOF) (280Ml/d at Pulborough gauging station). The decrease in flow may adversely affect the river's capacity to buffer phosphate (currently moderate status) inputs between the location of the abstraction and confluence with River Arun, understood to be less than 2 km. However, this is not deemed sufficient to prompt a between status deterioration for phosphorus due to the small stretch of river which will be impacted. With the hands-off flow conditions set at appropriate levels to safeguard the aquatic environment, there should be no material adverse effects of the abstraction on the water quality or ecology. Overall it is unlikely that deterioration between status classes for fish, macro-invertebrates or macrophytes and phytobenthos will occur.
	· Macro-invertebrates	High	High	
	· Macrophytes & Phytobentos	Moderate	Moderate	
	Chemical (Overall)	Good	Good	It is unlikely that any change in the chemical status will occur, considering the hands-off flow conditions are set at appropriate levels to ensure no material adverse effects of the abstraction on the water quality.
	Protected Area Details			Drinking water protected area: the water body (River Western Rother) is a Drinking Water Protected Area but there is negligible risk of adversely affecting the chemical status at the water body scale. Nutrient sensitive areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. River Western Rother is a nutrient sensitive area under the Urban Waste Water Treatment Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected (controlled via the EA abstraction licence conditions).
	Does the component comply with WFD Objective			
	1. No deterioration between status classes			Yes; no deterioration between status classes.
	2. No impediments to GES/GEP			Yes; no impediments to GES.
	3. No compromises to water body objectives			Yes; no compromises to water body objectives.
	4. No effects on other water bodies			Yes; no effects on other water bodies.
	5. Assists attainment of water body objectives			No; does not assist with the attainment of water body objectives.
	6. Assists attainment of protected area objectives			No; does not assist with the attainment of protected area objectives.

1.13 Reservoir at Pulborough (RES_Har): Arun

Water body	**WFD water body name**	ARUN		
	WFD water body type	Transitional Water		
	WFD management catchment	South East TraC	**WFD water body ID**	GB540704105000
	River Basin District	South East		
	WFD Designations, Objectives and Mitigation			
	WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**
		Moderate	-	Good
	Hydromorphological designation		Heavily modified	

	Water Body Mitigation Measure	No published mitigation measures					
	WFD Protected Areas						
	Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
	NO	YES	YES	YES	NO	NO	NO
WFD assessment (scoping)	**Scheme components potentially affecting water body**		**Construction:** New abstraction inlet				
			Operation: New 20Ml/d abstraction on the tidal River Arun to support Pulborough Reservoir during periods of low flows in the Rother				
	WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**				
	· Fish	Not assessed	Not assessed	Construction of the intake will be managed by good practice construction methods and any temporary risks to the water body are assessed as low. Temporary effects due to construction will not cause deterioration of the water body. Fish could be entrained in the proposed abstraction intake but this would be mitigated with appropriate screening of the intake structure in accordance with best practice guidance and regulatory requirements. There is a low risk of adverse impacts on the water quality within the tidal River Arun due to the new 20Ml/d abstraction. The water quality in the tidal Arun is already heavily influenced by effluent returns from various WwTWs. The abstraction may have a local impact on the river's capacity to buffer inorganic inputs. However, this is deemed insufficient to prompt a deterioration in dissolved inorganic nitrogen (DIN) status. The reduction in flows could impact upon impact invertebrates, which are not currently assessed. The macroalgal community in this transitional water body will be adapted to a cycle of exposure and submersion Therefore, the risk of deterioration between status classes is low.			
	· Invertebrates	Not assessed	Not assessed				
	· Macroalgae	High	High				
	· Phytoplankton	Not assessed	Not assessed				
	· Angiosperms	Not assessed	Not assessed				
	Chemical (Overall)	Good	Good	There is no risk of deterioration between chemical status classes.			
	Protected Area Details		Drinking water protected area: the water body (River Arun) is a Drinking Water Protected Area but there is no risk of adversely affecting the chemical status at the water body scale. Furthermore, Southern Water will want to ensure no risks to its drinking water supplies				
	Does the component comply with WFD Objective						
	1. No deterioration between status classes		Yes; no deterioration between status classes.				
	2. No impediments to GES/GEP		Yes; no impediments to GEP.				
	3. No compromises to water body objectives		Yes; no compromises to water body objectives.				
	4. No effects on other water bodies		Yes; no effects on other water bodies.				
	5. Assists attainment of water body objectives		No; does not assist with the attainment of water body objectives.				
	6. Assists attainment of protected area objectives		No; does not assist with the attainment of protected area objectives.				

1.14 Stourmouth WSW (SWA_Plu20)

Water body

WFD water body name	STOUR (KENT)		
WFD water body type	Transitional Water		
WFD management catchment	South East TraC	**WFD water body ID**	GB520704004700
River Basin District	South East		

WFD Designations, Objectives and Mitigation

WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**
	Poor	-	Moderate
Hydromorphological designation		Heavily modified	
Water Body Mitigation Measure	No published mitigation measures		

WFD Protected Areas

Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
NO	YES	YES	YES	YES	NO	YES

Scheme components potentially affecting water body	**Construction:** New abstraction intake**,** new WTW
	Operation: New 10 – 20 Ml/d abstraction from the tidal River Stour

WFD assessment (scoping)

WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
· Fish	Not assessed	Not assessed	Construction of the abstraction intake and new WTW will be managed by good practice construction methods such that any risk to the water body is low. Temporary effects due to construction are unlikely to cause deterioration of the water body. Fish could be entrained in the proposed abstraction intake but this would be mitigated with appropriate screening of the intake structure in accordance with best practice guidance and regulatory requirements. There is a potential risk of adverse impacts on the aquatic ecology of the tidal Great Stour as a consequence of the new abstraction near Stourmouth. The increased abstraction may reduce the proportion of freshwater in the river and lead to saline ingress. However, the abstraction is considered small relative to the freshwater flow entering the estuary and therefore the risk of deterioration in ecological status is considered to be low.
· Invertebrates	Not assessed	Not assessed	
· Macroalgae	High	High	
· Phytoplankton	Poor	Poor	
· Angiosperms	Not assessed	Not assessed	
Chemical (Overall)	Good	Good	There is a negligible risk of deterioration between chemical status classes.
Protected Area Details			Drinking water protected area: the water body (Great Stour) is a Drinking Water Protected Area but there is negligible risk of adversely affecting the chemical status at the water body scale Nutrient sensitive areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. Great Stour River is a nutrient sensitive area under the Urban Waste Water Treatment Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected. SPA and SAC: The HRA has identified no potential LSEs on the Thanet Coast SAC. However, the HRA identified the potential for LSEs on the Sandwich Bay SAC, the Stodmarsh SAC and SPA & RAMSAR and the Thanet Coast & Sandwich Bay SPA, see the HRA screening report for further information.

Does the component comply with WFD Objective	
1. No deterioration between status classes	Yes; no deterioration between status classes.
2. No impediments to GES/GEP	Yes; no impediments to GEP.
3. No compromises to water body objectives	Yes; no compromises to water body objectives.
4. No effects on other water bodies	Yes; no effects on other water bodies.
5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.
6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.

1.15 Lewes Road (AE_LEW)

Water body

WFD water body name	Brighton Chalk Block	**WFD water body ID**	GB40701G502500
WFD water body type	Groundwater	**River Basin District**	South East
WFD management catchment	South East GW		

WFD Designations, Objectives and Mitigation

WFD Status and Objectives	RBMP2 Overall Status	Objective (2021)	Objective (2027)
	Poor	-	-
Water Body Mitigation Measure	No published mitigation measures		

WFD Protected Areas

Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
NO	YES	NO	NO	YES	NO	NO

WFD assessment (scoping)

Scheme components potentially affecting water body	**Construction:** N/A
	Operation: Increase abstraction to reach full licenced volumes – 1.6Ml/d assumed output

WFD Status Test	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
Quantitative (Overall)	Poor		
Dependent Surface Water Body Status	Poor	Poor	There is negligible risk of impacting dependent surface water bodies.
GWDTEs test	Good	Good	There are no known SSSI or Natura 2000 GWDTE sites in the proximity of this abstraction.
Saline Intrusion	Good	Good	There is no risk of saline intrusion.
Water Balance	Poor	Poor	The abstraction is unlikely to affect the water balance on a groundwater body scale but the water body is at poor status.
Chemical (Overall)	Poor	Poor	Negligible risk of deterioration in chemical status at a groundwater body scale.
Protected Area Details	Drinking water protected area: the water body (Brighton Chalk Block) is a Drinking Water Protected Area but there is no risk of adversely affecting the chemical status at the groundwater body scale. Nutrient sensitive areas: The water body is associated with a groundwater nitrate vulnerable zone under the Nitrates Directive. However, the scheme will		

	not affect the management of the protected area and no significant changes in water quality are expected.
Does the component comply with WFD Objective	
1. No deterioration between status classes	Yes; no deterioration between status classes.
2. No impediments to Good Status	Yes; no impediments to Good Status.
3. No compromises to water body objectives	Yes; no compromises to water body objectives.
4. No effects on other water bodies	Yes; no effects on other water bodies.
5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.
6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.

1.16 Re-commissioning of Test valley WSW (BR_Bro): River Test Chalk

Waterbody

WFD waterbody name	River Test Chalk	**WFD waterbody ID**	GB40701G501200
WFD waterbody type	Groundwater	**River Basin District**	South East
WFD management catchment	South East GW		

WFD Designations, Objectives and Mitigation

WFD Status and Objectives	RBMP2 Overall Status	Objective (2021)	Objective (2027)
	Poor	-	Good
Water Body Mitigation Measure	No published mitigation measures		

WFD Protected Areas

Bathing Water Directive	Drinking Water Directive	Conservation of Wild Birds Directive	Habitats Directive	Nitrates Directive	Shellfish Directive	Urban Waste Water Treatment Directive
NO	YES	NO	NO	YES	NO	NO

WFD assessment (scoping)

Scheme components potentially affecting waterbody	**Construction:** N/A		
	Operation: Recommission Test Valley BH – 4.5Ml/d assumed output		
WFD Status Test	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
Quantitative (Overall)	Good		
Dependent Surface Water Body Status	Good	Uncertain	There is one dependent surface water body which may be impacted by this abstraction: Wallop Brook (GB107042022650). A separate assessment is provided below.
GWDTEs test	Good	Good	There are no known SSSI or Natura 2000 GWDTE sites in the proximity of this abstraction.
Saline Intrusion	Good	Good	There is no risk of saline intrusion.
Water Balance	Good	Good	The abstraction is unlikely to affect the water balance on a groundwater body scale.
Chemical (Overall)	Poor	Poor	Negligible risk of deterioration in chemical status at a groundwater body scale.

Protected Area Details	Drinking water protected area: the water body (River Test Chalk) is a Drinking Water Protected Area but there is negligible risk of adversely affecting the chemical status at the groundwater body scale. Nutrient sensitive areas: The water body is associated with a groundwater nitrate vulnerable zone under the Nitrates Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected.
Does the component comply with WFD Objective	
1. No deterioration between status classes	Uncertain; there is a potential risk of deterioration between status classes, further assessment needed.
2. No impediments to GES/GEP	
3. No compromises to water body objectives	Yes; no compromises to water body objectives.
4. No effects on other water bodies	Yes; the abstraction has the potential to impact on Wallop Brook (GB107042022650), but is assessed separately below as being unlikely.
5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.
6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.

1.17 Re-commissioning of Test valley WSW (BR_Bro): Wallop Brook

Waterbody

WFD water body name	Wallop Brook					
WFD water body type	River					
WFD management catchment	Test and Itchen		**WFD waterbody ID**	GB107042022650		
River Basin District	South East					
WFD Designations, Objectives and Mitigation						
WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**			
	Good	-	-			
Hydromorphological designation	not designated artificial or heavily modified					
Water Body Mitigation Measure	No published mitigation measures					
WFD Protected Areas						
Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
NO	NO	NO	NO	YES	NO	NO

WFD assessment (scoping)

Scheme components potentially affecting waterbody	**Construction:** N/A **Operation:** Recommission Test Valley BH – 4.5Ml/d assumed output		
WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
· Fish	Not assessed	Not assessed	There is a risk of adverse impacts on the flows in the Wallop Brook. Given the proximity of the brook. The flow could be reduced and minor impacts on its ecology could occur. However, it is unlikely that deterioration between status classes will occur. Further assessment is required.
· Macro-invertebrates	High	Uncertain	
· Macrophytes & Phytobentos	Good	Uncertain	

Chemical (Overall)	Good	Good	There is negligible risk of deterioration between chemical status classes.
Protected Area Details		Nutrient sensitive areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected.	
Does the component comply with WFD Objective			
1. No deterioration between status classes		Uncertain; potential for deterioration between status classes; further assessment required	
2. No impediments to GES/GEP			
3. No compromises to water body objectives		Yes; no compromises to water body objectives.	
4. No effects on other water bodies		Yes; no impacts on other water bodies.	
5. Assists attainment of water body objectives		No; does not assist with the attainment of water body objectives.	
6. Assists attainment of protected area objectives		No; does not assist with the attainment of protected area objectives.	

1.18 Fawley Desalination (DES_FAW50, DES_Faw150 and DES_Faw200): Southampton Water

Water body

WFD water body name	SOUTHAMPTON WATER		
WFD water body type	Transitional Water		
WFD management catchment	South East TraC	**WFD water body ID**	GB520704202800
River Basin District	South East		

WFD Designations, Objectives and Mitigation			
WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**
	Moderate	-	-
Hydromorphological designation		Heavily modified	
Water Body Mitigation Measure	No published mitigation measures		

WFD Protected Areas						
Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
NO	NO	YES	YES	YES	YES	YES

WFD assessment (scoping)

Scheme components potentially affecting water body	**Construction:** New abstraction intake
	Operation: New abstraction from Southampton Water - (up to 200Ml/d DO)

WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
· Fish	Good	Good	Construction of the abstraction intake will be managed by good practice construction methods and any temporary risks to the water body are assessed as low. Temporary effects due to construction will not cause deterioration of the water body. Fish could be entrained in the proposed abstraction intake but this would be mitigated with appropriate screening of the intake structure in accordance with best practice guidance and regulatory requirements.
· Invertebrates	Good	Good	

· Macroalgae	Good	Good	There is a low risk of adverse impacts on water quality within the Southampton Water due to the new abstraction. The abstraction is situated close to the mouth of the estuary and therefore the abstraction is not expected to prompt a deterioration in dissolved inorganic nitrogen (DIN) status. The abstraction may prompt changes in flow regime and these are likely to have some impact on invertebrates and macroalgae. However, any impacts will be localised and given the size of the estuary at the point of abstraction, any changes will not be sufficient to prompt deterioration between status classes at a water body scale. Furthermore, the macroalgal community in this transitional water body will be adapted to a cycle of exposure and submersion. Timing the abstraction to avoid low tides would further mitigate any possibility of impact.
· Phytoplankton	High	High	
· Angiosperms	Good	Good	
Chemical (Overall)	Fail	Fail	The risk of deterioration of chemical status is assessed as negligible and the water body already fails to achieve good chemical status.
Protected Area Details			Nutrient sensitive areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. (Southampton Water) is a nutrient sensitive area under the Urban Waste Water Treatment Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected. Shellfish Waters: The existing abstraction point for Fawley operates within the Southampton Water Shellfish Water and the approaches to Southampton Water Shellfish Water Saltmarsh: Areas of saltmarsh are present in Southampton Water WFD water body some distance from the boundary of The Solent WFD WB. The saltmarsh community here is unlikely to be affected by the scheme and will in any case be adapted to a cycle of exposure and submersion. SPA and SAC: The HRA Stage 1 screening identified the potential for LSEs on the Solent Maritime SAC and the Southampton Water SPA. The Stage 2 report concluded that the minor potential increase in salinity would be unlikely to have any significant effect upon floral and invertebrate species and wintering and breeding bird species associated with the designated site. It is therefore considered highly unlikely that the indirect effects of the operational desalination plant would have any significant effect upon the favourable conservation status of wintering and breeding birds which forms qualifying features of the designated site.
Does the component comply with WFD Objective			
1. No deterioration between status classes			Yes; no deterioration between status classes.
2. No impediments to GES/GEP			Yes; no impediments to achieving GEP.
3. No compromises to water body objectives			Yes; no compromises to water body objectives.
4. No effects on other water bodies			Yes; no impact on other water bodies.
5. Assists attainment of water body objectives			No; does not assist with the attainment of any mitigation water body objectives.
6. Assists attainment of protected area objectives			No; does not assist with the attainment of any mitigation measures required for the protected areas.

1.19 Fawley Desalination (DES_Faw50, DES_Faw150 and DES_Faw200): Solent

Water body

WFD water body name	Solent		
WFD water body type	Coastal Water		
WFD management catchment	South East TraC	**WFD water body ID**	GB650705150000
River Basin District	South East		

WFD Designations, Objectives and Mitigation

WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**
	Moderate	-	-

Hydromorphological designation	Heavily modified
Water Body Mitigation Measure	No published mitigation measures

WFD Protected Areas

Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
YES	NO	YES	YES	YES	YES	YES

Scheme components potentially affecting water body	**Construction:** New discharge outfall
	Operation: New discharge of brine (for a 200Ml/d output) from and back into the Solent

WFD assessment (scoping)

WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
· Fish	Not assessed	Not assessed	Construction of the discharge outfall will be managed by good practice construction methods and any temporary risks to the water body are assessed as low. Temporary effects due to construction will not cause deterioration of the water body There is potential for the new discharge of briny waters (via the currently disused Fawley Power Station) to impact the aquatic ecology of the Solent. Near field modelling indicates that the maximum discharge rate for a 200Ml/d plant, would reach equilibrium with surrounding water (10% above ambient salinity) at 50.09m from the outfall pipe. This was the maximum distance yielded by the model at this discharge volume, corresponding with spring tide at low water slack conditions. 50.09 m, equates to the radius of a circular area of <1ha in surface area. Given discharge velocity and tidal movement etc, the saline plume would not be expected to disperse in a circular pattern. Therefore, the figure of 1ha provides an over-estimate of the worst-case scenario for the area that could be subject to salinity levels of 10% above ambient. This is less than 0.004% of the surface area of the WB (25,598ha). The results of far field salinity modelling indicate that the maximum salinity uplift above ambient within the proximity of the discharge (at proposed maximum discharge rate) is 1.15 PSU (Practical Salinity Units). This would equate to a salinity uplift above ambient of 3.4%. This value drops by more than half within 500m. The EC Directive threshold for discharges affecting shellfish waters is 10%. The new discharge may affect the localised distribution of invertebrate communities but this is unlikely to have a major effect on fauna across most of the water body. Any impact is
· Invertebrates	Good	Good	
· Macroalgae	Not assessed	Not assessed	
· Phytoplankton	Not assessed	Not assessed	
· Angiosperms	Not assessed	Not assessed	

			expected to be largely proportional to the discharge volumes and will ultimately depend on the option variant to be implemented. Given these data, it is thought highly unlikely that a hypersaline plume originating in The Solent would raise salinity levels to the point where WFD deterioration could result (due to impacted ecology elements).
Chemical (Overall)	Fail	Fail	The risk of deterioration of chemical status is assessed as negligible and the water body already fails to achieve good chemical status.
Protected Area Details			Nutrient sensitive areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. The Solent is a nutrient sensitive area under the Urban Waste Water Treatment Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected. Shellfish Waters: The existing discharge point for Fawley is located within Stanswood Bay designated Shellfish Water, located in the Solent WFD Coastal WB. It was estimated from the near field modelling that the plume would equate to an area <0.2% of the surface area of the Stanswood Bay Shellfish Water. Bathing Waters: there is one bathing water located near Fawley, Calshot. The discharge outfall will be a significant distance from the shore and will not impact upon bathing water quality. SPA and SAC: The HRA Stage 1 screening identified the potential for LSEs on the Solent Maritime SAC and the Southampton Water SPA. The Stage 2 report concluded that the minor potential increase in salinity would be unlikely to have any significant effect upon floral and invertebrate species and wintering and breeding bird species associated with the designated site. It is therefore considered highly unlikely that the indirect effects of the operational desalination plant would have any significant effect upon the favourable conservation status of wintering and breeding birds which forms qualifying features of the designated site.

Does the component comply with WFD Objective	
1. No deterioration between status classes	Yes; no deterioration between status classes
2. No impediments to GES/GEP	Yes; no impediments to achieving GEP.
3. No compromises to water body objectives	Yes; no compromises to water body objectives.
4. No effects on other water bodies	Yes; no impact on other water bodies.
5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.
6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.

1.20 Camber (Rye) Desalination near Rye Bay (DES_Cam5 and DES_Cam10): Rother

Water body				
	WFD water body name	ROTHER		
	WFD water body type	Transitional Water		
	WFD management catchment	South East TraC	**WFD water body ID**	GB540704016100
	River Basin District	South East		
	WFD Designations, Objectives and Mitigation			
	WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**
		Moderate	-	-
	Hydromorphological designation	Heavily modified		
		No published mitigation measures		

	Water Body Mitigation Measure						
	WFD Protected Areas						
	Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
	NO	NO	YES	YES	YES	NO	NO

WFD assessment (scoping)	**Scheme components potentially affecting water body**			**Construction:** Desalination plant and new abstraction intake **Operation:** New abstraction from tidal River Rother – up to 10Ml/d assumed output
	WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
	· Fish	Not assessed	Not assessed	Construction of the abstraction intake will be managed by good practice construction methods and any temporary risks to the water body are assessed as low. Temporary effects due to construction will not cause deterioration of the water body. Fish could be entrained in the proposed abstraction intake but this would be mitigated with appropriate screening of the intake structure in accordance with best practice guidance and regulatory requirements There is the potential for the new abstraction to impact upon the aquatic ecology of the tidal Rother. Depending on the volume of tidal water abstracted relative to in-river flow, the abstraction may result in potential impacts upon biological communities including macroalgae and phytoplankton. It is not certain whether the reduced flows could lead to a deterioration in status of these primary producers from the High status reported in 2015. Further investigation is required to assess the scheme with greater certainty but measures such as timing of abstraction relative to tidal cycle could mitigate any ecological impact.
	· Invertebrates	Not assessed	Not assessed	
	· Macroalgae	High	High (uncertain)	
	· Phytoplankton	High	High (uncertain)	
	· Angiosperms	Not assessed	Not assessed	
	Chemical (Overall)	Good	Good	The risk of deterioration between chemical status classes is assessed as negligible.
	Protected Area Details			SPA and SAC: The HRA has identified no potential for LSEs on the Dungeness SAC or the Hasting SAC. However, the HRA has identified the potential for LSEs on the Dungeness Romney Marsh SAC, see HRA stage 1 screening report for further information. Nutrient sensitive areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected.

Does the component comply with WFD Objective	
1. No deterioration between status classes	Uncertain; there is a potential risk of deterioration, further assessment is needed.
2. No impediments to GES/GEP	
3. No compromises to water body objectives	Yes; no compromises to water body objectives.
4. No effects on other water bodies	Yes; no impact on other water bodies.
5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.
6. Assists attainment of protected area objectives	No; does not assist with the attainment of any mitigation measures required for the protected areas.

1.21 Camber (Rye) Desalination near Rye Bay (DES_Cam5 and DES_Cam10): Sussex East

Water	**WFD water body name**	Sussex East

	WFD water body type		Coastal Water				
	WFD management catchment		South East TraC		**WFD water body ID**	GB640704540002	
	River Basin District		South East				
	WFD Designations, Objectives and Mitigation						
	WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**		**Objective (2027)**		
		Moderate	-		Good		
	Hydromorphological designation		Heavily modified				
	Water Body Mitigation Measure	No published mitigation measures					
	WFD Protected Areas						
	Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
	YES	NO	YES	YES	NO	NO	NO
WFD assessment (scoping)	**Scheme components potentially affecting water body**		**Construction:** New discharge outfall				
			Operation: New discharge of brine via long sea outfall to coastal waters – 5-10Ml/d assumed output				
	WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**				
	· Fish	Not assessed	Not assessed	Construction of the discharge outfall will be managed by good practice construction methods and any temporary risks to the water body are assessed as low. Temporary effects due to construction will not cause deterioration of the water body. Near field modelling indicates that at a discharge rate of 5Ml/d, equilibrium with surrounding water (10% above ambient salinity) would be reached at 10.43m from the outfall pipe. This was the maximum distance yielded by the model at the only discharge volume modelled for this scheme, corresponding in this case with spring tide at low water slack conditions. This distance of 10.43m equates to the radius of a circular area of <0.04ha in surface area. Given discharge velocity and tidal movement etc, the saline plume would not be expected to disperse in a circular pattern. Therefore, crudely speaking, the figure of 0.04ha provides an over-estimate of the worst-case scenario for the area that could be subject to salinity levels of 10% above ambient. This is less than 0.0003% of the surface area of the Sussex East WB. A wider area would be subject to raised salinity levels of <10% above ambient and therefore less than the EC threshold for salinity discharges to shellfish waters. Further investigation would be needed to determine the chronic effect of slightly raised salinity levels over time on ecology and WFD status. Given these data, it is thought highly unlikely that a hypersaline plume originating from the discharge would raise salinity levels within the Sussex East WB to the point where any local impact on ecology caused a WFD deterioration. Any slight risk would generally be expected to reduce according to the volume of brine discharged, with lower discharge rates resulting in lower risk.			
	· Macro-invertebrates	Good	Good				
	· Macrophytes & Phytobentos	Not assessed	Not assessed				
	Chemical (Overall)	Good	Good	The risk of deterioration between chemical status classes is assessed as negligible.			

	Protected Area Details	Bathing water: The proposed discharge is understood to be approximately 1-2 km from Camber designated Bathing Water. There should be no impact as a result of the hypersaline effluent. SPA: The HRA has identified the potential for LSEs on the Dungeness Romney Marsh SPA, see HRA screening report for further information.
	Does the component comply with WFD Objective	
	1. No deterioration between status classes	Yes; no deterioration between classes or impediments to GES/GEP.
	2. No impediments to GES/GEP	Yes; no impediments to GEP.
	3. No compromises to water body objectives	Yes; no compromises to water body objectives.
	4. No effects on other water bodies	Yes; no impact on other water bodies.
	5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.
	6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.

1.22 Desalination Test Estuary with brine discharge into Solent via Fawley outfall (DES_Mar50, DES_Mar150 and DES_Mar200): Southampton Water

Water body	**WFD water body name**	SOUTHAMPTON WATER					
	WFD water body type	Transitional Water					
	WFD management catchment	South East TraC		**WFD water body ID**	GB520704202800		
	River Basin District	South East					
	WFD Designations, Objectives and Mitigation						
	WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**			
		Moderate	-	-			
	Hydromorphological designation	Heavily modified					
	Water Body Mitigation Measure	No published mitigation measures					
	WFD Protected Areas						
	Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
	NO	NO	YES	YES	YES	YES	YES
WFD assessment (scoping)	**Scheme components potentially affecting water body**	**Construction:** New abstraction intake					
		Operation: New abstraction from Southampton Water - up to 200Ml/d assumed output					
	WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**				
	· Fish	Good	Uncertain	Construction of the abstraction intake will be managed by good practice construction methods and any temporary risks to the water body are assessed as low. Temporary effects due to construction will not cause deterioration of the water body.			
	· Invertebrates	Good	Uncertain				
	· Macroalgae	Good	Good				

· Phytoplankton	High	High	Fish could be entrained in the proposed abstraction intake but this would be mitigated with appropriate screening of the intake structure in accordance with best practice guidance and regulatory requirements. There is a potential risk of deterioration in status class for invertebrates and fish as a result of the new abstraction from Southampton Water (and the tidal Test). Any potential risks are exacerbated by the fact that the abstraction is located in a narrow part of the water body, upstream of the confluence with the River Itchen. This change in flow regime may adversely impact fish populations and invertebrate communities, if they are especially sensitive to flow changes. The severity of impact is currently uncertain; however, it is expected that this will be proportional with the reduction in flows. Further assessment is therefore needed.
· Angiosperms	Good	Good	
Chemical (Overall)	Fail	Fail	The risk of deterioration of chemical status is assessed as negligible and the water body already fails to achieve good chemical status.
Protected Area Details			Nutrient sensitive areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. (Southampton Water) is a nutrient sensitive area under the Urban Waste Water Treatment Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected. Saltmarsh: The nearest areas of saltmarsh are present in the tidal Test within Southampton Water WFD WB approximately 1km upstream of the proposed abstraction point. These areas will remain subject to tidal ranges but there is potential for impact due to the proposed abstraction. Shellfish Waters: Southampton Water designated shellfish water lies within the WFD water body. There is potential for impact due to the abstraction. SPA, SAC and RAMSAR: The HRA has identified no potential LSEs on the Solent Maritime SAC, Solent & Southampton Water SPA or the Dorset Coast SPA.
Does the component comply with WFD Objective			
1. No deterioration between status classes			Uncertain; there is a potential risk of deterioration; further assessment required.
2. No impediments to GES/GEP			Yes; no impediments to achieving GEP.
3. No compromises to water body objectives			Yes; no compromises to water body objectives.
4. No effects on other water bodies			Yes; no impact on other water bodies.
5. Assists attainment of water body objectives			No; does not assist with the attainment of any mitigation water body objectives.
6. Assists attainment of protected area objectives			No; does not assist with the attainment of any mitigation measures required for the protected areas.

1.23 Desalination Test Estuary with brine discharge into Solent via Fawley outfall (DES_Mar50, DES_Mar150 and DES_Mar200): Solent

Water body

WFD water body name	Solent		
WFD water body type	Coastal Water		
WFD management catchment	South East TraC	**WFD water body ID**	GB650705150000
River Basin District	South East		

WFD Designations, Objectives and Mitigation

WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**
	Moderate	-	-

Hydromorphological designation	Heavily modified
Water Body Mitigation Measure	No published mitigation measures

WFD Protected Areas

Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
YES	NO	YES	YES	YES	YES	YES

Scheme components potentially affecting water body	**Construction:** N/A – existing outfall
	Operation: Discharge of brine (up to 200Ml/d depending on option) to the Solent

WFD assessment (scoping)

WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
· Fish	Not assessed	Not assessed	There is potential for the new discharge of briny waters (via the currently disused Fawley Power Station) to impact the aquatic ecology of the Solent, although this is likely to be restricted to an area of <1ha (see near field modelling below). This assumes that risk of deterioration can generally be discounted below a 10% increase in ambient salinity levels (regardless of duration), based on the EC threshold for salinity discharges to shellfish waters. The new discharge may affect the localised distribution of invertebrate communities but this is unlikely to have a major effect on fauna across most of the WB. Any impact is expected to be largely proportional to the discharge volumes and will ultimately depend on the option variant to be implemented. Near field modelling indicates that at a maximum discharge rate of 200Ml/d, equilibrium with surrounding water (10% above ambient salinity) would be reached at 50.09m from the outfall pipe. This was the maximum distance yielded by the model at this discharge volume, corresponding with spring tide at low water slack conditions. A slightly greater distance of 53.55m was yielded at 150Ml/d. This may be due to there being slightly greater uncertainty in the model at reduced discharge rates (50Ml/d and 100Ml/d were not modelled). 53.55m, equates to the radius of a circular area of <1ha in surface area. Given discharge velocity and tidal movement etc, the saline plume would not be expected to disperse in a circular pattern. This is less than 0.004% of the surface area of the WB (25,598ha). A wider area would be subject to raised salinity levels of <10% above ambient and therefore less than the EC threshold for salinity discharges to shellfish waters. Further investigation would be needed to determine the chronic effect
· Invertebrates	Good	Good	
· Macroalgae	Not assessed	Not assessed	
· Phytoplankton	Not assessed	Not assessed	
· Angiosperms	Not assessed	Not assessed	

			of slightly raised salinity levels over time on ecology and WFD status. The results of far field salinity modelling indicate that the maximum salinity uplift above ambient within the proximity of the discharge (at proposed maximum discharge rate) is 1.15 PSU (Practical Salinity Units). This would equate to a salinity uplift above ambient of 3.4%. This value drops by more than half within 500m. The EC Directive threshold for discharges affecting shellfish waters is 10%. Further to this, any slight risk would be expected to reduce according to the volume of brine discharged, with lower discharge rates resulting in lower risk. Given these data, it is thought highly unlikely that a hypersaline plume originating in The Solent would raise salinity levels to the point where WFD deterioration could result (due to impacted ecology elements). Any slight risk would generally be expected to reduce according to the volume of brine discharged, with lower discharge rates resulting in lower risk.
Chemical (Overall)	Fail	Fail	The risk of deterioration of chemical status is assessed as negligible and the water body already fails to achieve good chemical status.
Protected Area Details			Nutrient sensitive areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. The Solent is a nutrient sensitive area under the Urban Waste Water Treatment Directive However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected. Shellfish Waters: The existing discharge point for Fawley is located within Stanswood Bay designated Shellfish Water, located in the Solent WFD Coastal WB. Near field modelling indicates that for a distance of up to 53.55m from the discharge pipe outlet salinity levels could exceed 10% above ambient. This equates to an area <0.2% of the surface area of the Stanswood Bay Shellfish Water. Bathing Waters: There is one bathing water located near Fawley, Calshot. The discharge outfall will be a significant distance from the shore and will not impact upon bathing water quality. SPA, SAC and RAMSAR: The HRA has identified no potential LSEs on the Solent & Southampton Water SPA and the Solent Maritime SAC. However, the HRA identified potential for LSEs on the River Itchen SAC, see the HRA screening report for further information
Does the component comply with WFD Objective			
1. No deterioration between status classes			Yes; no deterioration between status classes
2. No impediments to GES/GEP			Yes; no impediments to achieving Good Ecological Potential
3. No compromises to water body objectives			Yes; no compromises to water body objectives.
4. No effects on other water bodies			Yes; no impact on other water bodies.
5. Assists attainment of water body objectives			No; does not assist with the attainment of any mitigation water body objectives.
6. Assists attainment of protected area objectives			No; does not assist with the attainment of any mitigation measures required for the protected areas.

1.24 Isle of Sheppey Desalination Plant (DES_IoS10 and DES_IoS20)

Water body

WFD water body name	MEDWAY		
WFD water body type	Transitional Water		
WFD management catchment	Thames TraC	**WFD water body ID**	GB530604002300
River Basin District	Thames		

WFD Designations, Objectives and Mitigation			
WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**
	Moderate	-	-
Hydromorphological designation		Heavily modified	
Water Body Mitigation Measure	No published mitigation measures		

WFD Protected Areas						
Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
YES	NO	YES	NO	YES	YES	NO

Scheme components potentially affecting water body	**Construction**: Desalination plant, abstraction intake and discharge outfall
	Operation: New abstraction of brackish water from Medway Estuary and discharge brine to the Medway Estuary - 10-20Ml/d DO

WFD assessment (scoping)

WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
· Fish	Not assessed	Not assessed	Construction of the abstraction intake and discharge outfall will be managed by good practice construction methods and any temporary risks to the water body are assessed as low. Temporary effects due to construction will not cause deterioration of the water body. Fish could be entrained in the proposed abstraction intake but this would be mitigated with appropriate screening of the intake structure in accordance with best practice guidance and regulatory requirements. There is a potential risk of impact on estuarine biological communities as a result of the new hypersaline discharge in the Medway estuary. Modelling from schemes elsewhere would suggest that adverse effects may potentially be limited to biota in the immediate vicinity of the discharge, however, due to the enclosed nature of the estuary it is uncertain how tidal hydrodynamics will influence the degree of exposure. There is therefore uncertainty regarding the likelihood of deterioration between WFD status classes. Dispersion modelling of the hyper-saline discharge would be required to investigate the impact on chemical and ecological status. The impacts are likely to be mitigatable through dilution of the brine prior to discharge or increased dispersion with the installation of a diffuser.
· Invertebrates	High	Uncertain	
· Macroalgae	Good	Uncertain	
· Phytoplankton	High	Uncertain	
· Angiosperms	Not assessed	Not assessed	
Chemical (Overall)	Good	Good	The risk of deterioration in chemical status is assessed as negligible.
Protected Area Details		Nutrient sensitive areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected.	

		Bathing water: The nearest bathing water to the proposed discharge is at Sheerness, approximately 3km distant, and is unlikely to be impacted by the scheme operation. Shellfish Waters: Southend and Sheppey shellfish Waters are both approximately 1.5 - 2km from the proposed discharge point. They are likely to fall well outside of the area of briny water at 10% above ambient salinity and would be expected to be unaffected by the discharge. SPA, SAC and RAMSAR: The HRA has identified no potential LSEs on the Medway Estuary and Marshes.
	Does the component comply with WFD Objective	
	1. No deterioration between status classes	Uncertain; there is a potential risk of deterioration between status classes; further assessment is required.
	2. No impediments to GES/GEP	Yes; no impediments to GEP.
	3. No compromises to water body objectives	Yes; no compromises to water body objectives.
	4. No effects on other water bodies	Yes; no impact on other water bodies.
	5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.
	6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.

1.25 Desalination plant at Sholling (DES_Shl10, DES_Shl20, DES_Shl50and DES_Shl100)

Water body

WFD water body name	SOUTHAMPTON WATER						
WFD water body type	Transitional Water						
WFD management catchment	South East TraC			**WFD water body ID**	GB520704202800		
River Basin District	South East						
WFD Designations, Objectives and Mitigation							
WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**				
	Moderate	-	-				
Hydromorphological designation	Heavily modified						
Water Body Mitigation Measure	No published mitigation measures						
WFD Protected Areas							
Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**	
NO	NO	YES	YES	YES	YES	YES	

WFD assessment (scoping)

Scheme components potentially affecting water body	**Construction:** New abstraction intake and discharge outfall		
	Operation: New abstraction of between and discharge to Southampton Water - 10 – 200Ml/d DO		
WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
· Fish	Good	Uncertain	Construction of the abstraction intake and discharge outfall will be managed by good practice construction methods and any temporary risks to the water body are assessed as low.
· Invertebrates	Good	Uncertain	
· Macroalgae	Good	Uncertain	
· Phytoplankton	High	Uncertain	

· Angiosperms	Good	Good	Temporary effects due to construction will not cause deterioration of the water body. Fish could be entrained in the proposed abstraction intake but this would be mitigated with appropriate screening of the intake structure in accordance with best practice guidance and regulatory requirements. There is a potential risk of deterioration in status class for ecology elements as a result of the new abstraction from Southampton Water. Depending on the final option variant to be implemented. Abstraction and discharge points are located in part of the tidal water body that is approximately 2km wide. The severity of impact relating to the proposed different abstraction volumes may relate to states of tide and volumes of water in Southampton Water and further investigation is needed to understand potential ecological impact, for example on fish movements and on benthic invertebrates, in more detail. The potential risk of impact on the aquatic ecology in Southampton Water due to the new discharge of briny waters is likely to be greatest nearest to the proposed discharge. Near field modelling indicates that at a maximum discharge rate of 200Ml/d, equilibrium with surrounding water (10% above ambient salinity) would be reached at 11.04m from the outfall pipe. The impacts are expected to be largely proportional to the discharge volumes and will ultimately depend on the option variant that will be implemented. Previous far field modelling for a different site in Southampton Water suggests that residence times for hypersaline waters in Southampton Water may be greater than in a more exposed, coastal water body.
Chemical (Overall)	Fail	Fail	The risk of deterioration of chemical status is assessed as negligible and the water body already fails to achieve good chemical status.
Protected Area Details			Nutrient sensitive areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. (Southampton Water) is a nutrient sensitive area under the Urban Waste Water Treatment Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected. Shellfish Waters: Southampton Water designated shellfish water lies within the WFD water body. There is potential for impact due to the abstraction. SPA, SAC and RAMSAR: The HRA has identified no potential LSEs on the Solent Maritime SAC. However, the HRA identified the potential for LSEs on the River Itchen SAC and the Solent & Southampton Water SPA see the HRA screening report for further information.

Does the component comply with WFD Objective	
1. No deterioration between status classes	Uncertain; there is a potential risk of deterioration between status classes; further assessment required.
2. No impediments to GES/GEP	Yes; no impediments to achieving GEP.
3. No compromises to water body objectives	Yes; no compromises to water body objectives.
4. No effects on other water bodies	Yes; no impact on other water bodies.
5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.
6. Assists attainment of protected area objectives	No; does not assist with the attainment of a protected area objectives.

1.26 River Medway Desalination, up as far as Allington Lock (DES_Med10 and DES_Med20)

Water body

WFD water body name	MEDWAY						
WFD water body type	Transitional Water						
WFD management catchment	Thames TraC				**WFD water body ID**	GB530604002300	
River Basin District	Thames						
WFD Designations, Objectives and Mitigation							
WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**				
	Moderate	-	-				
Hydromorphological designation	Heavily modified						
Water Body Mitigation Measure	No published mitigation measures						
WFD Protected Areas							
Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**	
YES	NO	YES	NO	YES	YES	NO	
Scheme components potentially affecting water body	**Construction:** New abstraction intake and discharge outfall						
	Operation: New abstraction and discharge of briny waters - 10 to 20Ml/d assumed output						

WFD assessment (scoping)

WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
· Fish	Not assessed	Not assessed	Construction of the intake will be managed by good practice construction methods and any temporary risks to the water body are assessed as low. Temporary effects due to construction will not cause deterioration of the water body. Fish could be entrained in the proposed abstraction intake but this would be mitigated with appropriate screening of the intake structure in accordance with best practice guidance and regulatory requirements. There is a potential risk of impact on the aquatic ecology of the tidal Medway as a result of the new abstraction and discharge. This abstraction may result in a reduction in freshwater flow within the tidal river with potential adverse impacts on the aquatic and inter-tidal ecology, including the macroalgal and invertebrate community. The potential risk from the scheme is exacerbated by the narrow shape of the tidal Medway, which may emphasize changes in volume and impede the effective dispersal of briny waters. Mixing with Medway WwTW final effluent is likely to assist with dispersal of the hypersaline discharge, but this may contribute to thermal pollution from other discharges in the water body. It is uncertain whether there is a potential for between class deterioration, particularly as the biological elements in question are currently at Good or High status. Further investigation is needed in order to better understand the potential impacts.
· Invertebrates	High	Uncertain	
· Macroalgae	Good	Uncertain	
· Phytoplankton	High	Uncertain	
· Angiosperms	Not assessed	Not assessed	
Chemical (Overall)	Good	Good	The risk of deterioration in chemical status is assessed as negligible.
Protected Area Details	Nutrient sensitive areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. However, the scheme will		

	not affect the management of the protected area and no significant changes in water quality are expected. Bathing Waters & Shellfish Waters: There is likely to be no noticeable impact on bathing waters or shellfish waters. SPA: The HRA identified no potential for LSEs on Medway Estuary & Marshes SPA.
Does the component comply with WFD Objective	
1. No deterioration between status classes	Uncertain; there is a potential risk of deterioration between status classes and further investigation is required.
2. No impediments to GES/GEP	
3. No compromises to water body objectives	Yes; no compromises to water body objectives.
4. No effects on other water bodies	Yes; no impact on other water bodies.
5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.
6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.

1.27 River Stour Desalination (DES_Sto10 and DES Sto20): Stour (Kent)

Water body

WFD water body name	STOUR (KENT)		
WFD water body type	Transitional Water		
WFD management catchment	South East TraC	**WFD water body ID**	GB520704004700
River Basin District	South East		

WFD Designations, Objectives and Mitigation			
WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**
	Poor	-	Moderate
Hydromorphological designation	Heavily modified		
Water Body Mitigation Measure	No published mitigation measures		

WFD Protected Areas						
Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
NO	YES	YES	YES	YES	NO	YES

WFD assessment (scoping)

Scheme components potentially affecting water body	**Construction:** Desalination plant and new abstraction intake
	Operation: New abstraction from tidal River Stour – 10-20Ml/d output

WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
· Fish	Not assessed	Not assessed	Construction of the abstraction intake will be managed by good practice construction methods and any temporary risks to the water body are assessed as low. Temporary effects due to construction will not cause deterioration of the water body. Fish could be entrained in the proposed abstraction intake but this would be mitigated with appropriate screening of the intake structure in accordance with best practice guidance and regulatory requirements.
· Invertebrates	Not assessed	Not assessed	
· Macroalgae	High	High	
· Phytoplankton	Poor	Poor	
· Angiosperms	Not assessed	Not assessed	

			There is the potential for impact on elements of the aquatic ecology of the tidal River Stour as a result of the new abstraction, although some elements including invertebrates are not currently classified. The abstraction is proposed to take place near to the mouth of the tidal river approximately 1km from the coast. This may reduce the freshwater input to the estuary for part of the tidal cycle leading to possible impacts on inter or subtidal macroalgae and on other, transitional groups. However, these impacts are considered to be minor. Macroalgae are adapted to tidal processes such as exposure at low tide and fluctuations in salinity levels. In addition, a reduction in freshwater input may result in a coincident reduction in nutrient loading from inland sources which could benefit phytoplankton communities in the estuary. Major adverse impact is thought to be unlikely on these two botanical elements at what appear to be relatively low abstraction volumes. Furthermore, phytoplankton are currently classified as Poor status and further deterioration is thought unlikely. Additional flow data regarding the volume and quality of water and the freshwater component discharging to the estuary is required but the most likely impact on macroalgae and phytoplankton is within class change.
Chemical (Overall)	Good	Good	The risk of deterioration of chemical status is assessed as negligible.
Protected Area Details			SPA, SAC and RAMSAR: The HRA identified the potential for LSEs on the Thanet Coast SAC and the Thanet Coast & Sandwich Bay SPA & RAMSAR, see the HRA screening report for further information. Drinking water protected area: the water body (Stour Kent) is a Drinking Water Protected Area but there is no risk of adversely affecting the chemical status at the water body scale. Nutrient sensitive areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. (Stour Kent) is a nutrient sensitive area under the Urban Waste Water Treatment Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected.

Does the component comply with WFD Objective	
1. No deterioration between status classes	Yes; no deterioration between status classes
2. No impediments to GES/GEP	Yes; no impediments to GEP.
3. No compromises to water body objectives	Yes; no compromises to water body objectives.
4. No effects on other water bodies	Yes; no impact on other water bodies.
5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.
6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.

1.28 River Stour Desalination (DES_Sto10 and DES Sto20): Kent North

Water body

WFD water body name	Kent North		
WFD water body type	Coastal Water		
WFD management catchment	South East TraC	**WFD water body ID**	GB650704510000
River Basin District	South East		

WFD Designations, Objectives and Mitigation			
WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**
	Moderate	-	-
Hydromorphological designation		Heavily modified	
Water Body Mitigation Measure	No published mitigation measures		

WFD Protected Areas						
Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
YES	NO	YES	YES	NO	YES	NO

Scheme components potentially affecting water body	**Construction:** New discharge outfall
	Operation: New discharge to the Kent North coastal waters - 10-20Ml/d assumed output

WFD assessment (scoping)

WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
· Fish	Not assessed	Not assessed	Construction of the discharge outfall will be managed by good practice construction methods and any temporary risks to the water body are assessed as low. Temporary effects due to construction will not cause deterioration of the water body. The new discharge may impact salinity in the vicinity of the outfall and therefore, may affect the localised distribution of invertebrate communities but this is unlikely to have a major effect on fauna across the wider WB. Salinity levels of more than 10% above ambient and therefore more than the EC threshold for salinity discharges to shellfish waters are most likely to be encountered for only a few metres from the discharge. The extent of impact in this area will be dependent upon factors including discharge salinity, tidal hydrodynamics and rates of dispersal. In addition, the impact of brine water discharge on the coastal waters will be mitigated by the assumed mixing with treated Weatherless WwTW effluent. Therefore, any risks of deterioration to the coastal water body are negligible.
· Invertebrates	Good	Good	
· Macroalgae	Not assessed	Not assessed	
· Phytoplankton	Not assessed	Not assessed	
· Angiosperms	Not assessed	Not assessed	
Chemical (Overall)	Good	Good	The risk of deterioration of chemical status is assessed as negligible.
Protected Area Details		SPA, SAC and RAMSAR: The HRA identified the potential for LSEs on the Thanet Coast SAC and the Thanet Coast & Sandwich Bay SPA & RAMSAR, see the HRA screening report for further information. Shellfish Waters: The discharge point is located on the edge of the Stour Estuary designated Shellfish Water. Modelling for other schemes indicates that, for a distance of a few metres from the discharge pipe salinity levels could exceed 10% above ambient. Should this area overlap with the edge of the shellfish water, it would likely represent a fraction of 1% of the designated fishery, but impacts on shellfish are possible within this zone.	

	Nutrient sensitive areas: The upstream Stour Kent water body is associated with a surface water nitrate vulnerable zone. It is a nutrient sensitive area under the Urban Waste Water Treatment Directive. However, the scheme will not affect, the management of the protected area and no significant changes in water quality are expected.
Does the component comply with WFD Objective	
1. No deterioration between status classes	Yes; no deterioration between status classes
2. No impediments to GES/GEP	Yes; no impediments to GEP.
3. No compromises to water body objectives	Yes; no compromises to water body objectives.
4. No effects on other water bodies	Yes; no impact on other water bodies.
5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.
6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.

1.29 River Thames Desalination adjacent to Swanscombe WwTW (DES_Swa10 and DES_Swa20)

Water body

WFD water body name	THAMES MIDDLE		
WFD water body type	Transitional Water		
WFD management catchment	Thames TraC	**WFD water body ID**	GB530603911402
River Basin District	Thames		

WFD Designations, Objectives and Mitigation			
WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**
	Moderate	-	-
Hydromorphological designation		Heavily modified	
Water Body Mitigation Measure	No published mitigation measures		

WFD Protected Areas						
Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
NO	NO	YES	NO	YES	NO	YES

WFD assessment (scoping)

Scheme components potentially affecting water body	**Construction:** New abstraction intake and discharge outfall		
	Operation: New abstraction from Thames Estuary and subsequent discharge of briny waters to the same water body - 20Ml/d assumed output		
WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
· Fish	Good	Uncertain	Construction of the intake and outfall will be managed by good practice construction methods and any temporary risks to the water body are assessed as low. Temporary effects due to construction will not cause deterioration of the water body. Fish could be entrained in the proposed abstraction intake but this would be mitigated with appropriate screening of the intake structure in accordance with best practice guidance and regulatory requirements. There is a potential risk of impact on estuarine biological communities as a result of the new abstraction and subsequent
· Invertebrates	Good		
· Macroalgae	Good		
· Phytoplankton	High		
· Angiosperms	Moderate	Moderate	

			hypersaline discharge in the Thames Estuary. This abstraction, likely to be twice the volume of the maximum scheme output, may result in a reduction in flow within the tidal river with potential adverse impacts on the aquatic and inter-tidal ecology, including the macroalgal and invertebrate community. Modelling from schemes elsewhere would suggest that adverse effects may potentially be limited to biota in the immediate vicinity of the discharge, however, due to the enclosed nature of the estuary it is uncertain how tidal hydrodynamics will influence the degree of exposure. There is therefore uncertainty regarding the likelihood of deterioration between WFD status classes which requires modelling and further assessment.
Chemical (Overall)	Good	Good	The risk of deterioration in chemical status is assessed as negligible.

Protected Area Details	Nutrient sensitive areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. (THAMES MIDDLE) is a nutrient sensitive area under the Urban Waste Water Treatment Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected. SPA, SAC and RAMSAR: The HRA identified the potential for LSEs on the Thames Estuary & Marshes SPA & RAMSAR, see the HRA screening report for further information.
Does the component comply with WFD Objective	
1. No deterioration between status classes	Uncertain; there is a potential risk of deterioration between status classes; further assessment required.
2. No impediments to GES/GEP	Yes; no impediments to achieving GEP.
3. No compromises to water body objectives	Yes; no compromises to water body objectives.
4. No effects on other water bodies	Yes; no impact on other water bodies.
5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.
6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.

1.30 Desalination Thanet (DES_Tha10 and DES_Tha20)

Water body

WFD water body name	Kent North		
WFD water body type	Coastal Water		
WFD management catchment	South East TraC	**WFD water body ID**	GB650704510000
River Basin District	South East		

WFD Designations, Objectives and Mitigation			
WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**
	Moderate	-	-
Hydromorphological designation	Heavily modified		
Water Body Mitigation Measure	No published mitigation measures		

WFD Protected Areas						
Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
YES	NO	YES	YES	NO	YES	NO

WFD	**Construction:** New abstraction intake and discharge outfall

Scheme components potentially affecting water body		**Operation:** New abstraction and discharge within Kent North coastal waters - 10- 20Ml/d DO	
WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
· Fish	Not assessed	Not assessed	Construction of the intake and outfall will be managed by good practice construction methods and any temporary risks to the water body are assessed as low. Temporary effects due to construction will not cause deterioration of the water body. Fish could be entrained in the proposed abstraction intake but this would be mitigated with appropriate screening of the intake structure in accordance with best practice guidance and regulatory requirements There is a negligible risk of deterioration to the coastal water body as a result of the new abstraction. However, the new discharge may impact salinity in the vicinity of the outfall and therefore, may affect the localised distribution of invertebrate communities but this is unlikely to have a major effect on fauna across the wider WB. Salinity levels of more than 10% above ambient and therefore more than the EC threshold for salinity discharges to shellfish waters are most likely to be encountered for only a few metres from the discharge. The extent of impact in this area will be dependent upon factors including discharge salinity, tidal hydrodynamics and rates of dispersal. The latter would be expected to be relatively high in an offshore coastal location. Any slight risks will be localised and not sufficient to prompt deterioration between status classes at a water body scale.
· Invertebrates	Good	Good	
· Macroalgae	Not assessed	Not assessed	
· Phytoplankton	Not assessed	Not assessed	
· Angiosperms	Not assessed	Not assessed	
Chemical (Overall)	Good	Good	The risk of deterioration in chemical status is assessed as negligible.
Protected Area Details		Shellfish Waters: The discharge point is located within the Margate designated Shellfish Water. Modelling for other schemes indicates that, for a distance of a few metres from the discharge pipe salinity levels could exceed 10% above ambient. This area would likely represent a fraction of 1% of the designated fishery, but impacts on shellfish are possible within this zone. Bathing Waters: A number of Bathing Waters are situated on the North Kent coastline (including Minnis Bay Birchington, West Bay Westgate). The use of a long sea outfall would most likely result in no noticeable impact on these waters. SPA and SAC: The HRA has identified the potential for LSEs on the Thanet Coast SAC and the Outer Thames Estuary SPA, see HRA stage 1 screening report for further information.	

Does the component comply with WFD Objective	
1. No deterioration between status classes	Yes; no deterioration between status classes is expected
2. No impediments to GES/GEP	Yes; no impediments to GEP.
3. No compromises to water body objectives	Yes; no compromises to water body objectives.
4. No effects on other water bodies	Yes; no impact on other water bodies.
5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.
6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.

1.31 Desalination Western Yar (DES_Yar10 and DES_Yar20)

Water body

WFD water body name	Solent		
WFD water body type	Coastal Water		
WFD management catchment	South East TraC	**WFD water body ID**	GB650705150000
River Basin District	South East		

WFD Designations, Objectives and Mitigation

WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**
	Moderate	-	-
Hydromorphological designation		Heavily modified	
Water Body Mitigation Measure	No published mitigation measures		

WFD Protected Areas

Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
YES	NO	YES	YES	YES	YES	YES

Scheme components potentially affecting water body	**Construction:** New abstraction intake and discharge outfall
	Operation: New abstraction and discharge within the Solent (10-20Ml/d DO output)

WFD assessment (scoping)

WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
· Fish	Not assessed	Not assessed	There is a potential risk of impact on elements of the aquatic ecology in the Solent due to the new discharge of briny waters. The proposed new discharge is located approximately 1km to the northeast of the mouth of the River Yar on the Isle of Wight within the Solent. Modelling of the discharge has not yet been undertaken. Modelling of other hyper-saline discharges for desalination plants of up to 200Ml/d has indicated good dispersion within the Solent. It is estimated that the worst-case scenario would be for the salinity levels to be 10% above ambient in an area of <0.02ha in surface area. This is less than 0.0001% of the surface area of the Solent Coastal WB (25,958ha). A wider area would be subject to raised salinity levels of <10% above ambient and therefore less than the EC threshold for salinity discharges to shellfish waters. Further investigation would be needed to determine the chronic effect of slightly raised salinity levels over time on ecology and WFD status. The new discharge may impact salinity locally and therefore, may affect the localised distribution of invertebrate communities but this is unlikely to have a major effect on fauna across the wider WB. Any slight risk would generally be expected to reduce according to the volume of brine discharged, with lower discharge rates resulting in lower risk. Therefore, it is considered unlikely that a hypersaline plume originating at Western Yar would cause a WFD status deterioration. Fish could be entrained in the proposed abstraction intake but this would be mitigated with appropriate screening of the intake structure in accordance with best practice guidance and regulatory requirements.
· Invertebrates	Good	Good	
· Macroalgae	Not assessed	Not assessed	
· Phytoplankton	Not assessed	Not assessed	
· Angiosperms	Not assessed	Not assessed	

Chemical (Overall)	Fail	Fail	The risk of deterioration of chemical status is assessed as negligible and the water body already fails to achieve good chemical status.
Protected Area Details	Bathing Waters: The water body is associated with the Colwell Bay Bathing Water. However, these bathing waters are situated at a considerable distance (>5km) from the point of discharge and therefore, the operation of the scheme and its associated construction activities are not expected to have any adverse impacts. Nutrient sensitive areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. The Solent is a nutrient sensitive area under the Urban Waste Water Treatment Directive However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected. Shellfish Waters: The scheme operates within the Yarmouth designated Shellfish Water. Modelling for other hypersaline discharges of similar output volume in The Solent indicate that salinity levels up to 7.58m from the outlet would exceed 10% above ambient. This is estimated to be <0.002% of the surface area of the Yarmouth Shellfish Waters and therefore the overall impact would be negligible. SPA and SAC: The HRA has identified no potential LSEs on the Solent Maritime SAC or the Solent & Southampton Water SPA.		
Does the component comply with WFD Objective			
1. No deterioration between status classes	Yes; no deterioration between classes is anticipated, however modelling is required for the scheme.		
2. No impediments to GES/GEP	Yes; no impediments to achieving Good Ecological Potential		
3. No compromises to water body objectives	Yes; no compromises to water body objectives.		
4. No effects on other water bodies	Yes; no impact on other water bodies.		
5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.		
6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.		

1.32 Sandown Coastal Desalination IOW (DES_San 20 and DES_San200)

Water body

WFD water body name	Isle of Wight East		
WFD water body type	Coastal Water		
WFD management catchment	South East TraC	**WFD water body ID**	GB650705530000
River Basin District	South East		
WFD Designations, Objectives and Mitigation			
WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**
	Good	-	-
Hydromorphological designation	Heavily modified		
Water Body Mitigation Measure	Flood protection use Flood protection use Flood protection use Coast protection use Coast protection use Coast protection use Flood protection use Flood protection use Coast protection use Coast protection use	26.Sediment management 27. Dredge disposal site selection 28.Manage disturbance 26.Sediment management 27. Dredge disposal site selection 28.Manage disturbance 2.Remove obsolete structure 7.Bank rehabilitation 2.Remove obsolete structure 7.Bank rehabilitation	
WFD Protected Areas			

	Bathing Water Directive	Drinking Water Directive	Conservation of Wild Birds Directive	Habitats Directive	Nitrates Directive	Shellfish Directive	Urban Waste Water Treatment Directive
	YES	NO	YES	YES	YES	YES	YES

WFD assessment (scoping)	**Scheme components potentially affecting water body**		**Construction:** Desalination plant, intake and outfall	
			Operation: New abstraction from coastal waters and discharge of brine to the coastal waters of the Isle of Wight – 9 to 200Ml/d DO	
	WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
	· Fish	Not assessed	Not assessed	Construction of the intake and outfall will be managed by good practice construction methods and any temporary risks to the water body are assessed as low. Temporary effects due to construction will not cause deterioration of the water body. Fish could be entrained in the proposed abstraction intake but this would be mitigated with appropriate screening of the intake structure in accordance with best practice guidance and regulatory requirements. The hyper-saline discharge point will be the existing wastewater treatment works (WTW) long sea outfall discharge. The intake will be constructed to avoid any WFD higher sensitivity habitat (notably chalk reef located some 2km away). There is no risk of hydro-morphological changes at a habitat scale. Near field modelling indicates that at a discharge rate of 20Ml/d, equilibrium with surrounding water (up to 10% above ambient salinity and therefore less than the EC threshold for salinity discharges to shellfish waters) would be reached at 8.7m from the outfall pipe. This was the maximum distance yielded by the model at this discharge volume, corresponding with spring tide at mid water conditions (the option for 200Ml/d was not modelled). It is estimated that a surface area of 0.025ha could be subject to salinity levels of 10% above ambient. This is less than 0.0001% of the surface area of the WB (26,369ha). A wider area would be subject to raised salinity levels of <10% above ambient and therefore less than the EC threshold for salinity discharges to shellfish waters. Further investigation would be needed to determine the chronic effect of slightly raised salinity levels over time on ecology and WFD status. The hyper-saline discharge is likely to have a highly localised impact on benthic habitats but these impacts are unlikely to extend to sensitive features of the water body due to the high mixing and dispersion characteristics. For option variants of 20Ml/d or less the risk of deterioration in ecological status appears negligible. There remains some uncertainty as to the impact of the hyper-saline/sewage effluent discharge, for the higher volume rate option of 200Ml/d. which would be expected to raise salinity levels over a wider area, although this is still likely to represent a minimal fraction of the total WFD WB area.
	· Invertebrates	Good	Good	
	· Macroalgae	Not assessed	Not assessed	
	· Phytoplankton	Not assessed	Not assessed	
	· Angiosperms	Not assessed	Not assessed	
	Chemical (Overall)	Good	Good	The risk of deterioration of chemical status is assessed as negligible.
	Protected Area Details		SAC: The HRA has identified no potential LSEs on the South Wight Maritime SAC. Bathing Waters: There are two bathing waters located near Sandown, including Sandown and Yaverland. The discharge outfall will be a significant distance from the shore and will not impact upon bathing water quality. Construction of the intake is also not considered to lead to any adverse effects on bathing water quality assuming best practice construction methods are applied.	

	Shellfish Waters: The water body is associated with the Chichester Harbour Shellfish waters. However, these shellfish waters are a significant distance from Sandown Bay and therefore there will be no impact. Nutrient sensitive areas (Nitrate vulnerable zones): The coastal water body is associated with a nutrient sensitive area; however, the scheme will not affect nitrate concentrations or the management of this protected area.
Does the component comply with WFD Objective	
1. No deterioration between status classes	Yes; no deterioration between status classes, however, modelling data for a 200Ml/d option would improve certainty.
2. No impediments to GES/GEP	Yes; no impediments to GEP.
3. No compromises to water body objectives	Yes; no compromises to water body objectives.
4. No effects on other water bodies	Yes; no effects on other water bodies.
5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.
6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.

1.33 Sandwich WTW Indirect Potable Water Reuse(PWR_Plu10)

Water body

WFD water body name	STOUR (KENT)		
WFD water body type	Transitional Water		
WFD management catchment	South East TraC	**WFD water body ID**	GB520704004700
River Basin District	South East		

WFD Designations, Objectives and Mitigation			
WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**
	Poor	-	Moderate
Hydromorphological designation	Heavily modified		
Water Body Mitigation Measure	No published mitigation measures		

WFD Protected Areas						
Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
NO	YES	YES	YES	YES	NO	YES

WFD assessment (scoping)

Scheme components potentially affecting water body	**Construction:** New discharge outfall **Operation:** Transfer of 7.5Ml/d treated effluent from Sandwich WwTW to a new discharge point upstream on the Stour

WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
· Fish	Not assessed	Not assessed	Construction of the discharge outfall will be managed by good practice construction methods such that any risk to the water body is low. Temporary effects due to construction are unlikely to cause deterioration of the water body. The discharge will be treated to tertiary standards for ammonia, phosphate and BOD. Therefore, there will be negligible risk of
· Invertebrates	Not assessed	Not assessed	
· Macroalgae	High	High	

· Phytoplankton	Poor	Poor	impacting the physico-chemical quality elements of this water body. The ecology in the Stour transitional water body is largely unassessed, with macroalgae and phytoplankton being the only two biological supporting elements currently monitored. The discharge would take place approximately 25 km upstream of the coast and be located approximately 4.5 km upstream of the abstraction point. Given the small proportion of this modified water body that will be subject to increased flows and the nature of the biological elements under consideration, it is considered unlikely that ecological status will deteriorate as a consequence of effluent inputs from Sandwich WwTW.
· Angiosperms	Not assessed	Not assessed	
Chemical (Overall)	Good	Good	The discharge will be tertiary treated and would be permitted through the EA discharge permit controls. The risk of deterioration in chemical status is therefore assessed as low.
Protected Area Details			Drinking water protected area: the water body (Great Stour) is a Drinking Water Protected Area but there is no risk of adversely affecting the chemical status at the water body scale. Furthermore, Southern Water will want to ensure no risks to its drinking water supplies. Nutrient sensitive areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. Great Stour River is a nutrient sensitive area under the Urban Waste Water Treatment Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected; the discharge would be permitted through the EA discharge permit controls. SPA and SAC: The HRA has identified no potential LSEs on the Stodmarsh SAC & SPA, Thanet Coast SAC, or the Thanet Coast & Sandwich Bay SPA.
Does the component comply with WFD Objective			
1. No deterioration between status classes			Yes; no deterioration between status classes.
2. No impediments to GES/GEP			Yes; no impediments to GEP.
3. No compromises to water body objectives			Yes; no compromises to water body objectives.
4. No effects on other water bodies			Yes; no effects on other water bodies.
5. Assists attainment of water body objectives			No; does not assist with the attainment of water body objectives.
6. Assists attainment of protected area objectives			No; does not assist with the attainment of protected area objectives.

1.34 Sandwich WTW Indirect Potable Water Reuse(PWR_Plu16)

Water body				
	WFD water body name	STOUR (KENT)		
	WFD water body type	Transitional Water		
	WFD management catchment	South East TraC	**WFD water body ID**	GB520704004700
	River Basin District	South East		
	WFD Designations, Objectives and Mitigation			
	WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**
		Poor	-	Moderate
	Hydromorphological designation	Heavily modified		
	Water Body Mitigation Measure	No published mitigation measures		
	WFD Protected Areas			

	Bathing Water Directive	Drinking Water Directive	Conservation of Wild Birds Directive	Habitats Directive	Nitrates Directive	Shellfish Directive	Urban Waste Water Treatment Directive
	NO	YES	YES	YES	YES	NO	YES

WFD assessment (scoping)				
	Scheme components potentially affecting water body	**Construction:** New discharge outfall **Operation:** Transfer of 16Ml/d treated effluent from Sandwich WwTW to a new discharge point upstream on the Stour		
	WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
	· Fish	Not assessed	Not assessed	Construction of the discharge outfall will be managed by good practice construction methods such that any risk to the water body is low. Temporary effects due to construction are unlikely to cause deterioration of the water body. The discharge will be treated to tertiary standards for ammonia, phosphate and BOD. Therefore, there will be negligible risk of impacting the physico-chemical quality elements of this water body. The ecology in the Stour estuary transitional water body is largely unassessed, with macroalgae and phytoplankton being the only two biological supporting elements currently monitored. The discharge would take place approximately 25 km upstream of the coast and be located approximately 4.5 km upstream of the abstraction point. Given the small proportion of this modified water body that will be subject to increased flows and the nature of the biological elements under consideration, it is considered unlikely that their ecological status will deteriorate as a consequence of effluent inputs from Sandwich WwTW.
	· Invertebrates	Not assessed	Not assessed	
	· Macroalgae	High	High	
	· Phytoplankton	Poor	Poor	
	· Angiosperms	Not assessed	Not assessed	
	Chemical (Overall)	Good	Good	The discharge will be tertiary treated and would be permitted through the EA discharge permit controls. The risk of deterioration in chemical status is therefore assessed as low.
	Protected Area Details	Drinking water protected area: the water body (Great Stour) is a Drinking Water Protected Area but there is no risk of adversely affecting the chemical status at the water body scale. Furthermore, Southern Water will want to ensure no risks to its drinking water supplies. Nutrient sensitive areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. Great Stour River is a nutrient sensitive area under the Urban Waste Water Treatment Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected; the discharge would be permitted through the EA discharge permit controls. SPA and SAC: The HRA has identified no potential LSEs on the Stodmarsh SAC & SPA, Thanet Coast SAC, or the Thanet Coast & Sandwich Bay SPA.		
	Does the component comply with WFD Objective			
	1. No deterioration between status classes	Yes; no deterioration between status classes.		
	2. No impediments to GES/GEP	Yes; no impediments to GEP.		
	3. No compromises to water body objectives	Yes; no compromises to water body objectives.		
	4. No effects on other water bodies	Yes; no effects on other water bodies.		
	5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.		
	6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.		

1.35 Sandown WwTW Indirect Potable Reuse (PWR_SEY5)

Water body

WFD water body name	Eastern Yar (Lower)		
WFD water body type	River		
WFD management catchment	Isle of Wight	**WFD water body ID**	GB107101005971
River Basin District	South East		

WFD Designations, Objectives and Mitigation

WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**
	Poor	-	Good
Hydromorphological designation		Heavily modified	
Water Body Mitigation Measure	No published mitigation measures		

WFD Protected Areas

Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
NO	YES	YES	YES	YES	NO	NO

WFD assessment (scoping)

Scheme components potentially affecting water body	**Construction:** New discharge outfall		
	Operation: New 5 Ml/d discharge of treated effluent into the Lower Eastern Yar River		
WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
· Fish	High	High	Construction of the outfall will be managed by good practice construction methods such that any risk to the water body is low. Temporary effects due to construction are unlikely to cause deterioration of the water body. The discharge will be treated to tertiary standards for ammonia, phosphate and BOD, and therefore, there will be a low risk of impacting the physico-chemical quality elements of this water body (currently at high status). The proposed treatment will also include a process (either UV AOP or reverse osmosis) to remove the majority organic chemical contaminants. Therefore, there will be a low risk of organic chemicals such as endocrine disruptors causing deterioration to fish status. Based on Q95 statistics at Alverstone GS, the discharge will prompt an increase of 120% in low flows, which may disrupt normal patterns of velocity and depth and impact upon resident biological elements such as macroinvertebrates, fish and macrophytes. In this case, where hydrological processes are already substantially altered and where the river is a designated HMWB, it is likely that the increase in low flows may benefit the hydrological regime however it may be detrimental to the ecology. Further assessment is required to ascertain the magnitude of impact on ecological receptors.
· Macro-invertebrates	High	High	
· Macrophytes & Phytobentos	Poor	Poor	
Chemical (Overall)	Good	Good	The discharge will be tertiary treated with RO or UV AOP and would be permitted through the EA discharge permit controls. The risk of deterioration in chemical status is therefore assessed as negligible.
Protected Area Details		Drinking water protected area: the water body (Lower Eastern Yar) is a Drinking Water Protected Area but there is no risk of adversely affecting the chemical status at the	

		water body scale. Furthermore, Southern Water will want to ensure no risks to its drinking water supplies Nutrient sensitive areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected; the discharge would be permitted through the EA discharge permit controls. SPA and SAC: The HRA has identified no potential LSEs on the Solent & Isle of Wight Lagoons SAC or Solent & Southampton Water SPA.
Does the component comply with WFD Objective		
1. No deterioration between status classes		Uncertain; there is a potential risk of deterioration between classes, further investigation is required
2. No impediments to GES/GEP		
3. No compromises to water body objectives		Yes; no compromises to water body objectives.
4. No effects on other water bodies		Yes; no effects on other water bodies.
5. Assists attainment of water body objectives		No; does not assist with the attainment of water body objectives.
6. Assists attainment of protected area objectives		No; does not assist with the attainment of protected area objectives.

1.36 River Adur offline Reservoir (RES_Bla)

Water body	**WFD water body name**	Adur East (Sakeham)					
	WFD water body type	River					
	WFD management catchment	Adur and Ouse		**WFD water body ID**	GB107041012900		
	River Basin District	South East					
	WFD Designations, Objectives and Mitigation						
	WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**		**Objective (2027)**		
		Moderate	-		-		
	Hydromorphological designation	Not designated artificial or heavily modified					
	Water Body Mitigation Measure	No published mitigation measures					
	WFD Protected Areas						
	Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
	NO	NO	NO	NO	YES	NO	YES
WFD	**Scheme components potentially affecting water body**	**Construction:** New abstraction intake on the Adur					
		Operation: New abstraction in the East Adur to support reservoir– 30Ml/d maximum assumed output					
	WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**				

· Fish	Moderate	Moderate	Construction of the intake will be managed by good practice construction methods and any temporary risks to the water body are assessed as low. Temporary effects due to construction will not cause deterioration of the water body. There is water available for abstraction all year round and the river is very discharge rich. Reduction in flow downstream of abstraction intake would be protected by the Minimum Residual Flow (MRF) to protect very low flows (0.01Ml/d at Sakeham). The proposed peak abstraction of 30Ml/d could still represent up to 37% of the flow during dry winters. Part of the Adur (East) is a designated Sensitive Area (Eutrophic), classified as Bad status for Phosphorous and, linked to this, Moderate for aquatic macrophytes. Treated sewage discharge is a stated reason for not achieving good status. It is possible that increased abstraction could serve to reduce the dilution for P rich effluent resulting in increased nutrient levels, particularly at times of low ambient flows. In addition, the fish community is failing to reach good status due to barriers and impoundments. It is believed that migratory species such as brown/sea trout are affected and a further decrease in flows at certain times of year could impact upon their movements. Conditions would need to be set at appropriate levels to safeguard the aquatic environment, there should be no material adverse effects of the abstraction on the water quality or ecology, including reducing access to available habitat for salmonids, in particular during key periods for migration. Water would be abstracted from the river through fine screens to prevent fish entrainment. The details of reservoir management measures and treatment process water discharges are currently unknown. It is assumed that they will be managed to minimise water quality issues. Overall it is unlikely that deterioration between status classes for fish, macro-invertebrates or macrophytes and phytobenthos will occur. However, given the uncertainty about the operational pattern, further assessment is required on the environmental flows and seasonality and the potential to cause a deterioration in status.
· Macro-invertebrates	High	High	
· Macrophytes & Phytobentos	Moderate	Moderate	
Chemical (Overall)	Good	Good (uncertain)	There is unlikely to be a change in the chemical status as the EA abstraction licence conditions, such that the buffering capacity of the river will remain largely the same. However, given the uncertainty about the operational pattern further assessment is required on the environmental flows.
Protected Area Details		Nutrient sensitive areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. River Adur East is a nutrient sensitive area under the Urban Waste Water Treatment Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected (controlled via the EA abstraction licence conditions.	
Does the component comply with WFD Objective			
1. No deterioration between status classes	Yes; no deterioration between status classes, however further assessment is required.		
2. No impediments to GES/GEP	Yes; no impediments to achieving GES.		
3. No compromises to water body objectives	Yes; no compromises to water body objectives.		
4. No effects on other water bodies	Yes; no effects on other water bodies.		
5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.		
6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.		

1.37 Tidal River Arun Desalination (DES_Aru20): Arun

Water body

WFD water body name	ARUN						
WFD water body type	Transitional Water						
WFD management catchment	South East TraC	**WFD water body ID**	GB540704105000				
River Basin District	South East						
WFD Designations, Objectives and Mitigation							
WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**				
	Moderate	-	Good				
Hydromorphological designation	Heavily modified						
Water Body Mitigation Measure	No published mitigation measures						
WFD Protected Areas							
Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**	
NO	YES	YES	YES	NO	NO	NO	
Scheme components potentially affecting water body	**Construction:** Desalination plant and new abstraction intake						
	Operation: New abstraction from tidal River Arun – 20 Ml/d assumed output						

WFD assessment (scoping)

WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation**	
· Fish	Not assessed	Not assessed	Construction of the abstraction intake will be managed by good practice construction methods and any temporary risks to the water body are assessed as low. Temporary effects due to construction will not cause deterioration of the water body. Fish could be entrained in the proposed abstraction intake but this would be mitigated with appropriate screening of the intake structure in accordance with best practice guidance and regulatory requirements. There is a low risk of adverse impacts on water quality within the tidal River Arun due to the new abstraction. The water quality in the tidal Arun is already heavily influenced by effluent returns from various WwTWs. The abstraction may have a local impact on the river's capacity to buffer inorganic inputs. However, this is deemed insufficient to prompt a deterioration in dissolved inorganic nitrogen (DIN) status. The reduction in flows is likely to impact most upon invertebrates, which are not currently assessed. The potential for between class deterioration in macroalgae is expected to be minimal. The macroalgal community in this transitional water body will be adapted to a cycle of exposure and submersion. Timing the abstraction to avoid low tides would further mitigate any possibility of impact.
· Invertebrates	Not assessed	Not assessed	
· Macroalgae	High	High	
· Phytoplankton	Not assessed	Not assessed	
· Angiosperms	Not assessed	Not assessed	
Chemical (Overall)	Good	Good	The risk of deterioration of chemical status is assessed as negligible.
Protected Area Details	Drinking water protected area: the water body (Arun) is a Drinking Water Protected Area but there is no risk of adversely affecting the chemical status at the water body scale.		

	SAC and SPA: The HRA has identified no potential for LSEs on the Arun Valley SAC or SPA.
Does the component comply with WFD Objective	
1. No deterioration between status classes	Yes; no deterioration between classes, further assessment is needed (e.g. timing abstraction)
2. No impediments to GES/GEP	Yes; no impediment to achieving GEP
3. No compromises to water body objectives	Yes; no compromises to water body objectives.
4. No effects on other water bodies	Yes; no impact on other water bodies.
5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.
6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.

1.38 Tidal River Arun Desalination (DES_Aru20): Sussex

Water body

WFD water body name	Sussex		
WFD water body type	Coastal Water		
WFD management catchment	South East TraC	**WFD water body ID**	GB640704540003
River Basin District	South East		

WFD Designations, Objectives and Mitigation

WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**
	Moderate	-	Good
Hydromorphological designation	Heavily modified		
Water Body Mitigation Measure	No published mitigation measures		

WFD Protected Areas

Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
YES	NO	YES	NO	NO	NO	NO

WFD assessment (scoping)

Scheme components potentially affecting water body		**Construction:** New discharge outfall	
		Operation: Discharge of briny waters to Sussex coastal waters – 20Ml/d output	
WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
· Fish	Not assessed	Not assessed	Construction of the outfall will be managed by good practice construction methods and any temporary risks to the water body are assessed as low. Temporary effects due to construction will not cause deterioration of the water body. There is a potential risk of impact on the aquatic ecology in the Sussex Coastal WB due to the new discharge of briny waters via the Littlehampton WwTW long sea outfall. The proposed new discharge is located approximately 1km to the east of the mouth of the River Arun in the Sussex coastal water body. Modelling of other hyper-saline discharges for larger desalination plants (up to 200 Ml/d output) has indicated good
· Invertebrates	Good	Good	
· Macroalgae	Not assessed	Not assessed	
· Phytoplankton	Not assessed	Not assessed	
· Angiosperms	Not assessed	Not assessed	

			dispersion within the same water body. It is estimated that the worst-case scenario would be for salinity levels to be 10% above ambient in an area of <0.21ha in surface area. This is just over 0.001% of the surface area of the water body. A wider area would be subject to raised salinity levels of <10% above ambient and therefore less than the EC threshold for salinity discharges to shellfish waters. Further investigation would be needed to determine the chronic effect of slightly raised salinity levels over time on ecology and WFD status. Therefore, it is considered unlikely that a hypersaline plume originating from the Arun discharge would cause a WFD status deterioration. The discharge may impact salinity locally and therefore may affect the localised distribution of invertebrate communities but this is unlikely to have a major effect on fauna across the wider water body. Any slight risk would generally be expected to reduce according to the volume of brine discharged, with lower discharge rates resulting in lower risk.
Chemical (Overall)	Good	Good	The risk of deterioration of chemical status is assessed as negligible.
Protected Area Details			Bathing Waters: at the water body is associated with the Littlehampton Bathing Water, situated in close proximity to the Littlehampton long-sea outfall (<1km) Impacts on bathing water quality are unlikely if the discharge outfall is situated at a significant distance from the shore. Nutrient sensitive areas (Nitrate vulnerable zones): The coastal water body is associated with a nutrient sensitive area; however, the scheme will not affect nitrate concentrations or the management of this protected area. The closest higher sensitivity WFD habitats to the proposed discharge are sub-tidal kelp beds approximately 1km distance from the outfall and beyond the likely maximum equilibrium distance stated above.

Does the component comply with WFD Objective	
1. No deterioration between status classes	Yes; no deterioration between status classes is anticipated, although further assessment would improve understanding of long-term effects.
2. No impediments to GES/GEP	Yes; no impediments to achieving Good Ecological Potential.
3. No compromises to water body objectives	Yes; no compromises to water body objectives.
4. No effects on other water bodies	Yes; no impact on other water bodies.
5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.
6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.

1.39 Medway Estuary WTW Indirect Potable Water Reuse (PWR_Mot20)

Water body	**WFD water body name**	Len			
	WFD water body type	River			
	WFD management catchment	Medway	**WFD water body ID**	GB106040018430	
	River Basin District	Thames			
	WFD Designations, Objectives and Mitigation				
	WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**	
		Moderate	-	-	
	Hydromorphological designation	Heavily modified			
	Water Body Mitigation Measure	No published mitigation measures			

	WFD Protected Areas						
	Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
	NO	NO	NO	NO	YES	NO	NO
WFD assessment (scoping)	**Scheme components potentially affecting water body**		**Construction:** N/A				
			Operation: New 20Ml/d discharge of treated effluent from Medway Estuary WwTW into one of the two small streams that flow into the River Len				
	WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**				
	· Fish	Poor	Uncertain	The discharge will be treated to tertiary standards for ammonia, phosphate and BOD, and therefore, there will be negligible risk of impacting the physico-chemical quality elements of this water body (currently at moderate status). The proposed treatment will also include a process (either UV AOP or reverse osmosis) to remove the majority organic chemical contaminants. Therefore, there will be a low risk of organic chemicals such as endocrine disruptors causing deterioration to fish status. There is a risk of deterioration due to changes in the flow regime of the River Len, in changing from the existing flow regime, due to the relative volume of the proposed discharge compared existing river flow. Based on the Q95 exceedance river flow and proposed scheme output, the river would, contain 41.6% effluent during operation at low flows. This change in flow regime poses a high risk of flooding and potential morphological changes to parts of the river which are not channelized. In addition, a potential increase in flows of this nature would be expected to disrupt normal flow patterns (depth and velocity) in a relatively small watercourse such as the River Len. This would be likely to change patterns of detritus deposition and seasonal drift and would be expected to reduce the frequency of natural low flow events. Consequently, this change in the hydrological process could impact the resident ecology, including fish and macroinvertebrates, potentially altering the composition, growth rate and structure of these biological elements and possibly resulting in a change to WFD status. Brown trout are known to be present here and would be expected to migrate within the river system and utilise gravel areas for spawning. Any substantial, year-round increase in flow could bring benefits (e.g. improve access) and disadvantages (eg alter the nature of substrate in places) to the success of this particular species. Therefore, further investigation is recommended to better understand the relationships between existing and potential hydrological processes here and the invertebrate and fish ecology.			
	· Macro-invertebrates	Good	Uncertain				
	· Macrophytes & Phytobentos	Not assessed	Not assessed				
	Chemical (Overall)	Good	Good	The discharge will be tertiary treated with RO or UV AOP and would be permitted through the EA discharge permit controls. The risk of deterioration in chemical status is therefore assessed as negligible.			
	Protected Area Details		Nutrient sensitive areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected; the discharge would be permitted through the EA discharge permit controls.				
	Does the component comply with WFD Objective						
	1. No deterioration between status classes		Uncertain; there is a potential risk of deterioration between status classes, further assessment is required				
	2. No impediments to GES/GEP						
	3. No compromises to water body objectives		Yes; no compromises to water body objectives.				

	4. No effects on other water bodies	Yes; no effects on other water bodies.
	5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.
	6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.

1.40 Raising Bewl by 0.4m (RES_RaB1)

Water body

WFD water body name	Bewl Water					
WFD water body type	Lake					
WFD management catchment	Medway			**WFD water body ID**	GB30644398	
River Basin District	Thames					
WFD Designations, Objectives and Mitigation						
WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**			
	Moderate	-	-			
Hydromorphological designation	heavily modified					
Water Body Mitigation Measure	No published mitigation measures					
WFD Protected Areas						
Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
NO	YES	NO	NO	NO	NO	YES

WFD assessment (scoping)

Scheme components potentially affecting waterbody	**Construction:** Raising the dam crest and construction of a new wave wall with embankments designed to prevent any adverse effects on Ancient Woodland.		
	Operation: Raising of Bewl Water, by 0.4m to increase storage and yield.		
WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
· Chironomids (CPET)	Not assessed	Not assessed	Construction will be managed by good practice construction methods and any temporary risks to the water body are assessed as low. Temporary effects due to construction will not cause deterioration of the water body. The reservoir is a heavily modified water body and the biology is unassessed. However, there is potential to impact macrophytes locally if they are present due to the change in water levels. Detailed surveys would be carried out as part of the design of the scheme to ascertain any specific risks to marginal macrophytes and where necessary compensatory measures will be agreed with the Environment Agency within the overall reservoir water body. This scheme will not involve any increased discharge of water from the reservoir to the downstream watercourses or any additional or larger scour valve release testing. The extra storage capacity will enable the river regulation releases to be maintained for a longer period of time in drought conditions. The changes in maximum depth and storage volume from this option are minor and will not lead to any material changes to the operation of the reservoir in
· Macrophytes	Not assessed	Not assessed	
· Phytoplankton	Not assessed	Not assessed	

			respect of its water quality and/or stratification processes. There is no change to the abstraction licence conditions governing abstraction from the River Medway System, with the additional capacity being filled by abstraction during high river flow conditions. For these reasons there is no risk of WFD status deterioration as a result of this scheme to either the reservoir WFD water body or the Medway water body.
Chemical (Overall)	Good	Good	There is a negligible risk of deterioration between chemical status classes.
Protected Area Details		Nutrient Sensitive Areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected. Drinking Water Protected Area: the water body is a Drinking Water Protected Area but there is negligible risk of adversely affecting the chemical status of the water body or increasing nutrient loading that might increase the risk of algal blooms in the reservoir.	

Does the component comply with WFD Objective	
1. No deterioration between status classes	Yes; no deterioration between status classes.
2. No impediments to GES/GEP	Yes; no impediment to GEP.
3. No compromises to water body objectives	Yes; no compromises to water body objectives.
4. No effects on other water bodies	Yes; no impact on other water bodies.
5. Assists attainment of water body objectives	No; does not assist with the attainment of any mitigation water body objectives.
6. Assists attainment of protected area objectives	No; does not assist with the attainment of any mitigation measures required for the protected areas.

1.41 Tidal River Arun Desalination (DES_Aru10): Sussex

Water body

WFD water body name	Sussex		
WFD water body type	Coastal Water		
WFD management catchment	South East TraC	**WFD water body ID**	GB640704540003
River Basin District	South East		

WFD Designations, Objectives and Mitigation

WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**
	Moderate	-	Good

Hydromorphological designation	Heavily modified
Water Body Mitigation Measure	No published mitigation measures

WFD Protected Areas

Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
YES	NO	YES	NO	NO	NO	NO

WFD

Scheme components potentially affecting water body	**Construction:** New discharge outfall
	Operation: Discharge of briny waters to Sussex coastal waters – 10Ml/d output

WFD element	RBMP2 (2015) status	Assessed status (construction and operation)	
· Fish	Not assessed	Not assessed	Construction of the outfall will be managed by good practice construction methods and any temporary risks to the water body are assessed as low. Temporary effects due to construction will not cause deterioration of the water body. There is a potential risk of impact on the aquatic ecology in the Sussex Coastal WB due to the new discharge of briny waters via the Littlehampton WwTW long sea outfall. The proposed new discharge is located approximately 1km to the east of the mouth of the River Arun in the Sussex coastal water body. Modelling of other hyper-saline discharges for larger desalination plants (up to 200Ml/d output) has indicated good dispersion within the same water body. It is estimated that the worst-case scenario would be for salinity levels to be 10% above ambient in an area of <0.21ha in surface area. This is just over 0.001% of the surface area of the water body. A wider area would be subject to raised salinity levels of <10% above ambient and therefore less than the EC threshold for salinity discharges to shellfish waters. Further investigation would be needed to determine the chronic effect of slightly raised salinity levels over time on ecology and WFD status. Therefore, it is considered unlikely that a hypersaline plume originating from the Arun discharge would cause a WFD status deterioration. The discharge may impact salinity locally and therefore may affect the localised distribution of invertebrate communities but this is unlikely to have a major effect on fauna across the wider water body. Any slight risk would generally be expected to reduce according to the volume of brine discharged, with lower discharge rates resulting in lower risk.
· Invertebrates	Good	Good	
· Macroalgae	Not assessed	Not assessed	
· Phytoplankton	Not assessed	Not assessed	
· Angiosperms	Not assessed	Not assessed	
Chemical (Overall)	Good	Good	The risk of deterioration of chemical status is assessed as negligible.
Protected Area Details		Bathing Waters: at the water body is associated with the Littlehampton Bathing Water, situated in close proximity to the Littlehampton long-sea outfall (<1km) Impacts on bathing water quality are unlikely if the discharge outfall is situated at a significant distance from the shore. Nutrient sensitive areas (Nitrate vulnerable zones): The coastal water body is associated with a nutrient sensitive area; however, the scheme will not affect nitrate concentrations or the management of this protected area. The closest higher sensitivity WFD habitats to the proposed discharge are sub-tidal kelp beds approximately 1km distance from the outfall and beyond the likely maximum equilibrium distance stated above.	

Does the component comply with WFD Objective	
1. No deterioration between status classes	Yes; no deterioration between status classes is anticipated, although further assessment would improve understanding of long-term effects.
2. No impediments to GES/GEP	Yes; no impediments to achieving Good Ecological Potential.
3. No compromises to water body objectives	Yes; no compromises to water body objectives.
4. No effects on other water bodies	Yes; no impact on other water bodies.
5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.
6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.

1.42 Portsmouth Harbour WTW Indirect Potable Reuse (PWR_Bit40)

Water body

WFD water body name	Itchen		
WFD water body type	River		
WFD management catchment	Test and Itchen	**WFD water body ID**	GB107042022580
River Basin District	South East		

WFD Designations, Objectives and Mitigation

WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**
	Good	-	-

Hydromorphological designation	Not designated artificial or heavily modified
Water Body Mitigation Measure	No published mitigation measures

WFD Protected Areas

Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
NO	YES	NO	YES	YES	NO	YES

Scheme components potentially affecting water body	**Construction:** New discharge outfall
	Operation: New 40Ml/d discharge of treated effluent to R Itchen to support abstraction at Lower Itchen

WFD assessment (scoping)

WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
· Fish	High	High	Construction of the outfall will be managed by good practice construction methods such that any risk to the water body is low. Temporary effects due to construction are unlikely to cause deterioration of the water body. The discharge will be treated to tertiary standards for ammonia, phosphate and BOD, and therefore, there will be a low risk of impacting the physico-chemical quality elements of this water body (currently at high status). The proposed treatment will also include a process (either UV AOP or reverse osmosis) to remove the majority organic chemical contaminants. Therefore, there will be a low risk of organic chemicals such as endocrine disruptors causing deterioration to fish status. Based on the Q95 exceedance river flow and proposed scheme output, the river would contain 14% effluent during operation at low flows. In this instance, the proposed discharge point is relatively close to Southampton Water (approximately 5 km upstream) where, due to the size and nature of the river, some buffering capacity against the impact of change in flow could be expected. In addition, the distance between discharge point and Lower Itchen (where re-abstraction will occur) appears to be short (< 1 km). Therefore, the changes in flow regime would not be expected to exert a major impact on the WFD status of resident biological elements, although there may be localised disturbances.
· Macro-invertebrates	High	High	
· Macrophytes & Phytobentos	High	High	
Chemical (Overall)	Good	Good	The discharge will be tertiary treated with RO or UV AOP and would be permitted through the EA discharge permit controls. The risk of deterioration in chemical status is therefore assessed as negligible.

Protected Area Details	Drinking water protected area: the water body (River Itchen) is a Drinking Water Protected Area but there is no risk of adversely affecting the chemical status at the water body scale. Furthermore, Southern Water will want to ensure no risks to its drinking water supplies. Nutrient sensitive areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. River Itchen is a nutrient sensitive area under the Urban Waste Water Treatment Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected; the discharge would be permitted through the EA discharge permit controls. SAC: The HRA stage 1 screening identified the potential for LSEs on the River Itchen SAC, see the HRA screening report for further information.
Does the component comply with WFD Objective	
1. No deterioration between status classes	Yes; no deterioration between classes, however further assessment is required.
2. No impediments to GES/GEP	Yes; no impediments to GES.
3. No compromises to water body objectives	Yes; no compromises to water body objectives.
4. No effects on other water bodies	Yes; no effects on other water bodies.
5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.
6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.

1.43 Portsmouth Harbour WTW Indirect Potable Reuse (PWR_Bit60)

Water body

WFD water body name	Itchen		
WFD water body type	River		
WFD management catchment	Test and Itchen	**WFD water body ID**	GB107042022580
River Basin District	South East		

WFD Designations, Objectives and Mitigation

WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**
	Good	-	-
Hydromorphological designation	Not designated artificial or heavily modified		
Water Body Mitigation Measure	No published mitigation measures		

WFD Protected Areas

Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
NO	YES	NO	YES	YES	NO	YES

WFD assessment

Scheme components potentially affecting water body	**Construction:** New discharge outfall	
	Operation: New 60Ml/d discharge of treated effluent to R Itchen to support abstraction at Lower Itchen	
WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**

· Fish	High	High	Construction of the outfall will be managed by good practice construction methods such that any risk to the water body is low. Temporary effects due to construction are unlikely to cause deterioration of the water body. The discharge will be treated to tertiary standards for ammonia, phosphate and BOD, and therefore, there will be a low risk of impacting the physico-chemical quality elements of this water body (currently at moderate status). The proposed treatment will also include a process (either UV AOP or reverse osmosis) to remove the majority organic chemical contaminants. Therefore, there will be a low risk of organic chemicals such as endocrine disruptors causing deterioration to fish status. Based on the Q95 exceedance river flow and proposed scheme output, the river would contain 19.5% effluent during operation at low flows. In this instance, the proposed discharge point is relatively close to Southampton Water (approximately 5 km upstream) where, due to the size and nature of the river, some buffering capacity against the impact of change in flow could be expected. In addition, the distance between discharge point and Lower Itchen abstraction appears to be short (< 1 km). Therefore, it would be unlikely that the increase in flow would exert a major impact on the WFD status of resident biological elements, although some local disturbance may be found.
· Macro-invertebrates	High	High	
· Macrophytes & Phytobentos	High	High	
Chemical (Overall)	Good	Good	The discharge will be tertiary treated with RO or UV AOP and would be permitted through the EA discharge permit controls. The risk of deterioration in chemical status is therefore assessed as negligible.
Protected Area Details			Drinking water protected area: the water body (River Itchen) is a Drinking Water Protected Area but there is no risk of adversely affecting the chemical status at the water body scale. Furthermore, Southern Water will want to ensure no risks to its drinking water supplies. Nutrient sensitive areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. River Itchen is a nutrient sensitive area under the Urban Waste Water Treatment Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected; the discharge would be permitted through the EA discharge permit controls. SAC: The HRA stage 1 screening identified the potential for LSEs on the River Itchen SAC, see the HRA screening report for further information
Does the component comply with WFD Objective			
1. No deterioration between status classes			Yes; no deterioration between classes, however further assessment is required.
2. No impediments to GES/GEP			Yes; no impediments to GES
3. No compromises to water body objectives			Yes; no compromises to water body objectives.
4. No effects on other water bodies			Yes; no effects on other water bodies.
5. Assists attainment of water body objectives			No; does not assist with the attainment of water body objectives.
6. Assists attainment of protected area objectives			No; does not assist with the attainment of protected area objectives.

1.44 Woolston WwTW Indirect Potable Reuse (PWR_Wol5)

Water body

WFD water body name	Itchen		
WFD water body type	River		
WFD management catchment	Test and Itchen	**WFD water body ID**	GB107042022580
River Basin District	South East		

WFD Designations, Objectives and Mitigation

WFD Status and Objectives	**RBMP2 Overall Status**	**Objective (2021)**	**Objective (2027)**
	Good	-	-
Hydromorphological designation	Not designated artificial or heavily modified		
Water Body Mitigation Measure	No published mitigation measures		

WFD Protected Areas

Bathing Water Directive	**Drinking Water Directive**	**Conservation of Wild Birds Directive**	**Habitats Directive**	**Nitrates Directive**	**Shellfish Directive**	**Urban Waste Water Treatment Directive**
NO	YES	NO	YES	YES	NO	YES

WFD assessment (scoping)

Scheme components potentially affecting water body	**Construction:** New discharge outfall
	Operation: New 5Ml/d discharge of treated effluent from Woolston WwTW to R Itchen to support abstraction at Lower Itchen

WFD element	**RBMP2 (2015) status**	**Assessed status (construction and operation)**	
· Fish	High	High	Construction of the discharge outfall will be managed by good practice construction methods such that any risk to the water body is low. Temporary effects due to construction are unlikely to cause deterioration of the water body. The discharge will be treated to tertiary standards for ammonia, phosphate and BOD. The proposed ammonia levels in the treated effluent would allow ammonia to remain at high status. Therefore, there will be negligible risk of impacting the physico-chemical quality elements of this water body (currently at good status). The proposed treatment will also include a process (either UV AOP or reverse osmosis) to remove the majority organic chemical contaminants. Therefore, there will be a low risk of organic chemicals such as endocrine disruptors causing deterioration to fish status. Discharges will be used to offset abstraction at Lower Itchen during low flows and therefore, the scheme is considered unlikely to have a negative impact on river ecology (and invertebrates in particular). Overall, the scheme will not pose any risk of deterioration to WFD elements.
· Macro-invertebrates	High	High	
· Macrophytes & Phytobentos	High	High	
Chemical (Overall)	Good	Good	The discharge will be tertiary treated with RO or UV AOP and would be permitted through the EA discharge permit controls. The risk of deterioration in chemical status is therefore assessed as low.
Protected Area Details		Drinking water protected area: the water body (River Itchen) is a Drinking Water Protected Area but there is no risk of adversely affecting the chemical status at the water body scale. Furthermore, Southern Water will want to ensure no risks to its drinking water supplies;	

		Nutrient sensitive areas: The water body is associated with a surface water nitrate vulnerable zone under the Nitrates Directive. River Itchen is a nutrient sensitive area under the Urban Waste Water Treatment Directive. However, the scheme will not affect the management of the protected area and no significant changes in water quality are expected; the discharge would be permitted through the EA discharge permit controls. SAC: HRA stage 1 screening identified the potential for LSEs on the River Itchen SAC, see the HRA screening report for further information.
	Does the component comply with WFD Objective	
	1. No deterioration between status classes	Yes; no deterioration between status classes.
	2. No impediments to GES/GEP	Yes; no impediments to GES
	3. No compromises to water body objectives	Yes; no compromises to water body objectives.
	4. No effects on other water bodies	Yes; no effects on other water bodies.
	5. Assists attainment of water body objectives	No; does not assist with the attainment of water body objectives.
	6. Assists attainment of protected area objectives	No; does not assist with the attainment of protected area objectives.