ATKINS

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Water Resource Management Plan 24

DRAFT Strategic Environmental Assessment

Portsmouth Water

November 2022

5201793

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Glossary

AONB	Area of Outstanding Beauty
AQMA	Air Quality Management Areas
BNG	Biodiversity Net Gain
CAMS	Catchment Abstraction Management Strategy
CFMP	Catchment Flood Management Plans
CPRE	Campaign for Rural England
CROW	Countryside and Rights Way
CO_2	Carbon Dioxide
DCLG	Department for Communities and Local Government
Defra	Department for Environment, Food and Rural Affairs
EAAP	Ecosystems Approach Action Plan
EU	European Union
FRA	Flood Risk Area
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIS	Geographic Information System
HER	Historic Environment Record
HRA	Habitats Regulations Assessment
IMD	Index of Multiple Deprivation
INNS	Invasive Non-Native Species
JNCC	Joint Nature Conservation Committee
km	Kilometres
$ktCO_2$	Kilo Tonnes of Carbon Dioxide
LNR	Local Nature Reserve
LSOA	Lower Super Output Area
LWS	Local Wildlife Sites
LULUCF	Land Use, Land-use Change, and Forestry
MCZ	Marine Conservation Zone
MPZ	Marine Protection Zone
NCA	National Character Area
NERC	Natural Environment and Rural Communities
NFM	Natural Flood Management
NNR	National Nature Reserve
NO_2	Nitrogen Dioxide
NPPF	National Planning Policy Framework
ONS	Office for National Statistics
PM	Particulate Matter

RAG	Red-Amber-Green
RCP	Representative Concentration Pathway
RBMP	River Basin Management Plan
SAC	Special Areas of Conservation
SEA	Strategic Environmental Assessment
SMP	Shoreline Management Plans
SPA	Special Protection Area
SSSI	Sites of Special Scientific Interest
SRO	Strategic Resource Option
SPA	Special Protection Area
UK	United Kingdom
UKCP18	UK Climate Projections 2018
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
WFD	Water Framework Directive
WRMP	Water Resource Management Plan
WRZ	Water Resource Zone
WRSE	Water Resource South East

1. Introduction

1.1. Purpose of this document

This is the Strategic Environmental Assessment (SEA) Report of the Portsmouth Water (PW) Water Resource Management Plan (WRMP24), which has been prepared by Atkins Limited.

In addition to the SEA, five other environmental assessments have been undertaken and integrate with the SEA, namely Habitats Regulations Assessment (HRA), Water Framework Directive (WFD) Assessment, Biodiversity Net Gain (BNG) Assessment, Natural Capital (NC) Assessment and Invasive Non-Native Species (INNS) Assessment. Notes on these assessments have been included as Appendices to this Report.

This SEA Report identifies the likely environmental effects of implementing the WRMP24, with an overview of the Water Resource Plan presented in the following section.

1.2. Portsmouth Water

Portsmouth Water is one of 21 regulated water supply companies in England and Wales and supplies an area of 868km^2 with a population of over 725,000 in nearly 320,000 properties across West Sussex and Hampshire. Portsmouth Water is a community focussed water company, with a strong history in supporting and maintaining good relationships with customers. The company also has an important role in the South East region, with support given to neighbouring water company, Southern Water, with bulk supplies of treated water so that they can reduce their abstractions on world renowned chalk rivers. Additionally, Portsmouth Water are developing Havant Thicket winter storage reservoir in collaboration with Southern Water, which is due for completion early 2029, to enable a further bulk supply into their Hampshire zone.

1.3. The background and need for the WRMP24

It is a regulatory requirement under the Water Industry Act 1991 for water companies to produce a Water Resources Management Plan (WRMP) every five years to help ensure customers and communities have adequate water supplies available. A WRMP should provide details on how the company will provide and develop an affordable and efficient water supply for its customers, whilst also protecting the environment, effectively improving the resilience of water supplies to droughts and other future challenges.

The Portsmouth Water WRMP24 outlines how the water company has considered the implications of climate change, sustainable abstractions, future population, and housing growth, in addition to other factors that affect long term future uncertainty. The Plan sets out the overall approach and recommended options to reduce any predicted deficits and how to maintain secure supplies to its customers, for the period 2025 to 2075. As it is recognised that the Plan could have implications for the environment beyond the Plan area, it is also couched within a wider regional planning context, which examines water resource planning and associated environmental effects across the south-east of England.

1.3.1. Regional Planning

At a national level, water companies across England are developing their own regional plans to give a complete picture of the nation's water resources for the first time. This ensures that the regional plans, when combined, can meet the national need in a dynamic yet flexible way. This more 'joined up' approach marks a step-change in water resource planning. There are five regional groups:

- Water Resources North;
- Water Resources West
- Water Resources East,
- Water Resources West Country; and
- Water Resources South East.

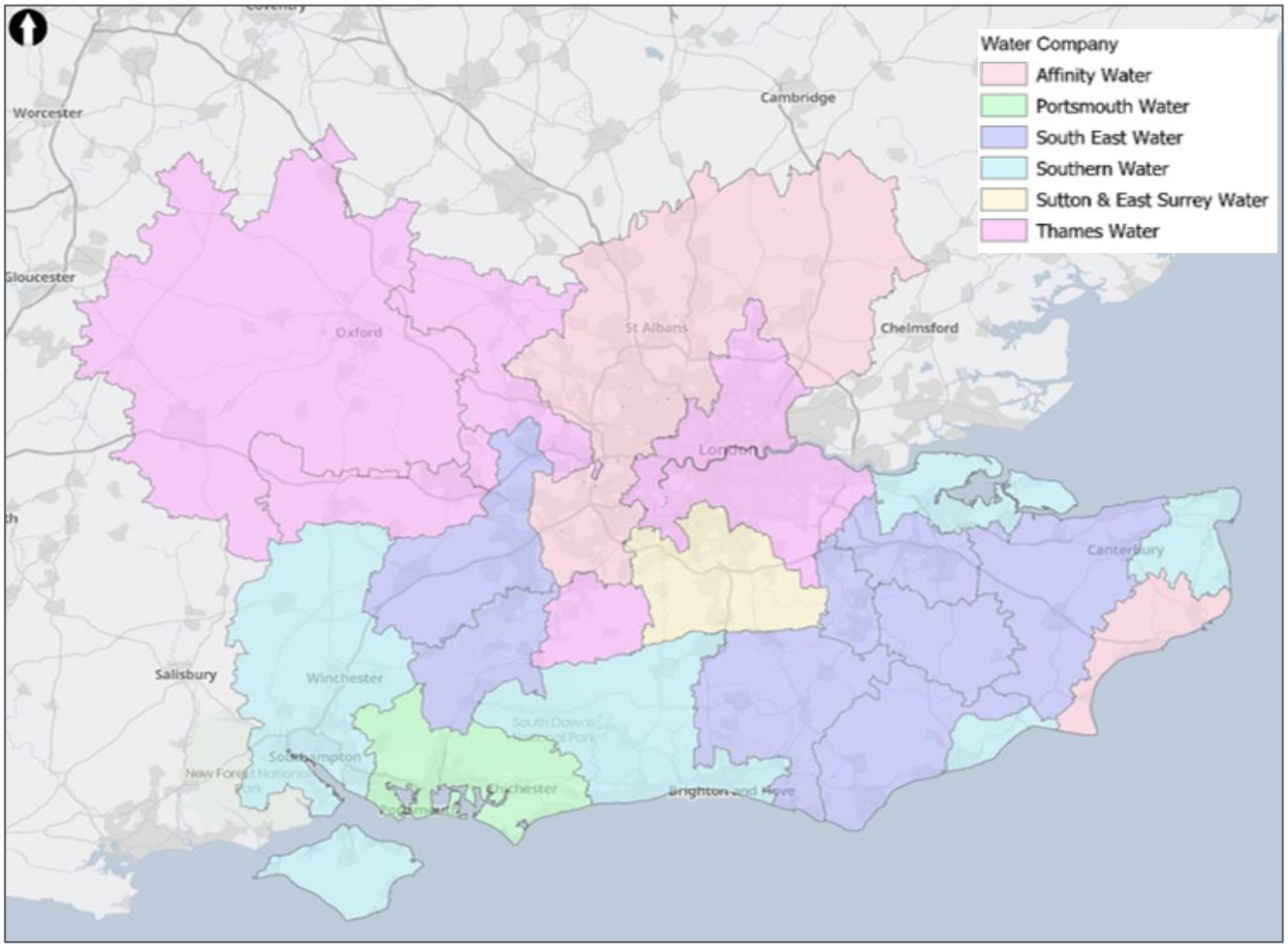
The Portsmouth Water WRMP24 is being produced alongside the Water Resources South East (WRSE) regional resilience Plan. The south-east faces the greatest pressures on public water supplies as a designated area of serious water stress by the Environment Agency. This means that current or future household demand for water is a high proportion of the effective rainfall available which is, or is likely to be, available to meet that

demand. It has been estimated that over 1 billion additional litres of water will be required per day by 2050 and nearly 1.7 billion litres per day by 2100[1].

Via a collaborative approach, Portsmouth Water are working with five other companies under the banner of WRSE (see Figure 1-1) to deliver the National Framework for water resources and help safeguard continued supplies of water to this part of the country. Alongside Portsmouth Water, the other companies within WRSE are:

- Affinity Water;
- SES Water (Sutton & East Surrey);
- Southern Water;
- South East Water; and
- Thames Water.

Figure 1-1 - Water Companies in the WRSE region



The WRSE regional resilience plan aims to take a long-term view to water resource planning across the region to 2100 in order to secure a sustainable and resilient water supply. It covers investment in new infrastructure, leakage reduction measures and water efficiency programmes. In addition, it also includes catchment management solutions which seek to provide more sustainable land management practices that will protect and enhance the quality of the water at source. This will reduce water treatment costs in future, enhance the biodiversity of rivers and streams and increase the overall resilience of the water environment. The Regional Plan seeks to:

- Ensure there is enough water for a **growing population** and to support economic growth;

[1] WRSE Draft Regional Plan SEA Environmental Report, September 2022

- **Improve the environment** by leaving more water in the region's rivers, streams and underground sources;
- Increase the region's resilience to **severe drought** and other extreme shocks and stresses; and
- Address the impacts of **climate change** on demand for water and how much is available.

In order to fully identify and assess effects at both the regional and local levels, the regional resilience plan and the local Portsmouth Water WRMP24 will iteratively inform each other.

1.4. Portsmouth Water's WRMP24

There are a number of challenges in developing a WRMP for the Portsmouth area, with implications for both future water supplies and customer demand. The key issues that have helped to inform the considerations during development of the WRMP24 include:

- **Portsmouth is an area of serious water stress.** This classification allows Portsmouth Water to target water efficiency measures in those areas of greatest need and greatest potential benefit through universal, compulsory, metering of household customers if it is shown to be both supported by customers and cost beneficial.
- **A need to reduce reliance on chalk aquifers.** This has been a key consideration within the development of the WRMP and a significant driver of proposed new Options and investment required.
- **An opportunity to contribute to a protected and enhanced environment**. Close alignment was made with the Water Industry Improvement Program (WINEP). This SEA and that undertaken by WRSE forms a key element of this alignment by ensuring evaluation of environmental effects of Options considered.
- **Uncertainty around population increase and the 'new normal' for water use**. This element includes the continued outworking of the Covid-19 pandemic, the continued outworking of the 'Brexit' process and its implications for population forecasts, along with general uncertainty related to population forecasts.
- **A changing climate**. Climate change is leading to hotter drier summers and milder wetter winters, and more frequent extreme weather events, beyond what we have seen historically. As the climate continues to change this will mean increasing demand for water and reduced ability to supply from existing sources.
- **Planning for normal conditions as well as dry years, critical peaks and droughts**. Planning needs to allow for ensuring reliable supplies over the whole of a dry year, as well as for shorter 'peak' periods which can put strains on the system such as summer heatwaves, or freeze-thaw events.
- **Increase resilience**. The Plan aims to increase resilience to a 1 in 500 year drought event by 2039. This is in keeping with Government requirements. This is a more demanding level of resilience than considered in previous WRMPs in the Portsmouth area.
- **Adaptive planning provides an opportunity to develop a plan able to accommodate uncertainty**. An adaptive planning approach has been developed to ensure the Portsmouth Water area is prepared now for a wide variety of future scenarios. The challenge of planning for the future in an uncertain year is not a new one, but the range of uncertainty has grown with the increasing extremes made more likely as the climate changes.

In the broadest terms, the components of the WRMP can be grouped into three of the following purposes:

- Defining the scale of the water resources challenge;
- Determining what feasible Options are available; and
- Taking steps to develop the preferred Plan.

These elements relied to a large extent on work undertaken by WRSE at the regional level, which helped inform development of the Portsmouth Water WRMP24.

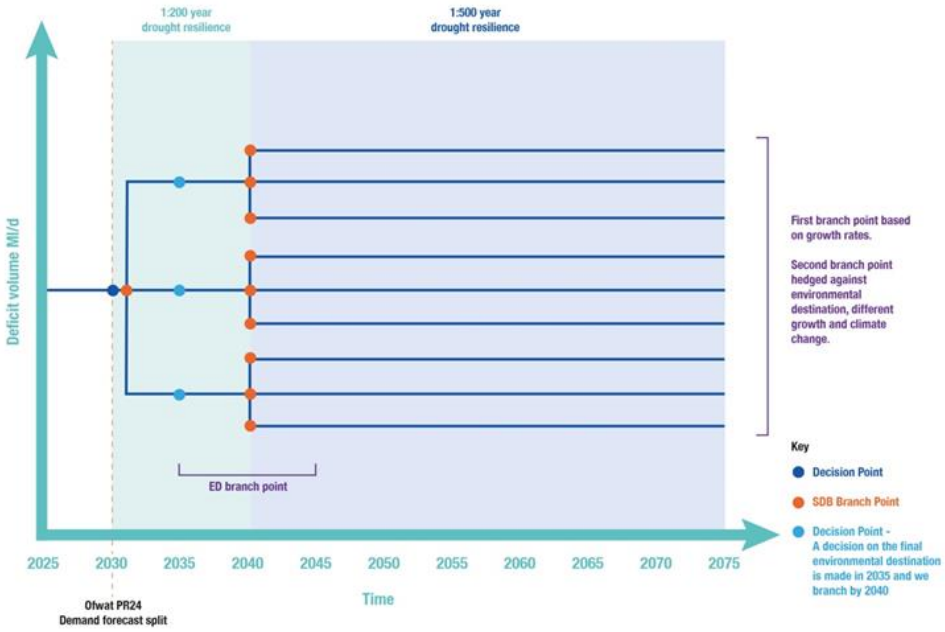
1.4.1. Adaptive planning

There is considerable uncertainty to planning many years in advance as it requires planning for different scenarios using various supply and demand projections. However, the regional planning process has been specifically designed to help water companies adopt a forward-looking approach to uncertain requirements through adaptive planning. This allows companies to plan for schemes that may be required from 2025 and beyond.

In order to do this, WRSE developed a 'root and branch' adaptive tree as the base for forecast for its regional plan investment modelling. This includes the most likely set of future challenges and uncertainties facing the south east region over the next 50 years. There are nine different pathways ('situations'), as shown in Figure 1-2, with different combinations of:

- **Population growth**: According to the Office for National Statistics (ONS) the south east region could grow between two (minimum growth) and 33 per cent (maximum growth) over the next 50 years;
- **Climate change impacts**: Using the Met Offices most recent climate change predictions the model reflects a low climate change forecast up to a high climate change scenario; and
- **Levels of environmental ambition**: There needs to be a reduction on the amount of water taken from rivers, streams and underground sources, all which have impacts on the environment. The model reflects a range of abstraction reduction scenarios from low to high.

Figure 1-2 - WRSE Adaptive Planning Approach[2]



The draft regional plan identifies the immediate investment needed in all the future pathways. It can then adapt depending on which future occurs. This ensures water companies, including Portsmouth Water, will make the right immediate investment decisions so they can provide resilient water supplies to their customers in the years ahead.

As part of WRSE, Portsmouth Water identified 840 different potential futures based upon 6 different population growth scenarios, 28 climate change scenarios and 5 different environmental scenarios. These futures encompass different planning scenarios of Normal Year Annual Average (NYAA), Dry Year Annual Average (DYAA), Dry Year Critical Period (DYCP) and different drought conditions (e.g., 1 in 100 year, 1 in 500 year). This results in a significant range of forecasts of approximately 3,200Ml/day across the South East region. It is this range in potential future challenge that drives different investment choices. To select the most appropriate pathways, WRSE has undertaken investment model runs using various iterations of branches and trees, which have then been tested and assessed by Portsmouth Water. Selected pathways also reflect how the plan is driven by policies out to 2035, and driven by uncertainties out to 2075 as follows:

- **2025–2030:** Within this short term period, the plan and selected scenario is driven predominantly by existing policies. These policies include leakage reduction, drought resilience, water efficiency, bulk supplies, and sustainability reductions. The plan is focused on achieving key policy objectives by fixed points in time, however, flexibility remains to choose different combinations of options to achieve these objectives, so that Portsmouth Water can be confident that options selected in the short term are right for the future. Therefore, the most likely scenario for the single central pathway out to 2035 has been

[2] Portsmouth Water dWRMP24 Figure 9: 'Adaptive planning branches used to develop our dWRMP24'

selected, based on policy and current best-estimates of population growth, climate change and environment scenarios. Uncertainty is accounted for within this period within target headroom.

- **2030-2035:** From 2035, alternative pathways are driven by choices; particularly, a choice of the speed and extent to which environmental destination is delivered is key to which adaptive pathway is triggered. Therefore, branches are selected to reflect the plausible range of potential environmental ambition. Enhanced environmental scenarios derived from the National Framework scenarios present the greatest challenge to supply forecasts, and are combined with maximum housing growth and median climate change impacts. Lower "alternative" environmental ambition forecasts present the least challenging scenario, and are combined with low growth forecasts and medium climate change. The central branch continues on with the root branch.
- **2035-2075:** From 2040, the plan is driven by longer term forecasts which include wider uncertainties around future challenges, resulting in a final set of 9 adaptive pathways out to 2075. This set of branches focus on how climate change could continue to impact of the future availability of water and have been selected to encompass a range of potential scenarios.

Through the process of adaptive planning, in accordance with Ofwat's guidance to plan for future uncertainties, Portsmouth Water considered the modelling outputs of all nine adaptive planning pathways. Comparing outputs for all nine adaptive pathways for the Best Value Plan, shows how the options are largely unchanged across the variety of adaptive planning situations considered, as set out in Table 1-1.

Table 1-1 - A comparison of when options are triggered to resolve each of the nine adaptive planning situations

Adaptive Planning Situation (DYAA)									
	S1	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**	**S8**	**S9**
Portsmouth Water Demand Basket High Plus	2026	2026	2026	2026	2026	2026	2026	2026	2026
Upgrade Source O Booster to 25Mld	2030	2030	2030	2030	2030	2030	2030	2030	2030
Bulk import of potable water from Southern Water	2054	n/a	n/a	2049	n/a	n/a	2049	n/a	n/a
Continuing drought measures until 2040									
Drought Permit: Source S	2026	2026	2026	2026	2026	2026	2026	2026	2026
Non-Essential Use Ban (NEUB)	2026	2026	2026	2026	2026	2026	2026	2026	2026
Temporary Use Ban (TUB)	2026	2026	2026	2026	2026	2026	2026	2026	2026

Portsmouth Water dWRMP24, Table 47

1.4.2. The preferred WMRP24

The adaptive dWRMP24 resolves the supply demand deficit identified in Portsmouth Waters baseline supply demand deficit using a selection of the feasible options identified. Portsmouth Water consider the plan to represent a best value plan that provides a solution for all nine branches of the adaptive pathway, but have reported the core pathway (also known as 'Situation 4'). This pathway is compliant with the Water Resources Planning Guideline produced by the Environment Agency. However, it is important to note, as detailed in Section 1.4.1, the options are largely unchanged across the variety of adaptive planning situations considered.

Pathway 4 is based on local authority housing plans, CC06 climate change forecasts and prepares for a high level of impact on our existing supplies to deliver environmental ambition and cap existing abstraction licences at recent actual levels.

The preferred WRMP24 has taken the adaptive planning approach considered by WRSE and consists of the following components:

- Starting in 2026: The 'high plus' basket of demand management measures which aims to reduce leakage by 50 per cent and overall customer demand for water by 15.6 per cent by 2050 compared to 2017-18 levels. This basket of measures includes universal household 'smart' metering over 10 years starting in 2025-26. Existing 'dumb' meters will also be replaced with smart meters starting in 2029-30 over a period of 10 years. By 2035-36 Portsmouth Water expect that 94 per cent of the households they serve will have a meter, compared with 37 per cent in 2021-22. Installing 'smart' meters will help reduce leakage inside and outside properties, as well as reducing water demand and improving customer engagement.
- 2030: An upgrade to Source O booster to improve the way Portsmouth Water can move water resources around their supply area, freeing up water resources where Portsmouth Water need them.
- 2049: Bulk import of potable water from Southern Water to the west of the Portsmouth Water supply area. This represents a reversal of flow in the existing and planned bulk supplies to Southern Water. Once Southern Water has more water in Hampshire, from other supply developments detailed within the WRSE regional draft plan and Southern Water's WRMP, Portsmouth Water would be able to start receiving supplies from Southern Water to support their own supplies in future.
- Continued use of existing drought schemes between 2025-26 until 2039-40, in accordance with Portsmouth Water drought plans:
  - Temporary use bans;
  - Non-essential use bans; and
  - Source S drought permit.
- Continued provision of existing bulk supply agreements with Southern Water, including the Havant Thicket and Source J baseline options agreed previously in WRMP19. This involves:
  - continuing to provide the 15 Ml/d Sussex transfer in the east beyond 2027,
  - from 2030 continuing to supply both the existing 15 Ml/d Source A bulk supply agreement and the further 9Ml/d supply resulting from AMP7 Source J enhancements (maximum capacity and utilisation is 24Ml/d).

Further detail on the Options proposed within WRMP24 are provided in Chapter 10. Note that not all Options contained within the WRMP24 have been subject to SEA for a range of reasons such as they are existing bulk supplies, previously approved bulk supplies, are associated with Options in adjacent water companies (and as such considered under the SEA of both WRSE and that water company), or are part of the Havant Thicket Option that has received Planning permission.

For full technical detail of how the WRMP24 was arrived at, please see both the WRSE regional plan and the Portsmouth Water WRMP24.

Figure 1-3 - Portsmouth Water supply area

2. Environmental destination

Environmental destination is a new term that was introduced through the Environment Agency's Water Resources National Framework document, published in March 2020 . The term refers to the consideration of actions to build environmental resilience to future challenges, for example, to drought, flooding, raw water quality decline, impact from invasive non-native species, land use change, and impacts from run off. This information is important to understand to ensure we meet the objective of leaving the environment in a better place for future generations.

This objective is also reflected in the Government's 25 Year Environment Plan, which also pledges to improve resilience to drought and minimise interruption to water supplies. The 25-year plan also includes a commitment to work with the water industry to set an ambitious personal consumption target. More widely, the 25-year plan embeds an 'environmental net gain' principle for development and sets out ten environmental goals:

1. Clean air;
2. Clean and plentiful water;
3. Thriving plants and wildlife;
4. A reduced risk of harm from environmental hazards such as flooding and drought;
5. Using resources from nature more sustainably and efficiently;
6. Enhanced beauty, heritage and engagement with the natural environment;
7. Mitigating and adapting to climate change;
8. Minimising waste;
9. Managing exposure to chemicals; and
10. Enhancing biosecurity.

Understanding how much water can be abstracted from the environment in a sustainable way now and in the future is important when developing a regional resilience multi-sector plan and individual water companies' water resources management plans within a given region.

WRSE regional resilience plan has sought to address this by incorporating an environmental forecast which sets out potential futures, looking at the potential water quality and availability requirements of the environment. The WRSE environmental assessments, including the SEA, will support the environmental destination by assessing and informing the long-term resilience of the regional plan and aiming to achieve a plan that provides environmental net gain.

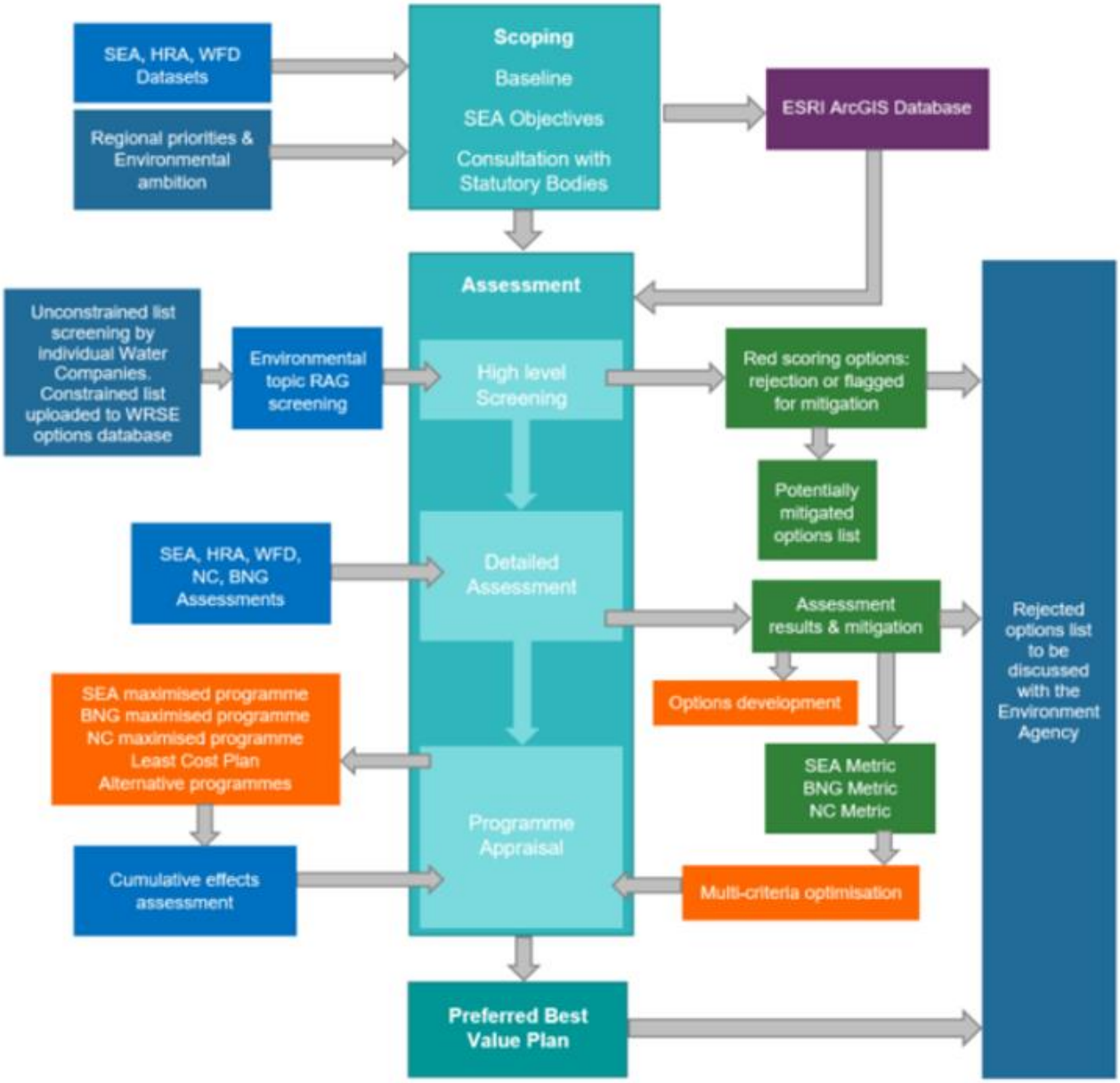
WRSE has developed an environmental assessment process (see Figure 2-1) to be applied in the development of the regional resilience plan. Portsmouth Water is adopting the same approach as far as possible for the WRMP24 environmental assessment. It is noted that the environmental assessment process includes six different assessments:

- Strategic Environmental Assessment (SEA);
- Habitats Regulations Assessment (HRA);
- Water Framework Directive (WFD) Assessment;
- Biodiversity Net Gain (BNG) Assessment;
- Natural Capital (NC) Assessment; and
- Invasive Non-Native Species (INNS) Assessment.

As such, Portsmouth Water have conducted an environmental assessment process grounded on using the SEA process as the umbrella process under which the parallel environmental assessments listed above will take place as advised in the UKWIR and WRSE environmental assessment guidance (see Figure 2-1).

WRSE have prepared and consulted upon a SEA Scoping Report for the Regional Plan with the statutory consultation bodies in 2020. WRSE have subsequently carried out (2021) a high level screening (for all six assessments mentioned above) of all feasible options provided by Portsmouth Water using a methodology as set out in the WRSE 'Method Statement: Environmental Assessment' guidance document. These assessments were fed into Portsmouth Water WRMP24 environmental assessment as the starting point for the identification of further mitigation for the Plan Options.

Figure 2-1 - WRSE Environmental method integration with Options decision making and plan development



3. Approach to the SEA

3.1. Introduction to SEA

Due to the various options contained in the WRMP24, as detailed in Chapter 10, and their potential for these to have significant effects on the environment, it has been decided that SEA is undertaken under the European Directive 2001/42/EC 'on the assessment of certain plans and programmes on the environment' (the 'SEA Directive'). This Directive came into force in the UK on 20 July 2004 through the Environmental Assessment of Plans and Programmes Regulations 2004. The Directive applies to a variety of plans and programmes including water resource planning and planning for droughts. While the United Kingdom has now left the EU, these SEA Regulations still apply to a wide range of plans and programmes, including water resource management plans, and modifications to them.

These SEA Regulations still reflect the overarching objective of the SEA Directive which is:

"*To provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans…with a view to promoting sustainable development, by ensuring that, in accordance with this Directive, an environmental assessment is carried out of certain plans…which are likely to have significant effects on the environment*." (Article 1)

The main requirements introduced by the SEA Regulations are that:

- the findings of the SEA are published in an Environmental Report (ER), which sets out the significant effects of the draft plan;
- consultation is undertaken on the plan and the ER;
- the results of consultation are taken into account in decision-making relating to the adoption of the plan; and
- information on how the results of the SEA have been taken into account is made available to the public.

As noted by WRSE, the WRSE regional plan environmental assessments including the SEA has been used as a framework for the WRSE member water companies when undertaking their WRMP24 statutory environmental assessments. A large amount of the supporting information required for WRMP24 has been produced as part of the regional plan environmental assessments which were made available for use by the individual water companies[3]. This SEA has utilised this information upon which to build upon this more detailed assessment of 'local' effects.

3.1.1. Geographical and temporal scope of the WRMP24

Portsmouth Water supply area is shown in Figure 1-3 and is the area to which WRMP24 applies. Portsmouth Water supply area operates as a single Water Resource Zone. The area supplied by the company extends through Hampshire and West Sussex from the River Meon in the West to the River Arun in the East, encompassing 868km^2. The distribution system includes significant strategic treated water storage spread across a series of large, treated water storage reservoirs and is based around a spine main that runs East to West across the Plan area. This system ensures that all customers in the supply area shown in Figure 1-3 experience the same level of service and the same overall risk of supply failure.

The company abstracts an average of around 170Ml/d and supplies 320,000 properties with clean drinking water from one group of springs, one river and 19 borehole sites under abstraction licences from the Environment Agency via 3,359km of watermains. As such, Portsmouth Water abstracts groundwater found within the Chalk rock of the South Downs to supply public drinking water. Around 85% of the water supply comes directly from groundwater (sourced from boreholes or springs) with the remaining 15% being derived from the River Itchen (itself groundwater fed).

The Portsmouth WRMP24, which will set out how Portsmouth Water will maintain secure supplies to its customers, will run from 2025 to 2075.

[3] See Section 4.7 of WRSE Draft Regional Plan SEA Environmental Report

3.1.2. Technical scope of the SEA

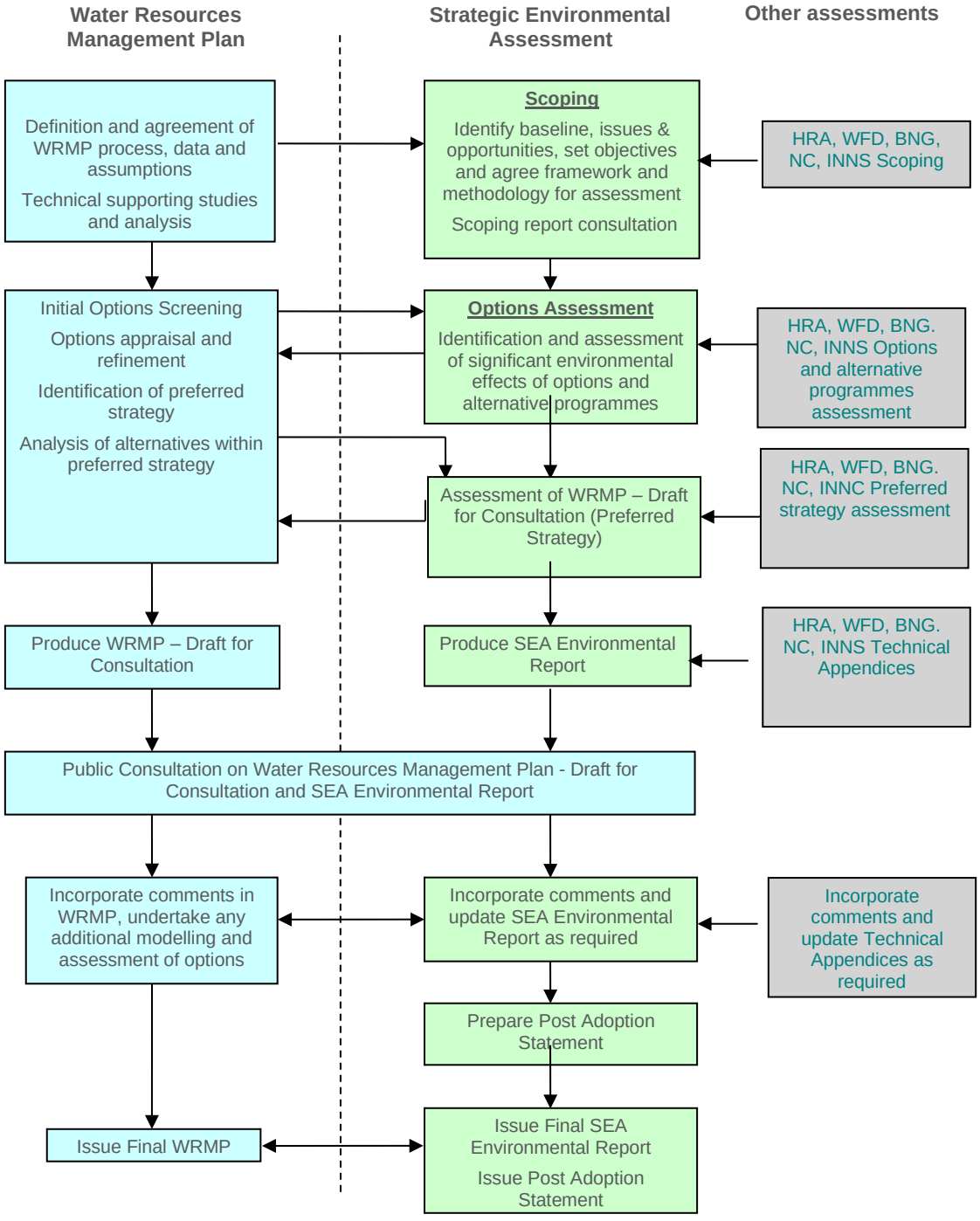
The SEA Directive and the SEA regulations require that the likely significant effects on the environment are assessed, considering the following factors and interrelationship between them:

- Biodiversity;
- Population;
- Human health (covering noise issues among other effects on local communities and public health);
- Fauna and flora;
- Soil;
- Water;
- Air;
- Noise;
- Climatic factors;
- Material assets (covering infrastructure, waste and other assets);
- Cultural heritage including architectural and archaeological heritage; and
- Landscape.

In addition to consideration of the above factors within the SEA, more detailed assessment of particular elements has been made and have been used to help inform the SEA. These elements are:

- Habitats Regulations Assessment (HRA);
- Water Framework Directive (WFD) Assessment;
- Biodiversity Net Gain (BNG) Assessment;
- Natural Capital (NC) Assessment; and
- Invasive Non-Native Species (INNS) Assessment.

Figure 3-1 - Relationship between WRMP24, SEA and other environmental assessment processes



An introduction to each of these other assessments is presented in turn as follows.

3.2. Introduction to Habitats Regulation Assessment

Habitats Regulation Assessment (HRA) is required by the Conservation of Habitats and Species Regulations 2017 (SI No. 2017/1012, as amended by The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 (SI 2019/579)) for all plans and projects which may have likely significant effects on a European site and are not directly connected with or necessary to the management of the European site. The

WRMP24 itself is not directly connected with, or necessary to, the nature conservation management of any European sites.

European sites include Special Areas of Conservation (SAC) and Special Protection Areas (SPA). As a matter of UK Government policy, potential SPAs (pSPA), possible SACs (pSAC), listed or proposed Wetlands of international importance (Ramsar sites) and sites identified, or required, as compensatory measures for adverse effects on European sites, pSPA, pSAC, and listed or proposed Ramsar sites, are included for the purposes of considering plans and projects which may affect them. Hereafter all of the above designated nature conservation sites are referred to as 'European sites'.

There are four stages to the HRA process. These are summarised below:

- Stage 1 – Screening: To test whether a plan or project either alone or in combination with other plans and projects is likely to have a significant effect on a European site;
- Stage 2 – Appropriate Assessment: To determine whether, in view of a European site's conservation objectives, the plan (either alone or in combination with other projects and plans) would have an adverse effect on the integrity of the site with respect to the site structure, function and conservation objectives. If adverse impacts are anticipated, potential mitigation measures to alleviate impacts should be proposed and assessed;
- Stage 3 – Assessment of alternative solutions: Where a plan is assessed as having an adverse impact (or risk of this) on the integrity of a European site, there should be an examination of alternatives (e.g. alternative locations and designs of development); and
- Stage 4 – Assessment where no alternative solutions remain and where adverse impacts remain: In exceptional circumstances where no alternative solutions remain and where adverse impacts remain (e.g. where there are imperative reasons of overriding public interest). Compensatory measures would usually be required to offset negative impacts.

As part of the regional level work, WRSE completed the Stage 1 'screening' assessments on all the options selected in Portsmouth Water's Preferred Plan. Where a scheme was assessed as having likely significant effects on a European site, either alone or in-combination, Atkins completed a Stage 2 'Appropriate Assessment'. The results of the Stage 2 assessments were reported back to WRSE, as part of the iterative process, and fed into the modelling and the option selection process. Please refer to Appendix G for full HRA report.

All the international sites within the WRMP24 area and up to 30km from its boundaries (in respect of bats) have been identified and are reported in Appendix D, as well as the HRA Appendix G).

3.3. Introduction to Water Framework Directive

The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 require all natural water bodies to achieve both Good Chemical Status (GCS) and Good Ecological Status (GES) which, collectively, result in a water body classification of good status. The River Basin Management Plans (RBMP) outline the actions required to enable natural water bodies to achieve good status. Artificial and Heavily Modified Water Bodies (A/HMWB) may be prevented from reaching GES due to the modifications necessary to maintain their function, or 'human use'. They are, however, required to achieve Good Ecological Potential (GEP).

New activities and schemes that affect the water environment may adversely impact biological, hydromorphological, physico-chemical and/or chemical quality elements (WFD quality elements), leading to a deterioration in the baseline water body status. They may also render proposed improvement measures ineffective, precluding the ability of the water body to meet its WFD objectives for GES/GEP. Under the WFD Regulations, and to attain WFD 'compliance', activities and schemes must not cause deterioration in water body status or prevent a water body from meeting GES/GEP by invalidating improvement measures.

The overall ecological status of a water body is primarily based on consideration of its biological quality elements and is determined by the lowest scoring of these elements. These biological elements are, however, supported by the physico-chemical and hydromorphological quality elements. Assessment of hydromorphological quality is not explicitly required for a water body to achieve GES or lower. However, for a water body to be classed as high status hydromorphological quality must be considered to be at near reference conditions within the classification assessment.

In addition, to achieve the overall WFD aim of GES, a water body must pass a separate chemical status assessment to reach Good Chemical Status, relating to pass/fail checks on the concentrations of various identified priority/dangerous substances.

There are two key objectives against which the impacts of proposed works on a water body need to be assessed and met to determine compliance and to avoid infraction of the WFD Regulations:

- The scheme will not cause a deterioration in any element of water body classification.
- The scheme will not prevent the WFD status objectives from being reached within the water body or other downstream water bodies.

A third objective that is central to the Environment Agency's implementation of the WFD is:

- The scheme will contribute to the delivery of the relevant WFD objectives. In this case, it will be what contribution the scheme can make towards the water body reaching its objective GES, or GEP directly via planned RBMP mitigation measures.

If a WFD assessment[4] concludes that a scheme is likely to cause deterioration in water body status or prevent a water body from meeting its ecological objectives, then an assessment is required against the conditions listed in Article 4.7 of the WFD. Article 4.7 can be invoked if; 'new modifications' (relating only to new physical modification and/or changes in groundwater levels) are of overriding public interest and/or the environmental and social benefits of achieving the WFD objectives are outweighed by the benefits of the new modifications to human health, safety and sustainable development; there are no significantly better environmental options that are technically feasible or not disproportionately costly; and, all practicable steps for mitigation have been taken.

'The All Company Working Group (ACWG) (the group of Water Companies involved in developing Strategic Resource Options for the future, as required by Ofwat) developed a consistent framework for undertaking WFD assessments for Strategic Resource Options (SROs) to demonstrate where options would or would not cause deterioration in status of any WFD water bodies. The assessment considers mitigation that would need to be put in place to protect water body status. The assessment also considers WFD future objectives. This methodology is also being used in the development of WRMP's and has been followed for this assessment.

Two stages of assessment are completed under the ACWG WFD approach, an initial Level 1 basic screening and a Level 2 detailed impact screening. These are conducted/reported using a spreadsheet assessment tool which is automated based on option information for Level 1 and expert judgment for Level 2. The Level 1 assessment broadly aligns to the Screening and Scoping stages of the PINS guidance and the Level 2 assessment the Impact assessment.

The Level 1 WFD assessment was completed by WRSE as part of the Emerging Regional Plan. Where water bodies and option impacts were 'screened in', Atkins have taken forward the assessment to Level 2, and the results of this work has been fed back to WRSE, as part of the iterative process, and fed into the modelling and the option selection process. Please see appendix H for full WFD report which outlines the detailed methodology and results.

The River Basin District (RBD) which makes up the plan area is the South East RBD. There are three surface water management catchments in the South East RBD and 282 surface water bodies in the South East RBD. See Figures in Appendix D, as well as the WFD Appendix H).

3.4. Introduction to Biodiversity Net Gain and Natural Capital Assessment

Biodiversity Net Gain (BNG) is an approach that aims to leave the natural environment in a measurably better state than beforehand. Natural England have produced a Biodiversity Metric that provides a way of measuring and accounting for biodiversity losses and gains resulting from development or land management change.

Natural capital is defined in the 25 Year Environment Plan (England) as "the elements of nature that either directly or indirectly provide value to people". As a new and emerging approach, natural capital incorporates methodologies and approaches (such as ecosystem services) to understand the value that natural assets provide. For the water industry, these can be substantial. The Water Resource Planning Guidelines (WRPG) (England and Wales) states that Water Resource Management Plans (WRMPs) should "use natural capital in decision-making", "use a proportionate natural capital approach", "deliver environmental net gain", and provide cost information on monetised ecosystem service costs and benefits where monetisation is used.

[4] Note in 2021 the UK Government sought to drop reference to any European legislation post BREXIT and thus has started to call the previously named WFD assessments as Water Environment Regulations (WER) assessments. However, as the terminology needs to be consistent across several ongoing assessments across the UK, WFD terminology has been retained for this assessment.

WRSE conducted both of these assessments in full for the options that required assessing according to the WRSE scoping criteria and exclusion rules for NCA and BNG. The findings of these assessments are reported in this SEA. As documented in WRSE's Regional Plan – Natural capital and Biodiversity Net Gain Report (2022) WRSE decided to use the most appropriate methodology for assessing and quantifying NCA and BNG and therefore based assessments on Defra's "Enabling and Natural Capital Approach" ENCA and Defra's BNG assessment methodology. It was important to ensure there was no double counting of benefits or disbenefits when assessing the effects of the options. Therefore, the assessment of those services that would be included in other metrics such as those for water quality, which were included in WFD assessments have been excluded from NCA.

Please refer to Appendix I and J for full reports.

3.5. Introduction to Invasive Non-Native Species

As part of the WRMP SEA, water companies may be required to undertake invasive non-native species (INNS) investigations to determine the threat of spreading INNS throughout their asset network and specific resource options and assess ways of mitigating this spread. The INNS investigation may be activated in the case that the selected options require it, or otherwise used at a high level to inform any significant environmental constraints for options assessment. During the first stages of the investigation, screening criteria were developed by WRSE to determine which of the WRMP24 options required an INNS assessment. This was based on the frequency in which transfers would be operational and the severity of their impact. These criteria formed the screening matrix for assessment in which only schemes scoring 'low', 'medium' or 'high' were to be taken forward for a Level 2 (L2) assessment. WRSE concluded that no options in Portsmouth Waters WRMP required L2 assessment.

The INNS investigation would be completed in accordance with the Environment Agency SRO Aquatic INNS Risk Assessment Tool (SAI-RAT) which has been developed based on working principles within the well-established Wessex Water and Northumbrian Water tools.

The results of these INNS investigations will form part of the SEA process for the biodiversity and water objectives. INNS dispersal can occur through a range of recreational and operational (water company) 'pathways', which may include water or land-based recreation and sports, and water company operations, such as ground maintenance and the operation of raw water transfers (RWTs).

Considering the potential for INNS dispersal and the requirement to assess this risk and mitigate where appropriate, the INNS process can be split into three distinct phases, including:

- Data gathering and water network understanding, including;
- Understanding the source, pathways and receptors of each resource option;
- Identify INNS present at key assets, and at the source, pathway and receptor of RWTs;
- Identify presence of INNS dispersal pathways and the frequency in which they occur;
- Risk assessment of each resource option; and
- Options appraisal of mitigation measures for higher-risk options.

A more detailed methodology statement is provided in Appendix K and outlines the approach to Invasive Non-Native Species assessment with respect to the Portsmouth Water WRMP24.

3.6. Reporting and Consultation

Key consultation requirements are those set in the SEA Regulations which identify three organisations (in England) to act as statutory consultation authorities in the SEA process: Environment Agency, Natural England and Historic England.

Two consultation periods involving the statutory consultation authorities and, in the latter period, the public are also set in the SEA Regulations. The consultation periods relate to:

- Scoping: The responsible authority is required to send details of the plan or programme to each consultation authority so that they may form a view on the scope, level of detail and appropriate consultation period of the Environmental Report. The consultation authorities are required to give their views within five weeks.
- The Environmental Report: The responsible authority is required to invite the consultation authorities and the public to express their opinions on the Environmental Report and the plan or programme to which it relates.

Listed below are the key stakeholders that were consulted on the Scoping Report and the responses from this consultation have been used to inform the SEA and have helped refine the WRMP24. The comments received, together with how these comments have been addressed in the preparation of this SEA Report, are set out in Appendix A to this report.

Statutory Consultees:

- Environment Agency;
- Historic England; and
- Natural England.

Key reporting requirements are those set by the SEA Directive and SEA Regulations:

'An Environmental Report shall be prepared in which the likely significant effects on the environment of implementing the plan or programme, and reasonable alternatives taking into account the objectives and the geographical scope of the plan or programme, are identified, described and evaluated.'

Table 3-1 below sets out the way specific SEA requirements have been met in this report.

Table 3-1 - Schedule of SEA Regulations

	Information to be included in the Environmental Report under the SEA Regulations (Regulation 12 and Schedule 2)	**Where covered in this report**
1	An outline of the contents, main objectives of the plan, and of its relationship with other relevant plans and programmes	Chapter 1 and Chapter 5 and Appendix B.
2	The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan;	Chapter 6 and Appendix C and D.
3	The environmental characteristics of areas likely to be significantly affected	Chapter 6 and Appendix C and D
4	Any existing environmental problems which are relevant to the plan including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Directives 79/409/EEC and 92/43/EEC;	Chapter 6 and Appendix C and D
5	The environmental protection objectives, established at international, Community or Member State level, which are relevant to the plan and the way those objectives and any environmental considerations have been taken into account during its preparation	Chapter 5 and Appendix B.
6	The likely significant effects on the environment, including short, medium and long-term effects, permanent and temporary effects, positive and negative effects, and secondary, cumulative and synergistic effects, on issues such as: biodiversity; population; human health; fauna; flora; soil; water; air; climatic factors; material assets; cultural heritage including architectural and archaeological heritage; landscape; the interrelationship between the above factors	Chapter 10 and Appendix E.
7	The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan	Chapter 11 and Appendix E.
8	An outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information	Chapter 9 – see also WRSE SEA draft Environmental Report.
9	A description of measures envisaged concerning monitoring in accordance with Regulation 17	Chapter 13.
10	A non-technical summary of the information provided under paragraphs 1 to 9	Non-Technical Summary

The SEA Report is thus an important consultation document and likely to be of interest to a wide variety of readers including decision makers, other plan/programme practitioners, statutory consultees, NGOs and members of the public. It accompanies the draft WRMP24 on public consultation.

4. SEA Methodology

4.1. Introduction

This Chapter describes the approach taken to complete the SEA and the wider environmental assessments undertaken and reported under its 'umbrella'.

4.2. Assessment methodology

The approach to SEA was based on a range of guidance documents, including of note, the following:

- Department for Communities and Local Government (2005). A Practical Guide to the Strategic Environmental Assessment Directive.
- Environment Agency, Natural Resources Wales, Defra, OFWAT (2022) Water Resource Planning Guideline.
- Environmental Assessments for Water Resources Planning, UKWIR, 2021.

It is also important to note that a number of other assessments (as outlined in Chapter 3) where used to inform the SEA. Consideration of these assessments is set out in Appendix G to K. These assessments were:

- Habitats Regulations Assessment (HRA);
- Water Framework Directive (WFD) Assessment;
- Biodiversity Net Gain (BNG) Assessment;
- Natural Capital (NC) Assessment; and
- Invasive Non-Native Species (INNS) Assessment

Full details of these assessments are made within the WRSE Draft Regional Plan SEA Report.

4.3. Strategic Environmental Assessment

4.3.1. Stage A – Setting the context and establishing the baseline

4.3.1.1. Other relevant legislation, plans and programmes

The WRMP24 will both influence and be influenced by other plans, policies and programmes (PPPs) produced by local and combined authorities, by statutory agencies and other bodies with plan making responsibilities. Legislation is a further driver that sets the framework for the WRMP24, both directly and indirectly. Relevant legislation, plans and programmes have been identified and considered to inform the preparation of this Environmental Report (see Chapter 5 and Appendix B).

4.3.1.2. Baseline information and key issues

To predict accurately how WRMP24 proposals will affect the current baseline, it is first important to understand its current state and then examine the likely evolution of the environment without the implementation of the plan. Baseline information provides the basis for understanding existing local environmental, economic and social issues, and alternative ways of dealing with them; formulating objectives to address these issues and predicting and monitoring effects.

Key environmental issues, across the Portsmouth Water area have been identified as a result of the analysis of the baseline data and the review of other plans and programmes. The identification of these issues helped focus the SEA processes on the aspects that really matter. Implications to WRMP24 development and opportunities for how the WRMP24 could assist in addressing these issues were also identified.

Information on key baseline and issues is presented in Chapter 6 of this report.

It is important to note that no issues were Scoped out at the Scoping stage of this assessment.

4.3.1.3. Developing the SEA Framework

A set of SEA Objectives has been developed, against which the policies and proposals in the WRMP24 could be assessed.

For each objective, assessment aid questions were set out to form the SEA framework. The assessment aid questions provided a clarification of the intended interpretation of each objective to support direction of change

sought through the implementation of the WRMP24. The questions have guided the WRMP24 assessment process.

The SEA Objectives and assessment aid questions were refined through the consultation on the Scoping Report and are presented in Chapter 7 of this report.

4.3.2. Stage B – Developing alternatives

4.3.2.1. Developing, refining and appraising strategic alternatives

WRSE have carried out an assessment of strategic alternatives[5] and this has informed WRMP24. As noted in Chapter 1, the approach has been to identify an Adaptive Plan, with different scenarios being considered and outlined in a 'situational tree'. This situational tree was used by the investment model to derive a series of investment plans to meet the needs of the region taking uncertainty into account. The uncertainties are around forecasting future conditions for supply, demand and environmental policy. WRSE has used an adaptive planning approach to allow for the uncertainties in forecasting future conditions over the planning period 2025 to 2075. The investment model uses a set of resilience, environmental, and cost metrics to select an optimum set of solutions over the longer term with alternative situations to meet many different potential futures. This adaptive planning approach is promoted by the National Framework and the Water Resources Planning Guidance (WRPG).

In order to build an adaptive plan, it was necessary to characterise the range of forecast supply demand balances using a set of pathways or situations that are representative of the range of challenges. For the regional plan, nine potential pathways were defined to cover the key forecasts including an upper and lower forecasted deficit. For each situation, a specific growth forecast; a supply forecast; an environmental destination and a climate change impact forecast were defined. Further details on the defining WRSE's situation tree are included in WRSE Draft Plan Annex 1, Section 12.

An investment model has been used with information on options inputted and different scenarios run to select options based on programmed parameters. In addition to the best value approach for the regional plan, for sensitivity testing and to meet regulatory guidance, the investment model was run to select a Least Cost Plan (LCP) by only using the cost information to optimise the solution. Similarly, WRSE also developed a Best Environmental and Social Plan (BESP) by ensuring the investment model optimised on the environmental and customer preference metrics. As is the case for the Best Value Plan, the alternatives are from the same pathway, Situation 4 as it includes the growth scenario and environmental destination scenario (business as usual (BAU)+ plus local commitments) that satisfies guidance.

The options within these plans include supply, demand, drought, catchment and multi-sector options. It is however important to note that model selected the same set of options for the BVP, LCP and BESP for Portsmouth Water.

The aim of the assessment was to ensure that the selected options in a branch will not result in significant negative effects cumulatively or in-combination with each other and that opportunities to maximise positive effects across the plan as a whole are identified.

4.3.2.2. Assessing the effects of WRMP24

Assessing the significance of predicted effects is essentially a matter of judgement. There are a number of factors that will determine the significance of an effect, e.g. its scale and permanence and the nature and sensitivity of the receptor. It is very important that judgements of significance are systematically documented, in terms of the characteristics of the effect which are deemed to make it significant and whether and what uncertainty and assumptions are associated with the judgement. The assessment of significance also includes information on how the effect may be avoided or its severity reduced.

In the current practice of SEA, the prediction and evaluation of effects can be often based on a qualitative seven point scale in easily understood terms. In general, this assessment has adopted the scale shown in Table 4-1 to assess the significance of effects of the Options in WRMP24. Note that this scale is aligned with that utilised by WRSE at the regional level assessment. In addition, Table 4-2 sets out the characteristics of effect: magnitude, scale, duration, permanence and certainty.

[5] See section 4.3 of the WRSE Draft Regional Plan SEA Environmental Report

Table 4-1 - Assessment scale

Assessment Scale	Assessment Category	Significance of Effect
+++	Major beneficial	Significant
++	Moderate beneficial	
+	Slight beneficial	Not Significant
0	Neutral or no obvious effect	
-	Slight adverse	
--	Moderate adverse	Significant
---	Major adverse	

Table 4-2 - Characteristics of Effect

Magnitude (size of effect)	Scale (implications of effect)	Duration (length of time over which effect will be present)	Permanence (lasting of effect)	Certainty (that effect will occur)
Large (L) Medium (M) Small (S)	Local (L) Regional (R) National (N) Global (G)	Long term (LT) Medium term (MT) Short term (ST)	Temporary (T) Permanent (P)	High (H) Medium (M) Low (L)

Moderate and strong beneficial and adverse effects (and combination of this type of effect) have been considered of significance, whereas no effect and slight beneficial and adverse effects (and combination of this type of effect) have been considered non-significant.

Assessments have been undertaken for proposals contained in the draft WRMP24. The results are discussed in Chapter 10.

As part of the assessment of the draft WRMP24, a number of mitigation measures (recommendations) are set out in Chapter 11 and also within Appendix E. Portsmouth Water has given careful consideration to these recommendations and has addressed these as appropriate in the preparation of the draft WRMP24 for public consultation.

The term mitigation encompasses any approach that is aimed at preventing, reducing or offsetting significant adverse environmental effects that have been identified. A range of measures applying one or more of these approaches has been considered in mitigating any significant adverse effects predicted as a result of implementing the WRMP24. In addition, measures aimed at enhancing positive effects have also been considered. All such measures are generally referred to as mitigation measures.

However, the emphasis of the assessments has been in the first instance on proactive avoidance of adverse effects. Only once alternative options or approaches to avoiding an effect have been examined, then ways of reducing the scale/importance of the effect have been examined and proposed.

Mitigation can take a wide range of forms, including:

- Refining intervention measures in order to improve the likelihood of positive effects and to minimise adverse effects;
- Technical measures (such as setting guidelines) to be applied during the implementation stage;
- Identifying issues to be addressed in project environmental impact assessments for certain projects or types of projects; and
- Proposals for changing other plans and programmes.

The assessment also considered cumulative, indirect (secondary) and synergistic effects of the draft WRMP24 as outlined in the following section.

4.3.2.3. Secondary and Cumulative effects assessment

The SEA Regulations require that the assessment of effects include secondary, cumulative and synergistic effects.

Secondary or indirect effects are effects that are not a direct result of the plan but occur away from the original effect or as a result of the complex pathway e.g. a development that changes a water table and thus affects the ecology of a nearby wetland. These effects are not cumulative and have been identified and assessed primarily through the examination of the relationship between various objectives during the Assessment of Effects.

Cumulative effects arise where several proposals individually may or may not have a significant effect, but in-combination have a significant effect due to spatial crowding or temporal overlap between plans, proposals and actions and repeated removal or addition of resources due to proposals and actions. Cumulative effects can be:

- Additive - the simple sum of all the effects;
- Neutralising - where effects counteract each other to reduce the overall effect; and
- Synergistic - is the effect of two or more effects acting together which is greater than the simple sum of the effects when acting alone. For instance, a wildlife habitat can become progressively fragmented with limited effects on a particular species until the last fragmentation makes the areas too small to support the species at all.

Many environmental problems result from cumulative effects. These effects are very hard to deal with on a project by project basis through Environmental Impact Assessment. It is at the strategic level that they are most effectively identified and addressed.

Cumulative effects assessment is a systematic procedure for identifying and evaluating the significance of effects from multiple activities. The analysis of the causes, pathways and consequences of these effects is an essential part of the process.

Cumulative (including additive, neutralising and synergistic) effects have been considered throughout the entire SEA process, as described below:

- Identification of key environmental issues as part of the review of relevant strategies, plans and programmes and baseline data analysis.
- Establishing the nature of likely cumulative effects, causes and receptors.
- Identifying key receptors in the process of collecting baseline information and information on how these have changed with time, and how they are likely to change without the implementation of the WRMP24.
- The development of SEA objectives and assessment aid questions has been influenced by cumulative effects identified through the process above and SEA objectives that consider cumulative effects have been identified.

It is also important to note that cumulative effects assessment has formed a key part of the WRSE regional plan development. This is an area where consideration of effects across the six water companies within WRSE is particularly beneficial as it allows careful consideration of the interaction and effects that an Option proposed in one water company plan can have with an Option located within the Plan area of another water company.

The results in respect of Options within the Portsmouth Water area are presented in Chapter 12 of this report. Reference should be made to the WRSE regional plan report in respect of cumulative effects of Options across Plan boundaries.

4.3.2.4. Monitoring the effects of the WRMP24 implementation

The SEA has indicated a series of possible monitoring indicators that could be implemented through the WRMP24.

It is anticipated that the monitoring programme will cover significant environmental effects and which will involve measuring indicators that will enable the establishment of a causal link between the implementation of the WRMP24 and the likely significant effects (both positive and negative) being monitored. This will allow identification at an early stage of unforeseen adverse effects and allow appropriate remedial action to be undertaken.

The monitoring indicators are presented in Chapter 13 of this report.

4.3.3. Stage C – Preparing the SEA Report

This SEA Environmental Report has been prepared to accompany the draft WRMP24 for consultation.

4.3.4. Stage D – Consulting on the draft WRMP24 and SEA Environmental Report

4.3.4.1. Assessing significant changes

The SEA Environmental Report will be published for formal consultation with the Draft WRMP24. The results of the formal public consultation exercise may well result in changes to the Draft WRMP24 and these will have implications for the SEA Environmental Report. In addition, the consultation exercise may result in direct changes to the contents of the SEA Environmental Report. These will be reported in the Post Adoption Statement.

4.3.4.2. Post Adoption Statement

Following completion of the public consultation and adoption of the Final WRMP24, a statement (separate document) will be prepared setting out the following:

- How environmental considerations have been integrated into the plan, for example any changes to or deletions from the plan in response to the information in the SEA Environmental Report.
- How the SEA Environmental Report has been taken into account.
- How the opinions and consultation responses have been considered and addressed. The summary should be sufficiently detailed to show how the plan was changed to take account of issues raised, or why no changes were made.
- The reasons for choosing the plan as adopted in the light of other reasonable alternatives dealt with.
- The measures that are to be taken to monitor the significant environmental effects of implementation of the WRMP24.

5. Relationship with other Policies, Plans and Programmes

The SEA Regulations require that information be provided on:

*"The degree to which the plan or programme influences other plans and programmes including those in a hierarchy" (*Schedule 1*);*

*"Its relationship with other relevant plans and programmes" (*Schedule 2*);* and

*"The environmental protection objectives, established at international, Community or Member State level, which are relevant to the plan or programme and the way those objectives and any environmental considerations have been taken into account during its preparation." (*Schedule 2*)*

The WRMP24 will both influence and be influenced by other plans, policies and programmes (PPPs) produced by local authorities, statutory agencies (at an international, national, regional and local level) and other bodies with plan making responsibilities. Legislation is a further driver that sets the framework for the WRMP24, both directly and indirectly

Therefore, the SEA needs to set out the relationship between the WRMP24 and relevant legislation, other relevant plans and programmes and the environmental protection objectives established at international, national (UK wide), regional (taken for the purposes of this study to be the Portsmouth Water area) and local (local authorities within and immediately adjacent to the Portsmouth Water area) levels. This ensures that the objectives in the SEA generally adhere to, and are not in conflict with, objectives found in other plans, programmes and legislation and also assists in the setting of objectives for the SEA. It can also be used to ascertain potential conflicts between objectives, which will need to be addressed as part of the process.

Building on the comprehensive review undertaken to inform the WRSE Regional Plan SEA Scoping Report and which covered international, European, national and regional plans, programmes and legislation, those plans, programmes and legislation of particular note to the WRMP24 listed in Appendix B have been reviewed. Appendix B also provides the full list of plans, programmes and legislation that were reviewed under the WRSE process.

The focus of the review undertaken has been recent plans, programmes and legislation published after the WRSE SEA Scoping Report was published such as the UK Environment Act, UK Net Zero Strategy and updates to the National Planning Policy Framework. Portsmouth Waters own relevant corporate plans and strategies have also been reviewed, in particular 2030 Net Carbon Zero Roadmap.

The review has also focussed on local policies, plans and programmes that fall within the boundary of the Portsmouth WRMP24 including:

- The Portsmouth Plan (The Portsmouth Core Strategy) adopted January 2012
- Draft Portsmouth Local Plan (September 2021)
- Portsmouth City Local Plan (2006)
- Somerstown and North Southsea Area Action Plan (2012)
- Southsea Area Action Plan (2007)
- East Hampshire Adopted Local Plan/Joint Core Strategy (2014)
- East Hampshire Emerging Local Plan
- Fareham Borough Local Plan Part 1 (Core Strategy)
- Fareham Borough Local Plan Part 2 (Development Sites and Policies)
- Fareham Borough Local Plan Part 3 (The Welbourne Plan)
- Gosport Borough Local Plan 2008
- Havant Adopted Local Plan (Core Strategy 2011 and Site Allocations Plan 2014)
- Havant Borough Submission Local Plan (Draft 2021)
- Winchester Development Plan
- Winchester District Local Plan (2018-2039)
- Arun Local Plan (2011-2031)

- Chichester Local Plan (2014-2029)
- South Downs Local Plan (2014-2033)
- Site Improvement Plans for Natura 2000 sites, Natural England;
- South East River Basin District - River Basin Management Plan (December 2015);
- Joint Strategic Flood Risk Assessment (Partnership for Urban South Hampshire) – under review
- Portsmouth Local Flood Risk Management Strategy
- Portsmouth Surface Water Management Plan
- South East Hampshire Catchment Flood Management Plan (2009)
- North Solent Shoreline Management Plan
- Southsea Seafront Masterplan (Coastal defences)
- The East Hampshire Catchment Partnership: Catchment Management Plan 2021-2027
- Arun and Western Streams Catchment Flood Management Plan 2009
- Strategic Flood Risk Assessment of Chichester District Council 2008
- Strategic Flood Risk Assessment 2007 – Winchester City Council
- Strategic Flood Risk Assessment (Level 1) Gosport Borough
- Strategic Flood Risk Assessment – Fareham Borough Council
- Strategic Flood Risk Assessment – East Hampshire District Council (2018)
- Portsmouth Water 2030 Net Carbon Zero Roadmap
- Portsmouth Water Climate Change Adaption Report
- Havant Thicket Reservoir Planning and Construction (in association with Southern Water, Havant Borough Council and East Hampshire District Council
- East Hampshire Abstraction Licensing Strategy, Environment Agency (March 2019)
- Solent and South Downs Abstraction Licensing Strategy (CAMS process), Environment Agency;
- Landscape Character Assessment (LCA);
- National Character Areas (NCAs);
- South Downs National Park Partnership Management Plan (PMP) – 'Shaping the future of you South Downs National Park 2014 – 2019'
- Test and Itchen Catchment Flood Management Plan 2009
- River Itchen Catchment Management Plan
- Downs and Harbours Clean Water Partnership

A series of key themes and messages relating to environmental sustainability within the context of water management planning which have emerged from the review are presented below.

Air Quality

- Reduce emissions of NO_2
- Reduce emissions from road transport in particular
- Reduce emissions from other forms of transport
- Increase use of low emission / zero emission at point of use vehicles
- Reduce emissions of PM_{10} and $PM_{2.5}$

Greenhouse Gas (GHG) Emissions

- Reduce GHG emissions, particularly CO_2
- Maximise the use of renewable energy
- Increase energy efficiency and make use of new technology

- Minimise use of fossil fuels
- Contribute to the achievement of national Net Zero target by 2050
- Portsmouth Water to achieve Net Zero operational emissions by 2030

Adaptation to a Changing Climate and Flooding

- Prepare for extreme weather events and sea level rise
- Minimise the risk and impact of river, surface and groundwater flooding
- Minimise risk and impact of coastal flooding and erosion damage
- Minimise risk and impact of heatwaves, wildfires, reduced water availability and soil desiccation.

Biodiversity, Fauna and Flora

- Protection of sites designated for nature conservation purposes and areas of irreplaceable habitat
- Protect and enhance endangered or important species and habitats
- Contribute to the delivery of biodiversity strategies and plans
- Increase area of important habitat
- Protect, maintain and enhance natural habitat networks and green infrastructure, to avoid fragmentation and isolation of networks
- Creation of green infrastructure
- Achievement of Biodiversity Net Gain

Cultural Heritage

- Conserve and protect historic assets (designated and undesignated) and those of cultural note, including archaeology and historic landscapes
- No harm to physical assets and their settings
- Improve setting to historic assets, including buildings and landscapes of value where appropriate
-

Water Resources

- Protect and improve the quality of ground and surface water and optimise conjunctive use of sources
- Help to meet objectives of the Water Framework Directive (WFD) Regulations
- Make use of Sustainable Drainage Systems (SuDS)
- Prevent or limit inputs of pollutants into groundwater, including chlorides and nitrates
- Monitor and provide information to consumers on drinking water quality
- Promote efficient use of water
- Accelerate the programme to reduce nutrient overload, particularly from diffuse pollution
- Make space for water and wildlife along rivers and around wetlands
- Restore natural processes in river catchments, including ways to support climate change adaptation and mitigation
- Ensure resilience in river catchments so that they are better able to cope with periods of dry weather / heavy rainfall

Land Use, Soil and Agriculture

- Prioritise development on brownfield sites
- Seek to reclaim derelict and contaminated land
- Prevent soil contamination
- Protect farmland and soils, particularly those considered Best and Most Versatile Agricultural Land
- Promote change of agricultural land use to forestry to help with carbon sequestration targets

Landscapes and Townscapes

- Protect and enhance landscape and townscape character and local distinctiveness
- Protect tranquillity from the impacts of noise and light pollution
- Protect and enhance seascapes

Natural Resources and Waste

- Ensure efficient resource use and minimise resource footprint
- Use secondary and recycled materials
- Consider opportunities to maximise on-site re-use of materials
- Employ waste reduction methods to minimise construction and maintenance waste
- Reduce the amount of waste disposed of at landfill
- Promote circular economy
- Avoid the sterilisation of mineral resources

Population and Human Health

- Tackle poor health by improving the health of everyone, and of the worst off in particular
- Create a green economy and promote sustainable growth
- Promote sustainable and healthy communities
- Promote social inclusion and community participation
- Address pockets of deprivation
- Provide for an ageing population

Cross cutting

- Support the UK Government's 25 Year Plan to Improve the Environment 2018 goals and key actions as follows:
  - Using and managing land sustainably, including embedding an "environmental net gain" principle into development.
  - Recovering nature and enhancing the beauty of landscapes.
  - Connecting people to the environment to improve health and wellbeing.
  - Increase resource efficiency and reducing pollution.
  - Securing clean, healthy and productive and biologically diverse seas and oceans.
  - Protecting and improving the global environment.

- Support Environment Act 2021 stipulations:
  - targets for four priority areas: (a) air quality; (b) water; (c) biodiversity; (d) resource efficiency and waste reduction to be set.
  - two priority areas: air quality ($PM_{2.5}$ air quality target) and biodiversity (species abundance target) and important new target to reverse the decline in species abundance by the end of 2030.
  - environmental improvement plan for significantly improving the natural environment for a period no shorter than 15 years.
  - 10% biodiversity net gain required for new development.
  - prevent waste/reduce the amount of a product that becomes waste and increase re-use, redistribution, recovery and recycling.

- Adhere to Portsmouth Water commitment to becoming net zero carbon by 2030. This will be achieved through combination of:
  - Minimising water leakage and promoting more efficient water usage.
  - Investing in energy efficient measures to streamline consumption.

- Installing sub-metering across our sites to better monitor energy consumption.
- Decarbonising our vehicle fleet and optimising travel.
- Keeping to a minimum any carbon emissions from new projects and growth

6. Baseline information and key environmental issues

6.1. Introduction

The SEA Regulations state that the Environmental Report should provide information on:

"*The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme*" and "*The environmental characteristics of areas likely to be significantly affected*" (Schedule 2)

and

"*Any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Directives 79/409/EEC on the conservation of wild birds and the Habitats Directive* " (Schedule 2).

In order to assess the potential environmental sustainability effects of the WRMP on Portsmouth and surrounding areas, it is therefore necessary to establish a baseline against which predicted effects can be assessed, and then to identify issues and trends that are related to each of the environmental, social and economic interests that may be affected by, or affect, the proposed plan. As such, it is first important to understand the current state of the baseline and then examine the likely evolution of the environment without the implementation of the plan.

The current environment and socio-economic baseline has been reviewed and summarised for the WRSE region in the WRSE Scoping Report. The baseline summarised is a high-level overview of the baseline conditions for the region but more detailed location specific baseline information has been developed in a GIS database which WRSE has made available as the starting point for this baseline exercise.

Baseline information also plays a key role in the other environmental assessments (HRA, WFD, BNG, NC and INNS).

6.2. Data Collection Methodology

The most efficient way to collate relevant baseline data is using indicators. This ensures that the data collation is both focused and effective. The identification of relevant indicators has taken place alongside the assessment of other relevant plans, policies and programmes, the identification of environmental sustainability issues and development of the SEA framework.

The baseline information in this chapter was collected from published sources, including but not limited to the following sources:

- Office for National Statistics (ONS);
- Local Authority Health Profiles (Public Health England, 2018);
- UK Climate Projections 2018 (UKCP18);
- Historic England;
- Natural England;
- Department for Environment, Food and Rural Affairs (Defra);
- Environment Agency;
- Joint Nature Conservation Committee (JNCC);
- Woodland Trust;
- RSPB;
- National Health Service (NHS) Digital;
- Public health England;
- Consumer Data Research Centre (CDRC) Mapmaker;
- Letsrecycle.com;
- Energy Network Association;

- South East Waste Planning Advisory Group (SEWPAG);
- Ministry of Housing, Communities and Local Government;
- Department for Business, Energy & Industrial Strategy;
- Local Government Association;
- United Nations Educational, Scientific and Cultural Organisation (UNESCO);
- Department for Culture, Media and Sport; and
- The National Association for Areas of Outstanding Natural Beauty.

References to all relevant baseline information is provided in the supporting Appendices document.

It should be noted that the SEA process does not require the collection of primary data, but relies on the analysis of existing information. As such, where data gaps exist this is highlighted in this report.

Indicators have been selected for their ability to provide objective data that will, over time, offer an insight into general trends taking place. Throughout the assessment process the following issues will need to be addressed:

- What is the current situation, including trends over time?
- How far is the current situation from known thresholds, objectives or targets?
- Are particularly sensitive or important elements of the environment, economy or society affected?
- Are the problems of a large or small scale, reversible or irreversible, permanent or temporary, direct or indirect?
- How difficult would it be to prevent, reduce or compensate for any negative effect?
- Have there been, or will there be, any significant cumulative or synergistic effects over time?

The datasets used to form environmental baseline are presented in Table 6-1 below.

Table 6-1 - Datasets used in Environmental Baseline

Topic	Environmental datasets used to form environmental baseline
1. Biodiversity	SAC, SPA, Ramsar, Marine Protection Areas/Marine Conservation Zones, SSSI, SSSI Impact Risk Zones, NNR, LNR, Ancient Woodland, Local Wildlife Sites, Priority Habitat, Nature Improvement Areas, National Priority Focus Areas, RSPB Reserves, Woodland Priority Habitat,
2. Cultural Heritage	Grade I, II, II* Listed Structures, Grade I, II, II* Registered Parks and Gardens, Protected Wreck, Registered Battlefields, Scheduled Monuments, Conservation Areas, World Heritage Sites
3. Landscape	AONB, National Landscape Character Areas, Woodland, Urban grade Agricultural Land, Green Belt
4. Air Quality	Air Quality Management Areas, Noise Action Planning Important Areas, Air Quality monitoring points and data
5. Community Health and Wellbeing	Allotments or Community Growing Spaces, Borough, Bowling Green, Cemetery, Country Parks, Golf Course, Medical facilities, National Parks, National Trails, Indices of Multiple Deprivation, Population and Migration Projections, Local Authority area profiles (NOMIS and Public Health England information)
6. Geology and Soils	Agricultural Land Classification, Geologically designated SSSIs, EA Special Sites
7. Water Quality and Resources	Source Protection Zones, Groundwater Vulnerability Zones, Drinking Water Safeguard Zones, WFD Groundwater status, Main Rivers, Surface Water Features, Bathing Waters, Shellfish Waters, Catchments and River Basins
8. Flood Risk	Flood Zones, Flood Alert/Warning Areas, EA Flood Defences
9. Infrastructure / Material Assets	Open access areas, Other Sports Facility, Play Space, Playing Field, Public Park Or Garden, Registered Common Land, Religious Buildings, Religious Grounds, Schools, Tennis Courts, Transport Route Major Roads, Railway tracks, Nationally designated cycle routes, National Grid Infrastructure (high voltage electricity lines and substations), Authorised and Historic Landfill sites

Since SEA is an iterative process, subsequent stages in its preparation and assessment might identify other issues and priorities that require the sourcing of additional data and/or information and identification of monitoring strategies. This makes the SEA process flexible, adaptable and responsive to changes in the baseline conditions and enables trends to be analysed over time.

Data Analysis

Data have been collated and analysed for the following indicators (as detailed in Appendix A):

Environmental Data

- CO_2 emissions
- Climate change
- Local air quality
- Noise / Light pollution ('Tranquillity')
- Biodiversity, fauna and flora (including designated sites)
- Landscape and townscape
- National Character Areas
- Heritage assets
- Green space
- Soil / land classification
- Water quality
- Flooding
- Waste and resources

Economic Data

- Employment
- Long term trends in GVA
- Long term trends in population
- Economic sectors, including those related to rural output
- Performance gap and sub-regional performance
- Identification of economic centres

Social Data (including Health, Equalities and Community Safety)

- Population and diversity
- General health statistics
- Accessibility
- Equality target groups
- Multiple deprivation

The baseline data provide an overview of the environmental characteristics of the WRMP area. This overview, together with contextual information, is presented in Appendix C. The analysis of the baseline has highlighted a number of key issues across the Portsmouth area. These, together with implications and opportunities arising for the WRMP, have been summarised in Table 6-2.

6.3. Data Limitations

It is believed that the data sets available and utilised in this assessment, along with the output from the WRSE process, provide a comprehensive and robust overview of the environmental situation across the Portsmouth Water area and the South East region as a whole.

It is to be noted that option development is in most cases at an outline or preliminary stage and as such may be subject to change or further development. In some instances, option routes (e.g. new transfers) or locations (e.g. new treatment works) are not sufficiently developed and point or coordinate data has been used to

represent indicative locations. Each option assessment significance of effect has been attributed with a 'certainty' classification that reflects limitations in locational understanding, data availability and reliability among other considerations that have an impact on the certainty of effect.

Specific data limitations with regard the technical environmental assessments (HRA WFD L2, Biodiversity Net Gain, Natural Capital and INNS) have been set out within the corresponding Technical Reports (Appendix G – K).

6.4. Future baseline

The SEA Regulations require that "the relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the Plan or Programme" is identified. Prediction of future trends depends on a wide range of global, national and regional factors and decision making. Key trends have been identified as part of the analysis of key issues and opportunities.

6.5. Key issues and opportunities

The SEA Regulations state that the Environmental Report should provide information on:

"*Any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of particular environmental importance, such as areas designated pursuant to Directives 79/409/EEC on the conservation of wild birds and the Habitats Directive*." (Schedule 2)

The key environmental issues have been identified from the review of baseline information and other plans and programmes (see Chapter 5). These key issues are summarised in Table 6-2 below. This table also provides a discussion on the implications/opportunities of such issues to the WRMP24 and provides clear links to the SEA Objectives. The analysis of key sustainability issues has influenced the development of the SEA Framework (see Chapter 7), in particular in formulating decision making questions.

Table 6-2 - Key issues, implications and opportunities for Portsmouth WRMP24

Key Environmental Issue	Implications / Opportunities for the WRMP24	SEA Objective
Biodiversity Within the South East region, there are a wide range of sites designated for nature conservation. Of note, there are 21 Ramsar sites, 25 Special Protection Areas, 69 Special Areas of Conservation and 1,189 Sites of Special Scientific Interest. Specifically within the Portsmouth Water Plan area there are: • **Five SPAs** (Portsmouth Harbour; Pagham Harbour; Chichester and Langstone Harbours; Solent and Dorset Coast; and Solent and Southampton Water SPA); • **Six SACs** (Rook Clift; Singleton and Cocking Tunnels; Kingley Vale; Butser Hill; Solent Maritime and Solent and Isle of Wight Lagoons SAC); • **Four Ramsar sites** (Solent and Southampton; Pagham Harbour; Portsmouth Harbour; and Chichester and Langstone Harbours Ramsar); and • **39 SSSIs.** Within the South East region, 52 National Nature Reserves and 623 Local Nature Reserves can be found. Within the Portsmouth Water Plan area there are five NNRs and 26 LNRs. Key pressures and risks in respect of biodiversity and nature conservation that are particularly relevant have been identified from air pollution and climate change, which can change distribution of species and habitats.	WRMP24 should aim to protect and enhance all sites of biodiversity importance and should place a particular emphasis on protecting sites designated for nature conservation and geodiversity purposes. Consideration should be made of protected and priority species and their habitats, including local wildlife sites, as well as consideration of issues such as Suitable Alternative Natural Greenspace. Opportunities for new habitat creation and enhancement associated with water resources should be explored. There should be achievement of Biodiversity Net Gain in areas not formally designated, recognising that a target of 10% has been set out in the Environment Act 2021 for new development. WRMP24 should avoid the fragmentation of green infrastructure, by seeking the integration and enhancement of the green infrastructure network to contribute to protecting natural habitats and delivering biodiversity net gain through all new developments. WRMP24 should help create cohesive habitat networks to help habitats and species adapt to the consequences of climate change, in particular. consider the support of water-dependent designated sites and priority habitat/species to adapt to climate change more specifically. WRMP24 should promote the increased accessibility to appropriately designed multi-functional green infrastructure which can play a	To protect and enhance biodiversity, priority species, vulnerable habitats and habitat connectivity and achieve biodiversity net gain

Areas of Ancient Woodland, i.e. those areas that have been continuously wooded since at least 1600AD are scattered across the South East region. The Ancient Woodland Inventory for England identifies over 4,600 sites of Ancient Woodland, within the Plan area. There are other priority habitats within the plan area that fall inside and outside of designated sites which are likely to be impacted by the WRMP. Examples include fen, wet heath, wet woodlands, reedbeds, wet grazing marsh etc. There are also unique flushes and seepages which are reliant on the chalk aquifers. Likely evolution of the baseline Habitats and species are likely to continue to be protected through European and UK legislation. Climate change will however likely result in decline of some habitats and species, though may afford opportunities for other species, including invasive species. England's wildlife habitats have also become increasingly fragmented and isolated, leading to declines in the provision of some ecosystem services, and losses to species populations'.	significant role in diverting pressure away from more sensitive sites or areas. In parallel with the SEA of the WRMP24, HRA is being undertaken which will identify the internationally designated nature conservation areas, where possible establish the likelihood of impacts on the integrity of these sites and identify appropriate avoidance and mitigation measures early in the development of the WRMP24. The INNS assessment also being undertaken in parallel with the SEA will in turn consider potential for INNS dispersal and assess this risk and mitigate where appropriate.	
Soil There are a mix of land uses across the Portsmouth Water Plan area, ranging from rural areas of open countryside or arable farmland and pasture to extensive heavily urbanised. There are also areas of suburban and urban fringe associated with the main towns and distinct pockets of 'isolated' urban development in the form of villages and small towns.	Soil is a non-renewable resource and is vulnerable to erosion, degradation and contamination. In addition, historic land uses have contributed to contamination across large areas. WRMP24 should seek to make best use of areas that are already urbanised and provide an opportunity for regeneration / improvements to land quality. Where use of agricultural land is unavoidable, measures should be taken to avoid those areas of the highest quality and aim to	To protect and enhance the functionality, quantity and quality of soils

Soils in England are already, and continue to be, degraded by human activity including intensive agriculture, historic levels of industrial pollution and urban development, making them vulnerable to erosion (by wind and water), compaction and loss of organic matter. Large swathes of the Plan area comprise Grades 3 and 4 under the Agricultural Land Classification. Large areas of Grade two persist towards the coast and 'non-agricultural' and 'urban' areas align with urbanised areas.

Many areas of land in the UK have been contaminated by past industrial and other human activities, including former factories, storage depots and landfills. Land at the full range of potentially contaminated sites could be contaminated by a wide range of harmful substances such as oils and tars, heavy metals, asbestos and chemicals.

By its nature, it is often very difficult to know where land has been contaminated previously or is currently suffering ongoing contamination. As such the number of known sites of contamination is likely to be only a very small fraction of the overall number of potentially contaminated sites.

Likely evolution of the baseline

Declining - it is likely that greenfield sites will experience increasing pressure for development in preference to the complexities of redeveloping previously developed and potentially contaminated sites. This could reduce available high quality soil resources and fail to realise the potential of existing capacity within existing urban and previously developed areas. Remediation of contamination is likely to remain sporadic and reflective of individual site requirements

protect soil and agricultural holdings through avoidance of impacts such as erosion, contamination or severance.

WRMP24 must protect soils as they are essential for achieving a range of important ecosystem services and functions.

Dealing with the past pollution / contamination legacy is a major issue and should be addressed at all opportunities due to its ongoing environmental impact.

WRMP24 should seek to avoid land that is covered by Mineral Safeguarding Area designations, to prevent the sterilisation of key mineral resources.

Water There are considerable pressures on water resources with resulting major impacts on many of the waterbodies across the UK. For the purposes of taking a holistic approach to management of water resources and to address the pressures on the water environment, under the Water Framework Directive (WFD), the UK has been divided into a series of 10 River Basin Districts (RBD). Those of relevance to the Portsmouth Water Plan area are: • South East There are 282 surface water bodies within the South East RBD. As with most water bodies in England, there are a range of significant water management issues manifested in these RBD. For the South East River Basin District, the following were identified as significant issues[6]: • Abstraction and other artificial flow regulation • Nitrate • Organic Pollution (ammonia and biochemical oxygen demand) • Pesticides • Phosphorus Groundwater provides a third of drinking water in England, and it also maintains the flow in many rivers. In some areas of Southern England, groundwater supplies up to 80% of the drinking water. Protecting these sources (along with any private water supplies) will help ensure that water is safe to drink.	WRMP24 options should seek implement and maximise opportunities to improve waterbody status through the suite of options proposed. Improving network and preventing leaks and bursts is a key outcome of many of the options contained within the WRMP24 and the plan should seek out areas that stand to benefit most from such interventions. Pollution prevention should also be sought during construction through robust construction management plans and pollution prevention plans In parallel with the SEA of the WRMP24, the WFD assessment is being undertaken which will identify if options will likely deteriorate water body classification or prevent the WFD objectives from being reached and propose appropriate avoidance and mitigation measures early in the development of the WRMP24. The WRMP24 should also seek to reduce the need for drought permits / orders through the suite of options proposed.	To protect and enhance the quantity and quality of surface, groundwater, estuarine and coastal waterbodies

[6] Annex 4 : Pressures and risks to the water environment (publishing.service.gov.uk)

In order to help protect sources, Source Protection Zones (SPZs) for groundwater sources such as wells, boreholes and springs used for public drinking water supply have been defined. 24 DWSZ fall entirely or partially within the plan area. Similarly, parts of the country at which there is increased risk of contamination to groundwater supplied from activities which might cause pollution are covered by Source Protection Zones (SPZs). There are several SPZs noted within the Portsmouth Water Plan area. Likely evolution of the baseline Maintained and improving - Surface and ground water quality is predicted to increase through legislation such as WFD, though significant challenges remain as noted in the River Basin Management Plan. The region is already water-stressed and projected economic and population growth will likely place further pressure on the region's water resource quantity (surface and groundwater) and water resource dependent environments.		
Air Air pollution impacts on public health, the natural environment and the economy. Air quality has improved in the UK over the last sixty years as a result of the switch from coal to gas and electricity for heating of domestic and industrial premises, stricter controls on industrial emissions, higher standards for the composition of fuel and tighter regulations on emissions from motor vehicles. Poor air quality is generally associated with urban/industrial areas and major road	The options within WRMP24 have the potential to impact air quality and noise. This could include the generation of air pollutants and noise from treatment plants and there is also likely to be effects from the construction phase. The Plan should meet Government targets for air quality and noise and be reflective of appropriate legislation and should consider ecological receptors alongside human receptors. There is also potential for the WRMP24 to mitigate any increases in air pollutants as a result	To reduce and minimise air and noise emissions.

infrastructure and this is reflected in the typical location for Air Quality Management Areas (AQMA), many of which have been designated due to high NO_2 and PM_{10} levels. A high proportion of the local authorities which fall within the South East region contain at least one AQMA (118 AQMAs in total) and are predominately designated for Nitrogen Dioxide (NO_2) and Particulate Matter (PM_{10}). There are 10 AQMAs declared within the Portsmouth Water Plan area. 135 Noise Action Important Areas have been identified within the plan area. The source of noise in these areas is predominately roads, with the exception of a small number in which the source is rail. Likely evolution of the baseline Improving - At the national level air quality is generally improving as industrial practices, energy sources and tighter environmental legislation have contributed to reductions in pollutants. While air quality is generally improving at a national level, new development, economic growth and tourism may lead to increased car journeys and congestion could lead to localised air quality effects.	of the options and improve air quality in the region.	
Greenhouse gas emissions Based on the local authorities which intersect the Portsmouth Water Plan area, as detailed in Appendix A, the total carbon dioxide (CO_2) emissions for 2018 across all sectors is estimated at 4,558.5 ktCO_2. Winchester is identified as having the highest emissions of all relevant LAs. Portsmouth Water abstract, treat and pump an average of 170 million litres of water each day.	WRMP24 must work to minimise water demand from households and businesses as this will result in reduced need to abstract, treat and transport water (and also less wastewater to treat) and consequently lesser carbon emissions. The options within WRMP24 have the potential to result in carbon emissions during the construction and operation phase which will further contribute to climate change. The impact of such emissions	To achieve Portsmouth Water target of reducing operational carbon emissions to Net Zero by 2030 and contribute to national target of Net Zero by 2050.

Each million litres of water produces around 95kg of carbon dioxide equivalent emissions. Portsmouth Water currently produce around 16 tonnes of CO2e each day through daily operations. Likely evolution of the baseline Carbon and other GHG emissions will continue to be emitted, however regulations and government legislation and incentives will continue to promote the reduction in emissions through national commitments to net zero by 2050. Portsmouth Water have been early adopters of solar power, which since installation in 2011 has saved 800 tonnes of CO2e emissions. Portsmouth Water anticipate reaching a net-zero operational emissions target by 2030. There is potential for an increased need for wastewater treatments as a result of WFD water quality standards combined with population increase. Given the energy intensity of wastewater treatment, the water industry CO_2 emissions may increase as a result of increased water consumption leading to increased volumes of wastewater requiring treatment and further contribute to climate change.	should be considered through the optioneering and design processes. WRMP24 should also ensure that opportunities are taken for maximising tree planting. Amongst other benefits, such flood protection, biodiversity enhancement and recreation, careful tree species selection can contribute to carbon sequestration by absorbing increased amounts of CO_2 from the atmosphere.	
Adaptation to a changing climate Current observations indicate that the UK is continuing to warm. In 2019, four new temperature records were set, including a high of 38.7°C and a new winter record of 21.2°C. The decade between 2010 and 2019 has been on average 0.3°C warmer than the 1981-2010 average and 0.9°C warmer than 1961- 1990. Annual precipitation has increased across the UK in the last few decades with 2019 seeing 107% more rainfall than the 1981-2010 average.	A greater degree of resilience will have to be incorporated into the WRMP24 optioneering and design processes to increased river, surface and groundwater flooding due to extreme winter rainfall events and increase in winter mean rainfall as well as increased coastal flooding and erosion damage due to sea level rise and storms sea level rise and the potential risks posed by increased heatwaves, wildfires, reduced water availability and soil desiccation due to increased	To reduce vulnerability built infrastructure to climate change risks and hazards To reduce or manage flood risk, taking climate change into account

Summers have been 11% wetter on average than 1981- 2010 and 13% wetter than 1961-1990. Winters have been 4% and 12% wetter than 1981-2010 and 1961-1990 respectively. These general trends have also been witnessed in the Portsmouth Water area. Likely evolution of the baseline The climate is expected to continue to change with annual average temperatures projected to increase, particularly in summer. Winters are projected to be wetter and summers drier. Climate change is projected to result in more extreme weather events, potentially causing or exacerbating periods of drought which alongside population and economic growth will impact water availability.	summer temperatures and reduction in summer mean rainfall. There is a need to manage the risks associated with flooding over the infrastructure's lifetime, without increasing the flood risk elsewhere and identifying opportunities to reduce the risk overall, including through working with nature based solutions. There are multiple benefits associated with the use of nature based solutions to reduce vulnerability such as tree planting or peat restoration. Flood risk should be considered in any design and the implementation of multi functional green infrastructure including SuDS and other similar appropriate measures or new approaches should be considered and encouraged where feasible. This should include Natural Flood Management and other means of increasing flood storage capacity. WRMP24 should seek to explore the possibilities for creating blue infrastructure which can both help to manage localised flood risk and simultaneously create new habitats. There is also a need to manage risks related to periods of limited water availability. It is possible limitations of abstraction could mean water infrastructure may have to cease to operate for periods of time and abstraction could cause environmental damage, including for sites with legal habitats and water protections (e.g. SSSIs, SACs, Water Framework Directive etc.).	
Landscapes The South East region's landscape is diverse and there are important landscapes within the region, including two National Parks, eight AONB and 34 National Character Areas (NCAs).	There is potential for the options within WRMP24 to have an impact on the landscape. This could include temporary construction effects and permanent effects associated with infrastructure which could affect visual amenity or the character of the area.	To conserve, protect and enhance landscape, townscape and seascape character and visual amenity

Specifically within the Plan area there is/are:

- One National Park (South Downs National Park, designated for its rolling hills, picturesque towns and villages, and dramatic cliffs)
- One AONBs (Chichester Harbour); and
- Five NCAs (Hampshire Downs; Wealden Greensand; South Downs; South Coast Plain; and South Hampshire Lowlands).

There are a range of pressures on landscape, many of which are altering landscapes in a direction which could be regarded as inconsistent with the traditional landscape vernacular of the area. These changes are a reflection of the fact that the landscape of the UK has changed over many years due to a range of issues such as urbanisation, changes to agriculture, reduced tranquillity, loss of habitats and forests, etc. In an effort to preserve the best landscapes a series of National Parks and Area of Outstanding Natural Beauty (AONBs) were designated.

Within the Plan area there are 114 designated Conservation Areas, the first areas designated in 1969, with the most recent being 2005, covering a range of building characters and reflecting a diverse array of architectural styles.

Likely evolution of the baseline

Stable - Many of the region's most exceptional landscape and townscapes benefit from protection through designations that will persist in the absence of the WRMP. In general terms, modern design / landscaping principles and interested parties expectations are promoting a renewed focus on the quality of scheme design and this trend is likely to continue, though risks

WRMP24 should seek to preserve and enhance the character of the region's landscape and seascape by ensuring that its integrity and valuable natural open space is not lost.

WRMP24 should also aim to ensure that sensitive areas are avoided and respect particular landscape settings, with consideration made of design quality in both an urban, rural or sea setting.

Opportunities for landscape enhancement should be explored, e.g. through sympathetic design and enhancements to existing landscape improvement areas, new planting opportunities.

Where a scheme would involve physical development within a Conservation Area or a wider area for which a townscape/urban character appraisal has been undertaken, the design of the scheme should take account of relevant guidance for the Conservation Area / townscape character area.

from increased urbanisation and infrastructure development remain.		
Cultural Heritage There are eight World Heritage Sites within the South East Region, and none falling within the Plan Area. There are however a wide range of other historic and cultural heritage features located across the WRMP24 area and which span the full range of human settlement, from the prehistoric to the present. These include Scheduled Monuments, Registered Parks and Gardens, Historic Battlefields and Listed Buildings. Numbers of sites within the Plan area are as follows: • Listed Buildings – 3825 (90 Grade I, 3556 Grade II and 178 Grade II*) • Registered Parks and Gardens – 14 (one Grade I, eight Grade II and five Grade II*); • Scheduled Monuments – 171; and • Historic Battlefields – none. It is important to note that the nature of cultural heritage features means that not all are known at present; in particular, buried archaeological remains. Likely evolution of the baseline Stable / Declining - Historic England recently reported that heritage assets at risk are decreasing. Designated heritage assets benefit from protection that will continue without the WRMP. However, there is a risk or uncoordinated and piecemeal development resulting in the successive erosion of the quantum and integrity of the region's cultural heritage resource.	WRMP24 should aim to protect and preserve designated and non-designated heritage assets and their contexts and settings. The options within WRMP24 have the potential to directly or indirect impact the historic environment through effecting the asset's fabric or setting. It is to be noted that some heritage features can be affected by changes to hydrological conditions. Infrastructure should be sensitively designed to be sympathetic to existing character and quality and opportunities for improving settings should be examined. Where schemes would involve physical development that could affect previously undiscovered archaeological assets the design of the scheme and site selection should be informed by early investigation of the potential archaeological interest of the affected land.	To conserve, protect and enhance the historic environment and assets, including archaeology

Population and Human Health There are approximately 19 million people living within the South East Region, which accounts for 30% of the UK's population. Within Portsmouth City there are approximately 205,000 people. Portsmouth Water supply a domestic population exceeding 698,000. Population is expected to grow which will likely place additional pressure on the water environment within the Plan area. Economic growth and climate change will also add to this pressure. Health profiles for LAs across the Plan Area show four LAs reporting generally better health than the England average and four reporting a varied picture. Potential options within the WRMP24 have the potential to result in temporary disturbance effects during the construction phase. There is also potential for impacts on the water or natural environment which could have impacts on recreation and wellbeing. Likely evolution of the baseline Stable / Uncertain – Population is projected to increase in the region and life expectancy is also higher than the national average meaning that the numbers of elderly residents are likely to increase. As such, water demand will increase, and further pressure will be placed on water resources within the region. Water available for consumptive use may also be affected by climate change whereby access to water is limited. Climate change may manifest through more frequent droughts or floods.	The options within WRMP24 have the potential to result in temporary disturbance effects during the construction phase and disturbance effects for the local community must be prevented There is also potential for impacts on the water or natural environment which could have impacts on recreation and wellbeing. WRMP24 should aim to protect public health and promote well being. There is an opportunity for WRMP24 to engage with the local community and maximise opportunities for recreation through enhancing access and the condition of the water environment, greenspaces or areas of the natural environment. Thus, improving the inclusivity of and connection to the local natural environment. WRMP24 also has the opportunity to ensure a resilient and reliable potable water supply for customers now and in the future, through continuing to increase awareness of water conservation and adapting to climate change so that there is enough water for a growing population and to support economic growth.	To maintain and enhance the health and wellbeing of the local community, including economic and social wellbeing To maintain and enhance tourism and recreation

Material Assets Within the UK, the south east is the most populated region with a population of approximately 19 million and expected long-term growth of around four million. and Portsmouth Water supply a domestic population exceeding 698,000. Settlements within the Plan area are diverse and range from large population centres to small rural hamlets and seaside towns. Key Urban areas within the Portsmouth Plan area include: • Chichester population of 26,795 • Havant population of 120,684 • Clanfield population of 4,637 • Bognor Regis population of 24,064 • Southbourne population of 5,648 • North Mundham population of 1,201 • Bishops Waltham population of 6,723 Portsmouth Water supply a domestic population exceeding 698000 as well as industry, large defence establishments and varied commercial businesses via thirty service reservoirs and 21 treatment works. In terms of infrastructure, the South East region contains over 400 authorised landfill sites. 18 authorised landfill sites and 213 historic landfill sites are identified within the Plan area. While there are no gas terminals or pipelines within the Plan area, an electrical substation is within the Plan area situated west of Horndean and the A3 motorway. From the substation extent four 132Kv and 400Kv overhead lines which traverse the Plan area north, east and west / south west.	WRMP24 has the opportunity to consider the efficiency in the use of resources within the option development and reduce the use of energy, materials and prevent waste generation through the promotion of low/zero carbon energy, use of recycled or secondary materials and furthering concepts of circular economy. WRMP24 area contains important transport links which could be affected during construction works. There is also significant water and wastewater treatment infrastructure across the area operated by Portsmouth Water.	To minimise resource use and waste production To avoid negative effects on built assets and infrastructure

There are a number of railway tracks within the plan area connecting areas such as Chichester and Littlehampton, Fareham and Portsmouth and Petersfield and Havant.

Portsmouth Port or Portsmouth Continental Ferry Port is a cruise, ferry and cargo terminal located in the city of Portsmouth

Likely evolution of the baseline

Regeneration and future investment and demand are likely to increase the number and quality of material assets such as housing, transport infrastructure, waste facilities, and community facilities. Portsmouth Port is anticipated to expand with over £33 million worth of investment earmarked from 2019. The expansion works are anticipated to lead to an increase in the number of cruise passengers at the Port from 50,000 to 15000. Of the investment £15 million is anticipated to be invested in improving facilities at Portico who operate two commercial quays within the Port

7. SEA Framework

7.1. Introduction

Following good practice, a number of bespoke SEA objectives have been developed for the WRMP24. These SEA objectives reflect the environmental sustainability objectives the WRMP24 should be aiming to achieve and the areas that the WRMP24 is expected to impact upon or have an influence on. The expectation is that even though some objectives may not be within the WRMP's direct remit, the WRMP24 should be able to influence the direction of change through setting out clear policies and approaches which could inform the work of Portsmouth Water's partners and other stakeholders.

7.2. Assessment Framework

The SEA Framework is a key component in completing the SEA, through providing a set of SEA objectives against which the performance of the WRMP can be predicted and evaluated.

An SEA Framework of 10 objectives and associated decision-making / assessment aid questions (see Table 7-1) has been drawn up for the assessment of WRMP24, developed through the analysis of baseline information and identification of key environmental sustainability issues and opportunities, as well as the review of relevant plans, policies and legislation.

In order to assess how each aspect of the WRMP24 performs against each of the SEA objectives, a series of decision-making criteria / assessment aid questions have also been developed. The decision-making criteria are a way of guiding the assessment. They are not the only considerations to be taken into account when determining likely effects arising from the WRMP24, as it is unlikely that every relevant question can be known at this stage, but they do provide a useful starting point and a transparent structure to help demonstrate how the assessment of the effects arising from the implementation of the WRMP24 will be undertaken. As the SEA progressed, they also helped in the development of a set of indicators to be included in the monitoring programme.

In deriving the SEA Framework, the information contained within the WRSE SEA Scoping Report has been considered (together with the comments received from statutory consultees on the WRSE SEA Scoping Report) have also been taken into account alongside a review of specific baseline data relevant to the Portsmouth Water area. An overview of the key issues identified that are specific to the Portsmouth area has been provided in the previous chapter. Allied to the identification of detailed baseline data relevant to the Portsmouth area, the SEA Objectives identified in the All Companies Working Group SEA Core Objective Identification Report (2020) were considered and a revised set of SEA Objectives has been developed that allow examination of a greater level of detail than would be expected at WRSE regional level. This has led to the addition of an important separate objective to reduce greenhouse gas emissions reflecting the climate emergency and adjustments in the wording of other WRSE SEA Objectives and decision-making criteria to better reflect Portsmouth Water priorities.

It should be noted that, from an assessment perspective, all SEA objectives are considered equally important to be achieved by the WRMP24 and that there is no inherent prioritisation of objectives.

It is also to be noted that there is a certain degree of cross-over of Assessment Aid Questions within the SEA Framework i.e. the same question may be asked across a number of Objectives. The rationale for this is that while the question may be the same, it is considered from a differing viewpoint and within a different context. This is the role of the Assessment Aid Questions i.e. to help consider all aspects of an Objective in arriving at an assessment of the performance.

Table 7-1 - SEA Objectives and decision aid questions for WRMP24

SEA Topic	SEA objective	Decision aid questions
Biodiversity	To protect and enhance biodiversity, priority species, vulnerable habitats and habitat connectivity and achieve biodiversity net gain	Will WRMP24: • Protect and enhance the conservation status of designated sites and their qualifying features (SPAs, SACs, Ramsar sites, MCZs, SSSIs, National Nature Reserves and Ancient Woodland)? • Ensure HRA compliance with regards to international sites? (taken from HRA results) • Affect direct or indirectly a priority habitat on the priority habitat inventory? • Protect and enhance priority habitats and species, including surface and ground water-dependent habitats and species? • Affect the marine environment, habitats and species (including MCZs and MPAs)? • Contribute to the loss or gain in habitat connectivity at local, regional and national scale? • Create or restore habitat delivering a 10% net gain for biodiversity? (taken from BNG assessment results) • Avoid the possibility for INNS to be spread/ introduced? • Create an opportunity to improve biodiversity value through removal of INNS? • (taken from the INNS assessment results)
Soil	To protect and enhance the functionality, quantity and quality of soils	Will WRMP24: • Affect high grade agricultural land? • Promote the efficient use of land? • Prevent soil erosion and retain soil stocks as a natural resource? • Involve use of brownfield or greenfield land? • Prevent mineral sterilisation? • Result in soil contamination or involve soil remediation? • Affect SSSIs of geological importance?

SEA Topic	SEA objective	Decision aid questions
Water	To protect and enhance the quantity and quality of surface, groundwater, estuarine and coastal waterbodies and water dependent habitats	Will WRMP24: • Affect surface water quality or quantity? • Affect groundwater quality or quantity? • Affect estuarine or coastal water quality or quantity? • Affect bathing waters? • Affect shellfish water protected areas? • Affect chalk rivers? • Reduce the flashy nature of surface waters? • Slow the flow in upper catchments and reduce soil losses to river systems? • Support achievement of environmental objectives set out in River Basin Management Plans and Shoreline Management Plans • Protect and enhance the environmental resilience of the water environment to climate change? • Contribute to the achievement of WFD objectives (taken from the WFD assessment results)?
Air	To reduce and minimise air and noise emissions	Will WRMP24: • Minimise air emissions (pollutants and noise) that affect human health and biodiversity? • Affect an existing air quality management area (AQMA) or lead to the creation of a new one? • Promote enhancements to green infrastructure networks to help improve air quality?
Greenhouse Gas Emissions	To achieve Portsmouth Water target of reducing carbon emissions to Net Zero by 2030 and contribute to national target of Net Zero by 2050	Will WRMP24: • Reduce direct and indirect emissions of all greenhouse gases, including carbon dioxide, during construction, operation and decommissioning of schemes? • Maximise supply of energy from low carbon/renewable energy sources / use of low carbon/renewable energy? • Maximise opportunities for making use of waste heat? • Use negative carbon emissions technologies to offset residual emissions such Nature Based Solutions?

SEA Topic	SEA objective	Decision aid questions
		• Create new carbon sinks/removals through natural sequestration including that provided by green infrastructure and soils which contribute to carbon sequestration?
Climate Factors	To reduce vulnerability of built infrastructure to climate change risks and hazards	Will WRMP24: • Avoid development in areas likely to be affected by flooding or where this is not possible ensure that flooding can be managed throughout the lifetime of the infrastructure? • Avoid development in areas likely to be affected by coastal erosion or where this is not possible ensure that coastal change can be managed throughout the lifetime of the infrastructure? • Avoid development which would cause or exacerbate climate related issues such as freshwater and coastal squeeze? • Manage the risks associated to periods of limited water availability during droughts over the lifetime of the infrastructure? • Manage the risks associated with heatwaves and wildfires over the lifetime of the infrastructure? • Manage the risks of flooding and coastal erosion, particularly through working with nature-based solutions?
	To reduce or manage flood risk, taking climate change into account	Will WRMP24: • Avoid development in flood risk areas (whether existing or future) when possible? • Lead to infrastructure development that is flood resilient over its lifetime, considering the effects of climate change, without increasing the flood risk elsewhere and identifying opportunities to reduce the risk overall?
Landscape	To conserve, protect and enhance landscape, townscape and seascape character and visual amenity	Will WRMP24: • Protect and enhance designated landscapes and features? • Affect the character of the landscape, townscape or seascape, including tranquillity and views? • Protect conservation areas or historic landscape/townscape areas? • Minimise noise and light pollution from construction and operational activities on residential amenity and on sensitive locations, receptors and views? • Improve access to the countryside? • Create or improve green infrastructure which contributes to access to the landscape?

SEA Topic	SEA objective	Decision aid questions
Cultural Heritage	To conserve, protect and enhance the historic environment and assets, including archaeology	Will WRMP24: • Protect designated historic assets, sites and features? • Protect heritage assets at risk? • Protect historic assets and their settings? • Protect important archaeology (including unknown archaeology)? • Alter the hydrological conditions of water-dependent heritage assets, including organic remains?
Population and Human Health	To maintain and enhance the health and wellbeing of the local community, including economic and social wellbeing	Will WRMP24: • Allow for green economic development? • Provide employment opportunities and economic diversity? • Minimise disturbance from noise, light, visual, and transport due to construction and operational activities? • Minimise disturbance to active travel (pedestrian and cycle routes, Public Rights of Way) during construction and operational activities? • Secure resilient water supplies for the health and wellbeing of customers?
	To maintain and enhance tourism and recreation	Will WRMP24: • Affect terrestrial, freshwater or marine water resources that are used for tourism and recreation? • Maintain or enhance tourism in the region through the creation or improvement of terrestrial or water-based attractions? • Improve access to the natural environment for recreation, including those living within deprived areas? • Provide education or information resources for the public about the natural environment?
Material Assets	To minimise resource use and waste production	Will WRMP24: • Minimise the use of materials, energy and resources? • Promote water efficiency and encourage a reduction in water consumption? • Minimise the production of waste? • Promote sustainable waste management practices in line with the waste hierarchy? • Encourage the use of recycled and / or secondary materials?

SEA Topic	SEA objective	Decision aid questions
		• Promote the use of low carbon materials and technologies? • Promote the use of local suppliers that use sustainably-sourced and locally produced materials?
	To avoid negative effects on built assets / infrastructure	Will WRMP24: • Reuse existing infrastructure? • Affect major built assets and infrastructure, including transport infrastructure?

8. Technical Environmental Assessment

The SEA objectives, as set out in Section 7, have been formulated to incorporate the findings of the various technical environmental assessments, specifically the Habitats Regulations Assessment, Water Framework Directive Assessment, Biodiversity Net Gain and Natural Capital assessments. This has helped to provide an integrated environmental assessment of the plan.

It is however important to note, that whilst the results of the various technical environmental assessments have been used to inform the SEA, care has been taken to align the approaches to ensure there is no risk of double counting where overlaps between some of the SEA objectives and various metrics used in the technical assessments may have occurred (introducing undue bias).

A summary of each of the environmental assessments has been provided in this section. Full reports are attached to this SEA Report in the Appendices (Appendix G – K) and should be consulted for further information.

8.1. Habitat Regulation Assessment

Habitat Regulation Assessment (HRA) is required by Regulation 63 of the Conservation (Natural Habitats, and Species) Regulations 2017 (as amended). The HRA of the WRMP24 comprises Stage 1 Screening and Stage 2 Appropriate Assessment (AA). It was undertaken following a methodology based on the extent and nature of the WRMP24 as a 'plan' and taking a precautionary approach.

The assessment provides a summary of the WRSE screening results for the two options considered, undertakes a Stage 1 Screening review and, dependent on the findings, takes forward to Stage 2 Appropriate Assessment those European Sites which could not be screened out, either alone or in-combination.

The two options assessed were Source S Drought Permit and Source O Booster. The Stage 1 Screening review ruled out Likely Significant Effects on European Sites, both alone and in-combination for Source S Drought Permit. However, Source O Booster was shown to have potential Likely Significant Effects on Solent Maritime Special Area of Conservation (SAC), Chichester and Langstone Harbours Special Protection Area (SPA) and Chichester and Langstone Harbours Ramsar site (wetland of international importance) due to hydrological connectivity and potential for water quality impacts both alone and in-combination.

At AA the Source O Booster option was assessed in light of the conservation objectives for each European Site. In making the assessment of whether an option (construction/ operation/ both) may have adverse effects on the integrity of a European site, potential avoidance and mitigation measures were considered. In the absence of detailed project-specific information, a high-level assessment of the potential for the Source O Booster option to have an adverse effect on the integrity of European Sites was undertaken at Stage 2 AA. A total of three European Sites within or adjacent to the Plan Area were included in the assessment and the potential for impacts arising from development as a result of the option was determined.

It is considered reasonable to anticipate from the information available that the Source O Booster option could be delivered in a manner which avoids any adverse effects on the integrity of the European Sites. This is through a combination of sensitively designing, programming and constructing options and through the use of standard mitigation techniques. The potential pathway relating to water quality is one that can be resolved through standard mitigation measures. However, this must be confirmed based on project design. HRA will therefore be required at project stage to fully assess all potential impacts upon European sites once the option design has been finalised and the construction programme is known.

Taking into account the requirements and controls set out above, it can reasonably be concluded that the inclusion of the Source O Booster option in WRMP24 will not have an adverse effect on the integrity of the European sites either alone or in-combination.

8.2. Water Framework Directive

The WFD TN available as Appendix G presents the findings of the Water Framework Directive (WFD) assessment that has been undertaken as part of the environmental assessment process to support the development of the WRSE Emerging Regional Plan.

The WFD assessments have been undertaken by WRSE and results considered in the undertaking of the SEA of Portsmouth Water's WRMP24. The Level 1 WFD assessments have been reviewed and updated for the WRMP24 Schemes. The Level 2 assessment has been undertaken only on those supply options selected

before 2050 by the WRSE Best Value Plan (BVP), Best Environmental and Societal Plan (BESP) or the Least Cost Plan (LCP) and is based on the All Companies Working Group methodology for each of the Schemes.

The pre-2050 Portsmouth Water option selected in the WRSE BVP, BESP and LCP is listed as follows:

- Source S Drought Permit

In summary, the L2 assessment for this drought permit option concludes that there is Medium risk for the temporary increased abstraction from the Chichester Chalk to be WFD non-compliant and, therefore, further assessment is required to ensure that the additional abstraction does not negatively impact under the quantitative GWDTE, dependent surface water body and water balance tests.

8.3. Biodiversity Net Gain

Biodiversity Net Gain (BNG) is a specific, measurable outcome of project activities that deliver demonstrable and quantifiable benefits to biodiversity compared to the baseline situation. Biodiversity metrics provide a way of measuring and accounting for biodiversity losses and gains resulting from development and/or land management change.

A BNG assessment forms an integral part of the Strategic Environmental Assessment and the inclusion of BNG as part of the WRMP24 environmental assessment process is supported by the updated Water Resources Planning Guideline Supplementary Guidance 'Environmental Society in Decision Making' (November 2021).

BNG assessments for the two emerging Portsmouth Water options were screened out as they will not result in a change in land use.

8.4. Natural Capital

Natural capital assessments (NCA) are required in order to evaluate the impact of the proposed Portsmouth Water (PW) options on the natural environment through an assessment of the impact of the Option on the natural capital stocks and subsequent ecosystem services these stocks provide.

This was undertaken by Water Resources South East's (WRSE) in accordance with the WPRG SG. A condition under this is that only supply-side options are within scope of a NCA, of which there are four options for PW.

All four supply side options were either scoped out of a natural capital assessment by WRSE, included in the baseline scenario for Portsmouth Water, or allocated as options to other water companies (due to being a transfer between two water companies). This means that there are no numerical outputs of the NCAs of PW options due to no expected future impacts, or the costs and benefits were allocated to other water companies.

This analysis contributes to the wider dWRMP objectives of PW through highlighting that the proposed options are not expected to materiality harm the natural capital stocks of the region.

8.5. Invasive Non-Native Species

This INNS risk assessment (the risk of INNS being introduced and spread through the functioning of each scheme via transfer pathways that may become active once the scheme is operational) has been undertaken through a Level 1 screening assessment only. The Level 1 screening assessment is used to determine whether any schemes are considered high-enough risk to warrant a Level 2 risk assessment using the Environment Agency's standardised risk assessment tool.

Water Resources South East's (WRSE) high-level screening methodology was used for this assessment which accounts for frequency in which transfers would be operational and the severity of their impact, as inferred by the nature and volume of water being transferred. These criteria formed a screening matrix for assessment, in which only schemes scoring 'low', 'medium' or 'high' are taken forward for a Level 2 assessment.

The Level 1 WRSE screening outcome (considering the general scheme type only) for the two schemes concluded that neither required a further Level 2 risk assessment, as all were considered to have 'very low' INNS transfer risk. As such, no further review of these high-level screening outcomes was undertaken.

9. Assessment of Alternatives

9.1. Introduction

Water resource planning is complicated and there is a lot of uncertainty, largely as it is an exercise in understanding the current water supply system that reflects past decision making processes, against future scenarios that are influenced by aspects such as climate change, population growth, changes in technology and economic outcomes. At all times, there is a need to ensure that the company can achieve a secure supply of water for the period 2025 – 2075. Where a risk of deficits in supply are identified, a series of 'demand side' (measures that reduce demand for water) and 'supply side' (measures that increase supply) Options are considered and incorporated into modelling, with the goal of identifying a preferred set of Options to meet the requirements and objectives of the Plan.

Traditionally, plans were developed to meet deficits at the least cost. Whilst this is still an important criterion, there are other factors which are considered. It was the aim of Portsmouth Water to develop a plan that represents 'best value'. A best value plan is defined as one that considers factors alongside economic cost and seeks to achieve an outcome that increases the overall benefit to customers, the wider environment and overall society. WRSE were tasked with developing the decision-making approach and tool (the investment model) that would be used by all companies in WRSE to select their preferred plan[7], as set out in Chapter 1.

In addition to developing the BVP, and as required by the revised Water Resources Planning Guidelines (WRPG), further optimisation runs were also automatically shortlisted by WRSE, to benchmark and appraise the BVP against. All alternatives where constrained to securing a wholesome supply of water to customers and other sectors (multi-sector plan) over the planning period. WRSE developed two reasonable alternatives for each water company:

- **Least Cost Plan**: The model was run in adaptive mode, solving all the future branches and design drought conditions simultaneously, but optimising to minimise cost only (i.e., no other objectives are optimised). The outputs from various runs of the least cost plan helped to identify the options that are selected most frequently, and the potential tipping points along the adaptive pathways. This helped to inform decision-making around best value.
- **Best Environmental and Societal Plan:** This programme is not optimised on cost, but the programme that Portsmouth Water consider delivers best overall environment and society value outcomes. This takes into account overall performance across the SEA, Natural Capital and Biodiversity Net Gain metrics, and through engagement with stakeholders.

Through the process of adaptive planning and considering strategic alternatives to the BVP, Portsmouth Water considered the modelling outputs of all nine adaptive planning pathways, and the two strategic alternatives to consider both what plans would look like if it was optimised on Least Cost, or on producing the best environmental and social metrics.

Comparing outputs for all nine adaptive pathways for the BVP, Portsmouth Water considered that the draft Preferred Plan is resilient and largely unchanged across the variety of Strategic alternatives considered. **Please see the WRSE SEA Report[8] for full discussion of this process and environmental findings made.**

[7] WRSE Method Statement (Jan 2022) and 'Developing our 'best value' multi-sector regional resilience plan' (Feb 2022)
[8] WRSE Draft Regional SEA Environmental Report, September 2022. (all WRSE documents can be located in the WRSE library: https://www.wrse.org.uk/library)

10. Assessment of Options within WRMP24

10.1. Introduction

In order to meet the requirements of WRMP24 to ensure Portsmouth Water customers and communities have continued adequate amounts of clean drinking water supplies available, a series of Options for enabling supplies have been identified and included within the Plan.

Stage B2 of the SEA process normally involves the generation and assessment of plan options. This exercise is undertaken in part to fulfil the requirements of the SEA Regulations, which requires that the Environmental Report should consider:

'reasonable alternatives taking into account the objectives and the geographical scope of the plan or programme' (SEA Regulations Part 3 Section 12 (2)b.

10.2. Development of Options

It is normal practice when developing a Plan to propose different ways (options) of fulfilling its objectives. In respect of the WRMP24, a series of Options were set out which can be implemented in a phased approach to address identified water supply requirements. The range of Options identified (along with the yield and year they are anticipated to be in service) are as follows:

Supply Side Options

Table 10-1 - Supply Side Options in WRMP24

Option	Year in Service	Brief description
Upgrade Source O Booster	2030	Upgrade to pumping station to remove a 'bottleneck' in the supply network and improve movement of water through the system, to allow 'freeing up' of water resources where they are needed.
Drought Permit: Source S	2026	Under normal conditions, Portsmouth Water's Source S source typically outputs between 1 Ml/d and 2.5 Ml/d and is constrained by the daily and annual average licensed rate of 2.5 Ml/d. Portsmouth Water is proposing the inclusion of a drought permit within its Drought Management Plan (DMP) to increase the licensed daily abstraction limit at Source S by 8.5 Ml/d to 11 Ml/d for about 6 months; to ensure necessary operational flexibility the individual annual and QRST Group licensed quantities may also need to be varied
Potable Resource for SRN Source A to Source A	2049	Reversal of flow in the existing and planned bulk supplies to Southern Water (i.e. once Southern Water has more water in Hampshire, bulk supplies from Portsmouth Water to Southern Water will end and instead supplies from Southern Water will be received to Portsmouth Water)
Import: PWC at SRN Source D extension	2027	This is an extension to an existing bulk supply (Portsmouth Water to Southern Water).
Import: PWC Source A to SRN Reservoir	2030	Part of Havant Thicket Option (21 Ml/d) (Portsmouth Water to Southern Water).
Works A increased treatment capacity	2030	Part of Havant Thicket Option
Havant Thicket Winter Storage Reservoir	2030	Havant Thicket Winter Storage Reservoir is a significant construction project being developed in collaboration between Portsmouth Water and Southern Water. It will provide resilient water supplies to the region, supporting reduced abstraction on

		chalk rivers. The project has an overall biodiversity net gain and will offer a new community leisure facility for the area.
Import: PWC Source A Extension	2030	This is an extension to an existing bulk supply (24 Ml/d) (Portsmouth Water to Southern Water).
Conjunctive Benefit of SRN Works A to Havant Thicket	2031	This Option is related to the Southern Water effluent reuse scheme
Recycling: Recharge of Havant Thicket reservoir from SRN Works A and new WRP	2031	This Option is the Southern Water effluent reuse scheme

While all of the above Options are noted in the WRMP24 Best Value Plan, only those relating to Upgrade to Source O Booster and Source S Drought Permit are detailed in this SEA. The reason for this is that the other Options noted are either existing bulk supplies, approved bulk supplies, associate Options with adjacent water companies or are part of the Havant Thicket Option which has already received planning permission. All of these Options have been treated as part of the Baseline to the WRMP24.

Demand Side Options

Table 10-2 - Demand Side Options in WRMP24

Option	Year	Brief Description
Company Demand: Gov-led B Hybrid	2027	Involves the water efficient labelling that has already been announced by DEFRA, the potential for minimum standards in water using goods, plus enhanced support on new developments that could be introduced in the future to support national targets. Of note, water efficient labelling systems (WELS) were identified in the Water UK 'Pathways to Long-Term PCC Reduction' report as the most significant and cost beneficial approach to demand management.
Demand Basket High Plus Company	2026	The demand option increases each year. By 2049/50 the cumulative saving is expected to be 39.14 Ml/d for both annual average and critical period planning conditions.
Non-essential use bans	2026	Between the start of the plan in 2025–26 until 2039–40 These options are no longer needed when the level of resilience that is planned for in the WRMP improves from a 1 in 200 to a 1 in 500 year drought event.
Temporary use bans	2026	As above

More information on the above Options is contained within the relevant Assessment tables within Appendix E, with further detail also available within WRMP24.

Each Option has been assessed against the SEA Framework in respect of construction and operation phases and considering positive and negative effects separately. Full details of the assessment for each Option is provided within Appendix E. Where available, the assessment tables have been supplemented with Option IDs, descriptions and mitigation that is considered embedded as part of the option.

To allow for the identification of different levels of effects when assessing the WRMP24 proposals, a scoring system has been used to differentiate in terms of magnitude and significance of effects. This scoring system is widely used in SEA and is based around the following scale (colour aligned with WRSE scale) to reflect the assessment aid questions in the SEA Framework.

Table 10-3 - Assessment Scoring Scale

Assessment Scale	Assessment Category	Significance of Effect
+++	Major beneficial	Significant
++	Moderate beneficial	
+	Slight beneficial	Not Significant
0	Neutral or no obvious effect	
-	Slight adverse	
--	Moderate adverse	Significant
---	Major adverse	

It is to be noted that the scores derived will be considered 'in the round' in light of the assessment aid questions (detailed in the SEA Framework) and a judgement made as to an appropriate summary score for that aspect of the WRMP24 being considered. The commentary provided explains the rationale behind the score. Any recommendations are noted, as are references to appropriate additional mitigation that is proposed to maximise beneficial effects and/or minimise/avoid any potential adverse effects identified.

This scoring system seeks to capture both the nature and the scale of predicted effects arising from the Options set out in the WRMP24. Alongside the overall summary rating (colour and symbol), the assessment tables attempt to identify the nature of the effects of the WRMP24 on the SEA objectives according to the level of detail required by the SEA Directive. This includes commentary on the effects, magnitude, scale, duration, permanence and certainty as shown in Table 10-4.

Table 10-4 - Characteristics of effect

Magnitude (size of effect)	Scale (implications of effect)	Duration (length of time over which effect will be present)	Permanence (lasting of effect)	Certainty (that effect will occur)
Large (L) Medium (M) Small (S)	Local (L) Regional (R) National (N) Global (G)	Long term (LT) Medium term (MT) Short term (ST)	Temporary (T) Permanent (P)	High (H) Medium (M) Low (L)

The commentary below will focus on significant effects only. These are effects which are considered to be moderate or major adverse/positive, as set out in Table 10-5 'Assessment Scoring Scale' table. The full details of the assessment for each Option are however provided within Appendix E.

Note that the assessment of significance, presented for each Option, in the summaries below, are presented in terms of residual effects (i.e., after any additional mitigation is applied) in respect of construction and operation.

The SEA objectives are:

1. To protect and enhance biodiversity, priority species, vulnerable habitats and habitat connectivity and achieve biodiversity net gain
2. To protect and enhance the functionality, quantity and quality of soils
3. To protect and enhance the quantity and quality of surface, groundwater, estuarine and coastal waterbodies
4. To reduce and minimise air and noise emissions
5. To achieve Portsmouth Water target of reducing carbon emissions to Net Zero by 2030 and contribute to national target of Net Zero by 2050
6. To reduce vulnerability of built infrastructure to climate change risks and hazards
7. To reduce or manage flood risk, taking climate change into account
8. To conserve, protect and enhance landscape, townscape and seascape character and visual amenity
9. To conserve, protect and enhance the historic environment and assets, including archaeology
10. To maintain and enhance the health and wellbeing of the local community, including economic and social wellbeing
11. To maintain and enhance tourism and recreation
12. To minimise resource use and waste production
13. To avoid negative effects on built assets / infrastructure

It is to be noted that where appropriate, the SEA has been informed by the findings of the Water Framework Directive, Biodiversity Net Gain, Natural Capital and Habitats Regulations Assessments. The findings of these assessments are contained within Appendices G to K.

10.3. Overview of assessment results

The following tables provide an overview of the assessment 'scores' for all of the Options considered within the SEA, for both the construction and operation phases (post mitigation). The assessment findings of each option is then discussed in turn, with full detail provided in Appendix E.

Table 10-5 - Construction Scores (Post Mitigation)

		Biodiversity		Soil		Water		Air Quality		Greenhouse Gas Emissions		Climate Factors				Landscape		Cultural Heritage		Population and human health				Material Assets						
		To protect and enhance biodiversity, priority species, vulnerable habitats and habitat connectivity and achieve biodiversity net gain		To Protect and enhance the functionality, quantity and quality of soils		To protect and enhance the quantity and quality of surface, groundwater, estuarine, coastal waterbodies and water dependent habitats		To reduce and minimise air and noise emissions		To achieve Portsmouth Water target of reducing carbon emissions to Net Zero by 2030 and contribute to national target of Net Zero by 2050		To reduce vulnerability of built infrastructure to climate change risks and hazards		To reduce or manage flood risk, taking climate change into account		To conserve, protect and enhance landscape, townscape and seascape character and visual amenity		To conserve, protect and enhance the historic environment and assets, including archaeology		To maintain and enhance the health and wellbeing of the local community, including economic and social wellbeing		To maintain and enhance tourism and recreation		To minimise resource use and waste production		To avoid negative effects on built assets / infrastructure		
Option Name	Plan Featured	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-
Source O Booster	BVP, BESP, LCP	0	-	0	0	0	0	0	-	0	-	0	0	0	0	0	0	-	0	0	0	0	0	0	0	-	0	-
Source S drought permit	BVP, BESP, LCP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Company Demand: Gov-led B Hybrid	BVP, BESP, LCP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Demand Basket High Plus Company	BVP, BESP, LCP	0	-	0	0	0	-	0	-	0	-	0	-	0	0	0	0	-	0	-	0	-	0	0	0	-	0	-
NEUBS	BVP, BESP, LCP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TUBS	BVP, BESP, LCP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Table 10-6 - Operation Scores (Post Mitigation)

		Biodiversity		Soil		Water		Air Quality		Greenhouse Gas Emissions		Climate Factors				Landscape		Cultural Heritage		Population and human health				Material Assets			
		To protect and enhance biodiversity, priority species, vulnerable habitats and habitat connectivity and achieve biodiversity net gain		To Protect and enhance the functionality, quantity and quality of soils		To protect and enhance the quantity and quality of surface, groundwater, estuarine, coastal waterbodies and water dependent habitats		To reduce and minimise air and noise emissions		To achieve Portsmouth Water target of reducing carbon emissions to Net Zero by 2030 and contribute to national target of Net Zero by 2050		To reduce vulnerability of built infrastructure to climate change risks and hazards		To reduce or manage flood risk, taking climate change into account		To conserve, protect and enhance landscape, townscape and seascape character and visual amenity		To conserve, protect and enhance the historic environment and assets, including archaeology		To maintain and enhance the health and wellbeing of the local community, including economic and social wellbeing		To maintain and enhance tourism and recreation		To minimise resource use and waste production		To avoid negative effects on built assets / infrastructure	
Option Name	Plan Featured	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-	+	-
Source O Booster	BVP, BESP, LCP	0	0	0	0	+	--	0	-	0	-	0	-	0	0	0	0	0	0	0	0	0	0	0	0	+	0
Source S drought permit	BVP, BESP, LCP	0	--	0	0	+	--	+	-	+	-	++	-	0	0	0	0	0	0	++	0	0	0	++	0	+	0
Company Demand: Gov-led B Hybrid	BVP, BESP, LCP	+	0	0	0	++	0	+	0	+	0	+	0	0	0	0	0	0	0	+	0	0	0	+	0	0	0
Demand Basket High Plus Company	BVP, BESP, LCP	++	0	0	0	++ +	0	+	0	+	0	+	0	+	0	+	0	0	0	+	0	0	0	0	0	+	0
NEUBS	BVP, BESP, LCP	+	-	0	-	+	0	+	0	+	0	+	0	0	0	0	-	0	0	0	-	0	-	+	0	0	-
TUBS	BVP, BESP, LCP	+	-	0	-	+	0	+	0	+	0	+	0	0	0	0	-	0	0	0	-	0	-	+	0	0	-

10.3.1. Supply Options

The following provides an overview of assessment results for Supply Side Options considered. Note that the assessment of significance is presented in terms of residual effects (i.e., after any additional mitigation is applied) in respect of construction and operation. A discussion on these assessment results follows, with full details of the assessment for each Option provided within Appendix E.

Upgrade Source O Booster to 25Mld

Supply Side Option		SEA Objective												
		1	2	3	4	5	6	7	8	9	10	11	12	13
Source O Booster														
Construction	Positive Residual Effects	0	0	0	0	0	0	0	0	0	0	0	0	0
	Negative Residual Effects	-	0	0	-	-	0	0	-	0	0	0	-	-
Operation	Positive Residual Effects	0	0	+	0	0	0	0	0	0	0	0	0	+
	Negative Residual Effects	0	0	--	-	-	-	0	0	0	0	0	0	0

Modelling has shown that the Source O Boosters are a bottleneck for moving water throughout the Portsmouth Water network and it has been shown that increasing the boosters maximum flow rate resulted in a significant increase in Water Resource Zone Deployable Output. This option involves upgrades required to secure pumping at 25 Ml/d from the Source O Boosters. A key element of this will be the replace the existing pumps (a total of three which were installed in 1998 and are approaching the end of the working life), with new pumps and variable speed drives for additional operational benefit. There would also be some pipe upgrades around the pumping station to allow for more efficient pumping.

It is anticipated that this option would not result in any significant adverse or beneficial effects during its construction. No slight beneficial effects during construction were identified either, though slight adverse effects are anticipated during construction in respect of Objective 1 due to potential effects on groundwater having an adverse effect on designated sites. Slight adverse effects are also anticipated from construction on air and noise emissions (Objective 4), carbon emissions (Objective 5), visual amenity (Objective 8) as the Option is located in the South Downs National Park, resource use and built assets (Objectives 12 and 13) due to the requirement for materials and potential effects on the transport network.

It is anticipated that all construction effects would be small scale, short term and temporary to the construction phase.

During operation, slight beneficial effects are anticipated in respect of Objective 3 (water quality) as it will help to contribute to resilience of supply and in respect of Objective 13 (built assets / infrastructure), the upgrade of this infrastructure will ensure that it remains as a valued built asset.

Slight adverse effects are anticipated in respect of air and noise emissions (Objective 4), carbon emissions (Objective 5), and vulnerability of built infrastructure to climate change (Objective 6).

The operation of this Option will likely produce significant adverse effects in relation to one SEA objective:

- **Objective 3: 'To protect and enhance the quantity and quality of surface, groundwater, estuarine, coastal waterbodies and water dependent habitats'** moderate adverse effects as the potential for lowering of the water table where the upgrade works result in additional abstraction may impact on nearby Chalk rivers and the Chichester Chalk groundwater body.

It is anticipated that operational effects would be at the local scale, but would be long term (as per the lifespan of the infrastructure) and effectively permanent.

Drought Permit: Source S

Supply Side Option	SEA Objective												
	1	2	3	4	5	6	7	8	9	10	11	12	13

Source S drought permit														
Construction	Positive Residual Effects	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Negative Residual Effects	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Operation	Positive Residual Effects	0	0	+	+	+	++	0	0	0	++	0	++	+
	Negative Residual Effects	--	0	--	-	-	-	0	0	0	0	0	0	0

The option looks to increase abstraction from the Source S source from licensed limit of 2.5Ml/d to 8.5 Ml/d or 11.5 Ml/d when Swanbourne Lake is already dry (i.e. in a severe drought 1:100 or worse - not dry due to abstraction). This would require a drought permit. Under normal dry conditions abstraction from Source S is limited due to its assumed impact on the SSSI (but artificial) Swanbourne Lake (at Arundel). The Source S source is part of the QRST Group. The group abstraction licence limited to 41 Ml/d and not more than 2,100 Ml in any period of 60 days. The permit would increase the group limit to 49.5 Ml/d.

As the existing infrastructure at Source S is sized for the original licence (11Ml/d) which was reduced to 2.5Ml/d in 1996, implementation of the new drought permit would not require modifications to the site nor construction of new ancillary infrastructure as operation would revert back to using the higher capacity pumps.

There is no construction phase associated with this option thus no effects on the SEA objectives emerging from construction.

A small number of slight beneficial effects are anticipated in respect of Objective 3 (water quality) as it will help ensure water supply during drought conditions, Objective 4 and 5 (air, noise and carbon emissions) as it may help reduce the need for additional intensive external transfers and abstractions with greater emissions implications. In addition, slight beneficial effects are anticipated in respect of Objective 13 (built assets / infrastructure) as the drought permit may act to alleviate demand restrictions which have the potential to impact on built assets by enforcing cleaning and maintenance restrictions.

During operation, slight adverse effects are anticipated in relation to biodiversity (Objective 1), Objective 4 and 5 (air, noise and carbon emissions) due to additional pumping and treatment requirements leading to emissions, as well as Objective 6 (vulnerability to climate change) as ultimately this could result in additional pressure on remaining resources.

Effects are anticipated to be local in scale, short term and temporary.

The operation of this option will likely produce significant (moderate) adverse effects in relation to two SEA objectives:

- **Objective 1: 'To protect and enhance biodiversity, priority species, vulnerable habitats and habitat connectivity and achieve biodiversity net gain'**, as the EAR (2022) records likely impacts on designated sites as up to major adverse for Arundel Park SSSI (unit 2) and for Arun Valley Watersfield to Arundel LWS. This effect is considered to be of regional scale, short term and temporary to the drought period.
- **Objective 3: 'To protect and enhance the quantity and quality of surface, groundwater, estuarine, coastal waterbodies and water dependent habitats'**, as the additional abstraction of groundwater from subterranean chalk spring, which supply groundwater to proximate waterbodies within the vicinity of the borehole (e.g. Swanbourne Lake and Arundel Park) and the increased abstraction limit may potentially exacerbate the effects of drought on the local water system regarding supply and recovery. This effect is considered to be of local scale, short term and temporary to the drought period. Note that the WFD Level 2 assessment concluded that there is a possible risk of WFD status deterioration (Chichester Chalk groundwater body).

The operation of this option will likely produce significant beneficial effects in relation to three SEA objectives:

- **Objective 6: 'To reduce vulnerability of built infrastructure to climate change risks and hazards'**, as implementation of this measure will increase resilience to climate change.

- **Objective 10: 'To maintain and enhance the health and wellbeing of the local community, including economic and social wellbeing'** owing to the options capacity to ensure provision of drinking water during periods of drought.
- **Objective 12: 'To minimise resource use and waste production'** as the drought permit has the potential to reduce the need for more resource intensive external transfers and abstractions.

Beneficial effects are considered to be of local scale, short term and temporary to the drought period.

10.3.2. Demand Side Options

The following provides an overview of assessment results for Demand Side Options considered. Note that the assessment of significance is presented in terms of residual effects (i.e., after any additional mitigation is applied) in respect of construction and operation. A discussion on these assessment results follows, with full details of the assessment for each Option provided within the SEA Appendices.

Company Demand: Gov-led B Hybrid

Demand Management		SEA Objective												
		1	2	3	4	5	6	7	8	9	10	11	12	13
Company Demand: Gov-led B Hybrid														
Construction	Positive Residual Effects	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Negative Residual Effects	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Operation	Positive Residual Effects	+	0	++	+	+	+	0	0	0	+	0	+	0
	Negative Residual Effects	0	0	0	0	0	0	0	0	0	0	0	0	0

It is to be noted that this Option applies across the whole of the Portsmouth area. The option involves the water efficient labelling that has already been announced by DEFRA, the potential for minimum standards in water using goods, plus enhanced support on new developments that could be introduced in the future to support national targets. Of note, water efficient labelling systems (WELS) were identified in the Water UK 'Pathways to Long-Term PCC Reduction' report as the most significant and cost beneficial approach to demand management.

There is no construction phase associated with this option thus no effects on the SEA objectives emerging from construction.

In relation to the operation phase of this Option, it is anticipated that there will be no adverse effects on any of the SEA Objectives. A number of slight positive effects have been identified. These positive effects include in relation to Biodiversity (Objective 1), where it is anticipated that these measures will help to keep water in the environment and reduce resource pressures and with consequent benefits for water dependent habitat and species. A reduction in demand may also provide slight benefits in respect of air, noise and carbon emissions (Objective 4 and 5) through reduced need for treatment and pumping. Keeping water in the environment may also help avoid negative effects on the built environment (Objective 6). An increased awareness through labelling should also result in improved health and wellbeing (e.g. reduced stress), where the measures will reduce the need for more disruptive action (Objective 10). This Option will also help to reduce and minimise the use of water which is considered a valuable resource and help reduce waste in its treatment (Objective 12).

These noted beneficial effects, though slight, can be considered of regional scale and permanent.

The operation of this option will likely produce moderate significant beneficial effects in relation to one SEA objective:

- **Obj 3: 'To protect and enhance the quantity and quality of surface, groundwater, estuarine, coastal waterbodies and water dependent habitats'**, due to water being kept within the environment, the protection of water resources, reduced pressures on water supplies and improved efficiency.

It is anticipated that this effect will be of regional scale and can be considered permanent.

Demand Basket High Plus Company

Demand Management	SEA Objective												
	1	2	3	4	5	6	7	8	9	10	11	12	13

Demand Basket High Plus Company														
Construction	Positive Residual Effects	0	0	0	0	0	0	0	0	0	0	0	0	0
	Negative Residual Effects	-	0	-	-	-	-	0	-	-	-	0	-	-
Operation	Positive Residual Effects	++	0	+++	+	+	+	+	+	0	+	0	+	+
	Negative Residual Effects	0	0	0	0	0	0	0	0	0	0	0	0	0

The option involves:

- Compulsory metering – Household
- AMI / Smart metering
- Enhanced metering – Household
- Optant metering
- Water use audit and inspection – Household and non-household water efficiency
- Awareness campaigns – Targeted water conservation information (advice on appliance water usage)
- Promotion of water saving devices – Retrofitting (new or subsidised)
- Reduction in other consumption
- Leakage reduction - trunk mains and service reservoir leakage reduction
- Leakage reduction - Pressure reduction programmes
- Customer supply pipe leakage reduction (non-metering options)
- Leakage reduction - Customer engagement / education / incentives
- Leakage reduction - Active Leakage Control

It is to be noted that this Option applies across the whole of the Portsmouth area. It is anticipated that this option would not result in any significant adverse or beneficial effects during its construction. During construction though, a number of slight adverse effects have been identified. These include on Biodiversity (Objective 1),where there may be minor effects such as disturbance or small areas of habitat loss during repair works. Similar slight adverse effects could be expected through the activities associated with repair works on water quality (Objective 3), air, noise and carbon emissions (Objective 4 and 5), built infrastructure (Objective 6), landscape and visual amenity (Objective 8), the historic environment (Objective 9), health and wellbeing due to disturbance causing effects on wellbeing (stress) induced by repair works (Objective 10). Repair works will also lead to the use of resources and increase waste (Objective 12), while there may be effects on built infrastructure (Objective 13) such as road surfacing.

Such construction adverse effects are anticipated to be local scale, short term and temporary to the construction / repair phase.

A range of slight beneficial effects have been identified associated with the operation phase of this Option. These include in relation to air, noise and carbon emissions (Objective 4 and 5) as reduced water pumping and treatment is required. Keeping water in the environment may also help avoid negative effects on the built environment (Objective 6). Network improvements are also likely to lead to a reduction in pipe bursts and help to reduce the risk of accidental flooding (Objective 7). More water will also be retained in the environment and help maintain visual amenity (Objective 8). Reduced need for disruptive actions will also help maintain health and wellbeing (Objective 10) and reduced leakage, increased awareness, and action to conserve water will acts to minimise resource use and waste production (Objective 12). Reduced leakage and improved repair etc. will help maintain built infrastructure (Objective 13).

Such construction / repair benefits, while small scale, will be long term and can be considered permanent.

The operation of this Option will likely produce significant beneficial effects in relation to two SEA objectives:

- **Obj 1: 'To protect and enhance biodiversity, priority species, vulnerable habitats and habitat connectivity and achieve biodiversity net gain'**, due to awareness campaigns, retrofitting, metering and leakage reduction works resulting in water being kept within the environment, the protection of water resources, reduced pressures on water supplies and improved efficiency.
- **Obj 3: 'To protect and enhance the quantity and quality of surface, groundwater, estuarine, coastal waterbodies and water dependent habitats'**, due to awareness campaigns, retrofitting, metering and leakage reduction works resulting in water being kept within the environment. reduced resource pressures, protection of water resources and increasing availability for water dependant habitat and species.

These beneficial effects can be considered of local scale but long term and can be considered permanent.

Non-essential use bans

Supply Bans		SEA Objective												
		1	2	3	4	5	6	7	8	9	10	11	12	13
NEUBS														
Construction	Positive Residual Effects	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Negative Residual Effects	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Operation	Positive Residual Effects	+	0	+	+	+	+	0	0	0	0	0	+	0
	Negative Residual Effects	-	-	0	0	0	0	0	-	0	-	-	0	-

This Option would apply to the whole of the Portsmouth area. NEUBs target non-domestic users and may only be implemented following approval of an Ordinary Drought Order by the Secretary of State. Typically, NEUBs would include:

- Watering outdoor plants on commercial premises
- Filling or maintaining a non-domestic swimming or paddling pool
- Filling or maintaining a pond
- Operating a mechanical vehicle-washer
- Cleaning any vehicle, boat, aircraft or railway rolling stock;
- Cleaning any exterior part of a non-domestic building or non-domestic wall
- Cleaning a window of a non-domestic building
- Cleaning industrial plant
- Suppressing dust
- Operating cisterns on unoccupied buildings

There is no construction phase associated with this Option thus no effects on the SEA objectives emerging from construction. In relation to operational effects, while no significant beneficial effects have been identified, there are anticipated to be a number of slight beneficial effects, and these are mainly associated with the outcome of reducing demand and potentially reducing abstraction / treatment. Slight beneficial effects are anticipated in relation to Biodiversity (Objective 1) as more water will remain in the environment, with consequent benefits for water dependant species and habitats. Reduced abstraction will help maintain river and groundwater levels (Objective 3) and this could have beneficial effects on built infrastructure by helping to ensure soil moisture does not reduce to a level that could pose a risk to infrastructure foundations (Objective 6). Reduced treatment and pumping will also reduce air, noise and carbon emissions (Objectives 4 and 5). Reduced abstraction, treatment and pumping will also reduce the use of resources and waste produced (Objective 12).

It is considered that all slight beneficial effects will be at the very local scale, short term and temporary.

It is not anticipated that the operation of this option will produce significant adverse effects in relation to any of the SEA objectives. A number of slight adverse effects have been identified though. In relation to Biodiversity (Objective 1), the restrictions on watering plants and using hosepipes may have minor adverse effects on pollinators, insects, fish (domestic ponds) and birds (bird baths) where gardens are found to support such

biodiversity. There could also be effects on soils (Objective 2) through dust generation and erosion e.g. in gardens or other such open spaces. Lack of ability to water open spaces, or operate ornamental fountains etc. could impact visual amenity and landscapes (Objective 8). Non-essential use ban is likely to have minor negative effects on the community and social well-being (Objective 10) as there will be restrictions on irrigation of gardens and allotments and use of water for recreational purposes. There may also be a small increased risk of fires in allotments as vegetation dries out. Risk to human health and wellbeing may also be increased where dust suppression measures cannot be implemented and cleaning of paths and other infrastructure restricted. This may increase health and safety risks. Assuming commercial properties including gardens are exempt from bans and restrictions there is likely to be only a minor effect on tourism and recreation (Objective 11). Non-commercial tourism sites may be affected. In addition, while temporary, the Option is likely to impact on the maintenance of buildings and industrial plant (Objective 13).

It is considered that all slight adverse effects will be short term and temporary and confined to the local scale.

Temporary use bans (TUBs)

Supply Bans		SEA Objective												
		1	2	3	4	5	6	7	8	9	10	11	12	13
TUBS														
Construction	Positive Residual Effects	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	Negative Residual Effects	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Operation	Positive Residual Effects	+	0	+	+	+	+	0	0	0	0	0	+	0
	Negative Residual Effects	-	-	0	0	0	0	0	-	0	-	-	0	-

This Option would apply to the whole of the Portsmouth area. TUBs are restrictions which cover the outdoor use of water for household purposes and can be introduced quickly. It is considered that these would be introduced in phases and include the following components:

- Watering a garden using a hosepipe
- Cleaning a private motor-vehicle using a hosepipe
- Watering plants on domestic or other non-commercial premises using a hosepipe
- Cleaning a private leisure boat using a hosepipe
- Filling or maintaining a domestic swimming or paddling pool
- Drawing water, using a hosepipe, for domestic recreational use
- Filling or maintaining a domestic pond using a hosepipe
- Filling or maintaining an ornamental fountain
- Cleaning walls, or windows, of domestic premises using a hosepipe
- Cleaning paths or patios using a hosepipe

There is no construction phase associated with this option thus no effects on the SEA objectives emerging from construction. In relation to operational effects, while no significant beneficial effects are identified, there are a number of slight beneficial effects anticipated and these are mainly associated with the outcome of reducing demand and potentially reducing abstraction / treatment. Slight beneficial effects are anticipated in relation to Biodiversity (Objective 1) as more water will remain in the environment, with consequent benefits for water dependant species and habitats. The option aims to reduce the water required for supply, therefore resulting in a reduction in abstraction which will help maintain river flows and protect ground water and surface water bodies (Objective 3) and this could have beneficial effects on built infrastructure by helping to ensure soil moisture does not reduce to a level that could pose a risk to infrastructure foundations (Objective 6). Reduced treatment and pumping will reduce air, noise and carbon emissions (Objectives 4 and 5). Reduced abstraction, treatment and pumping will also reduce the use of resources and waste produced (Objective 12).

It is considered that all slight beneficial effects will be at the very local scale, short term and temporary.

It is not anticipated that the operation of this option will produce significant adverse effects in relation to any of the SEA objectives. A number of slight adverse effects have been identified though. In relation to Biodiversity

(Objective 1), the restrictions on watering plants and using hosepipes may have minor adverse effects on pollinators, insects, fish (domestic ponds) and birds (bird baths) where gardens are found to support such biodiversity. There could also be effects on soils (Objective 2) through dust generation and erosion e.g. in gardens or other such open spaces. Lack of ability to water open spaces, or operate ornamental fountains etc. could impact visual amenity and landscapes (Objective 8). Non-essential use ban is likely to have minor negative effects on the community and social well-being (Objective 10) as there will be restrictions on irrigation of gardens and allotments and use of water for recreational purposes. There may also be a small increased risk of fires in allotments as vegetation dries out. Wellbeing impacts associated with reduced water based recreational activities which improve tolerance and capacity to enjoy higher temperatures. Assuming commercial properties including gardens are exempt from bans and restrictions there is likely to be only a minor effect on tourism and recreation (Objective 11). Non-commercial tourism sites may be affected. In addition, while temporary, the Option is likely to impact on private assets / residential properties (Objective 13).

It is considered that all slight adverse effects will be short term and temporary and confined to the local scale.

11. Mitigation

11.1. Introduction

The term mitigation encompasses any approach that is aimed at preventing, reducing or offsetting any significant adverse environmental effects that have been identified. In practice, a range of measures applying one or more of these approaches is likely to be considered in mitigating any significant adverse effects predicted as a result of implementing the WRMP24. In addition, it is also important to consider measures aimed at enhancing positive effects. All such measures are generally referred to as mitigation measures.

However, the emphasis should be in the first instance on proactive avoidance of adverse effects. Only once alternative options or approaches to avoiding an effect have been examined, should mitigation then examine ways of reducing the scale / importance of the effect.

Mitigation can take a wide range of forms, including:

- Refining Intervention measures in order to improve the likelihood of positive effects and to minimise adverse effects;
- Technical measures (such as setting guidelines) to be applied during the implementation phase;
- Identifying issues to be addressed in project assessment, such as Environmental Impact Assessment and the development of Environmental Management Plans for certain projects or types of project;
- Proposals for changing other plans and programmes; and
- Contingency arrangements for dealing with possible adverse effects.

11.2. Mitigation approaches applied through the SEA

A number of mitigation approaches have been used throughout the development of the Water Resource Management Plan, in order to mitigate potential effects (significant or otherwise). Of note is that within a number of Options, ‘embedded mitigation’ has been considered. ‘Embedded mitigation’ is mitigation that has been incorporated into the development of the Option and is set out for each Option in the tables below. Through the SEA process, further ‘additional mitigation’ has also been identified and this is also set out in Table 10-1 to 11-6. ‘Additional mitigation’ is mitigation that is required to address specific issues relating to significant effects in addition to ‘embedded mitigation’ and identified through the SEA process.

Table 11-1 - Source O Booster Mitigation

Source O Booster	
Embedded Mitigation considered in Option assessment	
None identified	
Additional Mitigation derived from Option assessment	
Objective 1: To protect and enhance biodiversity, priority species, vulnerable habitats and habitat connectivity and achieve biodiversity net gain	During the replacement of the pumps standard pollution control best practices will be applied at all times, and although HRA appropriate assessment will be required these measures are considered sufficient to mitigate for any significant effect on the designated sites. HRA Mitigation as follows: • Best practice measures during construction. • Sensitive design and avoidance/mitigation measures required during construction in order to minimise impacts. Further details on the required works and anticipated pollution levels are required in order to determine the likely impacts on the Chichester Chalk groundwater body.
Objective 2: To Protect and enhance the functionality, quantity and quality of soils	Best practicable means to prevent impacts associated with contaminated land.
Objective 3: To protect and enhance the quantity and quality of surface, groundwater, estuarine, coastal waterbodies and water dependent habitats	Further assessment to understand potential to impact on Chalk river habitat and groundwater resources.
Objective 4: To reduce and minimise air and noise emissions	Best practice mitigation measures implemented during construction, however minor and temporary impacts on air quality may remain. Investigate use of renewables during operation for energy supply
Objective 5: To achieve Portsmouth Water target of reducing operational carbon emissions to Net Zero by 2030 and contribute to national target of Net Zero by 2050	Investigate use of renewables during construction and operation for energy supply and use of materials with lower embodied carbon. Carbon footprint study could help identify areas for carbon savings or alternative materials. As the electricity grid is decarbonised, greener energy will be available.
Objective 6: To reduce vulnerability of built infrastructure to climate change risks and hazards	Monitor water levels, especially during long dry periods.
Objective 7: To reduce or manage flood risk, taking climate change into account	None identified

Objective 8: To conserve, protect and enhance landscape, townscape and seascape character and visual amenity	Best practicable means to minimise visual intrusion during construction.
Objective 9: To conserve, protect and enhance the historic environment and assets, including archaeology	None identified
Objective 10: To maintain and enhance the health and wellbeing of the local community, including economic and social wellbeing	None identified
Objective 11: To maintain and enhance tourism and recreation	None identified
Objective 12: To minimise resource use and waste production	Seek opportunity to implement sustainable design measures (design to reduce footprint, selection of materials) and reuse excavated material to reduce the impact, however it is likely that minor negative effects will remain. This may involve a Site Waste Management Plan and consideration of the waste hierarchy.
Objective 13: To avoid negative effects on built assets / infrastructure	Best practice measures including a Traffic Management Plan to be implemented to minimise disturbance during construction. However, minor and temporary effects are likely to still occur.

Table 11-2 - Source S Drought Permit Mitigation

Source S Drought Permit	
Embedded Mitigation considered in Option assessment	
None identified	
Additional Mitigation derived from Option assessment	
Objective 1: To protect and enhance biodiversity, priority species, vulnerable habitats and habitat connectivity and achieve biodiversity net gain	Further investigation/modelling required to improve certainty of effect on receptors including Arundel Park SSSI and Arun Valley Watersfield to Arundel LWS and dependant species.
Objective 2: To Protect and enhance the functionality, quantity and quality of soils	None identified
Objective 3: To protect and enhance the quantity and quality of surface, groundwater, estuarine, coastal waterbodies and water dependent habitats	Further WFD assessment and modelling required.
Objective 4: To reduce and minimise air and noise emissions	None identified
Objective 5: To achieve Portsmouth Water target of reducing operational carbon emissions to Net Zero by 2030 and contribute to national target of Net Zero by 2050	Investigate use of renewables during operation for energy supply. As the electricity grid is decarbonised, greener energy will be available.
Objective 6: To reduce vulnerability of built infrastructure to climate change risks and hazards	None identified
Objective 7: To reduce or manage flood risk, taking climate change into account	None identified
Objective 8: To conserve, protect and enhance landscape, townscape and seascape character and visual amenity	None identified
Objective 9: To conserve, protect and enhance the historic environment and assets, including archaeology	None identified
Objective 10: To maintain and enhance the health and wellbeing of the local community, including economic and social wellbeing	None identified

Objective 11: To maintain and enhance tourism and recreation	None identified
Objective 12: To minimise resource use and waste production	None identified
Objective 13: To avoid negative effects on built assets / infrastructure	None identified

Table 11-3 - Company Demand: Gov-led B Hybrid Mitigation

Company Demand: Gov-led B Hybrid	
Embedded Mitigation considered in Option assessment	
None identified	
Additional Mitigation derived from Option assessment	
Objective 1: To protect and enhance biodiversity, priority species, vulnerable habitats and habitat connectivity and achieve biodiversity net gain	None identified
Objective 2: To Protect and enhance the functionality, quantity and quality of soils	None identified
Objective 3: To protect and enhance the quantity and quality of surface, groundwater, estuarine, coastal waterbodies and water dependent habitats	None identified
Objective 4: To reduce and minimise air and noise emissions	None identified
Objective 5: To achieve Portsmouth Water target of reducing operational carbon emissions to Net Zero by 2030 and contribute to national target of Net Zero by 2050	None identified
Objective 6: To reduce vulnerability of built infrastructure to climate change risks and hazards	None identified
Objective 7: To reduce or manage flood risk, taking climate change into account	None identified
Objective 8: To conserve, protect and enhance landscape, townscape and seascape character and visual amenity	None identified
Objective 9: To conserve, protect and enhance the historic environment and assets, including archaeology	None identified
Objective 10: To maintain and enhance the health and wellbeing of the local community, including economic and social wellbeing	None identified

Objective 11: To maintain and enhance tourism and recreation	None identified
Objective 12: To minimise resource use and waste production	None identified
Objective 13: To avoid negative effects on built assets / infrastructure	None identified

Table 11-4 - Demand Basket High Plus Company Mitigation

Demand Basket High Plus Company	
Embedded Mitigation considered in Option assessment	
None identified	
Additional Mitigation derived from Option assessment	
Objective 1: To protect and enhance biodiversity, priority species, vulnerable habitats and habitat connectivity and achieve biodiversity net gain	Ensure best practicable means to prevent loss of habitat during construction. Use of access shafts (or similar) for leakage works would be used to avoid ecologically sensitive locations.
Objective 2: To Protect and enhance the functionality, quantity and quality of soils	Land reinstated upon completion of leakage works. Best practice construction measures to be implemented.
Objective 3: To protect and enhance the quantity and quality of surface, groundwater, estuarine, coastal waterbodies and water dependent habitats	None identified
Objective 4: To reduce and minimise air and noise emissions	Best practice mitigation measures implemented during construction. Consider use of electric vehicles to complete retrofitting, home visits and meter instillation.
Objective 5: To achieve Portsmouth Water target of reducing operational carbon emissions to Net Zero by 2030 and contribute to national target of Net Zero by 2050	Investigate use of renewables during construction.
Objective 6: To reduce vulnerability of built infrastructure to climate change risks and hazards	None identified
Objective 7: To reduce or manage flood risk, taking climate change into account	Measures to reduce the impact on flooding during the construction phase (leakage reduction works) should still be implemented
Objective 8: To conserve, protect and enhance landscape, townscape and seascape character and visual amenity	Best practice measures will likely be implemented to minimise effects during construction (leakage reduction works), however minor and temporary impacts may remain
Objective 9: To conserve, protect and enhance the historic environment and assets, including archaeology	Best practice measures will likely be implemented to minimise effects during construction (leakage reduction works), however minor and temporary impacts may remain.
Objective 10: To maintain and enhance the health and wellbeing of the local community, including economic and social wellbeing	Best practice mitigation measures e.g. noise management to be implemented to minimise effects during construction (leakage reduction works). However, minor and temporary effects are likely to still occur.

Objective 11: To maintain and enhance tourism and recreation	None identified
Objective 12: To minimise resource use and waste production	None identified
Objective 13: To avoid negative effects on built assets / infrastructure	Best practice measures including a Traffic Management Plan to be implemented to minimise disturbance during construction (leakage reduction works). However, minor and temporary effects are likely to still occur.

Table 11-5 - NEUBS Mitigation

NEUBS	
Embedded Mitigation considered in Option assessment	
None identified	
Additional Mitigation derived from Option assessment	
Objective 1: To protect and enhance biodiversity, priority species, vulnerable habitats and habitat connectivity and achieve biodiversity net gain	Risk of INNS to be considered when banning washing of water craft. Consider mandating of visual inspections to ensure no transfer of INNS
Objective 2: To Protect and enhance the functionality, quantity and quality of soils	None identified
Objective 3: To protect and enhance the quantity and quality of surface, groundwater, estuarine, coastal waterbodies and water dependent habitats	None identified
Objective 4: To reduce and minimise air and noise emissions	None identified
Objective 5: To achieve Portsmouth Water target of reducing operational carbon emissions to Net Zero by 2030 and contribute to national target of Net Zero by 2050	None identified
Objective 6: To reduce vulnerability of built infrastructure to climate change risks and hazards	None identified
Objective 7: To reduce or manage flood risk, taking climate change into account	None identified
Objective 8: To conserve, protect and enhance landscape, townscape and seascape character and visual amenity	None identified
Objective 9: To conserve, protect and enhance the historic environment and assets, including archaeology	None identified
Objective 10: To maintain and enhance the health and wellbeing of the local community, including economic and social wellbeing	Allowing allotments limited supplies of water and ensuring high levels of communication before, during and following the implementation of these measures will mitigate these effects.

	Consider exemptions where dust suppression would alleviate impacts on particularly vulnerable groups e.g. construction works near hospitals, schools, nursery and care homes.
Objective 11: To maintain and enhance tourism and recreation	None identified
Objective 12: To minimise resource use and waste production	None identified
Objective 13: To avoid negative effects on built assets / infrastructure	None identified

Table 11-6 - TUBS Mitigation

TUBS	
Embedded Mitigation considered in Option assessment	
None identified	
Additional Mitigation derived from Option assessment	
Objective 1: To protect and enhance biodiversity, priority species, vulnerable habitats and habitat connectivity and achieve biodiversity net gain	None identified
Objective 2: To Protect and enhance the functionality, quantity and quality of soils	None identified
Objective 3: To protect and enhance the quantity and quality of surface, groundwater, estuarine, coastal waterbodies and water dependent habitats	None identified
Objective 4: To reduce and minimise air and noise emissions	None identified
Objective 5: To achieve Portsmouth Water target of reducing operational carbon emissions to Net Zero by 2030 and contribute to national target of Net Zero by 2050	None identified
Objective 6: To reduce vulnerability of built infrastructure to climate change risks and hazards	None identified
Objective 7: To reduce or manage flood risk, taking climate change into account	None identified
Objective 8: To conserve, protect and enhance landscape, townscape and seascape character and visual amenity	None identified
Objective 9: To conserve, protect and enhance the historic environment and assets, including archaeology	None identified
Objective 10: To maintain and enhance the health and wellbeing of the local community, including economic and social wellbeing	Allowing allotments limited supplies of water and ensuring high levels of communication before, during and following the implementation of these measures.

Objective 11: To maintain and enhance tourism and recreation	None identified
Objective 12: To minimise resource use and waste production	None identified
Objective 13: To avoid negative effects on built assets / infrastructure	None identified

12. Cumulative, synergistic and indirect effects

12.1. Introduction

As noted in the SEA Directive, there is a requirement to consider secondary, cumulative and synergistic effects of implementation of the WRMP24. Secondary effects are effects that are not a direct result of the WRMP24, but which occur away from the original effect or as the result of a complex pathway. Cumulative effects arise where several proposals or elements individually may or may not have significant effect but in-combination have a significant effect due to spatial crowding or temporal overlap. Synergistic effects are when two or more effects act together to create an effect greater than the simple sum of the effects when acting alone

12.2. Likely cumulative effects

WRMP24 options which have the potential for cumulative effects have been identified (as required by the SEA Regulations) from the analysis of plans and programmes, the baseline data, consultation responses and an examination of the identified key issues and cumulative, synergistic and indirect effects have also been considered during the SEA.

12.3. In-plan cumulative effects

The results of the direct effects of the WRMP options are discussed in Chapters 9 and 10. It is considered that the options can interact cumulatively across environmental issues either through construction or operation.

In respect of the WFD Assessment, the cumulative assessment looks at whether the individual options that make up the regional plan could have in-combination effects that would affect the WFD objectives of a waterbody, noting that while an individual option may not affect WFD status on its own, when combined with another option or group of options, there could be an in-combination effect.

Of the pre-2050 PW options selected by the BVP, only two water supply options are selected (Source S Drought Permit and the Upgrade to Source O Booster to 25Ml/d. The assessment finds that the only water body potentially impacted by both pre-2050 BVP water supply options is the GB40701G505200 Chichester Chalk groundwater body. The Upgrade Source O Booster to 25Mld option was screened out during Level 1 assessment as it is the option activities are considered to present a low risk of WFD impact, even in combination with any other options. However, the Level 2 assessment of the Drought Permit: Source S option concluded individually that there was a WFD Medium impact risk of deterioration or of not achieving target objectives and these risks remain. This is the only risk that remains under a pre-2050 BVP selected option cumulative assessment.

With regards to the HRA, in-plan cumulative effects were not identified owing to the screening out of the Source S Drought Permit option which left the Source O Booster option as the only supply option progressing to Appropriate assessment.

12.3.1. Construction In-plan cumulative effects

There are 10 supply options that feature in Portsmouth Waters BVP however many of these are already in operation and represent extensions to existing baseline conditions (see Section 9.2 for further details). It is anticipated that construction or repair / refurbishment works are limited to just two of the options in the BVP, the Upgrade to ‘Source O Boosters’ (to 25Ml/D) and the ‘Demand Basket High Plus’.

However, while the location of the Source O Boosters is known, it is not possible to know at this stage precisely where measures taken under the ‘Demand Basket High Plus’ will take place. These could include works such as leakage reduction on trunk mains or at reservoirs. However, such activities and their consequent effects are anticipated to be small scale and will be localised to specific areas (reservoirs or trunk mains). It is also anticipated that in general such works would be undertaken at a wide spatial scale (at various locations across the Portsmouth area) and likely to be undertaken on a rolling programme, with little or no spatial overlap and undertaken at different times. Similarly, it is anticipated that the works to the Source O Boosters will be very localised (a key element being replacement of existing pumps). As such it is anticipated that there will be no cumulative effects in relation to construction.

12.3.2. Operational In-plan cumulative effects

As noted in Section 9.2, many of the supply side options that feature in the BVP represent existing options that are reflected in the baseline conditions and therefore unlikely to give rise to cumulative effects.

It is anticipated that the Demand Management Options noted in WRMP24 will apply across the whole of the Portsmouth area and are anticipated to have cumulative beneficial effects from reducing the demand for water. For example, while Demand Management Options such as NEUBs and TUBs would typically be implemented in a phased, sequential manner, it is the intention that such measures will act to reduce pressure on water resources by reducing demand for water and as such, reduce the need for abstraction, treatment and onward pumping. This will act cumulatively across the Plan area and into nearby / linked resource areas. Savings in water would likely have cumulative beneficial effects in respect of resilience to biodiversity (Obj. 1), the water environment (Obj. 3), reducing carbon, air and noise emissions (Obj. 4 and Obj. 5), climate change (Obj. 6), maintaining health and wellbeing (Obj. 10), as well as minimising resource use (Obj. 12). While some of the savings made are anticipated in themselves small and benefits would be slight, it is to be noted that cumulatively effects could be significant and of importance given that these will be implemented in a drought situation when the environment is naturally under stress. Other Demand Management measures would apply at all times and act cumulatively to continually reduce pressure on sources, with consequent permanent benefits for people and the environment.

12.4. In-combination cumulative effects with other plans and projects

WRSE have undertaken a cumulative effects assessment for the programme of WRMP options selected before 2050 and post 2050 for each of its constituent water companies. Those options have been identified from the WRSE investment model within Situation 4 for each of the BVP, LCP and BESP.

The WRSE assessment considered the options identified in the three plans of each water company that were selected by 2050 are within 500m of the water company boundaries. Where an environmental receptor such as a designated site falls within the 500m buffer region, any options impacting these designated sites (even if the option is over 500m from the company boundary) were considered within the assessment. Options that do not have defined geographical locations such as temporary use bans (TUBS), non-essential use bans (NEUBS), catchment management options, media campaigns and demand management options are also considered within the WRSE cumulative effects assessment.

In respect of Portsmouth Water supply options, WRSE have identified the following options that were included in the WRSE cumulative assessment:

- Drought Permit: Source S
- Recharge of Havant Thicket reservoir from SRN Works A and new WRP

In respect of the Source S Drought Permit, moderate adverse effects are attributed. WRSEs in-combination effects assessment identified a potential risk of WFD deterioration to the GB40701G505200: Chichester Chalk groundwater body as a result of the simultaneous operation of Drought option: North Arundel Drought Permit/Order (2025 onwards) and Source S Drought Permit. The assessment suggested that in the event of a drought event where both emergency drought groundwater options were operational, an in-combination effect would occur which could lead to temporary reduction in groundwater levels, leading to potential changes in the water balance and surface water dependant status elements.

Regarding the Recharge of Havant Thicket reservoir from SRN Works A and new WRP option, cumulative adverse effects, including significant adverse effects, have been identified across a range of objectives owing to its proximity to adjacent Southern Water options. This includes to objectives relating to soils and contaminated land owing to the potential disturbance of contaminants in historic landfill sites and on air quality, landscape (South Downs National Park) and on local communities and the noise environment during construction. Further construction cumulative adverse effects have been identified in respect of biodiversity (including on chalk rivers), heritage owing to the options situation near numerous listed buildings and being within Titchfield Abbey Conservation Area and on material assts due to proximity to major roads, railways and national cycle networks.

Cumulative assessment of these options is provided in WRSEs Draft Regional Plan (Section 5) Table 5.2 – Table 5.4 and a summary of the assessment provided in Section 5.3.1.4 of that report.

There are a large number of other plans relating to the Portsmouth Water area. These include spatial plans which will set out how development in local areas will take place, such as the draft Portsmouth Local Plan (2021) and the Portsmouth City Local Plan (2006), East Hampshire Adopted Local Plan / Joint Core Strategy (2014), Gosport Borough Local Plan 2038 and Action Plans such as Somerstown and North Southsea Area Action Plan (2012). There are also plans which are to address particular environmental or social issues such as the South East River Basin District – River Basin Management Plan (December 2015), or the Joint Strategic

Flood Risk Assessment (Partnership for Urban South Hampshire) which is currently under review and the Portsmouth surface water management plan. All such Plans have been considered as part of the SEA, for example to help identify baseline and are set out in Appendix B.

Within the above noted plans (as well as those not listed here), there are measures set out which could result in construction activities (of potentially significant scale), or operational plans. However, as noted above, it is anticipated that construction activities related to Options within WRMP24 will be small scale and of localised effect. A range of mitigation measures have been noted within this SEA which would act to reduce effects, many of which could be included in construction Environmental Management Plans – these would be further developed through detailed scheme design and would reflect conditions and context prevailing at that time. In addition, it is to be expected that all major infrastructure such as that which may arise from other Plans, will be developed within the appropriate Planning framework and will itself be subject to measures to ensure cumulative effects are addressed. As such, no significant cumulative effects are anticipated in respect of other plans in relation to any of the SEA Objectives at this stage.

A key element of the wider Portsmouth Water approach to water management is the development of the Havant Thicket reservoir. Clearly this project will require significant construction activities, but it is anticipated that there will be no construction cumulative effects for the reasons outlined above (the Options within WRMP24 being relatively small scale in construction / refurbishment terms, the mitigation measures identified and the expectation of the reservoir being developed within a strictly controlled construction and planning framework).

It is considered that there will be no cumulative effects between the Demand Management Options within WRMP24 and the Havant Thicket development, other than these will increase the availability of water from the reservoir (by reducing demand across the water resource zone).

In respect of HRA, it is considered feasible for the options selected within WRMP24 to have no adverse effects on the integrity of European sites in-combination with other plans and projects provided they are sensitively designed and mitigation adequately addresses all potential impacts alone and in-combination. However, a detailed in-combination assessment cannot be undertaken until the project stage. This is due to the potential for effects to be avoided or designed out and for temporal scope of impacts alone and in-combination to be more accurately assessed.

Project-level HRA will be required for all of the options taken through to AA and should take on board the high-level in-combination assessment presented here.

13. Monitoring

The SEA Regulations state that *'shall monitor the significant environmental effects of the implementation of each plan or programme with the purpose of identifying unforeseen adverse effects at an early stage and being able to undertake appropriate remedial action'* (Part 4 Post Adoption Procedures Regulation 17). In addition, the Environmental Report should provide information on a '*description of the measures envisaged concerning monitoring*' (Schedule 2 Information for Environmental Reports).

In line with the SEA Regulations, monitoring will cover significant environmental effects and it will involve measuring indicators that will enable the establishment of a causal link between the implementation of the WRMP24 and the likely significant effects (both positive and negative) being monitored. The SEA Regulations make clear that it is not necessary to monitor everything, or to monitor an effect indefinitely, rather monitoring should focus on those identified significant environmental effects. The DCLG guidance states that it is inappropriate to monitor everything, and monitoring proposals should be focused on the following areas:

- Identify potential breaches of international, national, or local legislation, recognised guidelines, or standards.
- Actions which may give rise to irreversible damage, with a view to identifying trends before such damage occurs.
- Where there was any uncertainty in the SEA and where monitoring would enable prevention or mitigation measures to be taken.

In short, it is the intention that the results of the monitoring will be of particular benefit to those involved with the further iterations of the WRMP24 (which will be of particular importance to help further consideration of this Adaptive Plan) and if required, will allow early remediation to be undertaken of any identified adverse effects.

13.1. Monitoring programme

It should be noted that many of the effects identified that would arise from implementation of the Options contained within the WRMP24 will be experienced during construction of infrastructure only and will not be experienced during operation of these facilities. In these circumstances monitoring will be restricted to the construction phase only.

It is also to be noted that as options are brought forward for development, further specific monitoring requirements may be incorporated in detailed designs and plans accompanying scheme development (including, where applicable, formal applications for any required environmental permits or abstraction licences, planning permission, as well as any scheme-specific HRA and WFD assessments). These will be discussed with relevant regulatory and statutory bodies and stakeholders to agree the appropriate scale and duration of such scheme-specific monitoring activities proportionate to the assessed environmental risks. The following table provides a list of monitoring that can be utilised to ensure that monitoring can be aligned with requirements of SEA Objectives for both construction and operation phases and will act to ensure any adverse effects can be identified. These could be included in Environmental Management Plans for both construction and operation, or measured across the company.

It is also the case that a number of Options within the WRMP24 are continuations or expansions of existing operational practice and are subject to existing regulatory requirements. No additional monitoring is therefore envisaged over that already being carried out by Portsmouth Water in relation to those Options. At present Portsmouth Water undertake water quality monitoring data from a series of boreholes, in order to demonstrate DWI compliance. In addition, monitoring is undertaken in respect of groundwater levels and river flows, along with some general environmental monitoring in certain catchments. Use is also made of a range of monitoring carried out by stakeholder organisations such as Environmental Agency and adjacent water companies such as Southern Water. It is anticipated that this monitoring will continue.

Table 13-1 - Proposed monitoring

Objective	Overview of typical effect	Requirement for monitoring	Options to which Monitoring applies
Objective 1: To reduce vulnerability of built infrastructure to climate change risks and hazards	The climate is changing. This is anticipated to result in more extreme weather events which could disrupt or destroy infrastructure, including that related to water supply, on a more frequent basis.	• No. of days / hours when water infrastructure disrupted (loss of service) due to extreme weather events	Company wide and across all Options
Objective 2: To reduce or manage flood risk, taking climate change into account	Increased occurrence of extreme weather events due to a changing climate could increase flood risk, or increase the area at risk of flooding. Flood risk can also occur due to the increase in areas of hardstanding or loss of floodplain due to the construction of infrastructure, including that related to water supply infrastructure.	• No. of days / hours when water infrastructure disrupted (loss of service) due to flooding • Area (Ha) of flood plain lost • No. of projects where flood risk compensation was required or increase provided	Company wide and across all Options
Objective 3: To protect and enhance the quantity and quality of surface, groundwater, estuarine, coastal waterbodies and water dependent habitats	Construction and operation of the water supply network can have a wider range of effects on the water environment, resulting in changes in water quantity within the environment, for example due to increased abstraction and water quality through pollution incidents.	• Changes in WFD condition (positive or negative) of relevant waterbodies. • No. of pollution incidents (both during construction and operation) • Continuation of monitoring at raw water intakes.	Company wide and across all Options Source O Booster Source S Drought Permit
Objective 4: To protect and enhance biodiversity, priority species, vulnerable habitats and habitat connectivity and	Construction and operation of the water supply network can have implications for biodiversity, for example through loss of habitat or disturbance to species. There is a potential that invasive species can spread through activities associated with moving water around the network, or through activities such as maintenance.	• Area (Ha) of designated site (including geological sites) directly affected by WRMP Options • Area or length of Priority Habitat affected / restored or created	Company wide and across all Options Source O Booster Source S Drought Permit

Objective	Overview of typical effect	Requirement for monitoring	Options to which Monitoring applies
achieve biodiversity net gain		• Area of Green / Blue Infrastructure created	
Objective 5: To Protect and enhance the functionality, quantity and quality of soils	Soil is a non-renewable resource and is vulnerable to erosion, degradation and contamination. Valuable soil resources can be lost of degraded due to construction of water supply infrastructure. Pollution incidents during construction and operation can lead to contamination of the soil resource.	• Area of Best and Most Valuable (Grade 1-3a) soils lost to WRMP Options • Total area of soil reinstated for agricultural use • No. of pollution / contamination incidents during construction or operation of water supply infrastructure.	Company wide and across all Options
Objective 6: To reduce and minimise air and noise emissions	Construction or repair activities are likely to have implications for air and noise emissions. These could include dust or other particulate matter generated by the activities themselves or the required plant and vehicles. Treatment and pumping of water is likely to lead to an increase in air and noise emissions. While most facilities will operate using energy mains supply, there may be a requirement for standby generators.	• Scheme-specific monitoring during construction works / during operation (where applicable) would be monitored through an Environmental Management Plan agreed as part of the planning permission process • Number of electric generators in use and period of usage.	Company wide and across all Options
Objective 7: To achieve Portsmouth Water target of reducing operational carbon emissions to Net Zero by 2030 and contribute to national target of Net Zero by 2050	As with air and noise, construction activities are likely to result in carbon emissions. Options would also result in embedded carbon, but also potentially ongoing emissions through the requirement for energy for pumping / treating water.	• Percentage of energy use from renewable sources • Renewable energy generated on Company property • Tonnes of embedded carbon in construction of Option • Carbon emissions from Company operations • Area (Ha) planted / restored for sequestration	Company wide and across all Options Source O Booster Source S Drought Permit

Objective	Overview of typical effect	Requirement for monitoring	Options to which Monitoring applies
		• Net greenhouse gas emissions per Ml (million litres) of treated water (kg CO2 equivalent emissions per Ml) • Company fleet fuel consumption	
Objective 8: To conserve, protect and enhance landscape, townscape and seascape character and visual amenity	Construction activities can lead to effects on landscape or visual amenity, though reinstatement would remove these effects or provide opportunities to improve visual amenity. Options may lead to the creation of new infrastructure in the landscape.	• Area / length of Option located within areas designated for landscape protection • Area / length of completed reinstatement	Company wide and across all Options
Objective 9: To conserve, protect and enhance the historic environment and assets, including archaeology	Construction activities can lead to effects on historic assets, including unknown artefacts though reinstatement would remove these effects or provide opportunities to improve the setting of these assets. Dewatering of areas could damage buried assets. Archaeological investigation may provide opportunities to understand the past history of the Portsmouth area better.	• Number of scheduled monuments or other historic asset damaged or enhanced by WRMP Option • Length of pipeline routes realigned to avoid heritage assets	Company wide and across all Options
Objective 10: To maintain and enhance the health and wellbeing of the local community, including economic and social wellbeing	Construction activities could result in direct and indirect effects on health and wellbeing, as well as impact on access to community facilities or provision of services.	• Monitoring to be discussed and agreed in light of prevailing conditions with relevant Health Officers of Local Authorities in the Plan area, or any other relevant parties e.g. health or educational establishments. Consideration to be given to need for monitoring of air and noise emissions. • Number of days / hours when water supply to people on the	Company wide and across all Options

Objective	Overview of typical effect	Requirement for monitoring	Options to which Monitoring applies
		vulnerable groups register is disrupted. • Duration of highways works • Number of complaints relating to construction works	
Objective 11: To maintain and enhance tourism and recreation	Tourism and recreation are two important sectors to the Portsmouth region. Construction and operation of WRMP Options could affect both tourism and recreational facilities through direct disturbance or loss. This could be both temporary or permanent.	• No net loss of important recreational / tourism amenity caused by WRMP Option • Generation of new recreational facilities • Area of greenfield / Open Space disturbed or lost • Km of PRoW affected / lost / created by WRMP Option	Company wide and across all Options
Objective 12: To minimise resource use and waste production	Construction and operation of WRMP Options will likely require resource use (including valuable treated water) and generate waste production.	• Proportion of material reused on site • Proportion of recycled material used on site • Tonnes of construction waste sent to landfill as a proportion of total waste produced • Tonnes of sludge sent to landfill	Company wide and across all Options
Objective 13: To avoid negative effects on built assets / infrastructure	Likely effects on built assets and infrastructure. This may include the maintenance and operation of public or private buildings, transport, amenity resource, machinery and plant. Major users such as hospitals, factories and food producers may be most susceptible unless protected.	• Number and nature of complaints to be measured and discussions to take place with sensitive operators in light of prevailing conditions. • Complaints / incidence of strategic infrastructure disruption or loss of service	Company wide and across all Options

14. Summary and Conclusions

The SEA and other assessments carried out throughout the development of WRMP24 has been thorough and comprehensive. Assessment was made of an initial long list of sites and environmental issues were considered through all stages of short listing and Option development. This was at both a regional level (carried out by WRSE) and at a more 'local' level that considered issues in light of the environmental context of the Portsmouth area. Consideration of both the regional and local level has meant that two SEA teams have been involved and have acted independently of each other, though liaison has been maintained and results of assessments shared. These teams have also liaised closely with the Portsmouth WRMP making team and have challenged the Plan development team when appropriate.

Based on the findings of the SEA, it is possible to recognise a number of key considerations and draw conclusions with regards to the WRMP24 and its 'environmental performance'. These are outlined as follows.

In the first instance, it is important to recognise that while WRMP24 clearly fits within a regional context, it also needs to reflect the issues and opportunities of the Portsmouth area. Similarly, there are a range of challenges and uncertainties facing both the region and the Plan area. Notably these include climate change and the need for increased climate resilience, water stress, population growth, along with economic uncertainties. Of particular note within the Portsmouth area is that there is a need to reduce reliance on chalk aquifers and this has been a key consideration within the development of the WRMP24 and a significant driver of proposed new Options and investment required. The approach to assessment made, of considering wider regional issues (by WRSE), as well as considering a 'local' Portsmouth baseline and review of relevant plans and policies to develop a bespoke SEA Framework has resulted in an enhanced understanding of environmental issues in the Plan area and the surrounding region and this has allowed full and robust consideration of Options proposed under WRMP24.

The Adaptive plan approach that has been developed, recognises the inherent uncertainties involved in water resource planning and has been specifically designed to help water companies adopt a forward-looking approach to allow companies to plan for schemes that may be required from 2025 and beyond. The essence of this approach is that the Plan can adapt depending on which of the potential future scenarios identified occurs.

Consideration of WRSE of the adaptive planning approach identified the following three plans:

- Best Value Plan – Investment model pareto runs for Best Value Plan metrics (Customer Preference, SEA+, SEA-, Natural Capital, Carbon, Resilience (reliability, adaptability, evolvability), intergenerational equity), this is optimised on both individual Best Value Plan and cost metrics
- Least Cost Plan – Investment model run result when optimising on cost only
- Best Environmental and Societal plan - Removes the resilience metrics from the Best Value Plan

Examination was made of the trade-offs between the anticipated additional value that different portfolios of options could provide against the least cost criterion to try to derive something that is best value – for the environment, society and Portsmouth Water customers. The WRMP24 has taken the adaptive planning approach and having identified the three Plan types, further identified what is considered the most realistic scenario, alongside the most realistic future pathway and from this has outlined a series of supply options (i.e. those which in general will increase the amount of water in the supply system), alongside a series of demand options (i.e. those which will act to reduce the need for water). Having identified the Options in the Best Value Plan, WRSE carried out initial assessment of these for SEA and the associated environmental assessments of Habitats Regulations Assessment, Water Framework Directive, Biodiversity Net Gain, Natural Capital Assessment and Invasive Non-Native Species. These assessments were further built upon by Portsmouth Water, with a particular emphasis on trying to identify issues of note in a local context.

The Options identified in the Best Value Plan included both 'demand side' Options (measures that reduce demand for water) and 'supply side' Options (measures that increase supply). It is important to note that there were a series of Options that are also included but which were not subject to SEA for a range of reasons such as they are existing bulk supplies, previously approved bulk supplies, are associated with Options in adjacent water companies (and as such considered under the SEA of both WRSE and that water company),or are part of the Havant Thicket Option that has received Planning permission.

Assessment of the Options outlined considered both construction effects and those which are anticipated to occur during operation of the Option. A series of mitigation measures were also identified, with the aim of reducing or nullifying any adverse effects, while potentially maximising any beneficial effects from the Option.

For the most part, it is anticipated that the Options within WRMP24 will not require any construction activities and effects were only identified in relation to Source O Booster and the 'Demand Basket High Plus' Options. None of the identified effects noted in relation to the implementation of these Options were considered significant.

In respect of Source O Booster, slight adverse effects are anticipated during construction in respect of Objective 1 due to potential effects on groundwater having an adverse effect on designated sites. Slight adverse effects are also anticipated from construction on air and noise emissions (Objective 4), carbon emissions (Objective 5), visual amenity (Objective 8) as the Option is located in the South Downs National Park, resource use and built assets (Objectives 12 and 13) due to the requirement for materials and potential effects on the transport network.

In relation to the implementation of the 'Demand Basket High Plus' Option, slight adverse effects identified include on Biodiversity (Objective 1),where there may be minor effects such as disturbance or small areas of habitat loss during repair works. Similar slight adverse effects could be expected through the activities associated with repair works on water quality (Objective 3), air, noise and carbon emissions (Objective 4 and 5), built infrastructure (Objective 6), landscape and visual amenity (Objective 8), the historic environment (Objective 9), health and wellbeing due to disturbance causing effects on wellbeing (stress) induced by repair works (Objective 10). Repair works will also lead to the use of resources and increase waste (Objective 12), while there may be effects on built infrastructure (Objective 13) such as road surfacing.

Such construction adverse effects of both these Options are anticipated to be local scale, short term and temporary to the construction / repair phase.

During operation, effects have been identified for all Options, though only in relation to the Source O Booster and Source S have significant adverse effects been identified – in all other instances, significant effects are considered beneficial.

Operation of Source O Booster and Source S are considered to have moderate adverse effects in respect of water quality and quantity, particularly due to additional abstraction potentially impacting on nearby Chalk rivers and the Chichester Chalk groundwater body. Source S is also anticipated to have moderate adverse impacts in terms of biodiversity due to the likely impacts on designated sites.

In terms of significant beneficial effects, demand management Options provide greatest potential. This is mainly due to the clear rationale of these measures leading to a reduced need for water abstraction and treatment, leading to keeping more water in the environment and reducing pressures on water sources, as well as a reduced need for infrastructure development. Major beneficial effects are anticipated from the 'Demand Basket High Plus' Option in this regard. It is also considered that these measures would have beneficial effects in terms of biodiversity, again from keeping water in the environment and reducing pressure on sources.

Reducing demand for water will also result in beneficial effects in relation to the need for pumping and treatment, which will help reduce air, noise and carbon emissions, maintaining public health and wellbeing, reducing the requirement for resource use and helping to avoid adverse effects on built assets. On the whole though, these effects while welcome, are not considered to be significant.

Conversely, slight adverse effects were also identified. Typical examples can be seen through those identified in relation to 'Non-Essential Use Bans' where anticipated slight adverse effects include in relation to Biodiversity (Objective 1), the restrictions on watering plants and using hosepipes may have minor adverse effects on pollinators, insects, fish (domestic ponds) and birds (bird baths) where gardens are found to support such biodiversity. There could also be effects on soils (Objective 2) through dust generation and erosion e.g. in gardens or other such open spaces. Lack of ability to water open spaces, or operate ornamental fountains etc. could impact visual amenity and landscapes (Objective 8). Non-essential use ban is likely to have minor negative effects on the community and social well-being (Objective 10) as there will be restrictions on irrigation of gardens and allotments and use of water for recreational purposes. There may also be a small increased risk of fires in allotments as vegetation dries out. Risk to human health and wellbeing may also be increased where dust suppression measures cannot be implemented and cleaning of paths and other infrastructure restricted. This may increase health and safety risks. Assuming commercial properties including gardens are exempt from bans and restrictions there is likely to be only a minor effect on tourism and recreation (Objective 11). Non-commercial tourism sites may be affected. In addition, while temporary, the Option is likely to impact on the maintenance of buildings and industrial plant (Objective 13).

It is considered that all slight adverse effects will be short term and temporary and confined to the local scale.

It is important to recognise that the Demand Management Options will apply across the whole of the Portsmouth area and are anticipated to have cumulative beneficial effects from reducing the demand for water. For example, while Demand Management Options such as NEUBs and TUBs would typically be implemented

in a phased, sequential manner, it is the intention that such measures will act to reduce pressure on water resources by reducing demand for water and as such, reduce the need for abstraction, treatment and onward pumping. This will act cumulatively across the Plan area and into nearby / linked resource areas. Savings in water would likely have cumulative beneficial effects in respect of resilience to biodiversity (Obj. 1), the water environment (Obj. 3), reducing carbon, air and noise emissions (Obj. 4 and Obj. 5), climate change (Obj. 6), maintaining health and wellbeing (Obj. 10), as well as minimising resource use (Obj. 12). While some of the savings made are anticipated in themselves small and benefits would be slight, it is to be noted that cumulatively effects could be significant and of importance given that these will be implemented in a drought situation when the environment is naturally under stress. Other Demand Management measures would apply at all times and act cumulatively to continually reduce pressure on sources, with consequent permanent benefits for people and the environment.

Another important element within WRMP24 that will have ongoing beneficial effects is the Havant Thicket Reservoir and associated elements. As this Option has been granted planning permission it has not been specifically considered in this SEA, but it is worth noting here as its presence allows for this WRMP24 to concentrate on measures such as Demand Management, with consequent benefits for the environment. The development of the Havant Thicket reservoir itself is anticipated to secure more reliable water supplies for the South East region. Portsmouth Water anticipate that by using the reservoir to supply their own customers, they can then share supplies from other water sources with Southern Water. This will mean Southern Water will be able to reduce the amount of water that they take from the Chalk Rivers Test and Itchen in Hampshire, which as noted in WRMP24, are rare and sensitive chalk streams and are considered of particular value.

It is recognised that WRMP24 will not act or be delivered in isolation and will influence and be influenced by, other Plans and Policies or developments across and beyond the Portsmouth Water area and the south east as a whole. While there is a potential for cumulative effects during construction, it is anticipated that for the most part construction works associated with the WRMP are anticipated to be relatively small scale, with localised effects and for the most part likely to be spatially and temporally isolated from major infrastructure developments. A range of mitigation measures have been noted within this SEA which would act to reduce effects, many of which could be included in construction Environmental Management Plans – these would be further developed through detailed scheme design and would reflect conditions and context prevailing at that time. In addition, it is to be expected that all major infrastructure such as that which may arise from other (non-water sector) Plans, will be developed within the appropriate Planning framework and will itself be subject to measures to ensure cumulative effects are addressed.

Nevertheless, there is a potential that individual options could act cumulatively with Options within other water company areas to produce adverse effects and WRSE have identified that in the event of a drought event where emergency drought groundwater options were operational, an in-combination effect would occur which could lead to temporary reduction in groundwater levels, leading to potential changes in the water balance and surface water dependant status elements. Similarly, WRSE identified that the Recharge of Havant Thicket reservoir from SRN Works A, cumulative adverse effects, including significant adverse effects, have been identified across a range of objectives owing to its proximity to adjacent Southern Water options.

While many aspects of WRMP24 are anticipated to result in beneficial effects, it is important that Portsmouth Water understand the effect of implementation of WRMP24, particularly in regard to those areas where significant adverse effects could occur. Portsmouth Water already undertake water quality monitoring data from a series of boreholes, in order to demonstrate DWI compliance. In addition, monitoring is undertaken in respect of groundwater levels and river flows, along with some general environmental monitoring in certain catchments. Use is also made of a range of monitoring carried out by stakeholder organisations such as Environmental Agency and adjacent water companies such as Southern Water. It is anticipated that this monitoring will continue. In addition, a series of monitoring measures have been noted through this SEA that could be incorporated into Environmental Management Plans for both the construction and operation phases of Option, or which could be applied across Portsmouth Water to help understand how implementing WRMP24 will interact with the Objectives of the SEA. This would allow early identification of unforeseen adverse effects, as well as crucially build up an evidence base to inform consideration of future iterations of this adaptive plan.

In conclusion, Portsmouth Water have developed a Water Resource Management Plan (WRMP24) which has been subject to a set of thorough and comprehensive environmental assessments, at both a regional level and at a level local to the Portsmouth Water area. The assessments undertaken have been consistent in approach and resulted in iterative development of the Plan, thereby allowing the Plan to be developed in the context of a thorough understanding of the key environmental issues and constraints of the Portsmouth Water area and beyond. This allowed for a robust consideration of alternatives to the Plan and allowed identification of a Preferred set of Options. The range and significance of anticipated effects to be anticipated from implementation of the WRMP24, including

both beneficial and adverse, have been identified and mitigation proposed where required. An emphasis on Demand Management will help to ensure that water can remain in the environment, unless absolutely needed. Monitoring will help to protect the environment by allowing action from unexpected effects to be taken and will help inform future iterations of the Plan. Overall, it is considered that WRMP24 represents a well balanced approach, in terms of environmental performance, to providing water to the Portsmouth area.

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