South Staffs Water

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STRATEGIC ENVIRONMENTAL ASSESSMENT – ENVIRONMENTAL REPORT

Revised Draft Water Resources Management Plan (rdWRMP) 2024

South Staffs Water

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Blithfield Reservoir, South Staffs Water

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NON-TECHNICAL SUMMARY

INTRODUCTION

South Staffs Water (SSW) is preparing its next Water Resources Management Plan (WRMP24). The WRMP sets out how the balance between water supply and demand, and security of supply, will be maintained over a minimum of 25 years in a way that is economically, socially and environmentally sustainable. WRMPs are reviewed on a rolling five-year basis, the most recent being published in 2019.

WRMPs must comply with international, UK and national legislation pertaining to the environment, as well as associated guidance on the development of WRMPs[1]. This includes The Environmental Assessment of Plans and Programmes Regulations 2004 (the 'Strategic Environmental Assessment (SEA) Regulations'). The SEA Regulations require an assessment of the likely significant environmental effects of the plans and identifies ways in which adverse effects can be avoided, minimised or mitigated and how any positive effects can be enhanced. In doing so, the SEA will be used to inform the development and selection of the water resource management options that will comprise the WRMP24.

This Non-Technical Summary (NTS) provides an overview of the Environmental Report produced as part of the SEA of the revised draft WRMP24 (rdWRMP24). The Environmental Report represents the second formal output of the SEA of the rdWRMP24 following a Scoping Report which was issued to SEA consultation bodies in April 2021.

This Environmental Report presents the findings of the SEA and the draft version was issued for consultation alongside the draft WRMP24. Any comments received as part of this consultation process have been incorporated when producing this revised draft Environmental Report.

The following sections of this NTS:

- provide an overview of the WRW Regional Plan and the Water Resource Management Plans (WRMPs);
- describe the SEA process together with how it is to be applied to the rdWRMP24;
- presents the key issues relevant to the SEA of the rdWRMP24
- summarises the approach to undertaking the assessment of the rdWRMP24;
- summarises the findings of the SEA of the rdWRMP24 and any reasonable alternatives;
- outlines the proposed mitigation and enhancement measures identified;
- summarises the conclusions; and
- set out the next steps in the SEA of the rdWRMP24.

WATER RESOURCE PLANNING

Consistent with the National Framework[2], water resources management planning is being undertaken regionally and by all water companies in England and Wales in order to ensure reliable, resilient water supplies over the long-term planning horizon.

WATER RESOURCES WEST (WRW) REGIONAL PLAN

Water Resources West (WRW) Regional Plan covers the management of water resources in the North West of England, the West Midlands and the cross-border catchments with Wales. It includes all or part of the operational areas of Dŵr Cymru Welsh Water (DCWW), Hafren Dyfrdwy[3], Severn Trent Water (STW), SSW

1 UK Government (2022 and 2023 update) Water Resource Planning Guidance (WRPG) [online]. Available at: https://www.gov.uk/government/publications/water-resources-planning-guideline/water-resources-planning-guideline. [Accessed August 2022; noting no change required for SEA in the 2023 update].

2 Environment Agency (2020) Meeting our future water needs: a national framework for water resources. Available from: https://www.gov.uk/government/publications/meeting-our-future-water-needs-a-national-framework-for-water-resources

3 At 1st July 2018, Hafren Dyfrdwy combined the water service area of Dee Valley Water and Severn Trent lying in Wales.

and United Utilities Water (UUW). These five companies, like all water companies in England and Wales, are required[4] to prepare, maintain and publish a Water Resource Management Plan (WRMP).

The WRW Regional Plan covers the period 2025 to 2085 and addresses long-term regional and inter-regional, multi-sectoral water resources management pressures and draws on water resource options from the member water companies' WRMP24s, as well as the Strategic Resource Options[5] (SROs) being taken forward by the companies.

WRW published its Emerging Regional Plan[6] in January 2022. This identified that 215 Ml/d of new water would be needed to meet public supply demand by 2031 and that an additional 63 Ml/d would be needed by 2050, for non-public water supply sectors.

WRW has taking an integrated approach to preparing the Regional Plan and the WRMPs. WRW member water companies have used a regionally consistent set of methodologies to reflect local, regional and national needs into the development of the plans.

SSW'S WATER RESOURCE MANAGEMENT PLAN 2024

South Staffs Water's rdWRMP24 sets out the proposals to ensure continued delivery of a secure and reliable supply of water from 2025 to 2050, looking beyond out to the year 2085.

The key objectives of South Staffs Water's WRMP24 are to:

- Deliver a sustainable and resilient supply of water for both our household and non-household customers now and in the future.
- Commit to reducing the amount of water we abstract from the environment over the lifetime of the plan in order to protect and enhance the natural environment in which we operate.
- Identify the longer term uncertainties e.g. climate change, and, if required, provide adaptive pathways within the plan in order to ensure we can respond to future challenges.
- Be acceptable and affordable for our customers.

WHAT IS STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA)?

SEA became a statutory requirement following the adoption[7] of Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment. In England, this was transposed into legislation on 20th July 2004 as Statutory Instrument 2004 No.1633 - The Environmental Assessment of Plans and Programmes Regulations 2004.

SEA is a systematic decision-making support process, aiming to ensure that the likely significant environmental effects of plans and programmes are identified, described to avoid, manage or mitigate any significant adverse effects and to enhance any beneficial effects. In this context, the purpose of SEA is to encourage relevant plan authors to integrate environmental considerations into the development of any plan or programme. Generally, a SEA is therefore conducted before an Environmental Impact Assessment (EIA) is undertaken.

In this context, the purpose of the SEA of the rdWRMP24 is to:

- identify the potentially significant environmental effects of the rdWRMP24 in terms of the measures being considered by South Staffs Water for water resource management;

4 Section 37 and 37A of Water Industry Act 1991, as amended by the Water Act 2003 and the Water Act 2014.

5 The Strategic Water Resource Options (SROs) programme has been initiated by Ofwat to provide at least 1500Ml/d of water to areas of England facing a water deficit. The SRO Programme includes 17 schemes which will be funded and assessed during AMP7 to determine the right portfolio of projects to be selected by Regional Plans ready for implementation in AMP8. Schemes are evaluated at a series of decision points (Gates).

6 WRW (2022) Emerging Regional Plan, January 2022. Available from: https://static1.squarespace.com/static/5e67889204d86850e1fdcece/t/61e5a4e237970d62de92fa10/1642439906757/WRW+Emerging+Regional+Plan+Executive+Summary.pdf

7 EU law has ceased to apply in the UK under the terms of the Withdrawal Agreement and EU Treaties. The European Union (Withdrawal) Act 2018 (EUWA) has established a new body of domestic law known as retained EU law. Any references to EU Directives in this Technical Note should be read as references to the domestic legislation that implemented the Directive (including that domestic legislation as it is revised or replaced from time to time).

- help identify appropriate measures to avoid, reduce or manage adverse effects and to enhance beneficial effects associated with the implementation of the rdWRMP24 wherever possible;
- give the statutory SEA bodies, stakeholders and the wider public the ability to see and comment upon the effects that the rdWRMP24 may have on them, their communities and their interests, and encourage them to make responses and suggest improvements to the rdWRMP24; and
- inform South Staffs Water's selection of measures to be taken forward into the final WRMP24.

SEA comprises five key stages:

- **Stage A:** Scoping;
- **Stage B:** Develop and Refine Alternatives and Assess Effects;
- **Stage C:** Prepare Environmental Report;
- **Stage D:** Consult on the Draft Plan and Environmental Report and Prepare the Post Adoption (SEA) Statement; and
- **Stage E:** Monitor Environmental Effects.

Stage A of the SEA of the WRMP24 led to the production of the WRW Regional Plan and WRMP24 SEA Scoping Report[8] (as the work was undertaken as part of the development of the consistent suite of assessment methodologies to be applied to water resource plan within the WRW region). The scoping stage itself comprised five tasks that are listed below:

i. Review of other relevant policies, plans, programmes and strategies (hereafter referred to as 'plans and programmes').
ii. Collation and analysis of baseline information.
iii. Identification of key sustainability issues.
iv. Development of an assessment framework.
v. Consultation on the scope of the SEA (this Scoping Report).

Information collected and analysed (as part of tasks i and ii) reflects South Staffs Water's operational area. The Scoping Report set out the proposed framework for assessing the likely significant environmental effects of the draft WRMP24 (as well as the WRW Regional Plan). It was issued for scoping consultation for 5 weeks from the 8th April and the 13th May 2021. The representations received and how they have been taken into account are presented in **Appendix B**.

Following scoping consultation and amendment as appropriate, the framework was used to assess the likely significant environmental effects (including cumulative effects) of the water resource options contained in the draft WRMP24 and any reasonable alternatives (**Stage B**).

These assessments are presented in this Environmental Report (in a form to meet the requirements of Schedule 2 of the SEA Regulations) which was completed to accompany the draft WRMP24 and has been updated to accompany the rdWRMP24 (**Stage C**).

The draft WRMP24 and accompanying documents including the Environmental Report were submitted to the Secretary of State for Environment, Food and Rural Affairs, for a request for publication and once directed to do so, South Staffs Water published the documents for consultation (**Stage D**).

Following consultation, and within 26 weeks of consultation beginning, South Staffs Water have prepared a Statement of Response to the representations received. South Staffs Water has produced a revised draft WRMP for submission alongside the Statement of Response in May 2023. The changes associated with the representations have also been incorporated into this rdWRMP Environmental Report. The rdWRMP24 and this rdWRMP Environmental Report will be sent to the Government, however, as changes are not likely to be significant, further assessment and consultation may not be necessary. Following direction from the Government, the final WRMP24 will be published and implemented accordingly (anticipated Autumn 2023). In conjunction with publishing the final WRMP24, a Post Adoption Statement will also be issued (to meet the

[8] Wood and Ricardo (2021) Water Resources West and Water Resources Management Plan 2024 Strategic Environmental Assessment Scoping Report, Water Resources West, Dŵr Cymru Welsh Water, Hafren Dyfrdwy, Severn Trent, South Staffordshire Water, United Utilities

requirements of SEA regulation 16 (4)). This will set out the results of the consultation and SEA processes and the extent to which the findings of the SEA have been accommodated in the final plan.

The SEA requires monitoring of any resulting environmental effects of the WRMP24 (**Stage E**).

Section 1.4 of the Environment Report describes in further detail the requirement for SEA of the rdWRMP24 and the SEA process including its relationship with the preparation of the South Staffs Water's rdWRMP24.

WHAT ARE THE KEY ISSUES FOR THE WRW REGIONAL PLAN AND WRMPS?

As part of the SEA process, a review has been undertaken to identify the key economic, social and environmental issues which are relevant to the assessment of the rdWRMP24. These issues have been identified from a variety of sources, including a review of baseline data and other relevant plans and programmes. A summary of the issues identified as being most relevant to the assessment of the rdWRMP24 are shown in **Table NTS.1**.

Table NTS.1: Key Issues Relevant to the rdWRMP24

Topic	Summary of Key Issues	SEA Objectives link (see Section 4)
Biodiversity Flora and Fauna	Relevance The construction of water resources infrastructure can affect biodiversity and ecosystem resilience. Impacts may be direct (for example, the loss of, or damage to, habitats and species) or indirect (for example, disturbance due to noise and emissions to air associated with construction works). The operation of water resources infrastructure can have a range of positive and negative impacts on habitats and species and wider ecosystem resilience due to, for example, changes in hydrology, changes in water chemistry and the spread of invasive non-native species. Water infrastructure can contribute positively to biodiversity, introducing new features that can provide opportunities for nature and wildlife in the medium to long term. Discharges associated with the construction and operation of water resources infrastructure e.g., desalination can adversely affect marine habitats. Key Issues • Key pressures and risks in respect of biodiversity and nature conservation that are relevant include, inter-alia: • population growth; • habitat loss and fragmentation by development; • agricultural intensification and changes in agricultural management practices; • water abstraction, drainage or inappropriate river management; • lack of appropriate habitat management; • atmospheric pollution (acid precipitation, nitrogen deposition); • water pollution from both point and wider (diffuse) agricultural sources; • climate change and sea level rise; • recreational pressure and human disturbance; and • invasive and non-native species. • The need to protect, maintain or enhance the region's biodiversity, particularly protected sites designated for nature conservation • The need to avoid and, mitigate against, where necessary, activities likely to cause damage to natural heritage. • The need to take opportunities to improve connectivity between fragmented habitats to create functioning habitat corridors • The need to recognise the importance of allowing wildlife to adapt to climate change	Objective 1: Biodiversity Objective 4: Soils, Land Use and Geology Objective 5: Water Quality Objective 6: Water Quantity Objective 7: Flood Risk Objective 10: Climatic Factors

Topic	Summary of Key Issues	SEA Objectives link (see Section 4)
	• The need to control the spread of Invasive Non-Native Species (INNS) and eradicate them where already present • The need to engage more people in biodiversity issues so that they personally value biodiversity and know what they can do to help, including through recognising the value of ecosystem services. • The depletion and pollution of groundwater.	
Soils, Land Use and Geology	Relevance Soils are a non-renewable resource vulnerable to changes in both hydrology and land use. Hydrogeology will affect the distribution and movement of groundwater and surface water and is a key consideration for water resources planning. The construction of water resources infrastructure can affect land use and soil. Impacts may be direct (for example, the loss of, or damage to, land and soil from new development) or indirect (for example, the location of new infrastructure affecting adjacent land uses). The appropriate management and control of soils and sediments that are excavated, moved and/or stored during construction is key to their long-term sustainability. Key Issues • The need to protect geological features of importance and maintain and enhance soil function and health. • The need to manage the land more holistically at the catchment level, benefitting landowners, other stakeholders, the environment and sustainability of natural resources (including water resources). • The need to make use of previously developed land (brownfield land) and to reduce the prevalence of derelict land in the region. • The need to protect, maintain and enhance geomorphological functions and services.	Objective 1: Biodiversity Objective 4: Soil, Land Use and Geology Objective 5: Water Quality Objective 6: Water Quantity
Water - Quantity	Relevance There is growing pressure on water resources in parts of the UK, particularly the south east and east of England with proposals to meet the demand from other parts of the country including WRW. The construction of water resources infrastructure would be expected to increase the volume and resilience of the water supply. The volume and flow of water significantly affects ecological functioning and the broader environment and can be affected (potentially positively or negatively) by water resources infrastructure through, for example, changes in supply and abstraction. Key Issues • The need to improve the resilience, flexibility and sustainability of water resources in the region, particularly in light of potential climate change impacts on surface water and groundwater. • The need to ensure sustainable abstraction to protect the water environment and meet society's needs for a resilient water supply. • The need to ensure that people understand the value of water. • The need to address increased pressures on the public water supply.	Objective 1: Biodiversity Objective 4: Soils, Land Use and Geology Objective 5: Water Quality Objective 6: Water Quantity Objective 11: Economy Objective 13: Human Health
Water - Quality	Relevance Reliable access to water of good quality is an essential aspect of water resources planning. The construction of water resources infrastructure would be expected to help ensure a robust future supply of good quality water in a changing climate. The construction and operation of water resources infrastructure can have adverse impacts on water quality due to, for example, pollution.	Objective 1: Biodiversity Objective 4: Soils, Land Use and Geology Objective 5: Water Quality

Topic	Summary of Key Issues	SEA Objectives link (see Section 4)
	The operation of water resources infrastructure can have both positive and negative impacts on water quality associated with, in particular, changes to water levels as a result of abstraction or discharge. This in-turn can affect the resilience of ecosystems. The historic pollution of groundwater and nitrate concentrations present an issue for water resources infrastructure and ensuring drinking water standards are met. Key Issues • The need to further improve the quality of the region's river, estuarine and coastal waters taking into account WFD/RBMP objectives. • The need to maintain and improve the quantity and quality of groundwater resources taking into account WFD/RBMP objectives.	Objective 6: Water Quantity Objective 11: Economy Objective 13: Human Health
Water - Flood Risk	Relevance Flood risk presents a significant planning issue in the development of major infrastructure projects, both in terms of the infrastructure itself being flooded during its construction and operational phases and the changes to flood risk resulting from the infrastructure, such as increased run-off raising the flood risk in downstream areas. The operation of water resources infrastructure (e.g., reservoirs) may provide an opportunity to address flood risk issues (for example, by providing extra space for flood water storage). Key Issues • The need to reduce and manage flood risk.	Objective 5: Water Quality Objective 6: Water Quantity Objective 7: Flood Risk Objective 10: Climatic Factors Objective 11: Economy Objective 13: Human Health
Air Quality	Relevance Air quality is sensitive to changes in traffic volume and emissions from other sources such as construction plant and machinery. Increases in transport movements and works associated with the construction and operation of nationally significant water resources infrastructure could affect air quality, particularly in areas with existing air quality issues. For example, construction traffic can lead to increased nitrate deposition in sensitive habitats. Key Issues • The need to reduce air pollutant and greenhouse emissions and limit air emissions to comply with air quality standards.	Objective 1: Biodiversity Objective 4: Soil, Land Use and Geology and Soils Objective 5: Water Quality Objective 6: Water Quantity Objective 8: Air Quality Objective 13: Human Health
Climatic Factors	Relevance The availability of additional water supplies can increase the resilience of the existing water network and broader environment and support adaptation to the effects of climate change such as drought. The construction and operation of water resources infrastructure is likely to result in a net increase in energy use and greenhouse gas emissions, noting however that new infrastructure may replace older, less energy efficient infrastructure with higher emissions. The energy requirements associated with different types of water resources infrastructure will vary with the scope for the use of renewable energy greater for certain infrastructure types than for others. Water resources infrastructure may be vulnerable to the effects of climate change such as flood risk and coastal change. Key Issues • The need to reduce greenhouse gas emissions (all sectors)	Objective 1: Biodiversity Objective 5: Water Quality Objective 6: Water Quantity Objective 7: Flood Risk Objective 9: Greenhouse Gases Objective 10: Climatic Factors Objective 13: Human Health

Topic	Summary of Key Issues	SEA Objectives link (see Section 4)
	• The need to mitigate against climate change through the reduction in greenhouse gas emissions in order to contribute to risk reduction over the long term • The need to adapt to the impacts of climate change for example through, sustainable water resource management, water use efficiencies, specific aspects of natural ecosystems (e.g. connectivity), as well as accommodating potential opportunities afforded by climate change.	
Population	Relevance The growing population within the WRW area and Wales will increase the demand for water resources. Long-term growth of the economy would be expected to lead to an increase in demand for water for commercial and industrial purposes. In turn, the risk of drought or interruptions to accessing water may pose a risk to economic productivity. The construction of large-scale water resources infrastructure can represent a significant capital investment with the potential to create employment opportunities, deliver supply chain benefits and contribute to skills development in the working population. The operation of water resources infrastructure can support long term socio-economic growth by ensuring sufficient supplies of water are made available to meet demand. The affordability of water, protection of vulnerable customers and delivering best value for money is a key consideration in water company investment decisions. The construction and operation of water resources infrastructure can adversely affect businesses and communities, principally due to disruption. Consumer preference and consumer behaviour can have a strong influence on the demand for water resources. Key Issues • The need to ensure that water supplies remain affordable, in particular for deprived or vulnerable communities. • The need to ensure public awareness of drought conditions and importance of maintaining resilient, reliable public water supplies without the need for emergency drought measures • The need to ensure water quantity and quality is maintained for other users including tourists, recreational users and other users such as farmers. • The need to ensure a balance between different aspects of the built and natural environment that will help to provide opportunities for local residents and tourists, including opportunities for access to, protecting and enhancing recreation resources, green infrastructure and the natural and historic environment • The need to accommodate an increasing population	Objective 11. Economy Objective 12. Tourism and Recreation Objective 13. Human Health Objective 14. Water Resources Objective 15. Waste and Resource Use
Human Health	Relevance A reliable source of clean water is required for basic sanitation and to ensure human health. The increase in the severity of drought, particularly in the south and east of England, poses a risk to health. The detection and removal of chemicals in the drinking water supply, or in treated waste water returned to the environment, is an important aspect of maintaining a wholesome water supply. Certain aspects of water resources infrastructure, such as reservoirs, can provide valuable recreational opportunities, both for water sports and for users of the associated land such as walkers and cyclists.	Objective 11. Economy Objective 12. Tourism and Recreation Objective 13. Human Health

Topic	Summary of Key Issues	SEA Objectives link (see Section 4)
	The construction and operation of water resources infrastructure can have adverse effects on human health for example, due to noise disturbance or loss of open space. Key Issues • The need to ensure continued improvements in levels of health across the region, particularly in urban areas and deprived areas • The need to ensure continuing safe, reliable and resilient provision of water and sewerage services to maintain health and wellbeing of the population. • The need to ensure that sites of nature conservation importance, heritage assets, water resources, important landscapes and public rights of way contribute to recreation and tourism opportunities, subsequently health, well-being, and the economy.	
Material Assets	Relevance Large scale infrastructure projects have the potential to generate very high volumes of waste during both construction and operation. This waste should be managed in accordance with the waste hierarchy. Large scale water resources infrastructure may require both short-term (i.e. during construction) and long-term (i.e. during operation) use of materials that are non-renewable or are imported. In doing, so schemes may have an environmental impact that extends outside the water company operational area. Key Issues • The need to minimise the consumption of resources, including water and energy. • The need to reduce the total amount of waste produced in the region, from all sources. The need to recognise waste as a potential resource and reuse waste productively where possible to support development of the circular economy. • The need to reduce the proportion of waste sent to landfill. • The need to continue to actively control leakage from the water supply system and promote the efficient use of water to help reduce future demand for water.	Objective 1: Biodiversity Objective 4: Soils, Land Use and Geology Objective 5: Water Quality Objective 6: Water Quantity Objective 9: Greenhouse Gases Objective 10: Climatic Factors Objective 11. Economy Objective 14. Water Resources Objective 15. Waste and Resource Use
Cultural Heritage	Relevance Wetlands are fragile and vulnerable to subtle changes arising from development that can affect paleoenvironmental deposits and archaeological assets. Other aspects of the wider historic environment that could be affected include disruption to historically important water sources, the flooding or drying of deep archaeological sites and assets such as mills and bridges which can be affected by local water levels. The construction and operation of large-scale water resources infrastructure can have adverse impacts on the significance of heritage assets and archaeological remains both directly (through the loss of, or damage to, assets) or indirectly (through effects on setting). Cultural landscape is a function of the interaction between human traditions, landscape and the environment and is a highly valued feature of some areas such as National Parks. Existing water resources infrastructure including, for example, pumping stations and reservoirs can be historically important in their own right. Key Issues • The need to conserve or enhance sites of archaeological importance and cultural heritage interest, and their settings, particularly those which are sensitive to the water environment.	Objective 4: Soils, Land Use and Geology Objective 11. Economy Objective 12. Tourism and Recreation Objective 13. Human Health Objective 16: Cultural Heritage Objective 17: Landscape

Topic	Summary of Key Issues	SEA Objectives link (see Section 4)
Landscape	Relevance The construction and operation of water resources infrastructure can have adverse impacts on landscape character, visual amenity and tranquillity. Where works are located in areas of high landscape value (for example, National Parks), these effects could be significant. Water infrastructure can also contribute positively to landscapes, introducing new features that can provide opportunities for nature and wildlife in the medium to long term. Key Issues • The need to protect and improve the natural beauty of the region's AONBs, and other areas of natural beauty. • The need to protect the settings and improve the character of designated landscapes and townscapes. • The need to maintain and enhance landscape and designated sites for the enjoyment of the public.	Objective 1: Biodiversity Objective 4: Soils, Land Use and Geology Objective 11. Economy Objective 12. Tourism and Recreation Objective 13. Human Health Objective 16: Cultural Heritage Objective 17: Landscape and Townscape

The key issues listed in **Table NTS.1** above have informed the proposed framework that will be used to assess the effects of the rdWRMP24.

Section 2 of the Environmental Report summarises the review of plans and programmes relevant to the rdWRMP24 and SEA contained in **Appendix C**.

Section 3 presents an overview of the baseline analysis of social, economic and environmental characteristics, and identification of the key issues and their relevance to the assessment. The detailed baseline information is presented in **Appendix D**.

HOW HAVE THE EFFECTS OF THE REVISED DRAFT WRMP24 AND ANY REASONABLE ALTERNATIVES BEEN ASSESSED?

A draft assessment framework was developed to assess the economic, social and environmental effects of the rdWRMP24, and revised to reflect scoping consultation comments. This framework sets out a number of assessment objectives relating to the key issues identified in **Table NTS.1**. For each objective, guide questions are also provided. The assessment framework that has been used to assess the rdWRMP24 is shown in **Table NTS.2**.

Table NTS.2: Assessment Framework for the rdWRMP24

Topic	Assessment Objective
Biodiversity, Flora and Fauna	1. To protect and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species, enhance ecosystem resilience and habitat connectivity and deliver a net biodiversity gain.
	2. To protect and enhance sustainable natural resources and the ecosystem services they provide.
	3. To avoid and, where required, manage invasive and non-native species (INNS).
Soils, Land Use and Geology	4. To protect and enhance soil quantity, quality and functionality and geodiversity and ensure the appropriate and efficient use of land.
Water – Quantity	5. To protect and enhance surface and ground water levels and flows.
Water –Quality	6. To protect and enhance the quality of surface and groundwater resources.
Water – Flood Risk	7. To reduce or manage flood risk.

Topic	Assessment Objective
Air	8. To minimise emissions of pollutant gases and particulates and enhance air quality.
Climatic Factors	9. To reduce greenhouse gas emissions.
	10. To adapt and improve resilience to the threats of climate change.
Population	11. To promote a sustainable economy and maintain and enhance the economic and social well-being of local communities.
	12. To maintain and enhance tourism and recreation.
Human Health	13. To protect and enhance human health and well-being.
Material Assets - Water Resources	14. To promote and enhance the sustainable and efficient use of resilient water resources.
Material Assets – Waste and Resource Use	15. To minimise waste, promote resource efficiency and move towards a circular economy.
Cultural Heritage	16. To conserve and enhance the historic environment including the significance of heritage assets and their settings and archaeological important sites.
Landscape	17. To conserve, protect and enhance landscape and townscape character and visual amenity.

The effects of the rdWRMP24 have been assessed in a staged process, complementary to the development of the plans, and reflecting the decision-making requirements, as follows:

- **Feasible option assessment**: a high-level assessment of all feasible options (including resource management and demand management options) against the 17 SEA assessment objectives detailed in **Table NTS.2** with findings used to inform the plan decision making.
- **Preferred option assessment**: for those options selected, a more detailed assessment has been undertaken of the preferred plan options against the 17 SEA assessment objectives detailed in **Table NTS.2**.
- **Preferred programme assessment**: the cumulative effects of the preferred programme of options has been completed, to ensure that the effects of the revised draft Plan have been identified, described and evaluated (noting that the preferred programme does not require any supply options in order to meet the deficit due to an ambitious demand management programme).
- **Reasonable alternative plan assessments**: the cumulative effects of any reasonable alternative plans has been identified, described and evaluated for consideration along with the preferred plan.

  In the case of South Staffs WRMP24, the deficit for any reasonable alternative scenarios is resolved through demand side options alone and no supply options are required.

The rdWRMP24 options have been assessed based on the nature of the effect, its timing and geographic scale, the sensitivity of the human or environmental receptor that could be affected, and how long any effect might last. Assessment matrices have been used to capture the assessment of each measure in a consistent manner.

Specific guidance has been developed for what constitutes a significant effect, a minor effect or a neutral effect for each of the SEA objectives. These 'definitions of significance' help to ensure a consistent approach to interpreting the significance of effects and will help the reader understand the decisions made by the assessor.

Section 4 of the Environmental Report provides further information in relation to the approach to the assessment of the rdWRMP24.

WHAT ARE THE LIKELY SIGNIFICANT EFFECTS OF THE FEASIBLE OPTIONS?

In support of the development of the Draft WRMP, the SEA has considered 16 feasible supply options and 3 feasible demand management options.

Each option was assessed against SEA objectives to identify the likely environmental effects during both construction/implementation and operation. The options were assessed based on the nature of the effect, its timing and geographic scale, the sensitivity of the human or environmental receptor that could be affected, and how long any effect might last. Where quantified information was available for the option from South Staffs, the assessment was also informed by reference to threshold values set out in definitions of significance (see **Appendix E** to the Environmental Report).

The findings of the assessments are summarised below by option type. **Section 5 of the Environmental Report presents the detailed results of the feasible options assessment, whilst the individual feasible option assessment matrices are presented in Appendix F to the Environmental Report.**

Supply Options

Construction Effects

A total of five of the feasible supply options would require a large capital investment (capital spend of ≥£25 million) that would be likely to generate a number of employment opportunities and supply chain benefits as well as increased spend in the local economy by contractors and construction workers. Where this is the case, the options were assessed as having a significant positive effect on the local economy (SEA Objective 11). The majority of the remaining options (seven options) were assessed as having a moderate positive effect on this objective (capital spend of between £5 million and <£25 million), whilst four options (7.5.1.1, 7.5.1.2, 7.5.13 and 7.5.1.4 were scored as having a neutral effect as no capital works are associated with these options (as any construction to transfer the water is assumed to be United Utilities responsibility). HGV movements and construction works associated with several options considered to have the potential to cause disruption to built assets and infrastructure such as traffic disruption, generating a minor or moderate negative effect (six options and one option respectively) on SEA Objective 11 and leading to an overall mixed score against the objective. No significant negative effects were identified in this regard.

No other significant positive effects were identified in the assessment of the feasible supply options. However, one option was assessed as having a minor positive effect on soils, geodiversity and land use (SEA Objective 4) as new infrastructure associated with this option would be located on existing developed land, making use of an existing site and/or not requiring new land but with some uncertainty regarding the location of this options (8.3.1). The option recorded a minor negative effect as whilst works would involve the use of an existing site, due to multiple historic and permitted landfill sites located within 5km of the reservoir option it would pose a minor risk of land contamination.

Options 6.1.3 and 7.1.5 also displayed significant negative effects during construction on Objective 4 due to being located within best and most versatile agricultural land and also being located within historical landfill sites with the risk of associated contamination. A further nine options were assessed as having moderate negative effects against this objective.

Four options (7.5.1.1, 7.5.1.2, 7.5.1.3 and 7.5.1.4) were assessed as having minor positive effects on waste and resource use (SEA objective 15) as these options are expected to make use of existing infrastructure such as treatment plants and reservoirs. However, two of these options also have associated significant negative effects for this objective (options 2.2.1.1 and 2.2.2.1) with the other four options (Options 2.1.1.1, 2.3.1, 2.3.2 and 8.1.1) assessed as having moderate negative effects, due to the volume of new materials expected with the associated levels of CAPEX spend. A further 2 options (6.1.1 and 6.1.3) also have significant negative effects on waste and resource use for these reasons and a further four have been assessed as having moderate negative effects (7.1.2.1, 7.1.5, 8.1.5 and 8.3.1).

Of the 16 feasible supply options assessed for the South Staffs Water Resource Zone, the majority were assessed as having a negative effect on biodiversity (SEA Objective 1) during the construction phase with eight options identified as having major negative effects. This reflects the potential for construction works associated with the option to result in the loss or disturbance to habitats and species as a result of, for example, land take, emissions to air and noise. Of this total, 3 options (6.1.1, 7.1.5 and 8.1.5) were identified as having a significant negative effect and four options (2.2.1.1, 2.2.2.1, 6.1.3 and 7.1.2.1) were identified as having significant negative uncertain effects with several others assessed as having a moderate negative (and in some cases uncertain) effect on this objective. Options 7.5.1.1, 7.5.1.2, 7.5.1.3 and 7.1.5.4 were assessed as having a neutral effect for biodiversity as the options do not require any capital works by SSW. The remaining five options will have a moderate effect on biodiversity (2.3.1, 2.3.2, 8.1.1 and 8.3.1), one of which remains moderate uncertain (2.1.1.1).

For 6.1.1 the proposed pipeline intersecting an area of ancient woodland and also the requirement for a Stage 2 Appropriate Assessment as the use of the River Trent by the qualifying features of the River Mease SAC is uncertain. For option 7.1.5 the pipeline is partly located within a SSSI.

The pipeline involved in Option 8.1.5 intersects an SAC/SSSI. From an HRA standpoint LSEs have been identified for River Mease SAC due to the proximity of the proposed pipeline, and the potential for direct impacts to qualifying habitats and species. There is also the potential for LSE on functionally liked habitat (hydrologically connected watercourses and direct loss of terrestrial habitats suitable for otter).

Options 2.2.1.1 and 2.2.2.1 involve Blithfield Reservoir which is itself a SSSI and an area of ancient woodland is located adjacent to the reservoir. A Stage 2 Appropriate Assessment will be required to consider the mitigation measures necessary to avoid an adverse effect to the River Mease SAC.

Option 6.1.3 intersects a parcel of ancient woodland. From an HRA standpoint, a Stage 2 Appropriate Assessment will also be required to consider the mitigation measures necessary to avoid an adverse effect to the River Mease SAC. For Option 7.1.2.1 it is assumed that a trenchless technique would be used for the river crossing, however a Stage 2 Appropriate Assessment will be required to also consider the mitigation measures necessary to avoid an adverse effect to the River Mease SAC.

Seven feasible options were assessed as having a negative effect on sustainable natural resources (Objective 2), associated with all, or part of the option being constructed on greenfield land, resulting in either temporary (e.g. related to the excavation of pipeline routes, where soil/land would be reinstated following completion) or permanent (e.g. where permanent above ground infrastructure would be constructed, such as water treatment works or pumping stations) loss of habitats (biodiversity net loss), as concluded by the BNG assessment. Options 6.1.1, 6.1.3, 7.1.2.1, 7.1.5 and 8.1.1 were assessed as having moderate negative effects. Options 2.1.1.1, 8.1.5 was assessed as having minor negative effects.

Most options were assessed as having a minor negative effect on INNS (Objective 3), as despite extensive construction activities resulting in increased distribution of terrestrial and aquatic INNS, the risk was considered to be minor assuming best practice biosecurity measures were to be adopted. Options 7.5.1.1 to 7.5.1.4 have no capital works associated with them, and therefore it is not anticipated that construction would have any effect on INNS risk during the construction period.

Aside of options 7.5.1.1 to 7.5.1.4 where there are no capital works, minor negative effects were identified on water quality (SEA Objective 6) across the rest of the feasible options as construction activities near watercourses may have a minor effect on water quality which result in short-term or intermittent effects on receptors.

Construction activity associated with ten of the feasible options would take place within Flood Zones 2/3 and works may therefore be vulnerable to flooding (timing dependent). A total of seven options were considered to be particularly vulnerable to flood risk given the scale of works that would take place in Flood Zones 2 and 3; in these cases, negative effects on flood risk (SEA Objective 7) were assessed as moderate (options 2.2.1.1, 2.2.2.1, 6.1.1, 6.1.3, 7.1.2, 7.1.5 and 8.1.1). The remaining three options (2.1.1.1, 8.3.1 and 8.1.5) were assessed as having a minor negative effect against Objective 7.

Three options (8.1.1, 8.1.5 and 8.3.1) were assessed as having a minor negative effect on climate resilience (SEA Objective 10) where major development would be partially situated within Flood Zones 2 or 3 and therefore, construction works may be at risk to the effects of climate change (flooding).

A range of minor and moderate negative effects were identified against air quality (SEA Objective 8) across the twelve options requiring construction. Construction activity would generate emissions to air associated with the use of plant and machinery as well as increase in vehicle movement associated with construction activities and will likely cause short-term deterioration in local air quality. The number of vehicle movements is unknown; thus the extent of impact has been highlighted as uncertain in some cases. Moderate effects were identified where the options are nearer to built up areas or Air Quality Management Areas (AQMAs).

All of the feasible options were assessed as having a negative effect on greenhouse gas emissions (Objective 9), aside of the options 7.5.1.1, 7.5.1.2, 7.5.1.3 and 7.5.1.4 which involve no capital works. The negative effects are associated with embodied carbon in construction materials and the requirement for vehicle movements to transport materials and equipment to site, in addition to the operation of plant and machinery. Five options were assessed as having a significant negative effect on Objective 9 (Options 2.2.1.1, 2.2.2.1, 6.1.1, 6.1.3, and 8.3.1), due to the significant scale of embodied carbon associated with construction materials and the scale of the schemes, whilst seven others were assessed as having a moderate negative effect with six of

those uncertain due to volumes of materials and number of construction vehicles not being known at time of assessment.

Twelve options were assessed as having negative effects on tourism and recreation (SEA Objective 12) with three of these having significant negative effects (Options 2.2.1.1, 2.2.2.1 and 6.1.3) as construction works would be adjacent to or would cross cycling routes or walking paths, local public greenspaces and sports or recreational facilities, with the potential to affect users of such spaces/facilities. Seven options were assessed as having moderate negative effects and two options having minor negative effects.

Two options (.6.1. and 6.1.3) were assessed as having major negative effects on human health and well-being (SEA Objective 13) due to the potential for emissions from HGV movements as well as noise, vibration, dust deposition and air quality impacts from construction activity affecting residential receptors located in close proximity to development sites and along transport routes. A further four options were assessed as having moderate negative effects and six having minor effects. Those options assessed as neutral were the options without associated capital works (7.5.1.1, 7.5.1.2, 7.5.1.3 and 7.5.1.4).

A range of negative effects were identified on cultural heritage (SEA Objective 16) including two significant negative effects (on Options 6.1.1 and 6.1.3) due to the volume of listed buildings within 1km of Option 6.1.1, and the close proximity to three listed buildings. The pipeline associated with Option 6.1.3 crosses two scheduled ancient monuments.

A further three moderate negative effects and five minor effects were identified due to the potential of effects on the structure or setting of cultural heritage assets such as scheduled ancient monuments and listed buildings.

All twelve options involving construction were identified as having moderate negative effects on landscape (Objective 17) due to the potential for visual intrusion of the proposed construction works and the potential to affect designated sites in the short-term.

All options were also assessed as having a neutral effect in respect of water quality (SEA Objective 5) and water resource use (SEA Objective 14) during the construction phase. There could be a short-term change in sediment dynamics associated with the construction activities near water, however, this is expected to be minimal and is unlikely to result in a change in channel morphology. Construction of these options is not expected to have any impact on water resource use.

A range of minor and moderate negative effects during construction were also assessed against several SEA objectives for the supply side options.

Operational Effects

Significant positive effects have been assessed on Climate Resilience (SEA Objective 10) for options 6.1.3 and 7.5.1.4 where the options are supplying in excess of 50Ml/d which is deemed to be supporting community resilience to climate change. These significant effects are reflected across economy (SEA Objective 11), human health and well-being (SEA Objective 13) and Water Resource Use (SEA Objective 14), as the operation of the options would help to ensure the continuity of a safe, sustainable and secure drinking water supply which may in-turn support economic and population growth as well as improve resilience to the impacts of climate change.

Five further options (options 2.1.1, 2.3.2, 6.1.1, 7.5.1.2 and 7.5.1.3) were assessed as having significant positive effects on economy (SEA Objective 11) and human health and well-being (Objective 13) with associated moderate affects for Climate Resilience (SEA Objective 10) and Water Resource Use (SEA Objective 14). There were also several other minor and moderate effects assessed for these Objectives, as all these options would contribute to providing resilient water supply to support economy and human health and increase adaptability to the effects of climate change.

No further significant positive effects were identified for operation, but several options were identified as having moderate or minor positive effects for flood risk where options were assessed as having the potential to help alleviate or mitigate flooding in the catchment.

Option 8.3.1 was identified as having minor positive uncertain effects with respect to tourism and recreation (Objective 12) as operation of the new reservoir has the potential to have a positive impact on providing opportunities for recreation.

Additionally for five options and two options respectively, moderate and minor positive effects were recorded on Sustainable Natural Resources (SNR) (SEA Objective 2) due to the assumption that that there would be operational biodiversity net gain which would be greater than the net loss in construction.

Seven options were assessed as having minor positive effects on water quality (SEA Objective 6) such as there may be minor positive impacts on the water quality in the receiving water courses as increased flow may dilute any point source water quality pressures.

Significant negative effects were identified for INNS (SEA Objective 3) from Options 2.1.1.1, 7.1.2.1 and 7.1.5. For option 2.1.1.1 the scheme will establish a new pathway for the distribution of INNS. There is no existing pathway of transfer to Blithfield Reservoir from the River Trent, and the transfer of water in an upstream direction will create a new pathway for transferring INNS which may not currently be present at the reservoir and within the downstream watercourse. Mitigation to prevent the transfer of INNS propagules during the transfer will be required in order to reduce the INNS transfer risk.

For options 7.1.2.1 and 7.1.5 the use of a canal as a transfer mechanism in these scenarios poses a high risk, although there is an existing canal, the use of a canal for the transfer of raw water will provide a primary and secondary pathway for transfer of INNS. Additionally, abstraction and transfer to Blithfield reservoir (in the case of option 7.1.2.1) or discharge of raw water to Craner Brook (option 7.1.5) represent a new distribution pathway from a canal with significant boating traffic and numerous secondary pathways for the distribution of INNS. Mitigation is limited to standard best practice biosecurity measures (such as signs, wash down facilities for recreational users. etc), which are likely to be only effective in reducing secondary pathway risks.

Further moderate and minor negative effects were identified for SEA Objective 3 (across 11 options), such as where new habitat and transfer pathways could be established due to associated works, new secondary pathways for the distribution of INNS or where there could be an increase in propagules being transported downstream.

Three options (Options 2.2.1.1, 6.1.1, 6.1.3) were assessed as having significant negative effects on greenhouse gas emissions (SEA Objective 9) with a further five having either moderate or moderate uncertain effects and four with minor negative effects. This is due to the volume of carbon expected to be emitted during the lifetime of operation for example from additional abstraction and pumping regimes and or treatment.

Option 6.1.3 was assessed as having a significant negative uncertain effect on waste and resource use (SEA Objective 15) as operation of the option will require additional energy (764kWh/Ml) and may require the use of additional chemicals to treat raw water and vehicle movements (requiring use of fossil fuels), the effects in this regard are currently uncertain. A range of negative effects was identified for the remaining fifteen options.

Option 7.5.1.4 was identified as having significant negative uncertain effects on biodiversity (SEA Objective 1). Operational activities will include the release of raw water to the River Vyrnwy, a tributary of the River Severn, from UUW (Vyrnwy Reservoir) which has the potential to result in the introduction of non-native species, change in flows, water level and geomorphology processes. However, water to be released would be available for abstraction downstream by SST, at Hampton Loade WTW. There are uncertainties with regards to impacts of water transfer between UUW and River Severn. This may have negative impact upon the migratory qualifying features of the Severn Estuary SAC, including sea lamprey and twaite shad and supporting habitats, introduction of non-native species, and the hydrology of the estuary. The use of the River Vyrnwy, and volume of water to be released into the watercourse, needs to be considered with regards impacts to supporting habitats for the freshwater life stages of the migratory fish of the Severn Estuary SAC and Ramsar. Changes in flow and water quality in the River Severn will also need to be considered alone and in-combination with other abstractions. LSEs identified and therefore a Stage 2 Appropriate Assessment will be required. There is a significant risk of an adverse effect with the volume of water.

Fourteen other options were identified as having a range of moderate and minor effects against SEA Objective 1.

Option 6.1.3 was identified as having a significant negative uncertain effect during operation as the option intersects two scheduled ancient monuments and the nature of the effects during operation are uncertain. This is also true for Option 7.1.2.1 but to a lesser extent. It is predicted that there will be a moderate effect on heritage assets as the associated pipeline is located in close proximity to a listed building, but the nature of the effect is uncertain.

No further significant negative effects were identified during assessment of the feasibly supply options, although a range of minor and moderate negative effects resulting from operation were also assessed against several SEA Objectives.

Demand Management Options

Construction effects

During construction, the effects are limited to limited temporary effects associated with vehicle movements during their commissioning phases. They may cause disruption as a result of streetworks or nuisance. As a result of meter installations, for example, a minor negative uncertain effect has been assessed from Water Efficiency measures on greenhouse gas emissions (SEA Objective 9). This reflects the potential for embodied carbon from material production of water meters and water efficiency devices. In addition, further emissions from an unspecified number of vehicle movements to carry out the home/site visits and installations. Due to the potential for additional materials required in the case of Water Efficiency measures have been assessed as having a minor effect on waste and resource use (SEA Objective 15).

Operational effects

During operation all three options have been assessed as having significant positive effects on water quantity (SEA Objective 5) and water resource use (SEA Objective 14) due to the reduction in leaks and reduction in demand for water that these measures will provide.

The Water Efficiency measures also provide significant positive effects to economy (SEA Objective 11), and human health and wellbeing (SEA Objective 13) by helping to ensure a continual supply of clean drinking water and increase resilience of supply to South Staffs customers, supporting economic growth which could result in a positive effect on the local economy and social wellbeing. Also providing access to improved water by use of products, fixtures, and fittings. Moderate positive effects were reported for the other two demand management options against these SEA objectives.

Moderate positive effects (for Water Efficiency measures) and minor positive effects (for Leakage and Non-Household Enhanced Meters) were reported on climate resilience (SEA Objective 10) due to the options contributing to increasing the resilience/decreasing vulnerability to the effects of climate change.

The Leakage measures have also been assessed as having a minor positive effect on Greenhouse Gas Emissions (SEA Objective 9). This option is anticipated to reduce operational carbon emissions by reducing lost Water put Into Supply (WIS), i.e. reduced pumping and treatment waste.

WHAT ARE THE LIKELY SIGNIFICANT EFFECTS OF THE REVISED DRAFT WRMP24?

Table NTS.3 lists the preferred options and summarises their findings. South Staffs Water has not included any supply options in the preferred plan as the ambitious demand management programme is expected to meet the deficit.

The detailed assessment of the preferred options and the preferred programme of options are contained in Section 6.2 and 6.3 of the Environmental Report respectively. The assessment of the cumulative effects of the rdWRMP24 in-combination with other plans and programmes are reviewed in Section 6.4. The detailed option assessments are presented in Appendix G.

WHAT ARE THE PROPOSED MITIGATION AND ENHANCEMENT MEASURES?

As noted above, in some cases, there is an opportunity to reduce some of the potential negative effects identified during the assessment of the rdWRMP24 and to enhance positive effects. The detail of this mitigation needs to be considered during the planning phases of each of the individual component schemes if taken forward.

Potential mitigation measures are included in Section 6.6.

HOW WILL THE EFFECTS OF THE REVISED DRAFT WRMP24 BE MONITORED?

Once the WRMP is implemented, its effects on the environment and people will need to be monitored. Monitoring the significant effects of the WRMP can help to answer questions such as:

- Were the SEA predictions of effects accurate?
- Is the WRMP contributing to the achievement of the SEA objectives?
- Are mitigation measures performing as well as expected?
- Are there any adverse effects? Are these within acceptable limits, or is remedial action desirable?

Section 7 of the Environmental Report identifies a number of potential indicators that could be used for monitoring the effects of the WRMP's implementation. Monitoring proposals will be considered further and a final monitoring framework that satisfies the requirements of the SEA Directive will be presented in the Post Adoption Statement.

WHAT ARE THE CONCLUSIONS?

The rdWRMP24 is focussed on delivering targets to halve leakage and reduce customer consumption to 110 litres per person per day by 2050. In addition, the plan targets 9% reduction of non-household consumption by 2037, in line with the proposed Environment Act target. Underpinning this is the company's programme of universal metering it is proposing to undertake between 2025 and 2035, which will provide invaluable information to support changes to customer behaviour as well as aiding with the targeting and delivery of leakage reductions.

The rdWRMP24 best value plan does not require any supply options during the planning period of 2025 to 2050 in order to meet the deficit. The ambitious demand management programme described above provides the 80 Ml/d of savings.

Overall, the rdWRMP24 is expected to generate significant positive effects across several of the SEA objectives including water quantity (SEA Objective 5), economy (SEA Objective 11), human health and well-being (SEA Objective 13) and water resources (SEA Objective 14) as demand will be reduced by 63.51Ml/d across the SSW supply area. Improvements to water efficiency will better support population and economic growth, contribute towards maintaining health and aid sustainable water resource provision. Additionally, no significant negative effects have been identified for any of the SEA Objectives and no adverse effects are anticipated during operation from the options and as such, mitigation and enhancement measures are not likely to be necessary.

The demand management measures required are likely to require some form of physical intervention or amendment to the network. The works required for these options will be very minor (e.g. meter installation)

with virtually no risk of significant effects. The HRA therefore concluded no effects on European sites, however, emphasised that it is not possible to predict or identify specific locations where such measures might be applied and therefore effects cannot be identified at this time. It is proposed that non-specific residual risks that may arise are likely to be avoided with established scheme-level mitigation.

The WFD compliance assessment has found the South Staffs Water Preferred Plan to be WFD compliant. As the preferred programme includes only demand management options there will only be very minor physical interventions, as such no significant effects have been identified.

As the WRMP24 preferred plan only includes demand management options, the related construction activities are likely to be discrete and implementation of mitigation measures are not considered likely.

WHAT ARE THE NEXT STEPS IN THE SEA PROCESS?

South Staffs Water have prepared and will publish a Statement of Response to the representations received during public consultation, within 26 weeks of publication of the draft plan. South Staffs Water has produced a revised draft WRMP for submission alongside the Statement of Response in May 2023. This rdWRMP24 Environmental Report will be published and sent to the Secretary of State alongside the Statement of Response and the rdWRMP24; demonstrating the changes that have been made.

The Secretary of State will review the rdWRMP24, the representations made and the Statement of Response and, along with advice from the regulators, decide whether the plan can be published. Once permission has been received, the final WRMP24 and associated environmental assessments will be published. In conjunction with publishing the final WRMP24, a Post Adoption Statement will also be issued (to meet the requirements of SEA regulation 16 (4)). The SEA Post Adoption Statement will demonstrate how SEA has influenced the overall development of the WRMP and also document the consultation process.

Table NTS.3 Options Included within the Preferred Programme

Option	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape	Commentary
Leakage	Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**Construction:** No significant positive or negative effects have been identified during construction. **Operation:** This option has been assessed as having a significant positive effect on water quantity (SEA Objective 5) and water resource use (SEA Objective 14). The operation of the option would result in a major reduction in leakage from the supply network and an associated major reduction in the demand for water (18.25 Ml/d benefit) and therefore a subsequent increase in water efficiency.
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Operation (negative)	?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Operation (positive)	0	0	0	0	+++	0	0	0	+	+	++	0	++	+++	0	0	0	
Water Efficiency	Construction (negative)	0	0	0	0	0	0	0	?	-/?	0	0	0	0	0	-/?	0	0	**Construction:** No significant positive or negative effects have been identified during construction. **Operation:** This option has been assessed as having a significant positive effect on water quantity (SEA Objective 5) and water resource use (SEA Objective 14). The operation of the option would result in a major reduction in the demand for water (33.25 Ml/d benefit) and a subsequent increase in water efficiency. The saving of 33.25 Ml/d, would help ensure a continual supply of clean drinking water and increase resilience of supply to Severn Trent customers, supporting economic growth which could result in a positive effect on the local economy and social wellbeing (SEA Objective 11). The positive impacts on human health and well-being (SEA Objective 13) are identified as significant through provision of access to improved water, using products, fixtures, and fittings.
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Operation (negative)	0	0	0	0	0	0	0	0	?	0	0	0	0	0	0	0	0	
	Operation (positive)	0	0	0	0	+++	0	0	0	0	++	+++	0	+++	+++	0	0	0	
Non-Household Enhanced Meters	Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**Construction:** No significant positive or negative effects have been identified during construction. **Operation:** This option has been assessed as having a significant positive effect on water quantity (SEA Objective 5) and water resource use (SEA Objective 14). The operation of the option would result in a major reduction in the demand for water (12.01 Ml/d benefit) and a subsequent increase in water efficiency.
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Operation (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Operation (positive)	0	0	0	0	+++	0	0	0	0	+	++	0	++	+++	0	0	0	

1. INTRODUCTION

1.1 OVERVIEW

South Staffordshire Water (SSW) is preparing its next Water Resources Management Plan (WRMP24). The WRMP sets out how the balance between water supply and demand, and security of supply, will be maintained over a minimum of 25 years in a way that is economically, socially and environmentally sustainable. WRMPs are reviewed on a rolling five-year basis, the most recent being published in 2019[9].

WRMPs must comply with international, UK and national legislation pertaining to the environment, as well as associated guidance on the development of WRMPs[10]. This includes The Environmental Assessment of Plans and Programmes Regulations 2004 (the 'Strategic Environmental Assessment (SEA) Regulations'). It assesses the likely environmental effects of the plans and identifies ways in which adverse effects can be avoided, minimised or mitigated and how any positive effects can be enhanced. In doing so, the SEA will be used to inform the development and selection of the water resource management options that will comprise the WRMP24.

This Environmental Report presents the findings of the SEA of South Staffs Water's revised draft WRMP24 (rdWRMP24).

1.2 PURPOSE OF THE ENVIRONMENTAL REPORT

The purposes of the report are

- to ensure that the likely significant environmental and socio-economic effects of the rdWRMP24 and any reasonable alternatives are identified, characterised and assessed;
- to help identify appropriate measures to avoid, reduce or mitigate adverse effects and to enhance beneficial effects associated with the implementation of the rdWRMP24 wherever possible;
- to provide a framework for monitoring the potential significant effects arising from the implementation of the rdWRMP24;
- to give the statutory consultees, stakeholders and the wider public the opportunity to review and comment upon the environmental effects that the rdWRMP24 may have on them, their communities and their interests, and to encourage and support them to make responses and suggest improvements to the rdWRMP24;
- to inform decisions on the rdWRMP24; and
- to demonstrate that the rdWRMP24 has been developed in a manner consistent with the requirements of the SEA Regulations.

1.3 WATER RESOURCE PLANNING

Water resources management planning is being undertaken regionally and by all water companies in England and Wales in order to ensure reliable, resilient water supplies over the long-term planning horizon.

Water resources management planning includes working out and forecasting how much water customers will need over the planning period (assessing demand) and how best to provide it (assessing options to reduce or constrain demand growth and/or augment reliable supplies of water) in an efficient, timely manner (programme appraisal). Companies (individually, and in collaboration across a region) identify the preferred, 'best value' programme of demand management and water supply options to develop an overall strategy to maintain a balance between reliable supply and demand.

Water companies in England and Wales have a statutory requirement to prepare a WRMP every five years. South Staffs Water is developing its rdWRMP24 within the context of Water Resources West Regional Plan.

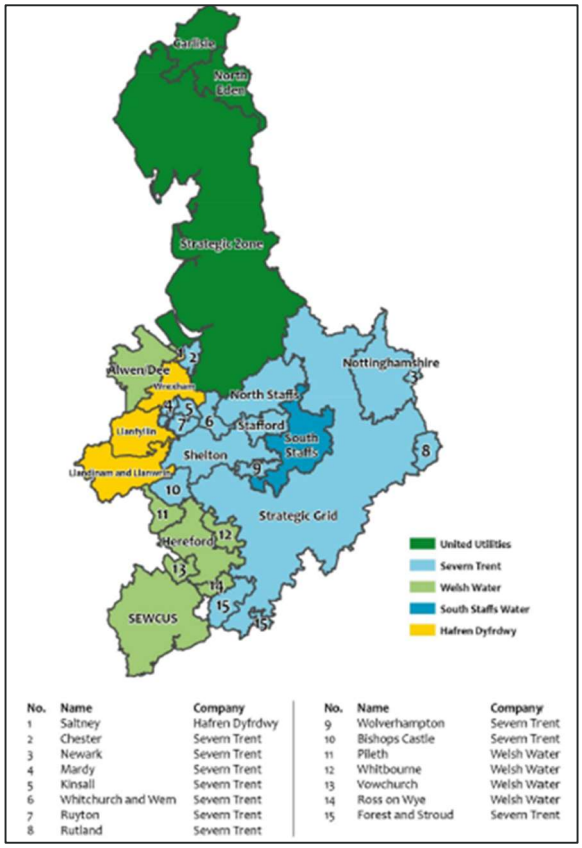
[9] SSW (2019) Water Resources management Plan 2019, December 2019. Available at: https://www.south-staffs-water.co.uk/about-us/our-strategies-and-plans/our-water-resources-management-plan [Accessed 26.08.2022].

[10] UK Government (2022 and 2023 update) Water Resource Planning Guidance (WRPG) [online]. Available at: https://www.gov.uk/government/publications/water-resources-planning-guideline/water-resources-planning-guideline. [Accessed 09.08.22; noting no change required for SEA in the 2023 update].

1.3.1 Water Resources West Regional Plan

Water Resources West (WRW) Regional Plan covers the management of water resources in the North West of England, the West Midlands and the cross-border catchments with Wales. It includes all or part of the operational areas of Dŵr Cymru Welsh Water (DCWW), Hafren Dyfrdwy[11], Severn Trent Water (STW), SSW and United Utilities (UUW) (**Figure 1.1**).

Figure 1.1 Extent of Water Resources West



No.	Name	Company
1	Saltney	Hafren Dyfrdwy
2	Chester	Severn Trent
3	Newark	Severn Trent
4	Mardy	Severn Trent
5	Kinsall	Severn Trent
6	Whitchurch and Wem	Severn Trent
7	Ruyton	Severn Trent
8	Rutland	Severn Trent
9	Wolverhampton	Severn Trent
10	Bishops Castle	Severn Trent
11	Plleth	Welsh Water
12	Whitbourne	Welsh Water
13	Vowchurch	Welsh Water
14	Ross on Wye	Welsh Water
15	Forest and Stroud	Severn Trent

These five companies, like all water companies in England and Wales, are required[12] to prepare, maintain and publish a WRMP. **Figure 1.2** presents South Staffs Water's WRMP24 operational area within the WRW regional plan area. The area under consideration encompasses the South Staffs Water water supply area and the wider assessment area which is the River Severn catchment area that supports the company's abstraction from the River Severn (**Figure 1.2).**

WRW is taking an integrated approach to preparing the Regional Plan and the WRMPs and aims to provide a Regional Plan that is multi-sector and takes account of the water supply needs of non-public water supply (non-PWS) abstractors as well as public water supplies. WRW member water companies have used a regionally consistent set of methodologies to reflect local, regional and national needs into the development of the plans.

Each water company is leading development of the WRMP and relevant aspects of the regional plan in the parts of their area included with WRW, as a single piece of work. This has necessitated a high degree of integration and fostered greater collaboration between companies and stakeholders.

The WRW Regional Plan covers the period 2025 to 2085 and addresses long-term regional and inter-regional, multi-sectoral water resources management pressures and draws on water resource options from the member water companies' WRMP24s, as well as the Strategic Resource Options[13] (SROs) being taken forward by the companies.

In March 2020, WRW published its Initial Resource Position[14]. This identified that by 2050, an estimated 166 million litres per day of additional water would be needed for public water supplies, and in the region of an additional 41 million litres per day needed for other abstractors. In an update[15] (published in February 2021) to its resource position, WRW noted that the need maybe greater than previously estimated. WRW published its Emerging Regional Plan[16] in January 2022. This updated the forecast, taking into account a commitment to achieve a 50% reduction in leakage from the public water supply network by 2050 and a per capita consumption reduction to 110 litres/person/day. The updated WRW forecast identified that 215 Ml/d of new water would be needed to meet public supply demand by 2031 and that an additional 63 Ml/d would be needed by 2050, for non-public water supply sectors.

[11] At 1st July 2018, Hafren Dyfrdwy combined the water service area of Dee Valley Water and Severn Trent lying in Wales.

[12] Section 37 and 37A of Water Industry Act 1991, as amended by the Water Act 2003 and the Water Act 2014.

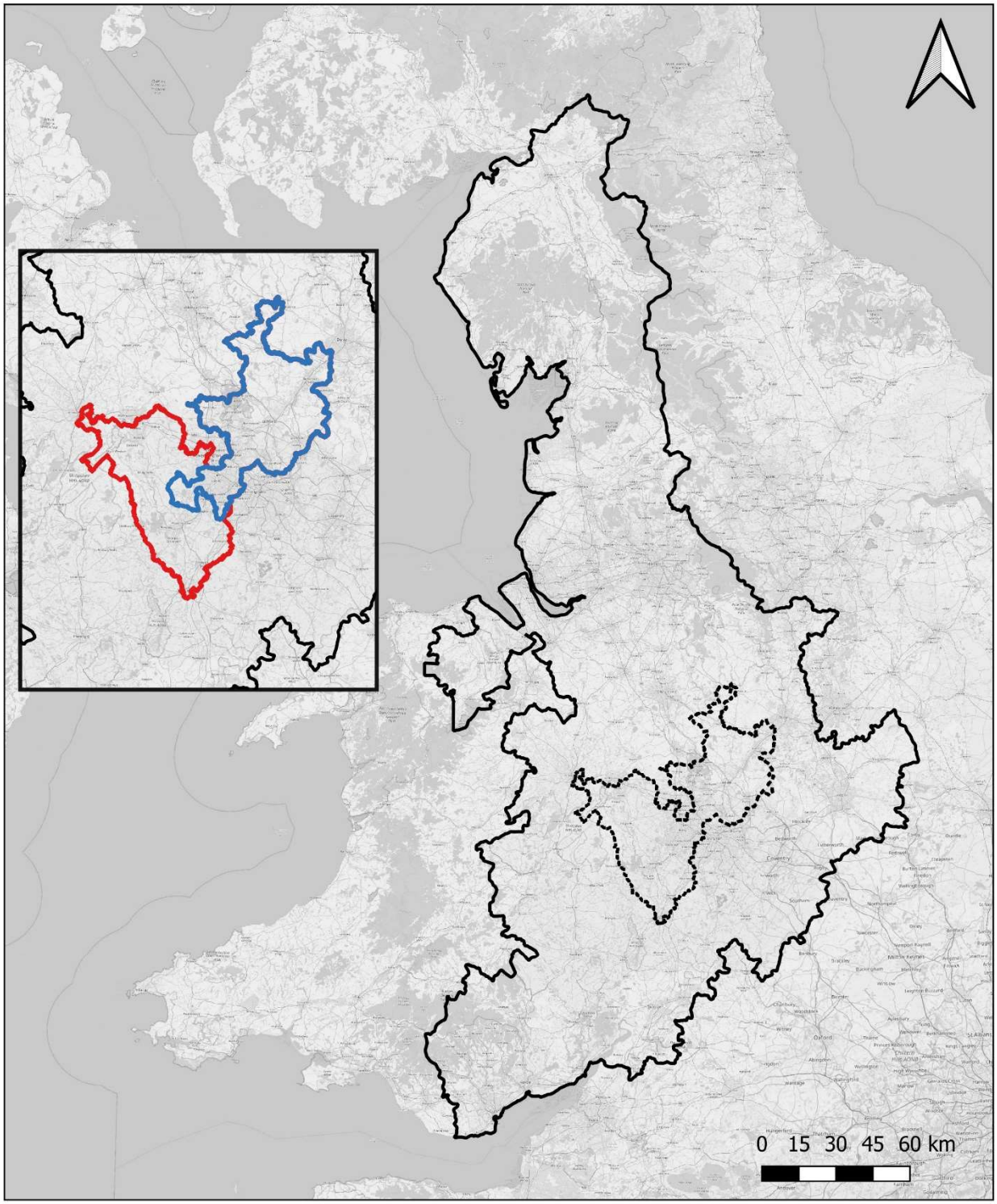
[13] The Strategic Water Resource Options (SROs) programme has been initiated by Ofwat to provide at least 1500Ml/d of water to areas of England facing a water deficit. The SRO Programme includes 17 schemes which will be funded and assessed during AMP7 to determine the right portfolio of projects to be selected by Regional Plans ready for implementation in AMP8. Schemes are evaluated at a series of decision points (Gates).

[14] WRW (2020) Initial Resource Position, March 2020. Available from https://waterresourceswest.co.uk/s/WRW-Initial-Resource-Position.pdf [Accessed January 2021].

[15] WRW (2021) Update on our Resource Position, February 2021. Available from https://waterresourceswest.co.uk/s/WRW-Update-on-Resource-Position-February-2021-web.pdf [Accessed August 2022].

[16] WRW (2022) Emerging Regional Plan, January 2022. Available from: https://static1.squarespace.com/static/5e67889204d86850e1fdcece/t/61e5a4e237970d62de92fa10/1642439906757/WRW+Emerging+Regional+Plan+Executive+Summary.pdf [Accessed August 2022].

Figure 1.2 South Staffordshire Water Supply Area



SEA Assessment Area
South Staffordshire Water Supply Area
Wider Assessment Area
WRW Assessment Area

Figure Title: South Staffordshire Water Supply Area

Figure No: 1.2

Date: August 2022

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1.3.2 Water Resource Management Plans

Each water company's WRMP sets out how the balance between water supply and demand, and security of supply, will be maintained over a minimum of 25 years in a way that is economically, socially and environmentally sustainable.

For each Water Resource Zone[17] (WRZ) in the WRMP area, a supply demand balance is generated for public water supply (PWS). A set of non-PWS water availability assessments will also be generated. Each supply-demand balance will be structured around a consistent "central" set of planning assumptions and will be used to identify WRZs in deficit over the plan period.

The plan process initially reviews as many potential solutions as possible (the 'unconstrained list' of options) to identify 'feasible' options for each WRZ which will contribute to meeting the supply demand deficit in one or more zones. Types of options considered to provide additional water resources to meet any forecast deficit in a WRZ can include:

- **demand management options** which include measures to manage the demand for water such as smart meters, rainwater harvesting, greywater recycling or household visits to install water efficiency measures;
- **distribution and leakage options** which include measures to optimise the efficiency of water networks, reduce leakage and minimise any unscheduled resource losses;
- **production efficiency options** include measures to increase the efficiency and effectiveness of treatment processes;
- **supply options** which include measures to increase supply such as greater peak output at existing groundwater sources, reservoir or surface water supply and which will include SROs; this also includes catchment management options, for example nature-based solutions;
- **non-PWS options** which include any options which increase water resource availability or reduce the need for abstraction outside of that needed for public water supplies.

Examples of these options are shown in **Table 1.1.** Note, that this illustrative and not intended to be an exhaustive list.

Options tend to be generated from the company responsible for the WRMP but can also be joint[18] (where more than one company is working in partnership), provided by third parties or be multi-sector.

All zones with deficits have then been subject to a "decision making" process using a Multi-Criteria Analysis (MCA) and option screening to identify a preferred plan (comprising of selected options) to address the supply demand deficit. The MCA is used consistently to supplement the traditional Economics of Balancing Supply and Demand (EBSD) approach and further zonal specific decision methods can also be used appropriate to the complexity of the zone. The decision-making method factors in multiple costs and benefits and consider the interaction between zones to establish a best value plan for the company (and for the region as whole).

Scenarios have been used to test the preferred and any identified alternative plans. They have been used to explore what would happen if one of these plans was adopted and the future was different to that assumed in the "central" planning assumptions. The scenarios could be used to make the preferred plan an adaptive plan (in which different options could be taken forward after key decision points, if circumstances changed). The same demand management options were selected under all scenarios tested. Please refer to the over-arching WRMP24 for further detail.

The process, and key decision points in the development of the WRMP and the WRW Regional Plan are illustrated in **Figure 1.3**

[17] Section 4.4. of the WRPG defines a water resource zone as "an area within which the sources of water and distribution of water to meet demand, is largely self-contained (apart from any agreed bulk transfers)".

[18] There are five Strategic Resource Options (SROs) being taken forward by the companies (the Severn Thames Transfer, Grand Union Canal transfer, Minworth Effluent Reuse, Severn Trent Sources and the North West Transfer (formerly Vyrnwy Reservoir Source and United Utilities Sources)).

Table 1.1 Example Feasible Option Types

Demand Management Options	Distribution and Leakage Options	Production Efficiency Options	Supply Options
Change in levels of service	Active leakage management	Outage reduction	Aquifer Recharge
Household water audit	External potable bulk supply/transfer	Water Treatment Works capacity increase	Catchment management
Household water recycling	Internal potable transfer	Water Treatment Works loss recovery	Conjunctive Use
Metering change of occupancy	Mains replacement (not trunk mains)		Desalination
Metering compulsory	Other leakage control		Drought permits/orders, Temporary Use bans or non-essential use bans
Metering optants	Pressure management		Effluent Reuse
Metering other selective	Trunk mains renewal		External raw water bulk supply/transfer
Non-household water audit			Groundwater enhancement
Other water efficiency			Internal raw water transfer
Rainwater harvesting			Internal raw water transfer
Retrofitting indoor water efficiency devices			Licence Trading
Supply pipe repairs / replacement			New groundwater
Tariff			New Reservoir
Water efficiency customer education / awareness			New surface water
Drought - water use restrictions			New water treatment works
			Reduction of raw water losses
			Reservoir enlargement
			Surface water enhancement

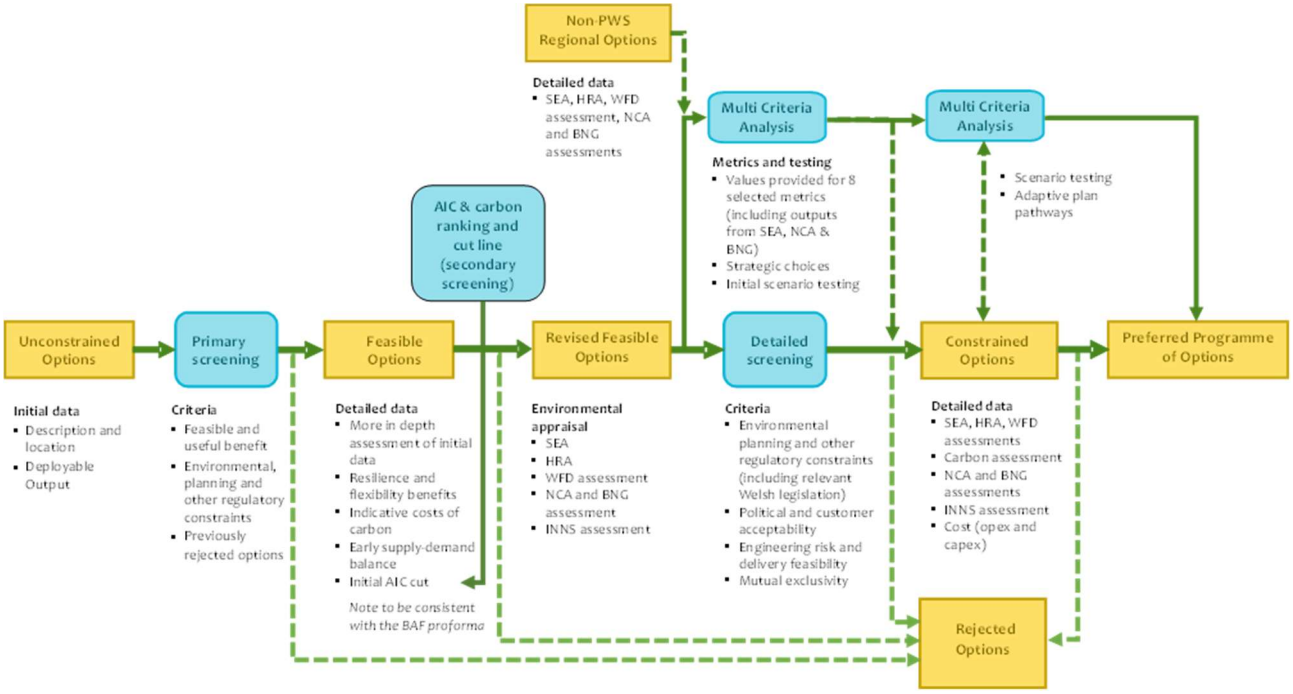

Figure 1.3 Environmental assessments into option and plan development

Environmental assessment information (derived from the SEA and other regulatory assessments) has been provided for the following key decision points:

- **Multi-Criteria Analysis (MCA):** South Staffs Water, as part of WRW developed a best value optimisation tool, ValueStream1, to provide equivalent monetised costs for best value metric scores, enabling option comparison;
- **detailed screening** of options, using screening criteria developed by South Staffs Water (in conjunction with WRW, the other core member companies and with regulator feedback);
- **scenario testing** of options; and **selection of the preferred programme of options.**

1.3.3 South Staffordshire Water's revised draft Water Resource Management Plan

South Staffs Water's rdWRMP24 sets out the proposals to ensure continued delivery of a secure and reliable supply of water from 2025 to 2050, looking beyond out to the year 2085.

The key objectives of South Staffs Water's rdWRMP24 are to:

- Deliver a sustainable and resilient supply of water for both our household and non-household customers now and in the future.
- Commit to reducing the amount of water we abstract from the environment over the lifetime of the plan in order to protect and enhance the natural environment in which we operate.
- Identify the longer term uncertainties e.g. climate change, and, if required, provide adaptive pathways within the plan in order to ensure we can respond to future challenges.
- Be acceptable and affordable for our customers.

1.4 STRATEGIC ENVIRONMENTAL ASSESSMENT

1.4.1 Overview

SEA is required under Statutory Instrument 2004 No.1633 - The Environmental Assessment of Plans and Programmes Regulations 2004. Throughout the course of the development of the plan, policy or programme, the aim of SEA is to identify the potential impact of options proposed in the plan in terms of their environmental, economic and social effects. If any adverse effects are identified, these options can then be avoided, or proposals modified to manage or mitigate adverse effects.

The SEA Regulations transposed the requirements of Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment. Following the UK's exit of the EU and the end of the transition period (31st December 2020), the SEA Directive no longer applies to the UK.

1.4.2 Applying SEA to the WRMPs and Regional Plan

The SEA Regulation 5 requires "*an environmental assessment … of certain plans and programmes which are likely to have significant effects on the environment*". Plans and programmes are defined as those:

- "*which are subject to preparation and/or adoption by an authority at national, regional or local level or which are prepared by an authority for adoption, through a legislative procedure by Parliament or Government; and*
- *which are required by legislative, regulatory or administrative provisions*" (Regulation 2 (1)).

Guidance produced by the European Commission (EC)[19] indicates that in preparing plans for ensuring water resources, privatised utilities companies can be considered an authority because they are providing services that would be carried out by public authorities in a non-privatised regime. The preparation of a WRMP is a statutory requirement and therefore meets the requirements of Regulation 2.

Plans and programmes that may have significant effects on the environment are identified as those:

- "*which are prepared for… water management… and which set the framework for future development consent of projects listed in Annexes I and II to Directive 85/337/EEC [the Environmental Impact Assessment Directive]; or*
- *which, in view of the likely effect on sites, have been determined to require an assessment pursuant to Article 6 or 7 of Directive 92/43/ EEC [the Habitats Directive]"* (Regulation 5 (2)).

Broadly, this includes plans that may include development of infrastructure to source, store, transfer or manage water, or may affect sites that have European designations (Special Areas of Conservation (SACs), Special Protection Areas (SPAs), and Ramsar sites).

Government[20], regulator[21] and industry[22] guidance indicates that there is a requirement for water companies, as responsible authorities, to determine if their WRMPs fall within the scope of the SEA Regulations and whether a SEA must be undertaken. The Welsh Government's guidance[23] on WRMPs, meanwhile, identifies environmental legislation relevant to the WRMP. As it is possible that the draft WRMPs could affect England and Wales, the UK SEA Regulations, as opposed to the Welsh SEA Regulations[24], will apply.

1.4.3 Applying SEA to Water Resource Management Plans

South Staffordshire Water's dWRMP24s will be subject to SEA. SEA is required based on the scope of the potential effects that could arise, particularly given the number and area covered by European designated conservation sites in the operational area covered by the WRMP. In this context, the purpose of the SEA of the rdWRMP24 will be to:

- identify the potentially significant environmental effects of the plan in terms of the water resource management options being considered;
- help identify appropriate measures to avoid, reduce or manage adverse effects and to enhance beneficial effects associated with the implementation of the plan wherever possible;

[19] EC (2003) Implementation of Directive 2001/42 on the Assessment of the Effects of Certain Plans and Programmes on the Environment. Available online: http://ec.europa.eu/environment/archives/eia/pdf/030923_sea_guidance.pdf

[20] Office of the Deputy Prime Minister (ODPM), Scottish Executive, Welsh Assembly Government and Department of the Environment Northern Ireland (2005) A Practical Guide to the SEA Directive and European Commission (2001) Assessment of plans and projects significantly affecting Natura 2000 sites and Welsh Government (2015) Strategic Environmental Assessment (SEA) in Wales

[21] EA, OfWAT and NRW (2022) Water Resource Planning Guidance [online]. Available at: https://www.gov.uk/government/publications/water-resources-planning-guideline/water-resources-planning-guideline

[22] UKWIR (2021) Environmental Assessment Guidance for Water Resources Management Plans and Drought Plans. Report Ref. No. 21/WR/02/15

[23] Welsh Government (2022) The Welsh Government Guiding Principles for Developing Water Resources Management Plans (WRMPs) 2022. Available at: https://gov.wales/sites/default/files/publications/2021-12/water-resources-management-plan-guidance-2022.pdf [Accessed August 2022].

[24] Statutory Instrument 2004 No. 1656 The Environmental Assessment of Plans and Programmes (Wales) Regulations 2004

- give the statutory SEA bodies, stakeholders and the wider public the ability to see and comment upon the effects that the plan may have on them, and encourage them to make responses and suggest improvements to the plan; and
- inform the selection of water resource management options to be taken forward into the final versions of the WRMP24.

In summary, the SEA will identify, describe and assess the likely significant effects arising from the following aspects of the WRMP24:

- the feasible water resource options;
- the preferred water resource options;
- the preferred programme of options selected to comprise the preferred plan to address the supply demand deficit;
- any alternative plans proposed to address the supply demand deficit;
- any cumulative, secondary and/or synergistic effects of implementing the plans.

Where relevant, any assessment work that has already been completed e.g., as part of the RAPID[25] gated submission process for the SROs, this will be used to inform the assessments of the options as they are presented.

1.4.4 Stages of Strategic Environmental Assessment

SEA comprises five key stages:

- **Stage A:** Scoping;
- **Stage B:** Develop and Refine Alternatives and Assess Effects;
- **Stage C:** Prepare Environmental Report;
- **Stage D:** Consult on the Draft Plan and Environmental Report and Prepare the Post Adoption (SEA) Statement; and
- **Stage E:** Monitor Environmental Effects.

Stage A of the SEA of the WRMP24 led to the production of the WRW Regional Plan and WRMP24 SEA Scoping Report[26] (as the work was undertaken as part of the development of the consistent suite of assessment methodologies to be applied to water resource plans within the WRW region). The scoping stage itself comprises five tasks that are listed below:

i. Review of other relevant policies, plans, programmes and strategies (hereafter referred to as 'plans and programmes').
ii. Collation and analysis of baseline information.
iii. Identification of key sustainability issues.
iv. Development of the assessment framework.
v. Consultation on the scope of the SEA (this Scoping Report).

Information collected and analysed (as part of tasks i and ii) covers England and Wales reflecting the South Staffs Water operational area. The Scoping Report set out the proposed framework for assessing the likely significant environmental effects of the rdWRMP24 (as well as the WRW Regional Plan). It was issued for scoping consultation for 5 weeks from the 8th April to the 13th May 2021. The representations received and how they have been taken into account are presented in **Appendix B.**

Following consultation, and amendment as appropriate, the assessment framework has been used for assessing the likely significant effects (including cumulative effects) of the water resource options contained in the rdWRMP24 and any reasonable alternatives (**Stage B**).

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[25] Regulator's Alliance for Progressing Infrastructure Development (RAPID) was established in 2019 to "help accelerate the development of new water infrastructure and design future regulatory frameworks. The joint team is made up of the 3 water regulators Ofwat, Environment Agency and Drinking Water Inspectorate". Available online https://www.ofwat.gov.uk/regulated-companies/rapid/3/ [Accessed January 2022]

[26] Wood and Ricardo (2021) Water Resources West and Water Resources Management Plan 2024 Strategic Environmental Assessment Scoping Report, Water Resources West, Dŵr Cymru Welsh Water, Hafren Dyfrdwy, Severn Trent, South Staffordshire Water, United Utilities

These assessments are presented in this Environmental Report (in a form to meet the requirements of Schedule 2 of the SEA Regulations) which has been completed to accompany the rdWRMP24 (**Stage C**).

The draft WRMP24 and accompanying documents including the Environmental Report were submitted to the Secretary of State for Environment, Food and Rural Affairs, for a request for publication and once directed to do so, South Staffs Water published the documents for consultation (**Stage D**). Following consultation, and within 26 weeks of consultation beginning, South Staffs Water have prepared a Statement of Response to the representations received. The rdWRMP24 will be sent to the Government, and as changes are likely to be significant, is likely to be subject to further assessment and consultation. Following direction from the Government, the final WRMP24 will be published and implemented accordingly (anticipated August 2023). In conjunction with publishing the final WRMP24, a Post Adoption Statement will also be issued (to meet the requirements of SEA regulation 16 (4)). This will set out the results of the consultation and SEA processes and the extent to which the findings of the SEA have been accommodated in the final plan. There is no legal timescale for publishing of the Post Adoption Statement, however, this would usually be published no more than four weeks of the final WRMP being published.

The SEA requires monitoring of any resulting environmental effects of the WRMP24 (**Stage E**).

1.5 HABITATS REGULATIONS ASSESSMENT

Regulations 63 and 64 of The Conservation of Habitats and Species Regulations (2017) (the 'Habitats Regulations') transpose the provisions of Articles 6(3) and 6(4) of Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (the 'Habitats Directive') as they relate to plans or projects in England and Wales. Regulation 63 states that if a plan or project is *"(a) is likely to have a significant effect on a European site*[27] *or a European offshore marine site*[28] *(either alone or in combination with other plans or projects); and (b) is not directly connected with or necessary to the management of the site" then the competent authority must "…make an appropriate assessment of the implications for the site in view of that site's conservation objectives"* before the giving consent or authorisation (etc.).

The plan or project can only be given effect if it can be concluded (following an 'appropriate assessment') that it *"…will not adversely affect the integrity"* of a site unless the provisions of Regulation 64 are met.

The process by which Regulation 63 (and, if applicable, Regulation 64) is met is known as the Habitats Regulations Assessment (HRA)[29]. An HRA determines whether there will be any 'likely significant effects' on any European site as a result of a plan's implementation (either on its own or 'in combination' with other plans or projects)[30] and, if so, whether there will be any 'adverse effects on site integrity'[31].

Water resource plans (whether WRMPs or Regional Plans) are not explicitly included within this legislation, although the regulator guidance[32] requires that it should extend to the WRMP if the preferred plan *"would be likely to have a significant effect on a European site (either alone or in combination with other plans or projects)"*. The Habitats Regulations require every Competent Authority, in the exercise of any of its functions, to have regard to the requirements of the Habitats Directive. The water companies have a statutory duty to prepare WRMP24 and are therefore the Competent Authority for an HRA.

Whilst the HRAs has been undertaken and reported separately from the SEAs, its findings have been used as appropriate to inform the findings of this SEA, notably against the biodiversity, fauna and flora topic.

The HRA of South Staffs Water's rdWRMP24 also contributes towards the HRA of the accompanying WRW draft Regional Plan. In this way it contributes to the evidence for how the water companies have coordinated

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[27] Strictly, 'European sites' are: any Special Area of Conservation (SAC) from the point at which the European Commission and the UK Government agreed the site as a 'Site of Community Importance' (SCI) (if this was before 31 Jan 2020); any classified Special Protection Area (SPA); and any candidate SAC (cSAC). However, the term is also commonly used when referring to potential SPAs (pSPAs), to which the provisions of Article 4(4) of Directive 2009/147/EC (the 'new wild birds directive') apply; and to possible SACs (pSACs) and listed Ramsar Sites. "European site" is therefore used in this proposal in its broadest sense, as an umbrella term for all of the above designated sites.

[28] 'European offshore marine sites' are defined by Regulation 18 of The Conservation of Offshore Marine Habitats and Species Regulations 2017; these regulations cover waters (and hence sites) over 12 nautical miles from the coast.

[29] The term 'Appropriate Assessment' has been historically used to describe the process of assessment; however, the process is now more accurately termed 'HRA', with the term 'Appropriate Assessment' limited to the specific stage within the process.

[30] Also referred to as the 'test of significance'.

[31] Also referred to as the 'integrity test'.

[32] EA, OfWAT and NRW (2023) *Water Resources Planning Guideline*

their water resources planning activities and considered the needs of multiple sectors (aligned with WRW Regional Plan).

1.6 EXISTING LICENCES

The rdWRMP24 sets out South Staff Water's long-term strategy for maintaining reliable and resilient water supplies to its customers. The strategy includes the use of existing water resources to meet demand as well as existing demand management measures to ensure sufficient supply under current baseline conditions.

The Environment Agency Review of Consents (RoC) process, undertaken in the early 2000s, considered South Staff Water's existing water source abstraction licences (at the abstraction licence limit) and the potential for adverse effects on European sites. Where adverse effects were identified, recommendations were made to change abstraction licences. Since the RoC process was completed, there have been changes to the baseline, conservation objectives and/or Supplementary Advice to Conservation Objectives, and site condition, which may require the original RoC conclusions to be revisited.

As part of the WRMP process, licences are identified between the water company and Environment Agency that are determined as valid for the planning period, or identified as requiring sustainability reductions. This informs the baseline, and provides an opportunity to flag any other licences considered to be at risk.

None of South Staff Water's existing licences have been identified as causing deterioration to the condition of a European site, and as such no further assessment work is required.

The UK Government is undergoing a process to reform the water abstraction management system in England. As a result, South Staffs Water undertook a series of investigations in AMP7 to understand the impact that any growth might have on some of their licences. In order to ensure that additional demand from growth does not cause a sustained increase in abstraction in areas where this could cause deterioration of the environment, South Staffs Water have agreed to licence caps across many of their sources. This equates to a reduction in DO of 9.29 Ml/d. This has been included in the planning as a reduction of our available baseline DO.

1.7 WATER FRAMEWORK DIRECTIVE ASSESSMENT

The Water Framework Directive[33] (WFD) has been enacted into UK legislation as the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 in England and Wales.

The WFD sets a default objective for all rivers, lakes, estuaries, groundwater and coastal water bodies to achieve 'good' status or potential by 2027 at the latest. The current (baseline) status (e.g., 2015 classification), and the measures required to achieve the 2027 status objective, are set out for each water body in the relevant River Basin Management Plans (RBMPs), prepared by the EA and NRW every six years. The current RBMPs (known as the 'Cycle 2 plans') were published in February 2016 and are expected to be updated in September 2022.

South Staffs Water (for the rdWRMP24) must be able to demonstrate that the plan will not cause a deterioration in respect of these baseline conditions. Furthermore, for those water bodies that are not currently attaining good status, South Staffs Water must be able to confirm that it would not preclude the delivery of measures to facilitate the improvements needed to attain good status.

A separate WFD assessment has been undertaken to provide the evidence base to respond to these requirements. Where appropriate, the findings have been used to inform this SEA, notably against the water quality topic.

1.8 NATURAL CAPITAL

The requirements for a BNG and NCA of a water company WRMP are outlined in WRPG 2023, Section 4.1.1., (produced by the regulatory bodies Ofwat, Environment Agency and Natural Resources Wales). This states that water companies are required to ensure their WRMP delivers net biodiversity gain where appropriate and uses a proportionate natural capital approach. The EA and NRW have published separate supplementary

[33] European Union (2000) Directive 2000/60/EC of the European Parliament and of the Council. Following the UK's exit from the European Union on 31.12.20, the Directive no longer applies to the UK.

guidance on Environment and Society in decision-making[34,35], which provides more detail about the expectation for NCA or ecosystem resilience in England and Wales respectively, and how a Natural Capital Assessment (NCA) and ecosystem resilience can support decision-making. The purpose of this is to allow water companies and Regional Groups to "make decisions that do not devalue and look to enhance the value of the natural world for society benefit" (WRPG Supplementary Guidance) together with supporting water companies within WRE to promote plans that have the potential to deliver wider environmental and social benefits.

BNG is an approach to the development of land and marine management that aims to leave biodiversity in a measurably better condition than prior to development. BNG seeks to provide a means of quantifying losses or gains in biodiversity value bought about by changes in land use, when designed and delivered well, BNG can secure benefits for nature, people and places, and for the economy.

NCA studies key components of nature which are essential for the long-term provision of benefits on which society relies. These components can have a direct or indirect value to people. A natural capital approach, which has been followed in this assessment, understands that nature underpins human wealth, health, wellbeing and culture and seeks to demonstrate the value of the natural environment for people and the economy.

Natural assets provide ecosystem services such as regulating floods and improving air quality, and those ecosystem services provide benefits such as reducing the chance a house will flood or improved health. This benefit can then be valued through use of natural capital metrics and can be used to help in the support of delivery of targets, such as putting a value on the potential delivery of BNG.

1.9 WELSH LEGISLATION

1.9.1 The Environment (Wales) Act 2016

The Environment (Wales) Act 2016 introduced a new legislative approach for the sustainable management of natural resources (SMNR). The Act seeks to maintain and enhance the resilience of Wales' ecosystems and the services and benefits they provide and, in so doing, meet the needs of the present generation without compromising the ability of future generations to meet their needs. Section 3(1) of the Environment (Wales) Act 2016 defines SMNR as:

"*-using natural resources in a way and at a rate that promotes achievement of the SMNR objective;*

-taking other action that promotes achievement of that objective; and

-not taking action that hinders achievement of that objective."

The objective for SMNR referred to above is "to maintain and enhance the resilience of ecosystems and the benefits they provide and, in so doing—

(a) meet the needs of present generations of people without compromising the ability of future generations to meet their needs, and

(b) contribute to the achievement of the well-being goals in section 4 of the Well-being of Future Generations (Wales) Act 2015".

Section 6 of the Act places a duty on public authorities to "seek to maintain and enhance biodiversity" so far as it is consistent with the proper exercise of those functions. In so doing, public authorities must also seek to "promote the resilience of ecosystems".

In line with the legislation, where relevant, consideration has been given to the effects on Wales in the assessment undertaken and reported in this Environmental Report.

1.10 ENVIRONMENTAL REPORT STRUCTURE

The remainder of this Environmental Report is structured as follows:

[34] EA (2021) WRPG 2024 supplementary guidance – Environment and society in decision-making. Published 24/03/2021

[35] NRW (2021) WRPG 2024 supplementary guidance – Environment and Society in decision-making (Wales). Published 07/04/2021

- **Section 2: Review of Plans and Programmes** - Provides an overview of the review of those plans and programmes relevant to the rdWRMP24 and SEA that is contained in **Appendix C**;
- **Section 3: Baseline Analysis** - Presents an overview of the baseline analysis and identifies the key issues relevant to the plan and SEA with the detailed social, economic and environmental characteristics presented in **Appendix D**;
- **Section 4: Approach to the Assessment** - Outlines the revised approach to the SEA of the rdWRMP24 including the assessment framework comprising assessment objectives and guide questions, categorisation of effects, matrices and definitions of significance/thresholds (**Appendix E**);
- **Section 5: Assessment of the Feasible Options** - Presents the findings of the assessment of the likely significant effects of the rdWRMP24's feasible options (detailed assessment matrices for feasible options presented in **Appendix F**);
- **Section 6: Assessment of the** rdWRMP24 - Presents the findings of the assessment of the preferred options and preferred programme of options that comprise the rdWRMP24 including consideration of cumulative effects and mitigation (with detailed assessment matrices for options presented in **Appendix G**);
- **Section 7: Next Steps and Proposals for Monitoring** - Details the next steps in the SEA process and presents views on how the environmental effects of the rdWRMP24 will be monitored.

The report also contains the following appendices:

- **Appendix A: Quality Assurance Checklist.**
- **Appendix B: Schedule of Scoping Consultation Reponses.**
- **Appendix C: Review of Plans and Programmes.**
- **Appendix D: Baseline Analysis.**
- **Appendix E: Definitions and Thresholds of Significance.**
- **Appendix F: Feasible Options SEA Matrices.**
- **Appendix G: Preferred Plan Options SEA Matrices.**

1.11 CONSULTATION

The SEA Regulations require consultation at the scoping stage and on the assessments documented in the Environmental Report. Scoping with the statutory consultation bodies defined by the SEA Regulations (the Environment Agency, Natural England and Historic England) is mandatory at both stages. Consultation with the public is only mandatory at the Environmental Report stage.

Scoping consultation comments received from statutory consultees and South Staffs Water's response to those comments are set out in Appendix B, along with the consequent actions. The assessment stage was undertaken according to the scope and approach agreed through consultation on the Scoping Report.

This Environmental Report underwent public consultation for 14 weeks between November 2022 and February 2023. Comments received during this period have informed subsequent changes to the Environmental Report of the rdWRMP24. These changes will be documented in the SEA Post Adoption Statement which sets out how the SEA an any views expressed by the consultation bodies or the public have influenced the WRMP24. This will be published by South Staffs Water following adoption of the final plan.

2. REVIEW OF PLANS AND PROGRAMMES

2.1 OVERVIEW

The SEA Regulations require a report containing *"an outline of the contents, main objectives of the plan or programme and relationship with other relevant plans and programmes" (Schedule 2(1))* as well as *"The environmental protection objectives, established at international (European) 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(5)).

One of the first steps in undertaking the SEA of the plan is therefore to identify and review other relevant plans and programmes which could influence the plan. These may be plans and programmes at an international / European, national, regional, or sub-regional level, commensurate with the scope of the rdWRMP24. The review aims to identify the relationships between the plan and these other documents i.e., how the rdWRMP24 could be affected by the other plans' and programmes' aims, objectives and/or targets, or how it could contribute to the achievement of their environmental and sustainability objectives. It is also a valuable source of information to support the completion of baseline analysis and to determine the key issues for the plan and SEA (see **Section 3** and **Appendix D**).

The completed review of plans and programmes is used to provide the policy context for the subsequent assessment process and helps to inform the development of objectives that comprise the assessment framework (see **Section 4**).

2.2 SUMMARY OF REVIEWED PLANS AND PROGRAMMES

Over 100 international/European, national, regional/sub-regional and local level plans and programmes have been reviewed in preparing this Environmental Report.

Those that are relevant to the WRMP are listed in **Table 2.1.** These are summarised in **Appendix C**.

Table 2.1 List of Plans and Programmes relevant to the WRMP

International
Conservation of Migratory Species (CMS) (1979) The Bonn Convention on the Conservation of Migratory Species of Wild Animals
Council of Europe (1979) The Convention on the Conservation of European Wildlife and Natural Habitats (The Bern Convention)
Council of Europe (1985) The Granada Convention for the Protection of the Architectural Heritage of Europe
Council of Europe (1992) Convention on the Protection of Archaeological Heritage (The Valetta Convention)
Council of Europe (2000), European Landscape Convention (The Florence Convention) (became binding March 2007)
Council of Europe (2003) European Soils Charter
European Commission (1991) The Nitrates Directive 91/676/EEC
European Commission (1991) Urban Waste Water Treatment Directive 1991/271/EEC
European Commission (1992) The Habitats Directive 1992/43/EEC
European Commission (1998) Drinking Water Directive 1998/83/EC
European Commission (2000) The Water Framework Directive 2000/60/EC
European Commission (2001) Directive on the Assessment of the Effects of Certain Plans and Programmes on the Environment (The SEA Directive) 2001/42/EC
European Commission (2002) Directive on the Energy Performance of Buildings 2002/91/EC
European Commission (2002) The Environment Noise Directive 2002/49/EC
European Commission (2004) Environmental Liability Directive 2004/35/EC
European Commission (2005) Thematic Strategy on Air Pollution
European Commission (2006) The Bathing Waters Directive 2006/7/EC
European Commission (2006) Directive on animal health requirements for aquaculture animals and products thereof, and on the prevention and control of certain diseases in aquatic animals 2006/88/EC
European Commission (2006) Directive on the protection of groundwater against pollution and deterioration 2006/118EC
European Commission (2006) Fresh Water Fish Directive 2006/44/EC
European Commission (2006) Mining Waste Directive 2006/21/EC
European Commission (2006) Thematic Strategy for Soil Protection
European Commission (2007) The Eel Directive 2007/1100/EC

European Commission (2007) Floods Directive 2007/60/EC

European Commission (2008) Ambient Air Quality and Cleaner Air for Europe Directive 2008/50/EC and Air Quality Framework Fourth Daughter Directive 2004/107/EC and previous directives (96/62/EC; 99/30/EC; 2000/69/EC & 2002/3/EC)

European commission (2008) Directive on Waste (Directive 75/442/EEC, 2006/12/EC 2008/98/EC as amended)

European Commission (2008) Environmental Quality Standards Directive 2008/105/EC

European Commission (2008) Marine Strategy Framework Directive 2008/56/EC

European Commission (2009) Directive on the Conservation of Wild Birds 2009/147/EC (codified version of Council Directive 79/409/EEC as amended)

European Commission (2009) Promotion of the use of energy from renewable sources Directive 2009/28/EC

European Commission (2010) Industrial Emissions Directive (integrated pollution prevention and control) 2010/75/EU

European Commission (2011) Directives on Environmental Impact Assessment (Codified Directive 2011/92/EU and Revised Directive 2014/52/EU)

European Commission (2011) A Roadmap for Moving to a Competitive Low Carbon Economy in 2050

European Commission (2012) A Blueprint to Safeguard Europe's Water Resources

European Commission (2012) Energy Efficiency Directive 2012/27/EU as amended by Directive (EU) 2018/2002

European Commission (2014) The EU Regulation on invasive alien (non-native) species 1143/2014/EU

European Commission (2014) A Policy Framework for Climate and Energy in the Period from 2020 to 2030

European Commission (2015) 'Closing the loop - An EU Action Plan for the Circular Economy' policy package

European Commission (2016) National Emissions reduction Commitments (NEC) Directive 2016/2284/EU

European Commission (2020) Biodiversity strategy for 2030

European Commission (2022) Eighth Environmental Action Programme

European Commission (2021) EU strategy on adaptation to climate change

ICOMOS (2011) Guidance on Heritage Impact Assessments for Cultural World Heritage Properties

IUCN (2013) World Heritage Advice Note: Environmental Assessment

UNEP (1973) Convention on International Trade in Endangered Species of Wild Fauna and Flora

UNESCO (1971) Ramsar Convention on Wetlands of International Importance

UNESCO (1972) Convention Concerning the Protection of the World Cultural and Natural Heritage.

UNESCO (2001) Convention on the Protection of Underwater Cultural Heritage

United Nations (1992) Convention on Biological Diversity (The Rio Convention)

United Nations (1997) The Kyoto Protocol to the UN Framework Convention on Climate Change

United Nations Economic Commission for Europe (1998), Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (The Aarhus Convention)

United Nations (2002) The World Summit on Sustainable Development

United Nations (2016) The Paris Agreement

United Nations Framework Convention on Climate Change (UNFCCC) (2011) The Cancun Agreements

World Commission on Environment and Development (1987) Our Common Future (The Brundtland Report)

World Health Organisation (2004) Children's Environment and Health Action Plan for Europe

National

BEIS (2011) National Policy Statements for Energy Infrastructure

BEIS (2013) UK Renewable Energy Roadmap

BEIS (2015) Future Electricity Networks

BEIS (2020) Energy white paper: Powering our net zero future

BEIS (2021) Heat and buildings strategy

BEIS (2021) Net Zero Strategy: Build Back Greener

Canal & River Trust (2015) Living Waterways Transform Places & Enrich Lives: Our 10 Year Strategy

Canal and River Trust (2015) Water Resources Strategy 2015 – 2020

Centre for Environment Fisheries and Aquaculture Science and Natural Resources Wales (2021) Assessment of Salmon Stocks and Fisheries in England and Wales 2020Climate Change Committee (2020) The path to Net Zero and progress on reducing emissions in Wales

Department for Culture, Media and Sport (DCMS) (2001) The Historic Environment – A Force for the Future

DCMS and Welsh Government (2007) Heritage Protection for the 21st Century

DCMS (2013) Scheduled Monuments & Nationally Important but Non-Scheduled Monuments

DCMS (2016) The Culture White Paper

Defra (2004) Rural Strategy

Defra (2005) Making space for water: taking forward a new government strategy for flood and coastal erosion risk management in England

Defra (2006) Shoreline Management Plan Guidance

Defra (2007) The Air Quality Strategy for England, Scotland, Wales and Northern Ireland

Defra (2009) Safeguarding our Soils – A Strategy for England

Defra, Department of the Environment (NI), Scottish Government and Welsh Assembly Government (2010) Air Pollution: Action in a Changing Climate

Defra (2010) Making Space for Nature: A Review of England's Wildlife Sites and Ecological Network

Defra (2011) UK National Ecosystem Assessment and Defra (2014), UK National Ecosystems Assessment Follow on, Synthesis of Key Findings

Defra (2011) Water for Life - Water White Paper

Defra (2011) Biodiversity 2020: A Strategy for England's Wildlife and Ecosystem Services

Defra (2011) Mainstreaming Sustainable Development

Defra (2011) The Natural Choice: Securing the Value of Nature

Defra (2011) Natural Environment White Paper

Defra (2012) National Policy Statement for Waste Water

Defra (2013) The National Adaptation Programme – Making the Country Resilient to a Changing Climate

Defra (2013) What nature can do for you

Defra (2015) The government's response to the Natural Capital Committee's Third State of Natural Capital report

Defra (2015) The Great Britain Invasive Non-native Species Strategy

Defra (2016) Guiding principles for water resources planning for water companies operating wholly or mainly in England

Defra (2017) Air Quality Plan for Nitrogen Dioxide (NO2) in UK

Defra (2018) The National Adaptation Programme and the Third Strategy for Climate Adaptation Reporting

Defra (2020) Drought Plan Direction 2020

Defra (2020) National food strategy for England

Defra (2020) Natural Capital Committee's Seventh Annual Report

Defra (2020) The Path to Sustainable Farming: An Agricultural Transition Plan 2021 to 2024

Defra (2020) Water abstraction plan: Environment

Defra (2021) Waste Management Plan for England

Defra and the Environment Agency (2018) Resources and Waste Strategy for England

Defra, Environment Agency, Natural England, Forestry Commission England (2016) Creating a great place for living

Defra and the Law Commission (2018) Draft National Policy Statement for Water Resources Infrastructure

Defra, Scottish Government, Welsh Government (2015) The Great Britain Invasive Non-native Species Strategy

Defra and Welsh Government (2014), River Basin Planning Guidance

Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government) (2014) National Planning Policy for Waste

Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government (2015) Renewable and Low Carbon Energy

Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government (2015) Strategic environmental assessment and sustainability appraisal

Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local (2021) National Planning Policy Framework 2021

Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local (various) Planning Practice Guidance

Department for Transport (2022) UK Electric Vehicle Infrastructure Strategy

Environment Agency (2004) Catchment Flood Management Plans: Guidelines – Volume 1 Policy

Environment Agency (2007) Soil: A Precious Resource

Environment Agency (2008) Better Sea Trout and Salmon Fisheries: Our Strategy for 2008-2021

Environment Agency (2009) Water for People and the Environment - Water Resources Strategy for England and Wales

Environment Agency (2010) Water Resources Action Plan for England and Wales

Environment Agency (2013) Areas of Water Stress: Final Classification

Environment Agency (2013) Climate Change Approaches in Water Resources Planning: New Methods

Environment Agency (2013) Managing Water Abstraction

Environment Agency (2017) Drought response: our framework for England

Environment Agency (2017) Groundwater Protection Technical Guidance

Environment Agency (2018) The Environment Agency's Approach to Groundwater Protection

Environment Agency (2020) EA2025 creating a better place

Environment Agency (2020) Meeting our future water needs: a national framework for water resources

Environment Agency (2020) National Flood and Coastal Erosion Risk Management Strategy for England

Environment Agency (2020) Water Company Drought Plan guideline

Environment Agency (2022) Water resources planning guideline supplementary guidance – Environment and society in decision-making

Environment Agency (undated) Hydroecology: Integration for modern regulation

Environment Agency (undated) Restoring Sustainable Abstraction Programme

Environment Agency (undated) WFD River Basin Characterisation Project: Technical Assessment Method - River abstraction and flow regulation.

Environment Agency, Natural Resources Wales and The Water Services Regulation Authority (2021) Water Resources Planning Guideline

English Heritage (2008) Climate Change and the Historic Environment

English Heritage (2010) Heritage at Risk

Historic England (2015) The Setting of Heritage Assets, Historic Environment Good Practice Advice in Planning 3

Historic England (2016) Historic England Advice Note 8: Sustainability Appraisal and Strategic Environmental Assessment

The Historic Environment Group (2018) Historic Environment and Climate Change Sector Adaption Plan

HM Government (1975) Salmon and Freshwater Fisheries Act, 1975

HM Government (1975) Reservoirs Act

HM Government (1979) Ancient Monuments and Archaeological Areas Act 1979

HM Government (1981) Wildlife and Countryside Act, 1981

HM Government (1990) Environmental Protection Act

HM Government (1990) Planning (Listed Buildings and Conservation Areas) Act 1990

HM Government (1990) Town and Country Planning Act 1990

HM Government (1991 and 1994) Land Drainage Act

HM Government (1991) Water Industry Act 1991 (as amended by the Flood and Water Management Act 2010)

HM Government (1991) Water Resources Act 1991

HM Government (1994) The Conservation (Natural Habitats, &c.) Regulations 1994

HM Government (1994) UK Biodiversity Action Plan

HM Government (1994) Urban Waste Water Treatment (England and Wales) Regulations 1994

HM Government (1995) Environment Act 1995

HM Government (2000) The Countryside and Rights of Way (CROW) Act 2000

HM Government (2002) The National Heritage Act 2002

HM Government (2003) The Water Act 2003

HM Government (2004) The Environmental Assessment of Plans and Programmes Regulations 2004

HM Government (2005) Securing the Future; Delivering UK Sustainable Development Strategy

HM Government (2006) Climate Change and Sustainable Energy Act 2006

HM Government (2006) Natural Environment and Rural Communities Act 2006

HM Government (2007) Water Resources Management Plan Regulations 2007

HM Government (2008) The Climate Change Act 2008 and The Climate Change Act 2008 (2050 Target Amendment) Order 2019

HM Government (2008) The Energy Act 2008

HM Government (2008) Planning Act 2008

HM Government (2009) The Eels (England and Wales) Regulations 2009 (as amended 2011)

HM Government (2009) The Groundwater (England and Wales) Regulations 2009

HM Government (2009) Marine and Coastal Access Act 2009

HM Government (2009) Water Resources Act 1991 (Amendment) (England and Wales) Regulations 2009 SI 3104

HM Government (2009) The UK Renewable Energy Strategy

HM Government (2010) Flood and Water Management Act 2010

HM Government (2011) Localism Act 2011

HM Government (2011) UK Marine Policy Statement

HM Government (2011) Water for Life: White Paper

HM Government (2013) The Energy Act 2013

HM Government (2014) Water Act 2014

HM Government (2015) The Environmental Damage (Prevention and Remediation) (England) Regulations 2015

HM Government (2015) Infrastructure Act 2015

HM Government (2015) The Nitrate Pollution Prevention Regulations 2015

HM Government (2015) Ozone-Depleting Substances Regulations 2015

HM Government (2016) Environmental Permitting (England and Wales) Regulations 2016 (as amended 2018)

HM Government (2017) Conservation of Habitats and Species Regulations 2017 (and the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019)

HM Government (2017) The Water Environment (WFD) (England and Wales) Regulations 2017

HM Government (2017, updated 2019) UK Clean Growth Strategy: Leading the way to a low carbon future

HM Government 2017) Climate Change Risk Assessment 2017 (CCRA2)

HM Government (2018) A Green Future: Our 25 Year Plan to Improve the Environment

HM Government (2018) The Water Supply (Water Quality) Regulations 2018

HM Government (2019) the Invasive Alien species (Enforcement and Permitting) Order 2019

HM Government (2020) The Agriculture Act 2020

HM Government (2020) Energy White Paper: Powering our Net Zero Future

HM Government (2021) The Environment Act

HM Government (2022) UK Climate Change Risk Assessment 2022

HM Treasury (2016) National Infrastructure Delivery Plan

JNCC and Defra (2012) UK Post-2010 Biodiversity Framework

National Assembly for Wales (2015) Well-being of Future Generations Act (2015)

National Assembly for Wales (2016) Environment (Wales) Act 2016

National Infrastructure Commission (2018) Preparing for a Drier Future, England's Water Infrastructure Needs

Natural England (2011) UK Geodiversity Action Plan

Natural England (2016) A narrative for conserving freshwater and wetland habitats in England

Natural England (2016) Conservation 21: Natural England's conservation strategy for the 21st century

Natural England and the Environment Agency (2014) Protected Species and Development: Advice for Local Planning Authorities

Natural Resources Wales (2020) The State of Natural Resources Report (SoNaRR) for Wales 2020

Ofwat (2016) Water 2020

Ofwat (2017) Resilience in the Round

UKCIP (2018) UK Climate Projections UKCP18

UKTAG: Phase 3 Review of Environmental Standards

Waterwise (2017) Water Efficiency Strategy for the UK

Water UK (2016) Water Resources Long-term Planning Framework (2015 – 2065)

Welsh Government (2017) Technical Advice Note 24 the Historic Environment

Welsh Government (2018) Priorities for the Historic Environment of Wales

Welsh Government (2020) Historic Environment and Climate Change in Wales

Welsh Government (2021) Planning Policy Wales (Edition 11)

Regional

English Heritage, now known as Historic England, Heritage at Risk Register: Midlands (2021)

Natural Resources Wales (2017) Drought Plan

Water Company (various) Drought Plans:

- Hafren Dyfrdwy Draft Drought Plan 2019
- Dwr Cymru Welsh Water Draft Drought Plan 2020
- Severn Trent Draft Drought Plan 2019-2024
- Yorkshire Water Draft Drought Plan 2019
- Northumbrian Water Final Drought Plan 2019
- United Utilities Final Drought Plan 2018

Water Company (various) Water Resources Management Plans (published and draft):

- Hafren Dyfrdwy Final Water Resources Management Plan 2019
- Dwr Cymru Welsh Water Final Water Resources Management Plan 2019
- Severn Trent Final Water Resources Management Plan 2019
- Yorkshire Water Revised Draft Water Resources Management Plan 2019
- Northumbrian Water Final Water Resources Management Plan 2019
- United Utilities (2019) Final Water Resources Management Plan 2019

Welsh Government (2018) Castles and Town Walls of King Edward in Gwynedd World Heritage Site: World Heritage Site Management Plan 2018 – 28

Wrexham County Borough Council British Waterways and the Royal Commission on the Ancient and Historical Monuments of Wales (2012) Pontcysyllte Aqueduct and Canal World Heritage Site – Management Plan

Torfaen County Borough Council (2011) Blaenavon Industrial Landscape World Heritage Site Management Plan

Sub-Regional/Local

Area of Outstanding Natural Beauty (AONB) Management Units (various) AONB Management Plans

Birmingham City Council (2010) Core Strategy 2026 Consultation Draft

Birmingham City Council (2017) Adopted Birmingham Development Plan 2031
Black Country Councils (2012) Core Strategy to 2026
Black Country Councils (2017) Review of the Black Country Plan
Cannock Chase Area of Outstanding Natural Beauty (AONB) Partnership (2019) Cannock Chase AONB Management Plan 2019-2024
Defra (2010), Eel Management Plans (various)
Environment Agency (various) Catchment Flood Management Plans
Environment Agency and Natural Resources Wales (various) Salmon Action Plans
Environment Agency (various dates) Abstraction Licensing Strategies (Catchment Abstraction Management Strategies – CAMS)
Environment Agency (2004) River Trent Salmon Action Plan (SAP)
Environment Agency and Scottish Environment Protection Agency (2021) Draft River Basin Management Plans: 2021 (Various)
Environment Agency (2015) Part 1: Severn River Basin District River Basin Management Plan
Environment Agency (2015) Part 1: Humber River basin District River Basin Management Plan
Environment Agency (2015) Humber River Basin District Flood Risk Management Plan
Environment Agency and Natural Resources Wales (2016) Flood Risk Management Plans (various)
Local Biodiversity Action Plans (BAPs) (various)
Local Geodiversity Action Plans (LGAPs)
Local Planning Authority (various) Land Use Plans
Local Planning Authority (various) Local Plans/Local Development Plans
Local Wildlife Trust Strategies (various)
Local Planning Authorities (various) Water Cycle Studies that have been undertaken for housing growth points
Local Biodiversity Action Plans (various)
Local and Strategic Flood Risk Management Strategies the South Staffordshire area of the Regional Plan
Local Authority Plans (various)
Natural England (2000) Site Improvement Plans for Natura 2000
Natural England National Character Area (NCA) Profiles (various)
Natural England and Environment Agency (various) River Restoration and Water Level Management Plans
Outline Water Cycle Studies
Public Rights of Way Improvement Plans (ROWIP)
River Restoration and Surface Water Management Plans
West Midlands Combined Authority (2016) Movement for Growth: The West Midlands Strategic Transport Plan
WRMPs from adjacent Water Companies

2.3 POLICY OBJECTIVES RELEVANT TO THE PLAN ASSESSMENT

The review of plans and programmes presented in **Appendix C** has identified a number of objectives and policy messages relevant to the rdWRMP24. Reflecting the topics identified in Schedule 2 of the SEA regulations, these objectives and messages are set out for the following topic areas:

- Biodiversity, Flora and Fauna;
- Geology Land use and Soils;
- Water (including flood risk);
- Air Quality;
- Climatic Factors;
- Population and Human Health;
- Material Assets and Resource Use;
- Cultural Heritage; and
- Landscape.

The policy objectives and messages identified from the review of other plans and programmes are summarised in **Table 2.2**. It is important that the assessment takes these into account as this will help to highlight any areas where the plan will help or hinder the achievement of the objectives of the other plans. Only the key sources are included; however, it is acknowledged that many other plans and programmes could also be included. The relevance of the key objectives and policy measures to the assessment of the WRMP is also indicated in **Table 2.2**.

Table 2.2 Key Policy Objectives Identified in Other Plans and Programmes relevant to the Assessment of the WRMP

Key Policy Objectives and Policy Messages	Key Sources	Relevant to the SEA of the WRMP?
Biodiversity, Flora and Fauna		
Conservation and enhancement of the levels and variety of biodiversity, including designated sites, priority species and habitats	Bern Convention; Bonn Convention; Habitats Directive; Invasive Alien Species Regulation; Ramsar Convention on Wetlands; Birds Directive; EU Biodiversity Strategy to 2030; Marine Strategy Framework Directive; Biodiversity 2020; UK post 2010 Biodiversity Framework; Eel Regulations: Wildlife and Countryside Act; The Natural Environment and Rural Communities Act; UK Biodiversity Action Plan; Marine and Coastal Access Act; Conservation of Habitats & Species Regulations; Better Sea Trout and Salmon Fisheries; The Great Britain Invasive Non-native Species Strategy; A Green Future: Our 25 Year Plan to Improve the Environment; UK Marine Policy Statement; Countryside and Rights of Way Act; National Planning Policy Framework; The State of Natural Resources Report (SoNaRR; Natural England's Conservation strategy for the 21st Century; Protected Species and Development; Local Biodiversity Action Plans (BAP) including Species and Habitats Action Plans (various); Local Planning Authority Local Plans (various); AONB Management Plans; National Park Management Plans (various); River Restoration and Surface Water Management Plans; Natural England (2000) Site Improvement Plans for Natura 2000; Cannock Chase Area of Outstanding Natural Beauty (AONB) Partnership (2019) Cannock Chase AONB Management Plan 2019-2024; Environment Agency (2004) River Trent Salmon Action Plan (SAP); Black Country Councils (2012) Core Strategy to 2026.	**Yes**
Soils, Land Use and Geology		
Protection and enhancement of soil quality, promoting sustainable patterns of land use and protecting designated geological features	Thematic Strategy for Soil Protection; National Planning Policy Framework; Soil: A Precious Resource; Local Planning Authority Local Plans (various); AONB Management Plans; National Park Management Plans (various); Black Country Councils (2012) Core Strategy to 2026.	**Yes**
Water (including flood risk)		
Protection and enhancement of all water supplies and resources	Blueprint to Safeguard Europe's Water Resources; Bathing Waters Directives; Drinking Water Directive; Nitrates Directive; Urban Waste Water Directive; Water Framework Directive; Environmental Quality Standards Directive; Habitats Directive; the Wildlife & Countryside Act; the Conservation of Habitats & Species Regulations; Water Supply (Water Quality) Regulations; Restoring Sustainable Abstraction Programme; Climate Change Approaches in Water Resources Planning; Drought Response: Our Framework for England; Water Resources Planning guideline; Future Water; Meeting our future water needs: a national framework for water resources; A Green Future: Our 25 Year Plan to Improve the Environment; National Planning Policy Framework; Water Resources Long-Term Planning Framework; River Basin Management Plans (various); Draft River Basin Management Plans (Various); Water Company Drought Plans (various); Water Company Water Resource Management Plans (various); Abstraction Licensing Strategies (various); Local Planning Authority Local Plans (various); Environment Agency (2015) Part 1: Severn River Basin District River Basin Management Plan; Environment Agency (2015) Part 1: Humber River basin District River Basin Management Plan; Environment Agency (2015) Humber River Basin District Flood Risk Management Plan; Black Country Councils (2012) Core Strategy to 2026.	**Yes**
Promoting the sustainable and efficient use of water	Blueprint to Safeguard Europe's Water Resources; Water Framework Directive; The Water Environment (WFD) (England and Wales) Regulations; Water for People and the Environment; Restoring Sustainable Abstraction Programme; Environment Agency's Approach to Groundwater Protection; Meeting our future water needs: a national framework for water resources; Water Act; A Green Future: Our 25 Year	**Yes**

Key Policy Objectives and Policy Messages	Key Sources	Relevant to the SEA of the WRMP?
	Plan to Improve the Environment; National Planning Policy Framework; River Basin Management Plans (various); Draft River Basin Management Plans (Various); Water Company Drought Plans (various); Water Company Water Resource Management Plans (various); Abstraction Licensing Strategies (various); Local Planning Authority Local Plans (various); Environment Agency (various dates) Abstraction Licensing Strategies (Catchment Abstraction Management Strategies – CAMS); Black Country Councils (2012) Core Strategy to 2026.	
Minimising flood risk and improving flood control infrastructure	Floods Directive; Water Framework Directive; Flood and Water Management Act; Shoreline Management Plan Guidance; National Flood and Coastal Erosion Risk Management Strategy for England; Flood and Water Management Act; National Planning Policy Framework; Shoreline Management Plans (various); Catchment Flood Management Plans (various); River Basin Management Plans (various); Draft River Basin Management Plans (Various); Catchment Flood Management Plans (various); Local Planning Authority Local Plans (various); Black Country Councils (2012) Core Strategy to 2026; Local and Strategic Flood Risk Management Strategies the South Staffordshire area of the Regional Plan;	**Yes**
Air		
Ensuring air quality is maintained or enhanced and that emissions of air pollutants are kept to a minimum	Ambient Air Quality and Cleaner Air for Europe; Industrial Emissions Directive; Air Quality Strategy for England, Scotland, Wales and Northern Ireland; Air Quality Plan for Nitrogen Dioxide (NO2) in UK; National Planning Policy Framework; Local Planning Authority Local Plans (various); Black Country Councils (2012) Core Strategy to 2026	**Yes**
Climatic Factors		
Minimising emissions of greenhouse gases that cause climate change	Kyoto Protocol; Paris Agreement; Climate Change Act; Renewable Energy Roadmap; UK Sustainable Development Strategy; UK Renewable Energy Strategy; Energy White Paper; UK Clean Growth Strategy; UK Climate Change Risk Assessment; Local Planning Authority Local Plans (various); Black Country Councils (2012) Core Strategy to 2026	**Yes**
Minimising the effects of climate change on natural resources, inhabitants and the economy	The Environment Act; Strategy on Adaptation to Climate Change; UK Sustainable Development Strategy; National Flood and Coastal Erosion Risk Management Strategy for England; National Planning Policy Framework; The National Adaptation Programme and the Third Strategy for Climate Adaptation Reporting; Water Resources Management Plans (various); River Basin Management Plans (various); Draft River Basin Management Plans (Various); Shoreline Management Plans (various); Catchment Flood Management Plans (various); Local Planning Authority Local Plans (various); Black Country Councils (2012) Core Strategy to 2026	**Yes**
Population and Human Health		
Addressing deprivation and reducing inequality	World Summit on Sustainable Development; Europe 2020; Sustainable Development Strategy; National Planning Policy Framework; Planning Policy Wales Edition 11; Local Planning Authority Local Plans (various); Black Country Councils (2012) Core Strategy to 2026	**Yes**
Promoting improvements to health and well-being	Aarhus Convention; Sustainable Development Strategy; World Summit on Sustainable Development; Eight Environmental Action Programme; National Planning Policy Framework; Local Planning Authority Local Plans (various); Black Country Councils (2012) Core Strategy to 2026	**Yes**
Providing high quality services, community facilities and social infrastructure that is accessible to all	National Planning Policy Framework; Planning Policy Wales Edition 11; Local Planning Authority Local Plans (various); Black Country Councils (2012) Core Strategy to 2026	**No**
Achieving sustainable economic growth and promoting key sectors in the local economy	World Summit on Sustainable Development; Europe 2020; UK Marine Policy Statement; Sustainable Development Strategy; National Planning Policy Framework; Local Planning Authority Local Plans (various); Black Country Councils (2012) Core Strategy to 2026	**Yes**

Key Policy Objectives and Policy Messages	Key Sources	Relevant to the SEA of the WRMP?
Improving and expanding the tourism economy	National Planning Policy Framework; Local Planning Authority Local Plans (various); AONB Management Plans (various); National Park Management Plans (various). Local Planning Authority Local Plans (various); Black Country Councils (2012) Core Strategy to 2026	**Yes**
Maximising job opportunities for all and enhancing the quality of employment opportunities	National Planning Policy Framework; Local Planning Authority Local Plans (various); Black Country Councils (2012) Core Strategy to 2026	**Yes**
Minimising noise pollution	Environment Noise Directive; National Planning Policy Framework; Local Planning Authority Local Plans (various); Black Country Councils (2012) Core Strategy to 2026	**Yes**
Promoting sustainable transport	Sustainable Development Strategy; A Roadmap for Moving to a Competitive Low Carbon Economy in 2050; National Planning Policy Framework; Local Planning Authority Local Plans (various); Black Country Councils (2012) Core Strategy to 2026	**No**
Material Assets and Resource Use		
Minimising waste production, promoting re-use and recycling	Waste Framework Directive; Landfill of Waste Directive; Waste Management Plan for England; National Planning Policy for Waste; Local Planning Authority Local Plans (various); Black Country Councils (2012) Core Strategy to 2026	**Yes**
Promoting the most effective and efficient use of natural resources	World Summit on Sustainable Development; Eighth Environmental Action Programme; Energy 2020; Europe 2020; UK Sustainable Development Strategy; National Planning Policy for Waste; Local Planning Authority Local Plans (various); Black Country Councils (2012) Core Strategy to 2026	**Yes**
Promoting the use of sustainable/renewable energy	Eighth Environmental Action Programme to 2020; Energy 2020; A Roadmap for Moving to a Competitive Low Carbon Economy in 2050; Renewable Energy Strategy; Sustainable Development Strategy; UK Clean Growth Strategy; Climate Change Act; UK Renewable Energy Strategy; UK Renewable Energy Roadmap; UK Sustainable Development Strategy; Net Zero Strategy; Resources and Waste Strategy; Renewable and Low Carbon Energy; National Planning Policy Framework; Future Electricity Networks; Energy White Paper; Local Planning Authority Local Plans (various); Black Country Councils (2012) Core Strategy to 2026	**Yes**
Promoting the use of sustainable design and construction and encouraging energy efficiency	Energy Efficiency Directive; A Roadmap for Moving to a Competitive Low Carbon Economy in 2050; Heat and Buildings Strategy; Renewable Energy Strategy; UK Sustainable Development Strategy; National Planning Policy Framework; Local Planning Authority Local Plans (various); Black Country Councils (2012) Core Strategy to 2026	**Yes**
Cultural Heritage		
Protecting and enhancing cultural heritage and archaeological sites	Ancient Monuments and Archaeological Areas Act; Planning (Listed Buildings and Conservation Areas) Act; National Planning Policy Framework; Planning Policy Wales Edition 11; Technical Advice Note 24 the Historic Environment; the Setting of Heritage Assets; Historic England Advice Note 8; Priorities for the Historic Environment of Wales; Historic Environment and Climate Change in Wales; Local Planning Authority Local Plans (various); Black Country Councils (2012) Core Strategy to 2026	**Yes**
Landscape		
Protecting and enhancing the quality and distinctiveness of natural landscapes and environmental resources	European Landscape Convention; National Planning Policy Framework; Planning Policy Wales Edition 11; AONB Management Plans (various); Local Planning Authority Local Plans (various); National Park Management Plans (various); Black Country Councils (2012) Core Strategy to 2026	**Yes**

3. BASELINE ANALYSIS

3.1 INTRODUCTION

Schedule 2 of the SEA Regulations require the completion of an Environmental Report that contains:

"The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme" (Schedule 2(2));

"The environmental characteristics of areas likely to be significantly affected" (Schedule 2(3)); 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 Council Directive 79/409/EEC on the conservation of wild birds(1) and the Habitats Directive", (Schedule 2(4)).

Appendix D of this Environmental Report identifies and characterises current environmental baseline conditions, along with their likely evolution. Only with a knowledge of existing conditions, and a consideration of their likely evolution, can the effects of the rdWRMP24 be identified, described and assessed and its subsequent success or otherwise be monitored. This is also useful in determining the key issues for each topic that should be taken forward in the SEA, through the SEA objectives and guide questions.

The analysis of baseline information is presented for the following topics:

- Biodiversity, Flora and Fauna;
- Geology Land use and Soils;
- Water (including flood risk);
- Air Quality;
- Climatic Factors;
- Population and Human Health;
- Material Assets and Resource Use;
- Cultural Heritage; and
- Landscape.

Each topic includes further sub-topics with information structured according to the following:

- Baseline Characteristics;
- Likely Evolution of the Baseline without the Plan;
- Key Issues Relevant to the Assessment of the Plan.

The data has been drawn from a variety of sources, such as the water companies themselves, the Office for National Statistics (ONS), government departments (such as BEIS, Defra and DLUHC), regulators (such as NRW, NE and the EA) and a number of the plans and programmes reviewed as part of the SEA process (see **Section 2** of this report and **Appendices C and D**).

3.2 SUMMARY OF THE KEY ISSUES

The key issues arising from the review of baseline conditions are summarised for each topic in **Table 3.1**.

Table 3.1 Summary of Key Issues

Topic	Summary of Key Issues	SEA Objectives link (see Section 4)
Biodiversity Flora and Fauna	Relevance The construction of water resources infrastructure can affect biodiversity and ecosystem resilience. Impacts may be direct (for example, the loss of, or damage to, habitats and species) or indirect (for example, disturbance due to noise and emissions to air associated with construction works). The operation of water resources infrastructure can have a range of positive and negative impacts on habitats and species and wider ecosystem	Objective 1: Biodiversity Objective 4: Soils, Land Use and Geology Objective 5: Water Quality

Topic	Summary of Key Issues	SEA Objectives link (see Section 4)
	resilience due to, for example, changes in hydrology, changes in water chemistry and the spread of invasive non-native species. Water infrastructure can contribute positively to biodiversity, introducing new features that can provide opportunities for nature and wildlife in the medium to long term. Discharges associated with the construction and operation of water resources infrastructure e.g., desalination can adversely affect marine habitats. <u>Key Issues</u> • Key pressures and risks in respect of biodiversity and nature conservation that are relevant include, inter-alia: • population growth; • habitat loss and fragmentation by development; • agricultural intensification and changes in agricultural management practices; • water abstraction, drainage or inappropriate river management; • lack of appropriate habitat management; • atmospheric pollution (acid precipitation, nitrogen deposition); • water pollution from both point and wider (diffuse) agricultural sources; • climate change and sea level rise; • recreational pressure and human disturbance; and • invasive and non-native species. • The need to protect, maintain or enhance the region's biodiversity, particularly protected sites designated for nature conservation • The need to avoid and, mitigate against, where necessary, activities likely to cause damage to natural heritage. • The need to take opportunities to improve connectivity between fragmented habitats to create functioning habitat corridors • The need to recognise the importance of allowing wildlife to adapt to climate change • The need to control the spread of Invasive Non-Native Species (INNS) and eradicate them where already present • The need to engage more people in biodiversity issues so that they personally value biodiversity and know what they can do to help, including through recognising the value of ecosystem services. • The depletion and pollution of groundwater.	Objective 6: Water Quantity Objective 7: Flood Risk Objective 10: Climatic Factors
Soils, Land Use and Geology	<u>Relevance</u> Soils are a non-renewable resource vulnerable to changes in both hydrology and land use. Hydrogeology will affect the distribution and movement of groundwater and surface water and is a key consideration for water resources planning. The construction of water resources infrastructure can affect land use and soil. Impacts may be direct (for example, the loss of, or damage to, land and soil from new development) or indirect (for example, the location of new infrastructure affecting adjacent land uses). The appropriate management and control of soils and sediments that are excavated, moved and/or stored during construction is key to their long-term sustainability. <u>Key Issues</u> • The need to protect geological features of importance and maintain and enhance soil function and health. • The need to manage the land more holistically at the catchment level, benefitting landowners, other stakeholders, the environment and sustainability of natural resources (including water resources).	Objective 1: Biodiversity Objective 4: Soil, Land Use and Geology Objective 5: Water Quality Objective 6: Water Quantity

Topic	Summary of Key Issues	SEA Objectives link (see Section 4)
	• The need to make use of previously developed land (brownfield land) and to reduce the prevalence of derelict land in the region. • The need to protect, maintain and enhance geomorphological functions and services.	
Water - Quantity	Relevance There is growing pressure on water resources in parts of the UK, particularly the south east and east of England with proposals to meet the demand from other parts of the country including WRW. The construction of water resources infrastructure would be expected to increase the volume and resilience of the water supply. The volume and flow of water significantly affects ecological functioning and the broader environment and can be affected (potentially positively or negatively) by water resources infrastructure through, for example, changes in supply and abstraction. Key Issues • The need to improve the resilience, flexibility and sustainability of water resources in the region, particularly in light of potential climate change impacts on surface water and groundwater. • The need to ensure sustainable abstraction to protect the water environment and meet society's needs for a resilient water supply. • The need to ensure that people understand the value of water. • The need to address increased pressures on the public water supply.	Objective 1: Biodiversity Objective 4: Soils, Land Use and Geology Objective 5: Water Quality Objective 6: Water Quantity Objective 11: Economy Objective 13: Human Health
Water - Quality	Relevance Reliable access to water of good quality is an essential aspect of water resources planning. The construction of water resources infrastructure would be expected to help ensure a robust future supply of good quality water in a changing climate. The construction and operation of water resources infrastructure can have adverse impacts on water quality due to, for example, pollution. The operation of water resources infrastructure can have both positive and negative impacts on water quality associated with, in particular, changes to water levels as a result of abstraction or discharge. This in-turn can affect the resilience of ecosystems. The historic pollution of groundwater and nitrate concentrations present an issue for water resources infrastructure and ensuring drinking water standards are met. Key Issues • The need to further improve the quality of the region's river, estuarine and coastal waters taking into account WFD/RBMP objectives. • The need to maintain and improve the quantity and quality of groundwater resources taking into account WFD/RBMP objectives.	Objective 1: Biodiversity Objective 4: Soils, Land Use and Geology Objective 5: Water Quality Objective 6: Water Quantity Objective 11: Economy Objective 13: Human Health
Water - Flood Risk	Relevance Flood risk presents a significant planning issue in the development of major infrastructure projects, both in terms of the infrastructure itself being flooded during its construction and operational phases and the changes to flood risk resulting from the infrastructure, such as increased run-off raising the flood risk in downstream areas. The operation of water resources infrastructure (e.g., reservoirs) may provide an opportunity to address flood risk issues (for example, by providing extra space for flood water storage). Key Issues • The need to reduce and manage flood risk.	Objective 5: Water Quality Objective 6: Water Quantity Objective 7: Flood Risk Objective 10: Climatic Factors Objective 11: Economy Objective 13: Human Health

Topic	Summary of Key Issues	SEA Objectives link (see Section 4)
Air Quality	Relevance Air quality is sensitive to changes in traffic volume and emissions from other sources such as construction plant and machinery. Increases in transport movements and works associated with the construction and operation of nationally significant water resources infrastructure could affect air quality, particularly in areas with existing air quality issues. For example, construction traffic can lead to increased nitrate deposition in sensitive habitats. Key Issues • The need to reduce air pollutant and greenhouse emissions and limit air emissions to comply with air quality standards.	Objective 1: Biodiversity Objective 4: Soil, Land Use and Geology and Soils Objective 5: Water Quality Objective 6: Water Quantity Objective 8: Air Quality Objective 13: Human Health
Climatic Factors	Relevance The availability of additional water supplies can increase the resilience of the existing water network and broader environment and support adaptation to the effects of climate change such as drought. The construction and operation of water resources infrastructure is likely to result in a net increase in energy use and greenhouse gas emissions, noting however that new infrastructure may replace older, less energy efficient infrastructure with higher emissions. The energy requirements associated with different types of water resources infrastructure will vary with the scope for the use of renewable energy greater for certain infrastructure types than for others. Water resources infrastructure may be vulnerable to the effects of climate change such as flood risk and coastal change. Key Issues • The need to reduce greenhouse gas emissions (all sectors) • The need to mitigate against climate change through the reduction in greenhouse gas emissions in order to contribute to risk reduction over the long term • The need to adapt to the impacts of climate change for example through, sustainable water resource management, water use efficiencies, specific aspects of natural ecosystems (e.g. connectivity), as well as accommodating potential opportunities afforded by climate change.	Objective 1: Biodiversity Objective 5: Water Quality Objective 6: Water Quantity Objective 7: Flood Risk Objective 9: Greenhouse Gases Objective 10: Climatic Factors Objective 13: Human Health
Population	Relevance The growing population within the WRW area and Wales will increase the demand for water resources. Long-term growth of the economy would be expected to lead to an increase in demand for water for commercial and industrial purposes. In turn, the risk of drought or interruptions to accessing water may pose a risk to economic productivity. The construction of large-scale water resources infrastructure can represent a significant capital investment with the potential to create employment opportunities, deliver supply chain benefits and contribute to skills development in the working population. The operation of water resources infrastructure can support long term socio-economic growth by ensuring sufficient supplies of water are made available to meet demand. The affordability of water, protection of vulnerable customers and delivering best value for money is a key consideration in water company investment decisions. The construction and operation of water resources infrastructure can adversely affect businesses and communities, principally due to disruption.	Objective 11. Economy Objective 12. Tourism and Recreation Objective 13. Human Health Objective 14. Water Resources Objective 15. Waste and Resource Use

Topic	Summary of Key Issues	SEA Objectives link (see Section 4)
	Consumer preference and consumer behaviour can have a strong influence on the demand for water resources. Key Issues • The need to ensure that water supplies remain affordable, in particular for deprived or vulnerable communities. • The need to ensure public awareness of drought conditions and importance of maintaining resilient, reliable public water supplies without the need for emergency drought measures • The need to ensure water quantity and quality is maintained for other users including tourists, recreational users and other users such as farmers. • The need to ensure a balance between different aspects of the built and natural environment that will help to provide opportunities for local residents and tourists, including opportunities for access to, protecting and enhancing recreation resources, green infrastructure and the natural and historic environment • The need to accommodate an increasing population	
Human Health	Relevance A reliable source of clean water is required for basic sanitation and to ensure human health. The increase in the severity of drought, particularly in the south and east of England, poses a risk to health. The detection and removal of chemicals in the drinking water supply, or in treated waste water returned to the environment, is an important aspect of maintaining a wholesome water supply. Certain aspects of water resources infrastructure, such as reservoirs, can provide valuable recreational opportunities, both for water sports and for users of the associated land such as walkers and cyclists. The construction and operation of water resources infrastructure can have adverse effects on human health for example, due to noise disturbance or loss of open space. Key Issues • The need to ensure continued improvements in levels of health across the region, particularly in urban areas and deprived areas • The need to ensure continuing safe, reliable and resilient provision of water and sewerage services to maintain health and wellbeing of the population. • The need to ensure that sites of nature conservation importance, heritage assets, water resources, important landscapes and public rights of way contribute to recreation and tourism opportunities, subsequently health, well-being, and the economy.	Objective 11. Economy Objective 12. Tourism and Recreation Objective 13. Human Health
Material Assets	Relevance Large scale infrastructure projects have the potential to generate very high volumes of waste during both construction and operation. This waste should be managed in accordance with the waste hierarchy. Large scale water resources infrastructure may require both short-term (i.e. during construction) and long-term (i.e. during operation) use of materials that are non-renewable or are imported. In doing, so schemes may have an environmental impact that extends outside the water company operational area. Key Issues • The need to minimise the consumption of resources, including water and energy. • The need to reduce the total amount of waste produced in the region, from all sources. The need to recognise waste as a potential resource	Objective 1: Biodiversity Objective 4: Soils, Land Use and Geology Objective 5: Water Quality Objective 6: Water Quantity Objective 9: Greenhouse Gases Objective 10: Climatic Factors

Topic	Summary of Key Issues	SEA Objectives link (see Section 4)
	and reuse waste productively where possible to support development of the circular economy. • The need to reduce the proportion of waste sent to landfill. • The need to continue to actively control leakage from the water supply system and promote the efficient use of water to help reduce future demand for water.	Objective 11. Economy Objective 14. Water Resources Objective 15. Waste and Resource Use
Cultural Heritage	Relevance Wetlands are fragile and vulnerable to subtle changes arising from development that can affect paleoenvironmental deposits and archaeological assets. Other aspects of the wider historic environment that could be affected include disruption to historically important water sources, the flooding or drying of deep archaeological sites and assets such as mills and bridges which can be affected by local water levels. The construction and operation of large-scale water resources infrastructure can have adverse impacts on the significance of heritage assets and archaeological remains both directly (through the loss of, or damage to, assets) or indirectly (through effects on setting). Cultural landscape is a function of the interaction between human traditions, landscape and the environment and is a highly valued feature of some areas such as National Parks. Existing water resources infrastructure including, for example, pumping stations and reservoirs can be historically important in their own right. Key Issues • The need to conserve or enhance sites of archaeological importance and cultural heritage interest, and their settings, particularly those which are sensitive to the water environment.	Objective 4: Soils, Land Use and Geology Objective 11. Economy Objective 12. Tourism and Recreation Objective 13. Human Health Objective 16: Cultural Heritage Objective 17: Landscape
Landscape	Relevance The construction and operation of water resources infrastructure can have adverse impacts on landscape character, visual amenity and tranquillity. Where works are located in areas of high landscape value (for example, National Parks), these effects could be significant. Water infrastructure can also contribute positively to landscapes, introducing new features that can provide opportunities for nature and wildlife in the medium to long term. Key Issues • The need to protect and improve the natural beauty of the region's AONBs, and other areas of natural beauty. • The need to protect the settings and improve the character of designated landscapes and townscapes. • The need to maintain and enhance landscape and designated sites for the enjoyment of the public.	Objective 1: Biodiversity Objective 4: Soils, Land Use and Geology Objective 11. Economy Objective 12. Tourism and Recreation Objective 13. Human Health Objective 16: Cultural Heritage Objective 17: Landscape and Townscape

3.3 LIMITATIONS OF THE DATA AND ASSUMPTIONS MADE

The information used has been sourced, so far as is possible, from recent datasets utilising a wide range of authoritative and official sources. It is important to acknowledge that there are variable time lags between raw data collection and its publication. Consequently, at the time of this Scoping Report's publication, the baseline or predicted future trends may have varied from those described above.

The data gathered to complete this baseline pre-dates the Covid-19 pandemic and its environmental, social and economic effects. Data that relates to these changes is only becoming available periodically and it may well be a number of years before the effects of the pandemic can be determined, along with whether changes to the topics covered in the baseline have been short-term or sustained. This is an additional uncertainty within the assessment, and where relevant, some qualitative commentary may be provided.

4. APPROACH TO THE ASSESSMENT

4.1 INTRODUCTION

This section describes the approach to the assessment of the rdWRMP24. It draws on the information contained in **Sections 2 and 3**, as well as the more detailed information contained in **Appendices C and D**, to define the scope of the assessment (in terms of the environmental and socio-economic issues to be considered) and sets out the SEA objectives and guide questions that comprise the assessment framework. The section then outlines how this assessment framework will be used to assess the options contained in the rdWRMP24.

4.2 THE SCOPE OF THE ASSESSMENT

4.2.1 Topics

The aim of SEA is to identify, describe and evaluate the likely significant effects of implementing the rdWRMP24 on the environment. Schedule 2 of the SEA Regulations require that the assessment includes information on the *"likely significant effects on the environment, including 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; and the inter-relationship between the issues referred to".*

The key policy objectives identified from the review of other plans and programmes relevant to the assessment of the rdWRMP24 (**Section 2**) and the key economic, social and environmental issues arising from the analysis of the baseline (**Section 3**), together with the characteristics of the water resource management options, have been used to define the scope of the assessment in terms of the topics set out in Schedule 2 of the SEA Regulations.

In this instance, all SEA topics identified by Schedule 2 of the SEA Regulations have been scoped in for assessment.

4.2.2 Geographic Scope

The geographic extent of the SEA reflects the operational area covered by the rdWRMP24. It includes all WRZs, as each is forecast to be in deficit over the lifetime of the plan. The SEA will focus on the effects associated with the water resource management options being proposed to address the deficit.

In considering the adverse operational effects on European sites, and reflecting the approach taken in the HRA, a 10km study area from each option component has been used plus consideration of exceptional, longer impact pathways e.g. downstream receptors, coastal dispersion, foraging areas for mobile species.

Where water resource options include transfers and potential water trading options between companies, where appropriate, further consideration has been given to the effects outside the operational area of the rdWRMP24. This also extends to the assessment of cumulative effects, where consideration of plans or programmes that cover areas that either overlap or are adjacent to the plan being assessed have also been taken into account.

4.2.3 Timescales

When considering the timing of potential effects of the rdWRMP24, the assessment has classified effects as 'short,' 'medium' or 'long-term.' This reflects an intention to capture the differences that could arise at different timescales, consistent with the requirements of Schedule 1 (2)(a) of the SEA Regulations where the assessment of the effects should have regard to *"the probability, duration, frequency and reversibility of the effects"*.

Table 4.1 below summarises the timescales applied in the SEA informed by the 5-year cycle of review of the plan. For the purposes of this assessment, short-term is considered as up to 1 year, medium-term (from 1 year to 5 years (to the end of the plan review cycle)) and long-term is for the period beyond 5 years (beyond the plan review cycle).

Table 4.1 Duration of Short, Medium and Long Term

Estimated Length (years)	Duration
0-1 years	Short
>1-5 years	Medium
Over 5 years	Long

4.3 ASSESSMENT FRAMEWORK

Establishing appropriate SEA objectives and guide questions is central to assessing the effects of the WRMP24 on the environment. Each of the feasible water resource management options and preferred options has been assessed against the SEA objectives to determine the scale and significance of the effect. Guide questions focus the assessment on specific aspects of the objective that reflect issues identified from the review of baseline and contextual information relating to South Staffs Water's WRMP24 area.

The SEA objectives and guide questions used in the assessment of the rdRMP24 reflect the topics contained in Schedule 2 (6) of the SEA regulations and have been informed by:

- the previous SEA assessment frameworks used to complete the SEA of DCWW, SSW, STW and UUW's WRMP19s;
- the suggested core set of objectives in the All Company Working Group (ACWG) 2020 report 'Strategic Environmental Assessment: Core Objective Identification'.
- the review of relevant plans and programmes and the associated key policy objectives and messages (**Section 2** and **Appendices C**);
- the baseline information and key issues contained in **Section 3** and **Appendix D**;
- the draft assessment framework presented in the WRW and draft WRMPs SEA Scoping Report, issued for scoping consultation in April 2021 (noting that an integrated approach to assessment has been undertaken, and this report set out the aligned approach to assessment that has then been employed for the SEA of WRW draft Regional Plan and the rdWRMP24s for DCWW, SSW, STW and UUW);
- scoping consultation responses received from (**Appendix B**).

The assessment framework is presented in **Table 4.2**. It contains 17 assessment objectives. It has been revised to reflect the scoping consultation responses and has been used to completion of the assessment of South Staffs Water's rdWRMP24.

Table 4.2 Assessment Framework

Topic	Assessment Objective	Guide Questions
Biodiversity, Flora and Fauna	1. To protect, restore and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species, enhance ecosystem resilience and habitat connectivity and deliver a net biodiversity gain.	• Will it protect, and enhance where possible, the most important sites for nature conservation (e.g., internationally or nationally designated conservation sites such as SACs, SPAs, Ramsar and SSSIs)? • Will it protect and enhance non-designated sites and local biodiversity? • Will it provide opportunities for new terrestrial and aquatic habitat creation or restoration and/or link existing habitats as part of the development process? • Will it provide opportunities to deliver biodiversity net gain? • Will it lead to a change in the ecological quality of habitats?

Topic	Assessment Objective	Guide Questions
		• Will it protect, and enhance where appropriate, coastal and marine habitats and species? • Will it alter geomorphological forms and processes which underpin physical habitat for aquatic ecosystems? • Will it maintain and enhance the green infrastructure network and the biodiversity it supports? • Will it alter geomorphological forms and processes which underpin physical habitat for aquatic ecosystems?
	2. To protect and enhance sustainable natural resources and the ecosystem services they provide.	• Will it protect or enhance natural capital and ecosystem services? • Will it maintain and enhance ecosystem resilience? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e., within their limits and capacities taking into account climate change adaptability? • Will it provide opportunities for climate adaptation and protect the climate resilience of vulnerable and priority sites?
	3. To avoid and, where required, manage invasive and non-native species (INNS).	• Will it prevent or minimise the risk of spread/introduction of invasive and non-native species? • Will it contribute to the eradication of invasive and non-native species, where they are already present and it is technically and economically feasible to do so?
Soils, Land Use and Geology	4. To protect and enhance soil quantity, quality and functionality and geodiversity and ensure the appropriate and efficient use of land.	• Will additional land be required for the development or implementation of the option or will the option require below ground works leading to land sterilisation? • Will it avoid damage to, protect and enhance where possible protected sites designated for their geological interest (GCR sites, SSSI and RIGS) and features of wider geodiversity interest? • Will it minimise the loss of best and most versatile agricultural land? • Will it avoid adverse effects on other land uses (such as forestry)? • Will it minimise land contamination? • Will it ensure efficient use of land (e.g., make use of previously developed land)? • Will it contribute towards a catchment-wide approach to land management?
Water – Quantity	5. To protect and enhance surface and ground water levels and flows.	• Will it minimise the demand for water resources? • Will it result in changes to river flows, channel morphologies, wetted width or river levels? • Will it result in changes to groundwater levels? • Will it support the achievement of relevant environmental objectives set out in River Basin Management Plans? • Will it alter the flow regime of surface waters?
Water – Quality	6. To protect and enhance the quality of surface and groundwater resources.	• Will it prevent pollution and protect and improve surface, groundwater, estuarine and coastal water quality? • Will it prevent the deterioration of Water Framework Directive (WFD) waterbody status (or potential)? • Will it support the achievement of WFD protected area objectives?

Topic	Assessment Objective	Guide Questions
		• Will it ensure a new activity or new physical modification does not prevent the future achievement of good status for a water body? • Will it support the achievement of relevant environmental objectives set out in River Basin Management Plans? • Will the option prevent nutrient loading in water bodies?
Water – Flood Risk	7. To reduce or manage flood risk.	• Will the option be at risk of flooding now or in the future? • Will it have the potential to cause or exacerbate flooding in the catchment area including the risks to people and property, now or in the future? • Will it have the potential to help alleviate or mitigate flooding in the catchment area including to people and property now or in the future? E.g., will it avoid reducing flood plain storage, or provide opportunities to improve flood risk management? • Will it promote the use of sustainable drainage systems? • Will it promote opportunities for collaborative working with other risk management authorities?
Air	8. To minimise emissions of pollutant gases and particulates and enhance air quality.	• Will it maintain or enhance ambient air quality, keeping pollution below Local Air Quality Management thresholds (e.g., in Air Quality Management Areas or sensitive habitats)?
Climatic Factors	9. To reduce greenhouse gas emissions.	• Will it reduce or minimise greenhouse gas emissions? • Will it have a low level of embodied carbon? • Will it provide new infrastructure that is energy efficient and/or minimizes the use of energy? • Will it provide new infrastructure that could contribute or make use of renewable energy sources? • Will the option affect carbon sequestration?
	10. To adapt and improve resilience to the threats of climate change.	• Will it improve resilience and/or adaptability to the likely effects of climate change, e.g., by increasing resilience of water supplies or catchments? • Will it increase environmental resilience to the effects of climate change including to impacts on flood risk and water quality? • Will coastal erosion have consequences on the operation of this option now or in the future, taking account of expected climate change sea level rise?
Population	11. To promote a sustainable economy and maintain and enhance the economic and social well-being of local communities.	• Will it ensure that sufficient water resources infrastructure is in place to support predicted population increases? • Will it ensure sufficient infrastructure is in place to sustain a seasonal influx of tourists? • Will it help to meet the employment needs of local people? • Will it ensure that an affordable supply of water is maintained, and vulnerable customers protected? • Will it contribute to sustaining and growing the local and regional economy? • Will it avoid disruption through effects on the transport network?

Topic	Assessment Objective	Guide Questions
		• Will it avoid negative effects on built assets/ existing infrastructure including transport?
	12. To maintain and enhance tourism and recreation.	• Will it protect and enhance public access to, and enjoyment of, green and blue infrastructure, open space/recreational facilities and the natural and historic environment, and in doing so help promote healthy lifestyles including mental well-being?
Human Health	13. To protect and enhance human health and well-being.	• Will it ensure the continuity of a safe and secure drinking water supply? • Will it help to protect or improve drinking water quality? • Will it maintain surface water and bathing water quality within statutory standards? • Will it help to promote healthy communities and avoid risks to health and wellbeing (for example, due to noise resulting from construction traffic or disruption to safe and reliable water/sewerage services)? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it be located in an area considered to be significantly more health deprived than others in the region? • Will it improve opportunities for social interaction and community cohesion?
Material Assets - Water Resources	14. To promote and enhance the sustainable and efficient use of resilient water resources.	• Will it lead to reduced leakage from the supply network? • Will it improve efficiency in water consumption? • Will it ensure sustainable abstractions, taking account of water resource availability? • Will it enable efficient water resource management to help maintain a supply-demand balance? • Will it increase the resilience of water resources, now and into the future? • Will it contribute towards improving the awareness of water sustainability?
Material Assets – Waste and Resource Use	15. To minimise waste, promote resource efficiency and move towards a circular economy.	• Will it make use of existing infrastructure? • Will it promote the re-use and recycling of waste materials and reduce the proportion of waste sent to landfill? • Will it help to encourage sustainable design or use of sustainable materials (e.g., supplied from local resources)?
Cultural Heritage	16. To conserve and enhance the historic environment including the significance of heritage assets and their settings and archaeological important sites.	• Will it avoid damage to, conserve or enhance the historic environment, including heritage assets and their settings such as historic buildings, conservation areas, features, places and spaces, that enhance local distinctiveness? • Will it avoid or minimise damage to archaeologically important sites? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it avoid damage to important wetland areas with potential for paleoenvironmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region?

Topic	Assessment Objective	Guide Questions
		• Will it protect or enhance (where relevant) Welsh language and culture?
Landscape	17. To conserve, protect and enhance landscape and townscape character and visual amenity.	• Will it avoid adverse effects to, and enhance where possible, protected/designated landscapes and the settings of designated landscapes (including woodlands) such as National Parks or AONBs? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g., woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it protect and enhance landscape character, townscape, seascape and green infrastructure? • Will it minimise adverse visual impacts?

4.4 ASSESSMENT METHODOLOGY

The effects of the rdWRMP24 have been assessed in a staged process, complementary to the development of the plans, and reflecting the decision-making requirements, as follows:

- **Feasible option assessment**: a high-level assessment of all feasible options (including resource management and demand management options) against the 17 SEA assessment objectives detailed in **Table 4.2** with findings used to inform the MCA (for plan decision making) and detailed screening of options (for the WRMPs).
- **Preferred option assessment**: for those options selected, a more detailed assessment has been undertaken of the preferred plan options against the 17 SEA assessment objectives detailed in **Table 4.2.**
- **Preferred programme assessment**: the cumulative effects of the preferred programme of options will be completed, to ensure that the effects of the revised draft Plan have been identified, described and evaluated.
- **Reasonable alternative plan assessments:** the cumulative effects of any reasonable alternative plans will be identified, described and evaluated for consideration along with the preferred plan. **In the case of South Staffs WRMP24, the deficit for any reasonable alternative scenarios is resolved through demand side options alone and no supply options are required.** The approach to these is described in more detail below.

4.4.1 Feasible Options

Both the construction and operational effects of each feasible option have been assessed against all of the SEA objectives that comprise the assessment framework. This approach ensures a comprehensive consideration of any likely effects. It also recognises that the environmental effects are likely to be different in their nature, scale and significance during construction as opposed to their operation. For those options that would not require construction works per se and may be ongoing in nature (for example, the installation of water efficient devices, audits and educational programmes), construction in the context of the SEA refers to any enabling/installation works or option implementation.

The assessment of effects will include consideration of the following:

- the nature of the potential effect (what is expected to happen);
- the timing and duration of the potential effect (e.g., short, medium or long term);
- the geographic scale of the potential effect (e.g., local, regional, national);
- the location of the potential effect (e.g., whether it affects rural or urban communities, or those in particular parts of a water company area); and
- the potential effect on vulnerable communities or sensitive sites.

Where relevant, other information and assessments including the HRA and WFD Assessment have been referenced as appropriate. Where the assessment is of a revised WRMP19 option, the assessment will take

into account, where appropriate, the previous assessment findings and any regulators and stakeholder feedback already received.

A matrix similar to that shown in **Table 4.3** has been used to capture the assessment of each feasible water resource management option in a consistent manner; a key to the meaning of the symbols is presented in **Table 4.4.**

Table 4.3 Example Feasible Options Assessment Matrix

Option	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape
Option Name	Construction (negative)	--/?	--	0	--/?	-	-	--	0	--/?	--	-/?	-/?	-/?	-	--/?	-	--
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	+++/?	0	+	0	+/?	0	0
	Operation (negative)	--/?	-	0	0	--	--/?	--	-	--	--	0	0	0	-	0	0	0
	Operation (positive)	+	+	0	0	+	+	+	0	+	+	++	+	++	+	+	0	0

Construction

Objective 1: Minor/Moderate/Major negative uncertain effect - due to....
Objective 1: Minor/Moderate/Major positive uncertain effect - due to....
Objective 2: Minor/Moderate/Major negative uncertain effect - due to....
Objective 2: Minor/Moderate/Major positive uncertain effect - due to....
Objective 3: Minor/Moderate/Major negative uncertain effect - due to....
Objective 3: Minor/Moderate/Major positive uncertain effect - due to....
Objective 4: Minor/Moderate/Major negative uncertain effect - due to....
Objective 4: Minor/Moderate/Major positive uncertain effect - due to....
Objective 5: Minor/Moderate/Major negative uncertain effect - due to....
Objective 5: Minor/Moderate/Major positive uncertain effect - due to....
Objective 6: Minor/Moderate/Major negative uncertain effect - due to....
Objective 6: Minor/Moderate/Major positive uncertain effect - due to....
Objective 7: Minor/Moderate/Major negative uncertain effect - due to....
Objective 7: Minor/Moderate/Major positive uncertain effect - due to....
Objective 8: Minor/Moderate/Major negative uncertain effect - due to....
Objective 8: Minor/Moderate/Major positive uncertain effect - due to....
Objective 9: Minor/Moderate/Major negative uncertain effect - due to....
Objective 9: Minor/Moderate/Major positive uncertain effect - due to....
Objective 10: Minor/Moderate/Major negative uncertain effect - due to....
Objective 10: Minor/Moderate/Major positive uncertain effect - due to....
Objective 11: Minor/Moderate/Major negative uncertain effect - due to....
Objective 11: Minor/Moderate/Major positive uncertain effect - due to....
Objective 12: Minor/Moderate/Major negative uncertain effect - due to....
Objective 12: Minor/Moderate/Major positive uncertain effect - due to....
Objective 13: Minor/Moderate/Major negative uncertain effect - due to....
Objective 13: Minor/Moderate/Major positive uncertain effect - due to....
Objective 14: Minor/Moderate/Major negative uncertain effect - due to....
Objective 14: Minor/Moderate/Major positive uncertain effect - due to....
Objective 15: Minor/Moderate/Major negative uncertain effect - due to....
Objective 15: Minor/Moderate/Major positive uncertain effect - due to....
Objective 16: Minor/Moderate/Major negative uncertain effect - due to....
Objective 16: Minor/Moderate/Major positive uncertain effect - due to....
Objective 17: Minor/Moderate/Major negative uncertain effect - due to....
Objective 17: Minor/Moderate/Major positive uncertain effect - due to....

Operation

Objective 1: Minor/Moderate/Major negative uncertain effect - due to....
Objective 1: Minor/Moderate/Major positive uncertain effect - due to....
Objective 2: Minor/Moderate/Major negative uncertain effect - due to....
Objective 2: Minor/Moderate/Major positive uncertain effect - due to....
Objective 3: Minor/Moderate/Major negative uncertain effect - due to....
Objective 3: Minor/Moderate/Major positive uncertain effect - due to....
Objective 4: Minor/Moderate/Major negative uncertain effect - due to....
Objective 4: Minor/Moderate/Major positive uncertain effect - due to....
Objective 5: Minor/Moderate/Major negative uncertain effect - due to....
Objective 5: Minor/Moderate/Major positive uncertain effect - due to....
Objective 6: Minor/Moderate/Major negative uncertain effect - due to....
Objective 6: Minor/Moderate/Major positive uncertain effect - due to....
Objective 7: Minor/Moderate/Major negative uncertain effect - due to....
Objective 7: Minor/Moderate/Major positive uncertain effect - due to....
Objective 8: Minor/Moderate/Major negative uncertain effect - due to....
Objective 8: Minor/Moderate/Major positive uncertain effect - due to....
Objective 9: Minor/Moderate/Major negative uncertain effect - due to....
Objective 9: Minor/Moderate/Major positive uncertain effect - due to....
Objective 10: Minor/Moderate/Major negative uncertain effect - due to....
Objective 10: Minor/Moderate/Major positive uncertain effect - due to....
Objective 11: Minor/Moderate/Major negative uncertain effect - due to....
Objective 11: Minor/Moderate/Major positive uncertain effect - due to....
Objective 12: Minor/Moderate/Major negative uncertain effect - due to....
Objective 12: Minor/Moderate/Major positive uncertain effect - due to....
Objective 13: Minor/Moderate/Major negative uncertain effect - due to....
Objective 13: Minor/Moderate/Major positive uncertain effect - due to....
Objective 14: Minor/Moderate/Major negative uncertain effect - due to....
Objective 14: Minor/Moderate/Major positive uncertain effect - due to....
Objective 15: Minor/Moderate/Major negative uncertain effect - due to....
Objective 15: Minor/Moderate/Major positive uncertain effect - due to....
Objective 16: Minor/Moderate/Major negative uncertain effect - due to....
Objective 16: Minor/Moderate/Major positive uncertain effect - due to....
Objective 17: Minor/Moderate/Major negative uncertain effect - due to....
Objective 17: Minor/Moderate/Major positive uncertain effect - due to....

Table 4.4 Qualitative Scoring System

Score	Description	Symbol
Major/Significant Positive Effect	Significant positive effect of the water resource option on this objective	**+++**
Moderate Positive Effect	Moderate positive effect of the water resource option on this objective	**++**
Minor Positive Effect	Minor positive effect of the water resource option on this objective	**+**
Neutral	Neutral effect of the water resource option on this objective	**0**
Minor Negative Effect	Negative effect of the water resource option on this objective	**-**
Moderate Negative Effect	Moderate effect of the water resource option on this objective	**--**

Score	Description	Symbol
Major/Significant Negative Effect	Significant negative effect of the water resource option on this objective	---
Uncertain	The water resource option has an uncertain relationship to the objective or the relationship is dependent on the way in which the aspect is managed. In addition, insufficient information may be available to enable an assessment to be made.	?

4.4.2 Preferred Options

The individual preferred options that comprise the preferred plan for South Staffs Water's rdWRMP24 has been subject to further detailed assessment against the 17 SEA assessment objectives with the results recorded in a matrix similar to that shown in **Table 4.3** (noting that the preferred programme does not require any supply options in order to meet the deficit due to an ambitious demand management programme). This has taken account of updated option information such as scheme design, incorporated mitigation measures, stakeholder and regulator views. Where relevant, the commentary section of the matrices includes justification for how the assessment has been reached, as well as:

- any assumptions used;
- the reasons for any uncertainty, where this is identified; and
- any further mitigation measures with the potential to avoid, minimise, reduce, mitigate or compensate for the identified effect(s) with evidence (where available).

4.4.3 Preferred Programme Assessment

In addition to the consideration of the effects of the individual preferred options, the cumulative effects of the preferred programme of options (for each WRZ in deficit) has been assessed. These programmes have then been combined and assessed cumulatively, to ensure that the strategic effects of the rdWRMP24 have been identified, described and evaluated.

4.4.4 Reasonable Alternative Plan Assessment

SEA Regulation 12(2) requires the identification, description and evaluation of "*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*". The EC guidance[36] on the SEA Directive discusses possible interpretations of handling 'reasonable alternatives'. It states that "*The alternatives chosen should be realistic. Part of the reason for studying alternatives is to find ways of reducing or avoiding the significant adverse effects of the proposed plan or programme. Part of the reason for studying alternatives is to find ways of reducing or avoiding the significant adverse effects of the proposed plan or programme*". Echoing this, Government guidance[37] of the SEA states *"Only reasonable, realistic and relevant alternatives need to be put forward. It is helpful if they are sufficiently distinct to enable meaningful comparisons to be made of the environmental implications of each*". It is an area of plan making that has received considerable scrutiny and challenge.

For the purposes of this SEA, the feasible options have been considered as reasonable alternatives to the preferred options (that comprise the Preferred Plan).

The cumulative effects have been identified, described and evaluated for the preferred plan. The deficit for any reasonable alternative scenarios is still resolved through the demand side options alone and hence no further cumulative assessment has been undertaken for alternative plans as they are similar to that of the preferred plan.

[36] EC (2003) *Implementation of Directive 2001/42 on the Assessment of the Effects of Certain Plans and Programmes on the Environment.*

[37] Office of the Deputy Prime Minister et al (2005) *A Practical Guide to the Strategic Environmental Assessment Directive. Available from* https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/7657/practicalguidesea.pdf [Accessed June 2022]

4.4.5 Assessment of Secondary, Cumulative and Synergistic Effects

The SEA Regulations require that the cumulative effects of the rdWRMP24 are assessed. In addition to the assessments of the preferred programme of options (at the WRZ level) and plan level assessments described above, this includes the cumulative effects of the rdWRMP24 in-combination with other plans and programmes. This includes:

- effects of the rdWRMP24 with other (same) water company plans – an assessment of the effects of the rdWRMP24 with SSW's Drought Plan and Drainage and Wastewater Management Plan (DWMPs);
- effects of the rdWRMP24 with adjacent water company plans and projects (SROs);
- effects of the rdWRMP24 as part of the WRW draft Regional Plan;
- effects of the rdWRMP24 with other plans e.g., Local Plans, National Policy Statements (NPSs);
- effects of the rdWRMP24 with other Nationally Significant Infrastructure Projects (NSIPs).

When considering the above, the assessment has been qualitative.

There are areas where the rdWRMP24 preparation has considered some of the other plans and programmes. For example, South Staffs Water's Drought Plan measures have been included in the rdWRMP24 and the Local Plan growth and population projections have already been included within the demand projections.

In terms of other water company and sector plans, some will have completed assessments in the public domain e.g. DWMPs and which have been used to inform this assessment, where appropriate.

When considering the effects of SROs, we have drawn on relevant assessment information provided for the RAPID gated submission process.

4.4.6 Definitions and Thresholds of Significance

Specific guidance has been developed for what constitutes a significant (major) effect, a moderate effect, a minor effect or a neutral effect for each of the SEA objectives. These 'definitions and thresholds of significance' help to ensure a consistent approach to interpreting the significance of effects and helps the reader understand the decisions made by the assessor.

An example is provided for biodiversity in **Table 4.5** with the full suite of definitions presented in **Appendix E**.

In developing the definitions and thresholds of significant effects, information has been drawn from:

- the previous definitions and thresholds used in the SEAs of DCWW, SSW, STW and UUW's WRMP19s;
- suggested definitions and thresholds for assessment scoring from the All Company Working Group (ACWG) for application to the SROs;
- suggested definitions and thresholds detailed in the WRSE Scoping Report, for application to the SEA of the WRSE Regional Plan;
- an evaluation of the range of quantitative values (such as yield, capex, embodied carbon, operational carbon and material quantities) available for a selection of the DCWW, STW, SSW and UUW's WRMP19 different option types (e.g., supply-side options such as reservoirs, transfers, boreholes, enhanced treatment);
- scoping consultation feedback;
- practical revisions made when applying the thresholds to the feasible option assessment.

In some instances (for example in specifying the quantity of operational carbon that would qualify as a significant/major effect), the thresholds have changed between the SEA of South Staffs Water's WRMP19, and for WRMP24. In consequence, in some instances, effects previously identified as significant may now be assessed as a moderate effect.

Table 4.5 Example Definitions of Significant Effects

Proposed SEA Objectives	Proposed Guide Questions	Score		Description
1. To protect, restore and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species, enhance ecosystem resilience and habitat connectivity and deliver a net biodiversity gain.	• Will it protect, restore, and enhance where possible, the most important sites for nature conservation (e.g., internationally or nationally designated conservation sites such as SACs, SPAs, Ramsar and SSSIs)? • Will it protect, restore, and enhance non-designated sites and local biodiversity? • Will it provide opportunities for new terrestrial and aquatic habitat creation or restoration and/or link existing habitats as part of the development process? • Will it provide opportunities to deliver biodiversity net gain? • Will it lead to a change in the ecological quality of habitats? • Will it protect, restore, and enhance where appropriate, coastal and marine habitats and species? • Will it maintain and enhance the green infrastructure network and the biodiversity it supports? • Will it alter geomorphological forms and processes which underpin physical habitat for aquatic ecosystems?	+++	Major/Significant Positive	The option would result in a major enhancement on the quality of designated sites / habitats due to changes in flow or groundwater levels, water quality or habitat quality and availability. The option would result in a major increase in the population of, or habitats for, a priority species. Effects could be caused by beneficial changes in water flows/water quality, or large amounts of creation or enhancement of habitat, promoting a major increase in ecosystem structure and function.
		++	Moderate Positive	The option would result in a moderate enhancement on the quality of designated and/or non-designated sites / habitats due to changes in flow or groundwater levels, water quality or habitat creation and enhancement measures. The option would result in a moderate increase in the population of, or habitats for, a priority species. Effects could be caused by beneficial changes in water flows/water quality, or moderate amounts of creation or enhancement of habitat, promoting a moderate increase in ecosystem structure and function.
		+	Minor Positive	The option would result in a minor enhancement of the quality of designated and/or non-designated sites / habitats due to changes in flow or groundwater levels, water quality or habitat creation and enhancement measures. The option would result in a minor increase in the population of, or habitats for, a priority species. Effects could be caused by beneficial changes in water flows/water quality, or small amounts of creation or enhancement of habitat, promoting a minor increase in ecosystem structure and function.
		0	Neutral	The option would not result in any effects on designated or non-designated sites including habitats and/or species).
		-	Minor Negative	The option would result in a minor negative effect on the quality of designated and/or non-designated sites / habitats due to changes in flow or groundwater levels, water quality or habitat loss or degradation. The option would result in a minor decrease in the population of, or habitats for, a priority species. Effects could be caused by detrimental changes in flows/water quality, or small losses or degradation of habitat leading to a minor loss of ecosystem structure and function.
		--	Moderate Negative	The option would result in a moderate negative effect on the quality of designated and/or non-designated sites / habitats due to changes in flow or groundwater levels, water quality or habitat loss or degradation. The option would result in a moderate decrease in the population of, or habitats for, a priority species. Effects could be caused by detrimental changes in flows/water quality, or moderate loss or degradation of habitat leading to a moderate loss of ecosystem structure and function.
		---	Major/Significant Negative	The option would result in a major negative effect on the quality of designated and/or non-designated sites / habitats due to changes in flow or groundwater levels, water quality or habitat loss or degradation. The option would result in a major decrease in the population of, or habitats for, a priority species. Effects could be caused by detrimental changes in flows/water quality, or large losses or degradation of habitat leading to a major loss of ecosystem structure and function.
		?	Uncertain	From the level of information available the effect that the option would have on this objective is uncertain

4.5 DIFFICULTIES ENCOUNTERED IN UNDERTAKING THE ASSESSMENT

The SEA Regulations require the identification of any difficulties encountered during the assessment process. The difficulties encountered in undertaking the SEA of the rdWRMP24 are summarised below:

- Due to the scope of the WRMP24, and its nature in combining site-specific options into a plan for the whole of South Staffs Water's region, a balance needed to be struck between the information provided as an overview of the whole area and the detail of a specific location. Throughout the whole process, it was necessary to ensure the need for enough information to undertake a robust assessment, while retaining its strategic focus.
- Reflecting the strategic nature of the rdWRMP24 and SEA, for many supply options exact site locations and pipeline routes are approximated at this stage whilst the final design of new infrastructure is unknown. However, the assessments of feasible and preferred options have been based on the best available information provided by South Staffs Water and any assumptions used in the assessment have been highlighted where appropriate. For some option types (e.g. demand management options), the location of works are not known at this stage and would (if taken forward) be subject to more detailed analysis during the implementation of the WRMP. In consequence, effects on some objectives such as biodiversity are uncertain for these options. Where this is the case, the assessment has reflected this uncertainty.
- Whilst the assessment of the cumulative effects of the implementation of the rdWRMP24 and other plans and programmes has been based on the most up to date information available at the time of writing, in many cases there is a lack of detailed information at this stage to make robust conclusions. This is a typical issue encountered during the assessment of WRMPs.

5. ASSESSMENT OF THE FEASIBLE OPTIONS

5.1 INTRODUCTION

This section presents the findings of the assessment of the feasible options identified as part of the preparation of the rdWRMP24 for the South Staffs Water Resource Zone. The types of feasible options considered in the assessment can be broadly categorised as follows:

- **supply options** which include measures to increase supply such groundwater enhancement at existing sources, reservoir enlargement, new surface water supply and which will include SROs / external raw water bulk supply / transfer;
- **demand options** including**:**
    - **distribution and leakage options** which include measures to optimise the efficiency of water networks, reduce leakage and minimise any unscheduled resource losses;
    - **metering options** which include options to manage the demand for water using enhance meter technology;
    - **efficiency options** which include measures to manage the demand for water such as water labelling, innovative tariffs or household visits to install water efficiency measures.

For the purposes of this Environmental Report the South Staffs options are split into supply and demand options.

5.2 SSW WATER RESOURCE ZONE

5.2.1 Supply Option Assessment Findings

A total of 16 feasible supply options were assessed which are all located in the South Staffs Water Resource Zone (WRZ); Each of the supply options on the Feasible List of options (**see Table 5.1**) considered for South Staffs Water's rdWRMP24 has been assessed against the SEA objectives. The completed appraisal tables for each of the options are provided in **Appendix F** and should be referred to for full details of potential adverse and beneficial effects of each feasible option. The findings of the WFD assessments and the HRA have also been incorporated into the SEA assessment. A visual summary of the SEA conclusions and associated commentary is provided in **Table 5.2.**

Table 5.1 Feasible Supply Options: SSW Water Resource Zone

Option Ref.	Yield	Option name
2.1.1.1	40Ml/d	40 Ml/d capacity raw water abstraction from the Trent to Blithfield
2.2.1.1	3.18Ml/d	Increase storage at Blithfield - Increase dam height by 1m
2.2.2.1	6.6Ml/d	Increase storage at Blithfield - Increase dam height by 2m
2.3.1	15Ml/d	Chelmarsh Reservoir 15 Ml/d <2m raising
2.3.2	30Ml/d	Chelmarsh Reservoir 30 Ml/d up to 2m raising
6.1.1	40Ml/d	40 Ml/d capacity treatment works on the Trent, with 14 day storage
6.1.3	70Ml/d	70 Ml/d capacity treatment works on the Trent, with 14 day storage
7.1.2.1	15Ml/d	Third Party Option: Canal & River Trust, Birmingham Blithfield surplus
7.1.5	2-5Ml/d	Third Party Option: Canal & River Trust, Chasewater options
7.5.1.1	15Ml/d	UU Vyrnwy reservoir raw water release 15 Ml/d to River Severn to support SSW
7.5.1.2	30Ml/d	UU Vyrnwy reservoir raw water release 30 Ml/d to River Severn to support SSW
7.5.1.3	45Ml/d	UU Vyrnwy reservoir raw water release 45 Ml/d to River Severn to support SSW
7.5.1.4	75Ml/d	UU Vyrnwy reservoir raw water release 75 Ml/d to River Severn to support SSW
8.1.1	3Ml/d (TBC)	Third Party Option: potable import
8.1.5	2.5Ml/d (TBC)	Third Party Option: drill new GW source with licence trade
8.3.1	7Ml/d (TBC)	Third Party Option: new raw water storage reservoir close to the River Trent

Table 5.2 Feasible Supply Options Assessment Summary against SEA Objectives: SSW Water Resource Zone

Option	Stage	SEA Objectives																
		1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape
Option 2.1.1.1: 40 Ml/d capacity raw water abstraction from the Trent to Blithfield	Construction (negative)	--/?	-	-	--	0	-	-	-/?	--	0	-	-	-	0	--	-	--
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	++	0	0	0	+	0	0
	Operation (negative)	--/?	0	---	?	-	-	0	-/?	---	0	0	0	0	0	-/?	0	0
	Operation (positive)	0	+	0	0	0	0	0	0	0	++	+++	0	+++	++	0	0	0
Option 2.2.1.1: Increase storage at Blithfield - Increase dam height by 1m	Construction (negative)	---/?	0	-	--	0	-	--	-/?	---	0	-	---	-	0	---	-	--
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	+++	0	0	0	+	0	0
	Operation (negative)	--/?	0	-	0	-	0	0	-/?	0	0	0	0	0	0	-/?	-	-
	Operation (positive)	0	0	0	0	0	0	++	0	0	+	+	0	+	0	0	0	0
Option 2.2.2.1: Increase storage at Blithfield - Increase dam height by 2m	Construction (negative)	---/?	0	-	--	0	-	--	-/?	---	0	-	---	-	0	---	-	--
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	+++	0	0	0	+	0	0
	Operation (negative)	--/?	0	-	0	-	0	0	-/?	0	0	0	0	0	0	-/?	-	-
	Operation (positive)	0	0	0	0	0	0	++	0	0	+	++	0	++	+	0	0	0
Option 2.3.1: Chelmarsh Reservoir 15 Ml/d <2m raising	Construction (negative)	--	0	-	--	0	-	0	-/?	--/?	0	0	--	-	0	--	0	--
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	++	0	0	0	+	0	0
	Operation (negative)	--	0	-	0	0	0	0	0	0	0	0	0	0	0	-	0	-
	Operation (positive)	0	0	0	0	0	+	+	0	0	+	++	0	++	+	0	0	0
Option 2.3.2: Chelmarsh Reservoir 30Ml/d up to 2m raising	Construction (negative)	--	0	-	--	0	-	0	-/?	--/?	0	0	--	-	0	--	0	--
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	++	0	0	0	+	0	0
	Operation (negative)	--	0	-	0	0	0	0	0	0	0	0	0	0	0	-	0	-
	Operation (positive)	0	0	0	0	0	+	+	0	0	++	+++	0	+++	++	0	0	0
Option 6.1.1: 40 Ml/d capacity treatment works on the Trent, with 14 day storage	Construction (negative)	---	--	-	--	0	-	--	--/?	---	0	-	--	---	0	---	---	--
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	+++	0	0	0	0	0	0
	Operation (negative)	--	0	-	-	-	-	0	-/?	---	0	0	0	0	0	--/?	0	--
	Operation (positive)	0	++	?	0	0	0	++	0	0	++	+++	0	+++	++	0	0	0

Option	Stage	SEA Objectives																
		1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape
Option 6.1.3: 70 Ml/d capacity treatment works on the Trent, with 14 day storage	Construction (negative)	---/?	--	-	---	0	-	--	--/?	---	0	--	---	---	0	---	---	--
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	+++	0	0	0	0	0	0
	Operation (negative)	--	0	-	--	-	-	0	-/?	---	0	0	0	0	0	---/?	---/?	--
	Operation (positive)	0	++	0	0	0	0	++	0	0	+++	+++	0	+++	+++	0	0	0
Option 7.1.2.1: Third Party Option: Canal & River Trust, Birmingham Blithfield surplus	Construction (negative)	---/?	--	-	--	0	-	--	-	--/?	0	-	-	-	0	--	--	--
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	++	0	0	0	0	0	0
	Operation (negative)	--	0	---	-	0	-	0	-/?	--	0	0	0	0	0	-/?	--/?	-/?
	Operation (positive)	0	++	0	0	0	0	0	0	0	+	++	0	++	+	0	0	0
Option 7.1.5: Third Party Option: Canal & River Trust, Chasewater options	Construction (negative)	---	--	-	---	0	-	--	--/?	--/?	0	-	--	--	0	--	-	--
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	++	0	0	0	0	0	0
	Operation (negative)	-	0	---	-	--	0	0	0	--	0	0	0	0	0	-/?	0	0
	Operation (positive)	0	++	0	0	0	+	0	0	0	+	+	0	+	0	0	0	0
Option 7.5.1.1: UU Vyrnwy reservoir raw water release 15 Ml/d to River Severn to support SSW	Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Operation (negative)	--/?	0	-	0	0	0	-	0	-	0	0	0	0	0	-	0	0
	Operation (positive)	0	0	0	0	0	+	0	0	0	+	++	0	++	+	0	0	0
Option 7.5.1.2: UU Vyrnwy reservoir raw water release 30 Ml/d to River Severn to support SSW	Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Operation (negative)	--/?	0	-	0	0	0	-	0	-	0	0	0	0	0	-	0	0
	Operation (positive)	0	0	0	0	0	+	0	0	0	++	+++	0	+++	++	0	0	0
Option 7.5.1.3: UU Vyrnwy reservoir raw water release 45 Ml/d to River Severn to support SSW	Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Operation (negative)	--/?	0	-	0	0	0	-	0	-	0	0	0	0	0	-	0	0
	Operation (positive)	0	0	0	0	0	+	0	0	0	++	+++	0	+++	++	0	0	0

Option	Stage	SEA Objectives																
		1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape
Option 7.5.1.4: UU Vyrnwy reservoir raw water release 75 Ml/d to River Severn to support SSW	Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Operation (negative)	---/?	0	-	0	0	0	-	0	-	0	0	0	0	0	-	0	0
	Operation (positive)	0	0	0	0	0	+	0	0	0	+++	+++	0	+++	+++	0	0	0
Option 8.1.1: Third Party Option: potable import	Construction (negative)	--	--	-	--	0	-	--	--/?	--/?	-	0	--	--	0	--	--	--
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	++	0	0	0	+	0	0
	Operation (negative)	0	0	0	0	0	0	0	0	--	0	0	0	0	0	-/?	0	0
	Operation (positive)	0	++	0	0	0	0	0	0	0	+/?	+/?	0	+/?	0	0	0	0
Option 8.1.5: Third Party Option: drill new GW source with licence trade	Construction (negative)	---	-	-	--	0	-	-	--/?	--/?	-	0	--	--	0	--	--	--
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	++	0	0	0	0	0	0
	Operation (negative)	--	0	0	0	-	-	0	0	--	0	0	0	0	0	-/?	0	0
	Operation (positive)	0	+	0	0	0	0	0	0	0	+/?	+/?	0	+/?	0	0	0	0
Option 8.3.1: Third Party Option: new raw water storage reservoir close to the River Trent	Construction (negative)	--	0	-	-	0	-	-	--/?	---	-	0	--	--	0	--	-	--
	Construction (positive)	0	0	0	+/?	0	0	0	0	0	0	+++	0	0	0	0	0	0
	Operation (negative)	-	0	--	0	-	-	0	0	--	0	0	0	0	0	-/?	0	--
	Operation (positive)	0	0	0	0	0	0	++	0	0	+/?	++/?	+/?	++/?	+/?	0	0	0

Construction Effects

A total of five of the feasible supply options would require a large capital investment (capital spend of ≥£25 million) that would be likely to generate a number of employment opportunities and supply chain benefits as well as increased spend in the local economy by contractors and construction workers. Where this is the case, the options were assessed as having a significant positive effect on the local economy (SEA Objective 11). The majority of the remaining options (seven options) were assessed as having a moderate positive effect on this objective (capital spend of between £5 million and <£25 million), whilst four options (7.5.1.1, 7.5.1.2, 7.5.13 and 7.5.1.4 were scored as having a neutral effect as no capital works are associated with these options (as any construction to transfer the water is assumed to be United Utilities responsibility). HGV movements and construction works associated with several options considered to have the potential to cause disruption to built assets and infrastructure such as traffic disruption, generating a minor or moderate negative effect (six options and one option respectively) on SEA Objective 11 and leading to an overall mixed score against the objective. No significant negative effects were identified in this regard.

No other significant positive effects were identified in the assessment of the feasible supply options. However, one option was assessed as having a minor positive effect on soils, geodiversity and land use (SEA Objective 4) as new infrastructure associated with this option would be located on existing developed land, making use of an existing site and/or not requiring new land but with some uncertainty regarding the location of this options (8.3.1). The option recorded a minor negative effect as whilst works would involve the use of an existing site, due to multiple historic and permitted landfill sites located within 5km of the reservoir option it would pose a minor risk of land contamination.

Options 6.1.3 and 7.1.5 also displayed significant negative effects during construction on Objective 4 due to being located within best and most versatile agricultural land and also being located within historical landfill sites with the risk of associated contamination. A further nine options were assessed as having moderate negative effects against this objective.

Four options (7.5.1.1, 7.5.1.2, 7.5.1.3 and 7.5.1.4) were assessed as having minor positive effects on waste and resource use (SEA objective 15) as these options are expected to make use of existing infrastructure such as treatment plants and reservoirs. However, two of these options also have associated significant negative effects for this objective (options 2.2.1.1 and 2.2.2.1) with the other four options (Options 2.1.1.1, 2.3.1, 2.3.2 and 8.1.1) assessed as having moderate negative effects, due to the volume of new materials expected with the associated levels of CAPEX spend. A further 2 options (6.1.1 and 6.1.3) also have significant negative effects on waste and resource use for these reasons and a further four have been assessed as having moderate negative effects (7.1.2.1, 7.1.5, 8.1.5 and 8.3.1).

Of the 16 feasible supply options assessed for the South Staffs Water Resource Zone, the majority were assessed as having a negative effect on biodiversity (SEA Objective 1) during the construction phase with eight options identified as having major negative effects. This reflects the potential for construction works associated with the option to result in the loss or disturbance to habitats and species as a result of, for example, land take, emissions to air and noise. Of this total, 3 options (6.1.1, 7.1.5 and 8.1.5) were identified as having a significant negative effect and four options (2.2.1.1, 2.2.2.1, 6.1.3 and 7.1.2.1) were identified as having significant negative uncertain effects with several others assessed as having a moderate negative (and in some cases uncertain) effect on this objective. Options 7.5.1.1, 7.5.1.2, 7.5.1.3 and 7.1.5.4 were assessed as having a neutral effect for biodiversity as the options do not require any capital works by SSW. The remaining five options will have a moderate effect on biodiversity (2.3.1, 2.3.2, 8.1.1 and 8.3.1), one of which remains moderate uncertain (2.1.1.1).

For 6.1.1 the proposed pipeline intersecting an area of ancient woodland and also the requirement for a Stage 2 Appropriate Assessment as the use of the River Trent by the qualifying features of the River Mease SAC is uncertain. For option 7.1.5 the pipeline is partly located within a SSSI.

The pipeline involved in Option 8.1.5 intersects an SAC/SSSI. From an HRA standpoint LSEs have been identified for River Mease SAC due to the proximity of the proposed pipeline, and the potential for direct impacts to qualifying habitats and species. There is also the potential for LSE on functionally liked habitat (hydrologically connected watercourses and direct loss of terrestrial habitats suitable for otter).

Options 2.2.1.1 and 2.2.2.1 involve Blithfield Reservoir which is itself a SSSI and an area of ancient woodland is located adjacent to the reservoir. A Stage 2 Appropriate Assessment will be required to consider the mitigation measures necessary to avoid an adverse effect to the River Mease SAC.

Option 6.1.3 intersects a parcel of ancient woodland. From an HRA standpoint, a Stage 2 Appropriate Assessment will also be required to consider the mitigation measures necessary to avoid an adverse effect to the River Mease SAC. For Option 7.1.2.1 it is assumed that a trenchless technique would be used for the river crossing, however a Stage 2 Appropriate Assessment will be required to also consider the mitigation measures necessary to avoid an adverse effect to the River Mease SAC.

Seven feasible options were assessed as having a negative effect on sustainable natural resources (Objective 2), associated with all, or part of the option being constructed on greenfield land, resulting in either temporary (e.g. related to the excavation of pipeline routes, where soil/land would be reinstated following completion) or permanent (e.g. where permanent above ground infrastructure would be constructed, such as water treatment works or pumping stations) loss of habitats (biodiversity net loss), as concluded by the BNG assessment. Options 6.1.1, 6.1.3, 7.1.2.1, 7.1.5 and 8.1.1 were assessed as having moderate negative effects. Options 2.1.1.1, 8.1.5 was assessed as having minor negative effects.

Most options were assessed as having a minor negative effect on INNS (Objective 3), as despite extensive construction activities resulting in increased distribution of terrestrial and aquatic INNS, the risk was considered to be minor assuming best practice biosecurity measures were to be adopted. Options 7.5.1.1 to 7.5.1.4 have no capital works associated with them, and therefore it is not anticipated that construction would have any effect on INNS risk during the construction period.

Aside of options 7.5.1.1 to 7.5.1.4 where there are no capital works, minor negative effects were identified on water quality (SEA Objective 6) across the rest of the feasible options as construction activities near watercourses may have a minor effect on water quality which result in short-term or intermittent effects on receptors.

Construction activity associated with ten of the feasible options would take place within Flood Zones 2/3 and works may therefore be vulnerable to flooding (timing dependent). A total of seven options were considered to be particularly vulnerable to flood risk given the scale of works that would take place in Flood Zones 2 and 3; in these cases, negative effects on flood risk (SEA Objective 7) were assessed as moderate (options 2.2.1.1, 2.2.2.1, 6.1.1, 6.1.3, 7.1.2, 7.1.5 and 8.1.1). The remaining three options (2.1.1.1, 8.3.1 and 8.1.5) were assessed as having a minor negative effect against Objective 7.

Three options (8.1.1, 8.1.5 and 8.3.1) were assessed as having a minor negative effects on climate resilience (SEA Objective 10) where major development would be partially situated within Flood Zones 2 or 3 and therefore, construction works may be at risk to the effects of climate change (flooding).

A range of minor and moderate negative effects were identified against air quality (SEA Objective 8) across the twelve options requiring construction. Construction activity would generate emissions to air associated with the use of plant and machinery as well as increase in vehicle movement associated with construction activities and will likely cause short-term deterioration in local air quality. The number of vehicle movements is unknown, thus the extent of impact has been highlighted as uncertain in some cases. Moderate effects were identified where the options are nearer to built up areas or Air Quality Management Areas (AQMAs).

All of the feasible options were assessed as having a negative effect on greenhouse gas emissions (Objective 9), aside of the options 7.5.1.1, 7.5.1.2, 7.5.1.3 and 7.5.1.4 which involve no capital works. The negative effects are associated with embodied carbon in construction materials and the requirement for vehicle movements to transport materials and equipment to site, in addition to the operation of plant and machinery. Five options were assessed as having a significant negative effect on Objective 9 (Options 2.2.1.1, 2.2.2.1, 6.1.1, 6.1.3, and 8.3.1), due to the significant scale of embodied carbon associated with construction materials and the scale of the schemes, whilst seven others were assessed as having a moderate negative effect with six of those uncertain due to volumes of materials and number of construction vehicles not being known at time of assessment.

Twelve options were assessed as having negative effects on tourism and recreation (SEA Objective 12) with three of these having significant negative effects (Options 2.2.1.1, 2.2.2.1 and 6.1.3) as construction works would be adjacent to or would cross cycling routes or walking paths, local public greenspaces and sports or recreational facilities, with the potential to affect users of such spaces/facilities. Seven options were assessed as having moderate negative effects and two options having minor negative effects.

Two options (.6.1. and 6.1.3) were assessed as having major negative effects on human health and well-being (SEA Objective 13) due to the potential for emissions from HGV movements as well as noise, vibration, dust deposition and air quality impacts from construction activity affecting residential receptors located in close

proximity to development sites and along transport routes. A further four options were assessed as having moderate negative effects and six having minor effects. Those options assessed as neutral were the options without associated capital works (7.5.1.1, 7.5.1.2, 7.5.1.3 and 7.5.1.4).

A range of negative effects were identified on cultural heritage (SEA Objective 16) including two significant negative effects (on Options 6.1.1 and 6.1.3) due to the volume of listed buildings within 1km of Option 6.1.1, and the close proximity to three listed buildings. The pipeline associated with Option 6.1.3 crosses two scheduled ancient monuments.

A further three moderate negative effects and five minor effects were identified due to the potential of effects on the structure or setting of cultural heritage assets such as scheduled ancient monuments and listed buildings.

All twelve options involving construction were identified as having moderate negative effects on landscape (Objective 17) due to the potential for visual intrusion of the proposed construction works and the potential to affect designated sites in the short-term.

All options were also assessed as having a neutral effect in respect of water quality (SEA Objective 5) and water resource use (SEA Objective 14) during the construction phase. There could be a short-term change in sediment dynamics associated with the construction activities near water, however, this is expected to be minimal and is unlikely to result in a change in channel morphology. Construction of these options is not expected to have any impact on water resource use.

A range of minor and moderate negative effects during construction were also assessed against several SEA objectives for the supply side options.

Operational Effects

Significant positive effects have been assessed on Climate Resilience (SEA Objective 10) for options 6.1.3 and 7.5.1.4 where the options are supplying in excess of 50Ml/d which is deemed to be supporting community resilience to climate change. These significant effects are reflected across economy (SEA Objective 11), human health and well being (SEA Objective 13) and Water Resource Use (SEA Objective 14), as the operation of the options would help to ensure the continuity of a safe, sustainable and secure drinking water supply which may in-turn support economic and population growth as well as improve resilience to the impacts of climate change.

Five further options (options 2.1.1, 2.3.2, 6.1.1, 7.5.1.2 and 7.5.1.3) were assessed as having significant positive effects on economy (SEA Objective 11) and human health and well-being (Objective 13) with associated moderate affects for Climate Resilience (SEA Objective 10) and Water Resource Use (SEA Objective 14). There were also several other minor and moderate effects assessed for these Objectives, as all these options would contribute to providing resilient water supply to support economy and human health and increase adaptability to the effects of climate change.

No further significant positive effects were identified for operation but several options were identified as having moderate or minor positive effects for flood risk where options were assessed as having the potential to help alleviate or mitigate flooding in the catchment.

Option 8.3.1 was identified as having minor positive uncertain effects with respect to tourism and recreation (Objective 12) as operation of the new reservoir has the potential to have a positive impact on providing opportunities for recreation.

Additionally for five options and two options respectively, moderate and minor positive effects were recorded on Sustainable Natural Resources (SNR) (SEA Objective 2) due to the assumption that that there would be operational biodiversity net gain which would be greater than the net loss in construction.

Seven options were assessed as having minor positive effects on water quality (SEA Objective 6) such as there may be minor positive impacts on the water quality in the receiving water courses as increased flow may dilute any point source water quality pressures.

Significant negative effects were identified for INNS (SEA Objective 3) from Options 2.1.1.1, 7.1.2.1 and 7.1.5. For option 2.1.1.1 the scheme will establish a new pathway for the distribution of INNS. There is no existing pathway of transfer to Blithfield Reservoir from the River Trent, and the transfer of water in an upstream direction will create a new pathway for transferring INNS which may not currently be present at the reservoir

and within the downstream watercourse. Mitigation to prevent the transfer of INNS propagules during the transfer will be required in order to reduce the INNS transfer risk.

For options 7.1.2.1 and 7.1.5 the use of a canal as a transfer mechanism in these scenarios poses a high risk, although there is an existing canal, the use of a canal for the transfer of raw water will provide a primary and secondary pathway for transfer of INNS. Additionally, abstraction and transfer to Blithfield reservoir (in the case of option 7.1.2.1) or discharge of raw water to Craner Brook (option 7.1.5) represent a new distribution pathway from a canal with significant boating traffic and numerous secondary pathways for the distribution of INNS. Mitigation is limited to standard best practice biosecurity measures (such as signs, wash down facilities for recreational users. etc), which are likely to be only effective in reducing secondary pathway risks.

Further moderate and minor negative effects were identified for SEA Objective 3 (across 11 options), such as where new habitat and transfer pathways could be established due to associated works, new secondary pathways for the distribution of INNS or where there could be an increase in propagules being transported downstream.

Three options (Options 2.2.1.1, 6.1.1, 6.1.3) were assessed as having significant negative effects on greenhouse gas emissions (SEA Objective 9) with a further five having either moderate or moderate uncertain effects and four with minor negative effects. This is due to the volume of carbon expected to be emitted during the lifetime of operation for example from additional abstraction and pumping regimes and or treatment.

Option 6.1.3 was assessed as having a significant negative uncertain effect on waste and resource use (SEA Objective 15) as operation of the option will require additional energy (764kWh/Ml) and may require the use of additional chemicals to treat raw water and vehicle movements (requiring use of fossil fuels), the effects in this regard are currently uncertain. A range of negative effects was identified for the remaining fifteen options.

Option 7.5.1.4 was identified as having significant negative uncertain effects on biodiversity (SEA Objective 1). Operational activities will include the release of raw water to the River Vyrnwy, a tributary of the River Severn, from UUW (Vyrnwy Reservoir) which has the potential to result in the introduction of non-native species, change in flows, water level and geomorphology processes. However, water to be released would be available for abstraction downstream by SST, at Hampton Loade WTW. There are uncertainties with regards to impacts of water transfer between UUW and River Severn. This may have negative impact upon the migratory qualifying features of the Severn Estuary SAC, including sea lamprey and twaite shad and supporting habitats, introduction of non-native species, and the hydrology of the estuary. The use of the River Vyrnwy, and volume of water to be released into the watercourse, needs to be considered with regards impacts to supporting habitats for the freshwater life stages of the migratory fish of the Severn Estuary SAC and Ramsar. Changes in flow and water quality in the River Severn will also need to be considered alone and in-combination with other abstractions. LSEs identified and therefore a Stage 2 Appropriate Assessment will be required. There is a significant risk of an adverse effect with the volume of water.

Fourteen other options were identified as having a range of moderate and minor effects against SEA Objective 1.

Option 6.1.3 was identified as having a significant negative uncertain effect during operation as the option intersects two scheduled ancient monuments and the nature of the effects during operation are uncertain. This is also true for Option 7.1.2.1 but to a lesser extent. It is predicted that there will be a moderate effect on heritage assets as the associated pipeline is located in close proximity to a listed building but the nature of the effect is uncertain.

No further significant negative effects were identified during assessment of the feasibly supply options, although a range of minor and moderate negative effects resulting from operation were also assessed against several SEA Objectives.

5.2.2 Demand Option Assessment Findings

Three demand options were assessed for the SSW WRZ; these are listed in **Table 5.3.** A summary of the assessment of these options is presented in **Table 5.4** with commentary on the likely significant construction and operational effects provided below.

Table 5.3: Feasible Demand Management Options: SSW WRZ

Option Ref.	Yield	Option name
N/A	18.25 Ml/d by 2050	Leakage (50% reduction by 2050)
N/A	33.25 Ml/d by 2050	Water Efficiency /Per Capita Consumption (110 l/h/d by 2050)
N/A	12.01 Ml/d by 2037	Non-household Enhanced Meters (9% demand reduction by 2037):- Installation of enhanced meter technology

The Demand Management options comprise measures to reduce leakage (e.g. Active leakage control, trunk mains leakage reduction, advanced pressure optimisation, pipe repair or replacement), water efficiency measures (e.g. changings to tariff structures, and promotion of water efficient devices) and installation of enhanced meter technology. Overall, demand management options serve to reduce pressure on water resources by reducing customer demand for water and thereby helping to reduce the volumes of water abstracted from the water environment. This, in turn, also contributes to reducing the amount of energy needed for water abstraction, treatment and distribution.

Construction

During construction, the effects are limited to limited temporary effects associated with vehicle movements during their commissioning phases. They may cause disruption as a result of streetworks or nuisance. As a result of meter installations, for example, a minor negative uncertain effect has been assessed from Water Efficiency measures on greenhouse gas emissions (SEA Objective 9). This reflects the potential for embodied carbon from material production of water meters and water efficiency devices. In addition, further emissions from an unspecified number of vehicle movements to carry out the home/site visits and installations. Due to the potential for additional materials required in the case of Water Efficiency measures have been assessed as having a minor effect on waste and resource use (SEA Objective 15).

Operation

During operation all three options have been assessed as having significant positive effects on water quantity (SEA Objective 5) and water resource use (SEA Objective 14) due to the reduction in leaks and reduction in demand for water that these measures will provide.

The Water Efficiency measures also provide significant positive effects to economy (SEA Objective 11), and human health and wellbeing (SEA Objective 13) by helping to ensure a continual supply of clean drinking water and increase resilience of supply to South Staffs customers, supporting economic growth which could result in a positive effect on the local economy and social wellbeing. Also providing access to improved water by use of products, fixtures, and fittings. Moderate positive effects were reported for the other two demand management options against these SEA objectives.

Moderate positive effects (for Water Efficiency measures) and minor positive effects (for Leakage and Non-Household Enhanced Meters) were reported on climate resilience (SEA Objective 10) due to the options contributing to increasing the resilience/decreasing vulnerability to the effects of climate change.

The Leakage measures have also been assessed as having a minor positive effect on Greenhouse Gas Emissions (SEA Objective 9). This option is anticipated to reduce operational carbon emissions by reducing lost Water put Into Supply (WIS), i.e. reduced pumping and treatment waste.

Table 5.4: Feasible Demand Management Options Assessment Summary: SSW Water Resource Zone

Option	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape
Leakage	Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Operation (negative)	?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Operation (positive)	0	0	0	0	+++	0	0	0	+	+	++	0	++	+++	0	0	0
Water Efficiency	Construction (negative)	0	0	0	0	0	0	0	?	-/?	0	0	0	0	0	-/?	0	0
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Operation (negative)	0	0	0	0	0	0	0	0	?	0	0	0	0	0	0	0	0
	Operation (positive)	0	0	0	0	+++	0	0	0	0	++	+++	0	+++	+++	0	0	0
Non-Household Enhanced Meters	Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Operation (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Operation (positive)	0	0	0	0	+++	0	0	0	0	+	++	0	++	+++	0	0	0

5.3 USING THE FINDINGS OF THE FEASIBLE OPTIONS ASSESSMENT TO INFORM DECISION MAKING

The SEA findings for the feasible options have been used as inputs to Multi-Criteria Analysis (MCA) detailed screening, scenario testing and, selection of the preferred programme of options.

5.3.1 Screening

South Staffs Water has completed a process of option screening using screening criteria, developed in conjunction with WRW core member companies and stakeholders to inform option selection and development. These were applied at two stages of option development:

- high-level screening of unconstrained options; and
- a detailed screening of feasible options.

A Red-Amber-Green (RAG) approach was adopted for both stages of the screening process, which grades an option to a given criteria on a satisfactory to unsatisfactory basis (Green being satisfactory, Red being un-satisfactory).

The high-level screening included three criterion that reflected environmental considerations, under the 'Environmental, planning, and other regulatory constraints' category:

- Does the option cause unmitigable damage to a European designated site (SAC/SPA/Ramsar)?
- Does the option cause unmitigable damage to a Nationally designated site (SSSI/NNR/National Park/Ancient Woodland)?
- Does the option cause unmitigable damage to a Site with significant heritage or visual amenity value (e.g. Scheduled Ancient Monument or AONB)?

The detailed screening included a criterion that explicitly used the findings of the SEA, in terms of outputs from the feasible option assessments:

- Does the option meet the social and environmental objectives of the relevant SEA?

The high-level screening led to 8 unconstrained options being screened out, with justifications including:

- Environmental risks being too great and/or deemed unmitigable.
- Water bodies / groundwater bodies affected by option already being in Poor status or already under considerable stress.
- Option is deemed far too politically or socio-economically unacceptable.
- Not enough evidence or information given to support the option and allow it to carry forward to the Secondary screening level.

The detailed screening of the feasible supply options led to:

- 16 options being screened in;
- 8 options being screened out.

Options that were screened out at detailed screening stage on the basis of environmental risks identified by the SEA including the following justifications:

- Potentially significant negative impacts on biodiversity (SAC). The risk would be significant as effects are certain and adverse effects likely to be unavoidable.
- Potential for deterioration in the context of the WFD. Mitigation or operational controls would be needed to avoid WFD impacts.
- Potentially significant INNS transfer risk due to the transfer of raw water from the source in another WFD surface water catchment. Potential impacts would require mitigation.
- Significant constraints arising from effects on air quality from traffic congestion during the construction period
- Significant effects on designated landscapes and cultural heritage (proximity of various scheduled monuments, listed buildings, conservation areas and a world heritage site) are identified.

The outputs of the detailed screening were used to validate the outputs of the MCA (ValueStream1) decision-making process.

5.3.2 MCA (ValueStream1)

With respect to the MCA and ValueStream 1 (the best value optimisation tool), the SEA objectives were mapped onto the following decision-making metric (there are a further four which are not presented as they are outside the scope of the SEA):

- Flood risk (SEA Objective 7);
- Human and social wellbeing (SEA Objectives 8, 10, 11, 12, 13, 16, 17;
- Sustainable natural resources (SEA Objectives 1, 2, 3, 4 and 15); and
- Mult-abstractor benefits (SEA Objectives 5, 6 and 14).

The assessment of effects for each SEA Objective for each feasible option were converted into values (on a scale of 0 – 12). These were then used as input values into the identified four metrics used in the MCA (ValueStream1). The values were then normalised to -100 to +100 scale. ValueStream1 uses solving algorithms to minimise overall costs, including environmental and social costs, while generating a scheduled plan which meets South Staffs Water's supply-demand balance. Best-value scores have been multiplied by weightings taking into account customer preferences, and the resulting scores are used in the optimisation.

Broadly, proposed options that seek to minimise demand, increase efficiencies and decrease leakages are less intrusive and have fewer adverse environmental effects; however, are not of sufficient scale to meet future water resource demands, taking into account future challenges. Supply-side options that seek to maximise existing operational efficiencies tend also to be associated with few or minor adverse effects, although consequences from any reduced flows in rivers and water bodies need also to be considered. As the scale of infrastructure requirements increases, there are consequential increases in the magnitude and significance of positive and negative effects. As reflected in the MCA (ValueStream1) process, these has then led to the preferential selection of demand management, leakage and efficiency options with a limited number of supply side options as those representing best value options.

5.3.3 Scenario Testing

Different scenarios were considered in the selection of best value options and to confirm sensitivities and dependencies within the decision-making process. This led to the review of the treatment and scoring of operational flood risk (arising from increased catchment storage associated with reservoir raising and provision) as well as threshold values for water resources (when some schemes were providing benefits below 0.01Ml/d). In both instances, this led to further revisions of the SEA findings, and use of the updated assessment.

5.3.4 Preferred Options

The preferred plan will be resolved by demand management options alone. However, the company has explored a wide range of supply options in parallel and tested both demand and supply options to ensure the preferred plan delivers the best value for both customers and the environment. The preferred plan represents the most likely scenario and whilst this is not the true definition of a core pathway (see Section 1.1 of main WRMP document) the true core pathway in South Staffs Water's case would not meet the Environment Act targets and therefore the requirements of the WRPG.

There were an additional 10 groundwater related options in the SSW South Staffs Water feasible option list at pre-consultation in January. The EA fed back that these were not viable, hence they were removed of those from South Staffs Water lists.

The final feasible options, have then been taken forward and subject to further assessment (individually and cumulatively) to ensure that the effects of South Staffs Water's rdWRMP24 has been identified, described and evaluated.

6. ASSESSMENT OF THE REVISED DRAFT WRMP24

6.1 INTRODUCTION

This section describes the findings of the assessment of the rdWRMP24. In particular, it presents:

- **Section 6.2: rdWRMP24 Preferred Option Assessment** to identify, describe and evaluate the effects of the preferred options (three supply options and three demand management options).
- **Section 6.3: Preferred Programme Assessment** to identify the likely significant effects of the preferred programme of options (considering the effects of all preferred options as a whole).
- **Section 6.4**: Reasonable Alternative Plan Assessment to identify, describe and evaluate the effects of the reasonable alternative plan identified by Cambridge Water.
- **Section 6.5: Secondary, Cumulative and Synergistic Effects Assessment** to identify, describe and evaluate the cumulative effects assessment of the preferred programme taking into account other relevant plans.
- **Section 6.6: Contribution of the Draft WRMP to Wales' Well-being Goals and the Objective for SMNR.**
- **Section 6.7: Mitigation and Enhancement.**
- **Section 6.8: Conclusions.**

6.2 REVISED DRAFT WRMP24 PREFERRED OPTION ASSESSMENT

6.2.1 Overview of Selected Options

Following the detailed screening and selection of best value options, a total of three demand management options have been identified by South Staffs Water as preferred options. The options are summarised in **Table 6.1.**

The rdWRMP24 does not require any supply options during the planning period of 2025 to 2050 to meet the deficit in the preferred plan because the required level of savings are met by the proposed demand management programme. However, the company has explored a wide range of supply options in parallel and tested both demand and supply options to ensure the preferred plan delivers the best value for both customers and the environment.

The preferred plan represents the most likely scenario and whilst this is not the true definition of a core pathway (see Section 1.1 of main WRMP document) the true core pathway in South Staffs Water's case would not meet the Environment Act targets and therefore the requirements of the WRPG. The preferred plan below is considered to be South Staffs Water's core pathway as it includes low regrets actions that allow for further feasibility in the future, should that come from worsening climate change or an increased environmental ambition. The preferred plan is also the least-cost plan.

Table 6.1: Preferred Demand Management Options included in the rdWRMP24

Option Ref.	Option name
N/A	Leakage (50% reduction by 2050)
N/A	Water Efficiency /Per Capita Consumption (110 l/h/d by 2050)
N/A	Non-household Enhanced Meters (9% demand reduction by 2037):- Installation of enhanced meter technology

6.2.2 Summary of Effects

Table 6.2 present summaries of the construction and operational effects and accompanying commentary of the preferred supply and demand options respectively with the likely significant effects detailed by option.

Table 6.2 Summary of Preferred Demand Management Option Assessments

Option	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape	Commentary
Leakage	Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**Construction:** No significant positive or negative effects have been identified during construction. **Operation:** This option has been assessed as having a significant positive effect on water quantity (SEA Objective 5) and water resource use (SEA Objective 14). The operation of the option would result in a major reduction in leakage from the supply network and an associated major reduction in the demand for water (18.25 Ml/d benefit) and therefore a subsequent increase in water efficiency.
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Operation (negative)	?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Operation (positive)	0	0	0	0	+++	0	0	0	+	+	++	0	++	+++	0	0	0	
Water Efficiency	Construction (negative)	0	0	0	0	0	0	0	?	-/?	0	0	0	0	0	-/?	0	0	**Construction:** No significant positive or negative effects have been identified during construction. **Operation:** This option has been assessed as having a significant positive effect on water quantity (SEA Objective 5) and water resource use (SEA Objective 14). The operation of the option would result in a major reduction in the demand for water (33.25 Ml/d benefit) and a subsequent increase in water efficiency. The saving of 33.25 Ml/d, would help ensure a continual supply of clean drinking water and increase resilience of supply to Severn Trent customers, supporting economic growth which could result in a positive effect on the local economy and social wellbeing (SEA Objective 11). The positive impacts on human health and well-being (SEA Objective 13) are identified as significant through provision of access to improved water, using products, fixtures, and fittings.
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Operation (negative)	0	0	0	0	0	0	0	0	?	0	0	0	0	0	0	0	0	
	Operation (positive)	0	0	0	0	+++	0	0	0	0	++	+++	0	+++	+++	0	0	0	
Non-Household Enhanced Meters	Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**Construction:** No significant positive or negative effects have been identified during construction. **Operation:** This option has been assessed as having a significant positive effect on water quantity (SEA Objective 5) and water resource use (SEA Objective 14). The operation of the option would result in a major reduction in the demand for water (12.01 Ml/d benefit) and a subsequent increase in water efficiency.
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Operation (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Operation (positive)	0	0	0	0	+++	0	0	0	0	+	++	0	++	+++	0	0	0	

6.3 PREFERRED PROGRAMME ASSESSMENT

Table 6.3 presents the cumulative assessment of the strategic effects of the rdWRMP24 preferred programme of options.

Table 6.3 Preferred Programme Assessment

SEA Objective	Cumulative score	Commentary
1. To protect and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species, enhance ecosystem resilience and habitat connectivity and deliver a net biodiversity gain.	**0/?**	Only demand management options have been taken forward into the preferred plan. No Likely Significant effect were identified in relation to the construction activities associated with the plan. No adverse effects during construction are anticipated. The operation of the leakage demand management options may lead to some effects due to disturbance of habitats and species if repair works are required; however, any likely significant effects remain uncertain at this stage.
2. To protect and enhance sustainable natural resources and the ecosystem services they provide.	**0**	Construction of the preferred plan is not expected to cause a temporary or permanent loss of habitat. Impacts during operation are considered neutral.
3. To avoid and, where required, manage invasive and non-native species (INNS).	**0**	Effects on INNS from implementation of the preferred plan are expected to be neutral during construction. Impacts during operation are considered neutral.
4. To protect and enhance soil quantity, quality and functionality and geodiversity and ensure the appropriate and efficient use of land.	**0**	No likely significant effects on soils and land use are expected during construction. Impacts during operation are considered neutral.
5. To protect and enhance surface and ground water levels and flows.	**+++/0**	Impacts during construction are anticipated to be neutral. The demand management options would result in a reduction for water demand of 63.51 Ml/d which is cumulatively a major positive operational effect.
6. To protect and enhance the quality of surface and groundwater resources.	**0**	The preferred demand management options would have a neutral effect on water quality both during construction and operation.
7. To reduce or manage flood risk.	**0**	The preferred demand management options would have a neutral effect on flood risk both during construction and operation.
8. To minimise emissions of pollutant gases and particulates and enhance air quality.	**0**	Construction of the preferred programme is expected to have a neutral effect on emissions. The location of the deployment of water efficiency measures is currently unknown (as well as the number of vehicular movements that may be required), yet cumulatively, at this stage, effects are anticipated to be minimal/neutral. In the operational phase effects are expected to be neutral.
9. To reduce greenhouse gas emissions.	**+/-/?**	The location of the deployment of water efficiency measures is currently unknown (as well as the number of vehicular movements that may be required), therefore effects on greenhouse gas emissions are considered minor negative uncertain at this stage. The leakage measures are anticipated to cause a reduction in carbon linked to reducing lost water (i.e reduced pumping and treatment waste) resulting in a minor positive effect during operation.
10. To adapt and improve resilience to the threats of climate change.	**++**	No likely significant effects on climate resilience are expected during construction.

SEA Objective	Cumulative score	Commentary
		Cumulatively the preferred programme of options would increase the capacity by demand management reduction of 63.51 Ml/d which would make a moderate significant contribution towards securing a continual supply of clean drinking water and increase resilience of this supply, thereby increasing resilience and adaptability to the effects of climate change during operation.
11. To promote a sustainable economy and maintain and enhance the economic and social well-being of local communities.	**+++/0**	Expenditure during construction is anticipated to have a neutral effect on the economy. In the operational phase the Preferred Programme of options would contribute towards a demand management reduction of 63.51 Ml/d. This will, in-turn, support population and economic growth which would also support achievement of a cumulative significant positive effect.
12. To maintain and enhance tourism and recreation.	**0**	The preferred demand management options are expected to have a neutral effect on tourism and recreation both during construction and operation.
13. To protect and enhance human health and well-being.	**+++/0**	Construction effects on human health and well-being are considered neutral. In the operational phase the effects on health primarily relate to the demand management reduction of 63.51Ml/d across the SSW area. Therefore, major negative effects are expected during operation.
14. To promote and enhance the sustainable and efficient use of resilient water resources.	**+++/0**	Construction effects on water resilience are considered neutral. The preferred programme of options will help to support the resilience of water resources in the SSW area. The preferred programme will cumulatively support increased water efficiency (33.25 Ml/d), leakage reduction (18.25 Ml/d), and non-household enhanced metering (approx. 12.01 Ml/d). This is considered to be a cumulative significant positive effect.
15. To minimise waste, promote resource efficiency and move towards a circular economy.	**0/-/?**	During construction it is anticipated that there would be a need for minor additional materials for the water efficiency demand management measures. Effects on waste and resource use are considered minor negative uncertain at this stage. Impacts during operation are considered neutral.
16. To conserve and enhance the historic environment including the significance of heritage assets and their settings and archaeological important sites.	**0**	The preferred demand management options would have a neutral effect on cultural heritage both during construction and operation.
17. To conserve, protect and enhance landscape and townscape character and visual amenity.	**0**	The preferred demand management options would have a neutral effect on the landscape both during construction and operation.

6.4 REASONABLE ALTERNATIVE PLAN ASSESSMENT

In determining the WRMP24 preferred plan of options, South Staffs Water used the findings of the option-level environmental assessments to inform the programme appraisal process and to determine the preferred programme.

As discussed in **Section 6.2**, the preferred plan is considered to be South Staffs Water's core pathway and, due to the optimisation of activities, is also the least cost plan. The demand management programme is considered sufficient to meet any deficit and as such no supply side options are required in the preferred plan therefore there is no separate plan that is best for environment and society. Further details on the options appraisal process and development of programmes can be found in the main revised draft WRMP24 documentation.

The deficit for any reasonable alternative scenarios is still resolved through the demand side options alone and hence no further cumulative assessment has been undertaken for alternative plans as they are similar to that of the preferred plan.

6.5 SECONDARY, CUMULATIVE AND SYNERGISTIC EFFECTS ASSESSMENT

The SEA Regulations require that the cumulative effects of the rdWRMP24 are assessed. This includes the cumulative effects of the individual preferred options that comprise the preferred programme and the effects of the rdWRMP24 in combination with other plans and programmes.

The cumulative effects of the individual options that comprise the preferred programme of WRMP24 options have already been presented in **Section 6.3**. This section therefore considers the cumulative effects of the rdWRMP24 in combination with other plans and programmes, including:

- the rdWRMP24 with other SSW plans (SSW's Drought Plan)
- the rdWRMP24 with adjacent water company plans and projects (SROs);
- the rdWRMP24 as part of the WRW draft Regional Plan;
- the rdWRMP24 with other plans e.g., Local Plans, National Policy Statements (NPSs);
- the rdWRMP24 with other Nationally Significant Infrastructure Projects (NSIPs).

In general, the cumulative effects of the rdWRMP24 are difficult to accurately assess given the inherent uncertainties concerning (inter alia): future changes to baseline environmental conditions; future population and economic growth; the deliverability of some NSIPs (and the potential for new NSIPs to be brought forward); and the proposals of emerging water company WRMPs. As such, it is necessary to keep under review these factors as the preferred programme is implemented (e.g. in Environmental Impact Assessments (EIA) and HRAs) to ensure that the latest and most up to date information is taken into account.

In addition, as the preferred plan contains **demand-side measures** and has no supply options, the only realistic mechanism for cumulative impacts would be through any construction required (for example, the leakage reduction programme may require repair of a pipe), but this cannot be meaningfully assessed at the strategic level since information on the location of specific intervention requirements (e.g. leaks; households requesting meters) is not available without specific investigations, which would form part of the option package, and there is consequently no information on the scale (etc.) of any construction required. Therefore, a meaningful assessment of cumulative impact is not possible but are considered highly unlikely given the discrete nature of any intrusive works required for the demand-side measures and that it is very likely that negative impacts could be avoidable at a project level.

6.5.1 Other SSW Plans

South Staffs Water published its Draft Final Drought Plan in August 2022. The drought plan describes how South Staffs Water will 'continue, during a period of drought to discharge our duties to supply adequate quantities of wholesome water, with as little recourse as possible to drought orders or drought permits'.

The Drought Plan provides a comprehensive statement of the actions that South Staffs Water will consider implementing during drought conditions in order to protect essential water supplies for customers and to minimise environmental impact. The Plan includes a range of drought management actions (linked to drought triggers), that can be broadly categorised as:

- Demand-side actions (such as enhanced communications and extra promotion of water efficiency and demand management; leakage reduction, enhanced pressure management, appeals for restraint, temporary use bans, implementing restrictions, ordinary drought orders-non essential use bans);
- Supply side actions (such as reviewing planned outage and ensuring existing sources are fully operational, conserving Blithfield Reservoir, operating River Blithe pump back and using Brindley Bank, Reviewing the potential for bulk supplies and transfers with Severn Trent Water)
- Drought permits and orders;
- Extreme drought measures.

The potential drought permit/order sites are summarised in **Table 6.4**.

Table 6.4: Draft Drought Plan 2022: Potential sites for Drought Permit/ Order Sites

Potential South Staffs Water site	Environment Agency area	Option Type
River Blithe Pumpback and River Trent	West Midlands Area	Drought permit
River Severn at the River Severn Works	West Midlands Area	Drought order

It is not anticipated that there would be any additional adverse cumulative effects from implementation of the rdWRMP24 in-combination with the Drought Plan. The rdWRMP24 includes the drought measures and complements the Drought Plan. Through leakage reduction and network metering, the preferred programme of rdWRMP24 options is designed to improve levels of service for drought permits and orders. The demand management options will also result in reduced required abstraction at source.

6.5.2 Adjacent water company plans and projects (SROs)

South Staffs Water's supply boundary is surrounded by Severn Trent Water's supply area. Severn Trent Water published their Drought Plan in 2021 and their draft WRMP24 for consultation in November 2022[38]. The draft WRMP24 is now in the revision process with the final WRMP24 expected to be published later this year. As such, it is important to note the information used in these assessments is considered to be the most up to date information available.

As the South Staffs Water's rdWRMP24 preferred plan features demand management measures only, there are unlikely to be any cumulative adverse effects with the options proposed to Severn Trent Water's draft WRMP24 or Drought Plan.

Severn Trent Water's draft WRMP24 and Drought Plan both include demand management components, similar to those included in South Staffs Water's rdWRMP24. Improved water efficiency and leakage reduction across the Midlands will provide beneficial cumulative effects in terms of reduced consumption and water abstraction, as well as reduced energy use due to less water pumping and treatment. South Staffs Water will continue to engage with Severn Trent Water as the WRMPs are finalised.

The cumulative assessments should be reviewed at the time of implementation of any WRMP measures to ensure that no changes to Severn Trent Water's Drought Plan and/or WRMP measures have been made in the intervening period, and therefore whether the assessment provided in this Environmental Report remains valid.

No other cumulative effects with any other water company draft WRMPs or published Drought Plans have been identified.

6.5.3 Water Resources West draft Regional Plan

Water Resources West (WRW) is one of five regional groups established to develop regional water resources plans, to ensure the continuous provision of resilient, efficient and sustainable water supplies for the future. The requirement was established by the National Framework for Water Resources[39]. WRW includes all or part of the operational areas of Dŵr Cymru Welsh Water (DCWW), Hafren Dyfrdwy[40], Severn Trent Water (STW), South Staffs Water and United Utilities (UUW). The Regional Plan focuses on demand management and supply options to address water supply deficits.

WRW is taking an integrated approach to preparing the Regional Plan and the WRMPs and aims to provide a Regional Plan that is multi-sector and takes account of the water supply needs of non-public water supply (non-PWS) abstractors as well as public water supplies. The Regional Plan contains all the proposals for the component WRMP24s that relate to the area covered by the regional Plan. In consequence, there is likely to be overlap between likely measures that will be forthcoming within the Regional Plan and those included within

[38] Severn Trent (2022) Draft Water Resources Management Plan (documents available at dwrmp24 DRAFT documents | Water resources management plan | Our plans | About us | Severn Trent Plc)

[39] EA (2020) Meeting our future water needs: a national framework for water resources

[40] On 1st July 2018, Hafren Dyfrdwy combined the water service area of Dee Valley Water and Severn Trent lying in Wales.

the draft WRMP24 and therefore there are likely to be cumulative effects where the plans work together to support effective management of water resources.

6.5.4 Other plans

6.5.4.1 Canal and River Trust Management Plans

The Canal & River Trust (formerly British Waterways) is responsible for managing the various navigable waterways and canals in the South Staffs supply area and the wider assessment area considered in this SEA. The Canal & River Trust Water Resources Strategy[41] set out the vision for how it intends to manage water resources across its network through to 2050. It contains the Trust's planned actions relating to the canal network but with a focus on 2015-2020 (there does not appear to be a new strategy planned). The Birmingham Canal Navigations (BCN) hydrological unit partially overlaps with South Staffs water supply area. However, the main actions for the strategy are to undertake a range of modelling scenarios for the hydrological units in order of preference. Specific restoration projects or other canal developments are not detailed, however Strategic Action 4 states that appropriate water resource assessments will be undertaken aiming for "no net impact on long term water resource levels of service". No adverse cumulative effects between the Canal & River Trust Water Resources Strategy and the options included in South Staff's Final WRMP24 have been identified.

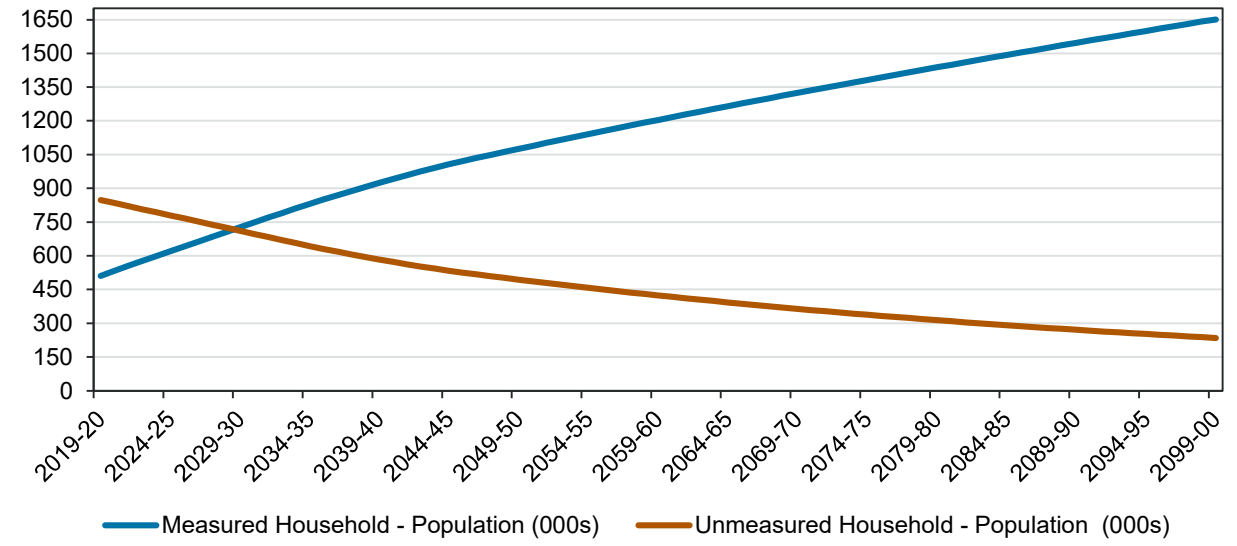
6.5.4.2 Local Plans

Population change in the South Staffs Water region has already been considered in the rdWRMP24 along with the potential for further changes in demographics throughout the plan period.

These forecasts have been based upon population projections published by the ONS and engagement with local and unitary authorities regarding their local plans to determine how many household properties are likely to be built in the region over the planning horizon. The forecasts have also taken into account potential economic growth in the South Staffs region. South Staffs Water has also carried out an initial impact assessment of the 2021 Census findings on population data.

Figure 6.1 shows the rdWRMP24 plan based population forecast.

Figure 6.1 Population Forecast



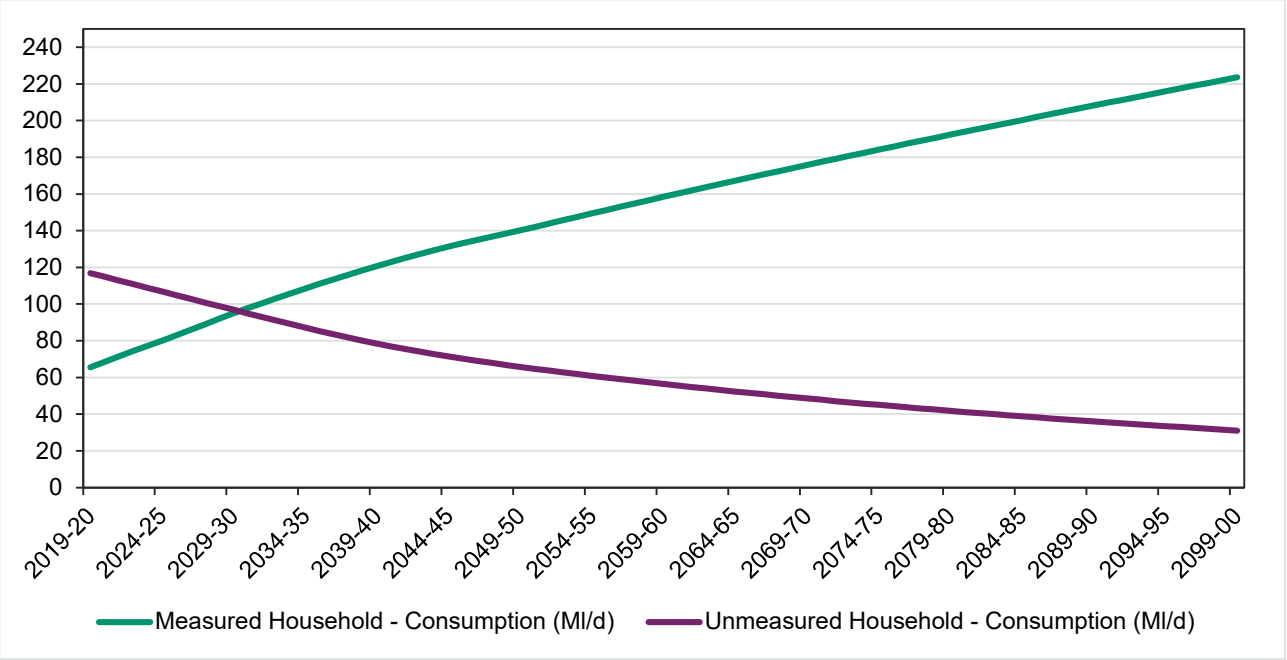
As a result, the in-combination water-resource effects of growth promoted by other plans (for example, local planning authority local plans and strategic growth plans) or projects are considered and accounted for during the rdWRMP24 development process. Arguably, therefore, potential in-combination effects in respect of water-resource demands due to other plans or projects are unlikely since these demands are explicitly modelled when determining the supply-demand balance. Conversely, in respect of water resources, the WRMP24 is

[41] Canal & Rivers Trust (2015) Putting the water into waterways: Water Resources Strategy 2015-2020 https://canalrivertrust.org.uk/refresh/media/thumbnail/24335-water-resources-strategy.pdf

not likely to make non-significant effects in other plans significant (indeed, other plans are arguably the 'source' of any potential effects in respect of water demand, with the WRMP24 having to manage potential effects that are not generated by the WRMP24 itself).

South Staffs Water tested a range of different scenarios for their forecasts of household consumption, based on different assumptions regarding the housing and population growth, rate of meter switching and other factors. South Staffs Water selected a core or principal forecast to adopt for the WRMP24 and applied this forecast in their analysis of the baseline supply-demand balance to assess the potential timing and magnitude of any future supply-demand options which may be required. Projections are set out in **Figure 6.2.**

Figure 6.2 Measured/unmeasured household consumption trends and projections to 2099



South Staffs Water's baseline supply-demand balance in the rdWRMP24 shows that without intervention there is a potential deficit in 2031/32, reaching -55 Ml/d by 2050.

The forecast deficit will be offset through the implementation of the demand management measures that comprise the preferred programme of WRMP24 options. These seek to implement measures to enhance leakage reduction, reduce both household and non-household consumption, and increase resilience to other hazards which is expected to help ensure that a continual supply of water is maintained to support future population, household and economic growth within SSW's region.

Local Plans Developments in South Staffs Water's operational area include those listed in **Table 6.5**: The implementation timings of South Staffs Water's preferred plan demand management option is provided in **Table 6.6**.

Table 6.5 Local Plan Developments

The Plan for Stafford Borough (2011-2031)[42]
Policy Stafford 2 – North of Stafford
This is a strategic mixed-use development area that aims to be delivered by 2023. It is expected to provide 3,100 new homes (including affordable housing) and 36 hectares of new employment land.
Policy Stafford 4 – East of Stafford

[42] https://www.staffordbc.gov.uk/sites/default/files/cme/DocMan1/Planning%20Policy/Plan%20for%20Stafford%20Borough/PFSB-Adoption.pd

This is a strategic mixed-use development area that aims to be delivered by 2023. It is expected to provide 600 new homes and at least 20 hectares of new employment land.
East Staffordshire Local Plan (2012-2031)[43]
Branston Locks Development This development is currently ongoing, when complete the development will provide 2,500 homes and 20 hectares of land for office, general industrial, storage or distribution use. Other amenities will include new schools, care home, hotel and public house. South of Branston Development The strategic site will provide 659 homes and 18 hectares of employment land for general industrial, storage or distribution uses.
Lichfield District Local Plan Allocations (2008-2029)[44]
Rugeley Power Station The allocated site covers an area of 69 hectares. The local plan expects the site to provide a minimum of 800 homes in the local plan, however in April 2021 outline planning permission was granted for a sustainable and innovate mixed-use neighbourhood providing 2,300 new homes, a school, 5 hectares of employment land and a new 25-hectare country park alongside the river Trent to name a few. Land at Watery Lane (Site OR7) The allocated site covers an area of 49.7 hectares and is expected to provide 750 homes by 2029.
South Derbyshire Local Plan (2011 - 2028)[45]
Policy H6: Drakelow Park The site of the former Drakelow Power Stations has been allocated as a strategic mixed-use site. It is expected that the site will provide up to 2,239 homes (with 1,200 expected to be built by 2028).

Table 6.6: Preferred plan demand management option implementation timings

Option	Implementation Time	Year option benefit delivered
Leakage	Unknown	(50% reduction by 2050)
Water Efficiency /Per Capita Consumption	Unknown	(110 l/h/d by 2050)
Non-household Enhanced Meters:- Installation of enhanced meter technology	Unknown	(9% demand reduction by 2037)

The potential for cumulative effects of Local Development Plans with SSW's preferred plan is unlikely given the discrete nature of any intrusive works required for the demand-side measures and likelihood that negative impacts could be avoidable at project level.

Therefore, it is expected that no negative construction cumulative impacts will arise as a result of SSW's WRMP24.

6.5.4.3 National Policy Statements (NPSs)

The Planning Act 2008 introduced a procedure to streamline the decision-making process for NSIPs. Under the Act, a developer wishing to construct a Nationally Significant Infrastructure Projects (NSIP) must first apply

[43] https://www.eaststaffsbc.gov.uk/sites/default/files/docs/planning/planningpolicy/localplan2012-2031/Local-Plan-2012-2031-FINAL.pdf
[44] https://www.lichfielddc.gov.uk/downloads/file/1228/local-plan-allocations-adopted
[45] Adopted Local Plan | South Derbyshire District Council

to the Secretary of State for development consent. National Policy Statements (NPSs) establish the need for specific types of infrastructure and provide planning guidance for promoters of NSIPs, and the basis for the examination by the Examining Authority and decisions by the Secretary of State on development consent order applications. A number of NPSs have been published which set out the definition, and in some cases the location, of NSIPs. The current status of NPSs is set out in **Table 6.5**.

Table 6.5 List of Published NPSs

National Policy Statement (NPS)	Status	Are Potential Locations of NSIPs included in the NPS?
Overarching Energy EN-1[46]	Designated July 2011	No
Fossil Fuel Electricity Generating Infrastructure EN-2	Designated July 2011	No
Renewable Energy Infrastructure EN-3	Designated July 2011	No
Gas Supply Infrastructure and Oil and Gas Pipelines EN-4	Designated July 2011	No
Electricity Networks Infrastructure EN-5	Designated July 2011	No
Nuclear Power Generation EN-6	Designated July 2011	Yes
Ports	Designated January 2012	No
Waste Water Infrastructure	Designated March 2012	Yes
Hazardous Waste Infrastructure	Designated June 2013	No
National Networks	Designated January 2015	No
Airports NPS: new runway capacity and infrastructure at airports in the South East of England	Designated June 2018	Yes
Water Resources Infrastructure	Draft published November 2018	No
Geological Disposal Infrastructure	Designated July 2019	No

The rdWRMP24 is not expected to have any adverse cumulative effects in-combination with the NPSs listed above. This is because the NPS are either not site specific or because specific NSIP proposals are unlikely to affect, or be affected by, the measures that comprise the rdWRMP24.

The Nuclear Power NPS (EN-6) sets out eight potentially suitable sites for the deployment of new nuclear power stations in England and Wales. None of these sites are located within the South Staffs Water WRMP24 area. Therefore, no significant cumulative effects in combination with the implementation of the draft WRMP are predicted.

Two NSIPs are set out in the Waste Water Treatment NPS; however, both of these are located in London and are not expected to have any effect on water resource management within the South Staffs Water rdWRMP24 area. Similarly, the Airports NPS concerns runway capacity in the South East of England only.

Defra has consulted on a draft NPS for water resources. This will set out the need for NSIPs related to water resources, and the Government's policies to deliver them. Whilst this NPS will not be site specific, implementation of the rdWRMP24 is likely to be compatible with those objectives of the NPS for improving water supply resilience.

6.6 CONTRIBUTION TO THE REVISED DRAFT WRMP24 TO WALES WELL-BEING GOALS FOR THE OBJECTIVE FOR SUSTAINABLE MANAGEMENT OF NATURAL RESOURCES (SMNR)

The preferred options in the rdWRMP24 do not affect Wales, and therefore this is not applicable.

6.7 MITIGATION AND ENHANCEMENT

The potential effects of the rdWRMP24 are described in the sections above. It is unlikely that mitigation and enhancement measures will need to be implemented as only minor construction works are anticipated relating

[46] A revised draft National Policy Statement for Energy (and for EN2 to EN5) was published by the Government for consultation in September 2021.

to the water efficiency demand option (minor pipe work/repairs). As the location of works is not yet confirmed potential effects of the preferred programme will be subject to further investigation once locations are confirmed. If any mitigation measures are considered necessary to take forward after further investigation, then this should be consolidated into a Construction Environmental Management Plan (CEMP) for the scheme, noting that all works should be carried out in accordance with relevant Construction Design Management (CDM) Regulations 2015.

6.7.1 Species Specific Measures and Biodiversity

Most species-specific avoidance or mitigation measures can only be determined at the scheme level, following scheme-specific surveys, and 'best-practice' mitigation for a species will vary according to a range of factors that cannot be determined at this stage. The CEMP should include measures to minimise disturbance to biodiversity during the construction phase, for example:

- scheme design should aim to minimise the environmental effects by 'designing to avoid' potential habitat features that may be important e.g. those used by species that are European site interest features when outside the site boundary (e.g. linear features such as hedges or stream corridors; large areas of scrub or woodland; mature trees; etc.) through scheme-specific routing studies;
- the works programme and requirements for each measure should be determined at the earliest opportunity to allow investigation schemes, surveys and mitigation to be appropriately scheduled and to provide sufficient time for consultations with NE;
- night-time working, or working around dusk / dawn, should be avoided to reduce the likelihood of negative effects on nocturnal species;
- any lighting required (either temporary or permanent) will be designed with an ecologist to ensure that potential 'displacement' effects on nocturnal animals, particularly designated bat species, are avoided;
- all materials will be securely stored away from migratory routes / foraging areas that may be used by designated species;
- all excavations will have ramps or battered ends to prevent species becoming trapped; and
- pipe-caps must be installed overnight to prevent species entering and becoming trapped in any laid pipe-work.

As the WRMP24 preferred plan only includes demand management options, the related construction activities are likely to be discrete and implementation of biodiversity construction mitigation measures are not considered likely.

6.7.2 Scheme Design and Planning

All measures will be subject to project-level environmental assessment, which will include assessments of their potential to affect European sites during their construction or operation. These assessments should consider or identify (inter alia):

- opportunities for avoiding potential effects on European sites through design (e.g. alternative pipeline routes; micro-siting; etc);
- construction measures that need to be incorporated into scheme design and or planning to avoid or mitigate potential effects – for example, ensuring that sufficient space is available for pollution prevention measures to be installed, such as sediment traps; and
- operational regimes required to ensure no adverse effects occur (e.g. maintain minimal flows – although note that these measures can only be identified through detailed investigation schemes).

As the WRMP24 preferred plan only includes demand management options, the related construction activities are likely to be discrete and implementation of construction mitigation measures are not considered to be likely.

6.7.3 Pollution Prevention

There is a substantial body of general construction good-practice which is applicable to all of the proposed measures and can be relied on (at this level) to prevent significant or adverse effects on a European site occurring as a result of construction site-derived pollutants. The following guidance documents detail the current industry best-practices in construction that are relevant to the proposed schemes:

- DEFRA's Pollution prevention for businesses (https://www.gov.uk/guidance/pollution-prevention-for-businesses);
- Venables R. et al. (2000) Environmental Handbook for Building and Civil Engineering Projects. 2nd Edition. Construction Industry Research and Information Association (CIRIA), London.

The best-practice procedures and measures detailed in these documents should be followed for all construction works derived from the rdWRMP24 as a minimum standard, unless scheme-specific investigations identify additional measures and / or more appropriate non-standard approaches for dealing with potential site-derived pollutants.

Care should also be taken during construction regarding the potential for contaminants such as silt, concrete or fuel oil to pollute water courses via surface run off. This can be mitigated by undertaking all construction activities in accordance with relevant best practice pollution prevention guidance. Pollution Incident Control Management Plans should be developed to limit adverse effects arising from pollution events.

In addition, consideration should be given regarding the location of the storage reservoir since it appears to be located on a historic landfill site which could cause contamination impacts. Phase I and phase II contaminated land surveys may be required at project level.

As the WRMP24 preferred plan only includes demand management options, the construction activities are likely to be discrete and implementation of construction mitigation measures are not considered to be likely.

6.7.4 Air Quality

With regard to the potential for effects on air quality, the following measures should be considered for inclusion within the CEMP:

- South Staffs Water should consider the use of low emission plant, air quality monitoring and preparation of a Dust Management Plan;
- A Construction Traffic Management Plan (CTMP) could be prepared for each preferred supply option to manage the traffic impacts associated with construction which would include measures to mitigate air quality effects including routing of traffic to avoid sensitive receptors and the timing of HGV movements to avoid peak traffic hours;
- Low emission/electric vehicles should be used during the construction and operational phases where possible, consistent with the Water UK Net Zero 2030 Route Map.

As the WRMP24 preferred plan only includes demand management options, the related construction activities are likely to be discrete and implementation of Air Quality construction mitigation measures are not considered likely.

6.7.5 Effects on Human Health and Social and Economic Well-being

With regard to the potential for effect on health, social and economic well-being, South Staffs Water and its contractors are enrolled in the Considerate Constructors Scheme, a voluntary scheme which commits those contractors in the Scheme to be considerate and good neighbours, as well as clean, respectful, safe, environmentally conscious, responsible and accountable. The following measures should be considered for inclusion within the CEMP:

- care should be taken to avoid works near to the most sensitive health receptors;
- routing of traffic to avoid sensitive receptors and the timing and phasing of HGV movements to avoid peak traffic hours;
- construction activities should be undertaken so as to minimise short term adverse effects on recreational areas, such as footpaths including realigning the pipeline in option 6.1.3 to avoid National Cycle Route 54, and on landscape and biodiversity.

To maximise economic benefits in the South Staffs Water area, it is recommended that, where possible, work is carried out by local firms and contractors or by those with a policy for training and skills development that could help contribute to the local economy and meet employment needs. Where possible, South Staffs Water should seek to use locally-sourced materials.

As the WRMP24 preferred plan only includes demand management options, the related construction activities are likely to be discrete and implementation of construction mitigation measures are not considered likely.

6.7.6 Effects on Climate Change and Resource Use

To help South Staffs Water respond to the challenges of climate change, noting that greenhouse gas emissions are a likely significant effect identified by the SEA, a Carbon Management Plan should be developed. This should be consistent with the Water UK Net Zero 2030 Route Map and could include:

- the provision of on-site renewables during both the construction and operational phases of the sub-options;
- adoption of high quality, sustainable design principles to maximise energy efficiency in new infrastructure;
- use of low emission and electric vehicles in construction and operational fleets;
- use of low emission plant during construction;
- provision of enhanced carbon sequestration as part of biodiversity enhancement measures; and
- offsetting of all residual carbon emissions.

Design measures should be adopted to ensure the long-term resilience of infrastructure to the effects of climate change. Measures may include, for example, the provision/enhancement of natural flood management measures as part of wider biodiversity enhancement and habitat creation.

Where significant raw materials are required for options, this can be mitigated by utilising recycled and locally sourced materials. Construction and operational wastes should also be reused/recycled where appropriate.

As the WRMP24 preferred plan only includes demand management options, the related construction activities are likely to be discrete and implementation of construction mitigation measures are not considered likely.

6.7.7 Effects on Cultural Heritage and Landscape

The potential for adverse impacts of the settings of cultural heritage assets should be considered early in the design process and any adverse effects minimised, for example through micrositing/ alternative pipeline routes to avoid designated sites. Further measures, for consideration within the CEMP could include:

- careful consideration being given to the presence of heritage assets when finalising proposals for pipeline routing;
- where required, a programme of trial trenching and archaeological recording should be undertaken at development sites, with results disseminated;
- new above-ground infrastructure should be screened, where possible and informed by informed by a heritage appraisal/assessment, to minimise effects on the settings of heritage assets;
- consideration should be given to enhancing the significance of, and access to, heritage assets.

Proposed rdWRMP24 schemes could have a negative effect on landscape if new infrastructure is required, particularly where development cannot be located on previously developed land and/or where schemes are located within landscapes recognised for their importance and special qualities (National Parks and AONBs). In order to minimise such effects, new structures could be located close to existing structures or hedgerows and trees to provide some screening with the potential to utilise local building styles or incorporate landscaping schemes (e.g. tree/ hedge planting). Further measures, for consideration within the CEMP could include:

- where required, proposals should be accompanied by a lighting strategy that is designed to minimise outward glows;
- new above ground infrastructure should adopt high quality design principles where possible (for example, the use of local materials);
- where appropriate, proposals should be accompanied by a landscape mitigation plan, informed by a landscape and visual assessment.

As the WRMP24 preferred plan only includes demand management options, the related construction activities are likely to be discrete and implementation of construction mitigation measures are not considered likely.

6.8 CONCLUSIONS

The rdWRMP24 is focussed on delivering targets to halve leakage and reduce customer consumption to 110 litres per person per day by 2050. In addition, the plan targets 9% reduction of non-household consumption by 2037, in line with the proposed Environment Act target. Underpinning this is the company's programme of universal metering it is proposing to undertake between 2025 and 2035, which will provide invaluable information to support changes to customer behaviour as well as aiding with the targeting and delivery of leakage reductions.

The rdWRMP24 best value plan does not require any supply options during the planning period of 2025 to 2050 in order to meet the deficit. The ambitious demand management programme described above provides the required level of savings.

Overall, the rdWRMP24 is expected to generate significant positive effects across several of the SEA objectives including water quantity (SEA Objective 5), economy (SEA Objective 11), human health and well-being (SEA Objective 13) and water resources (SEA Objective 14) as demand will be reduced by 63.51Ml/d across the SSW supply area. Improvements to water efficiency will better support population and economic growth, contribute towards maintaining health and aid sustainable water resource provision. Additionally, no significant negative effects have been identified for any of the SEA Objectives and no adverse effects are anticipated during operation from the options and as such, mitigation and enhancement measures are not likely to be necessary.

The demand management measures required are likely to require some form of physical intervention or amendment to the network although the works required for these options are likely to be relatively minor (e.g. meter installation or pipe repair) and risk of significant effects unlikely. From an HRA perspective, an effect pathway is still conceivable and therefore cannot be ruled out. Therefore, since information on the location of specific intervention requirements is not available, a meaningful appropriate assessment is not possible at the strategic level, the assessment is necessarily deferred to the project level.

The South Staffs Water rdWRMP24 has been deemed as WFD compliant against each of the core WFD Assessment Objectives with the plan only containing demand management options which sit outside the scope of the WFD compliance assessment as they are deemed WFD compliant activities.

7. NEXT STEPS

7.1 CONSULTATION ON THIS ENVIRONMENTAL REPORT

This Environmental Report is being issued for consultation. We would welcome views on any aspect of this report.

Please e-mail your responses to Wrmp.consultation@south-staffs-water.co.uk

7.2 NEXT STEPS

South Staffs Water's rdWRMP24 and accompanying documents including the Environmental Report were issued for consultation in Autumn 2022 following permission from Defra.

South Staffs Water have prepared and will publish a Statement of Response to the representations received during public consultation, within 26 weeks of publication of the draft plan. South Staffs Water has produced a revised draft WRMP for submission alongside the Statement of Response in May 2023. This rdWRMP24 Environmental Report will be published and sent to the Secretary of State alongside the Statement of Response and the rdWRMP24; demonstrating the changes that have been made.

The Secretary of State will review the rdWRMP24, the representations made and the Statement of Response and, along with advice from the regulators, decide whether the plan can be published. Once permission has been received, the final WRMP24 and associated environmental assessments will be published. In conjunction with publishing the final WRMP24, a Post Adoption Statement will also be issued (to meet the requirements of SEA regulation 16 (4)). The SEA Post Adoption Statement will demonstrate how SEA has influenced the overall development of the WRMP and will also document the consultation process.

7.3 HOW ENVIRONMENTAL EFFECTS WILL BE CONSIDERED DURING PLAN IMPLEMENTATION

Once the final WRMP24 has been published, the selected schemes for water resource management will need to be implemented through specific projects. As part of this process, each project may be subject to further assessment to understand and manage its potential environmental and social impacts. These assessments, which may include HRA and EIA, will take account of the issues discussed in this report but will also be informed by the greater detail available as the work progresses about construction techniques, building materials, and agreed locations and routes.

7.4 MONITORING THE EFFECTS OF THE WRMP

Once the WRMP24 is implemented and specific options deployed, its effects on the environment and people will need to be taken into account. In this regard, it is a requirement of the SEA Regulations to establish how the significant effects of the WRMP24 will be monitored. Monitoring can help to answer questions such as:

- Were the SEA predictions of effects accurate?
- Are mitigation measures performing as well as expected?
- Are there any adverse effects? Are these within acceptable limits, or is remedial action desirable?

It is not necessary to monitor everything or monitor an effect indefinitely. Instead monitoring should be focussed on:

- significant effects that may give rise to irreversible damage, with a view to identifying trends before such damage is caused; and
- significant effects where there was uncertainty in the SEA and where monitoring would enable preventative or mitigation measures to be undertaken.

South Staffs Water expects to monitor the effects of the WRMP24 alongside the other impacts of its operations, and as such, is likely to rely on existing sources of information that are collected either by South Staffs Water or by other relevant organisations such as the Environment Agency or Natural England. For example, South Staffs Water already collects certain data for an annual review process (the Annual Performance Report) that is submitted to the Office of Water Services (Ofwat) and their own environmental reporting.

Table 7.1 indicates some of the issues currently monitored or which could be monitored in future, and how they relate to the SEA objectives used in the SEA of the rdWRMP24. This list is provisional and indicative only; monitoring proposals will be considered further and a final monitoring framework that satisfies the requirements of the SEA Regulations will be presented in the Post Adoption Statement.

Table 7.1 Potential Indicators for Monitoring Effects

SEA Objective	Potential Indicator	Source of Information	Commentary
1. To protect, restore and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species, enhance ecosystem resilience and habitat connectivity and deliver a net biodiversity gain.	Condition of specific protected sites (e.g. SACs, SPAs, SSSIs)	South Staffordshire Water (SSW), Environment Agency, Natural England (NE)	Additionally, open communication between Environment Agency, NE and SSW results in up-to-date information and identification of any potential issues. If unexpected significant effects are found during monitoring: • Immediately identify root cause through detailed investigation. • Upon determination, cease activity deemed to be the cause. • Identify remediation actions. • Identify elimination and mitigation measures to enable activity to recommence with. • If this is not possible, alternative activities would be assessed in order to deliver the requirements without significant effects.
2. To protect and enhance sustainable natural resources and the ecosystem services they provide.	Biological monitoring (macroinvertebrates, macrophytes, fisheries, bird surveys)	SSW, EA, Angling clubs, British Trust for Ornithology (BTO)	Using data sets and comparing them against other monitored information such as levels and flows will assist in identifying whether there are any adverse effects and if mitigation measures are performing as well as expected. If unexpected significant effects are found during monitoring: • Immediately identify root cause through detailed investigation. • Upon determination, cease activity deemed to be the cause. • Identify remediation actions. • Identify elimination and mitigation measures to enable activity to recommence with. • Increase monitoring to demonstrate effectiveness of remedial actions If this is not possible, alternative activities would be assessed in order to deliver the requirements without significant effects.
	Number and area of new or restored habitats	SSW	SSW could consider recording the number of locations and area of habitats created or restored
3. To avoid and, where required, manage invasive and non-native species (INNS).	INNS presence	SSW, NBN Atlas and the EA's Ecology & Fish Data Explorer website	If unexpected significant effects are found during monitoring: • Immediately identify root cause through detailed investigation. • Upon determination, cease activity deemed to be the cause. • Identify remedial actions.

SEA Objective	Potential Indicator	Source of Information	Commentary
			• Identify elimination and mitigation measures to enable activity to recommence with. • Increase monitoring to demonstrate effectiveness of remedial actions If this is not possible, alternative activities would be assessed in order to deliver the requirements without significant effects.
4. To protect and enhance soil quantity, quality and functionality and geodiversity and ensure the appropriate and efficient use of land.	Area of previously undeveloped land used during construction	SSW	SSW could record the area of previously undeveloped land that is built on as a result of the WRMP24 scheme (linked to biodiversity net gain/resilience assessment).
	Condition of sites designated for geological interest (e.g. geological SSSIs) on water industry land holdings	SSW, NE	Previous studies may also be used to inform monitoring and assessment. If unexpected significant effects are found during monitoring: • Immediately identify root cause through detailed investigation. • Upon determination, cease activity deemed to be the cause. • Identify remedial actions. • Identify elimination and mitigation measures to enable activity to recommence with. • Increase monitoring to demonstrate effectiveness of remedial actions If this is not possible, alternative activities would be assessed in order to deliver the requirements without significant effects.
5. To protect and enhance surface and ground water levels and flows.	River flows, river levels, lake and reservoir levels. Groundwater levels, recharge characteristics and abstracted groundwater quality	SSW, EA	If unexpected significant effects are found during monitoring: • Immediately identify root cause through detailed investigation. • Upon determination, cease activity deemed to be the cause. • Identify remedial actions. • Identify elimination and mitigation measures to enable activity to recommence with. • Increase monitoring to demonstrate effectiveness of remedial actions If this is not possible, alternative activities would be assessed in order to deliver the requirements without significant effects.
6. To protect and enhance the quality of surface and groundwater resources.	Water quality of surface and ground water.	SSW, EA	Previous studies may also be used to inform monitoring and assessment. If unexpected significant effects are found during monitoring: • Immediately identify root cause through detailed investigation. • Upon determination, cease activity deemed to be the cause. • Identify remedial actions, including expanding our catchment management

SEA Objective	Potential Indicator	Source of Information	Commentary
			activities and utilisation of nature based solutions. • Identify elimination and mitigation measures to enable activity to recommence with. • Increase monitoring to demonstrate effectiveness of remedial actions If this is not possible, alternative activities would be assessed in order to deliver the requirements without significant effects.
7. To reduce or manage flood risk.	Number of properties that experience internal flooding from public sewers	SSW, EA	SSW could identify opportunities for Blithfield to provide flood mitigation support through balancing the level at certain times of the year.
8. To minimise emissions of pollutant gases and particulates and enhance air quality.	Number of vehicle movements/distance travelled	SSW	SSW could consider recording the number of vehicle movements and distance travelled as an indicator of air quality impacts during implementation. SSW net zero plan aims to replace nearly all company vehicles with electric vehicles. If unexpected significant effects are found during monitoring: • Immediately identify root cause through detailed investigation. • Identify remedial actions • Implement actions • Increase monitoring to demonstrate effectiveness of remedial actions
9. To reduce greenhouse gas emissions.	Quantity of greenhouse gas emissions per megalitre of water supplied.	SSW	SSW can use company data, and guidance from the UKWIR greenhouse gas workbook and BEIS (Department for Business, Energy & Industrial Strategy) conversion factors to derive this information. SSW WRMP reduces GHG emissions and SSW net zero plan supports delivery of this measure. If unexpected significant effects are found during monitoring: • Immediately identify root cause through detailed investigation. • Identify remedial actions • Implement actions, including renewable energy, innovation, green process upgrades • Increase monitoring to demonstrate effectiveness of remedial actions
	Energy use used in the operation of options.	SSW	SSW energy consumption data e.g. via accounts / invoices.

SEA Objective	Potential Indicator	Source of Information	Commentary
	Renewable energy generated or purchased.	SSW	SSW renewable energy generation data, in addition to data on renewable energy purchased e.g. via accounts / invoices. SSW net zero plan supports delivery of this measure.
10. To adapt and improve resilience to the threats of climate change.	Number of properties that experience internal flooding from public sewers	SSW, EA, NRW	SSW report this data to Ofwat as part of the statutory returns process. If unexpected significant effects are found during monitoring: • Immediately identify root cause through detailed investigation. • Upon determination, cease activity deemed to be the cause. • Identify remedial actions. • Identify elimination and mitigation measures to enable activity to recommence with. • Increase monitoring to demonstrate effectiveness of remedial actions If this is not possible, alternative activities would be assessed in order to deliver the requirements without significant effects
11. To promote a sustainable economy and maintain and enhance the economic and social well-being of local communities.	Number of SSW sites with public access which provide sporting, recreational and leisure resources and number of visits per year.	SSW	SSW hold information on the number of annual visitors to sites where specific visitor facilities are provided. These could be analysed to determine effects of operation on visitor use.
	Planned residential new development (informing predicted growth forecast to target catchments requiring investigations for potential future capacity constraints).	SSW	SSW examine information on planned growth and forecasts across Local Planning Authorities within the area.
12. To maintain and enhance tourism and recreation.	Number of SSW sites with public access which provide sporting, recreational and leisure resources and number of visits per year.	SSW	
13. To protect and enhance human health and well-being.	Compliance with drinking water standards at customers' taps (%).	SSW	SSW reports these data to Ofwat as part of the statutory returns process (Annual Performance Report) and to the Drinking Water Inspectorate. If unexpected significant effects are found during monitoring: • Immediately identify root cause through detailed investigation. • Upon determination, cease activity deemed to be the cause. • Identify remedial actions. • Identify elimination and mitigation measures to enable activity to recommence with. • Increase monitoring to demonstrate effectiveness of remedial actions

SEA Objective	Potential Indicator	Source of Information	Commentary
			If this is not possible, alternative activities would be assessed in order to deliver the requirements without significant effects
	Compliance with water quality standards under the EC Bathing Waters Directive.	Environment Agency	Environment Agency monitors the compliance of bathing waters and report this annually.
	Number of nuisance-related complaints e.g. noise, dust.	SSW	SSW could record the number of nuisance-related complaints made in relation to implementation of the WRMP24. If unexpected significant effects are found during monitoring: • Immediately identify root cause through detailed investigation. • Upon determination, cease activity deemed to be the cause. • Identify remedial actions. • Identify elimination and mitigation measures to enable activity to recommence with. • Increase monitoring to demonstrate effectiveness of remedial actions If this is not possible, alternative activities would be assessed in order to deliver the requirements without significant effects
	Pollution and flooding Incidents	SSW, Environment Agency	SSW measure the number of pollution incidents per year and monitor and report against discharge compliance. If unexpected significant effects are found during monitoring: • Immediately identify root cause through detailed investigation. • Upon determination, cease activity deemed to be the cause. • Identify remedial actions. • Identify elimination and mitigation measures to enable activity to recommence with. • Increase monitoring to demonstrate effectiveness of remedial actions If this is not possible, alternative activities would be assessed in order to deliver the requirements without significant effects
14. To promote and enhance the sustainable and efficient use of resilient water resources.	Leakage Water saved through demand management/ water efficiency measures	SSW	SSW report these data to Ofwat as part of the annual returns process. If unexpected significant effects are found during monitoring: • Immediately identify root cause through detailed investigation. • Upon determination, cease activity deemed to be the cause. • Identify remedial actions. • Identify new activities or adaptations to existing activities

SEA Objective	Potential Indicator	Source of Information	Commentary
			required in order to ensure we achieve this measure. • Increase monitoring to demonstrate effectiveness of remedial actions
15. To minimise waste, promote resource efficiency and move towards a circular economy.	Amount of recycled / reused materials used	SSW (contractors/consultants)	Information on the use of recycled / reused materials should be held by construction managers and accounts (contractors / consultants accounts, waste or procurement records). If unexpected significant effects are found during monitoring: • Immediately identify root cause through detailed investigation. • Upon determination, cease activity deemed to be the cause. • Identify remedial actions. • Identify elimination and mitigation measures to enable activity to recommence with. • Increase monitoring to demonstrate effectiveness of remedial actions If this is not possible, alternative activities would be assessed in order to deliver the requirements without significant effects
	Proportion of waste sent to landfill	SSW (services data)	Information on waste disposal to landfill should be held by SSW. If unexpected significant effects are found during monitoring: • Immediately identify root cause through detailed investigation. • Upon determination, cease activity deemed to be the cause. • Identify remedial actions. • Identify elimination and mitigation measures to enable activity to recommence with. • Increase monitoring to demonstrate effectiveness of remedial actions If this is not possible, alternative activities would be assessed in order to deliver the requirements without significant effects
	Chemical use in water treatment	SSW (services data)	Information (quantities, composition) on chemical use should be held in accounts. If unexpected significant effects are found during monitoring: • Immediately identify root cause through detailed investigation. • Upon determination identify remedial actions – these will be both short term and long term actions. • Implement short term actions to ensure mitigation of issue. • Develop and implement long term remediation plan

SEA Objective	Potential Indicator	Source of Information	Commentary
			• Increase monitoring to demonstrate effectiveness of remedial actions
16. To conserve and enhance the historic environment including the significance of heritage assets and their settings and archaeological important sites.	Loss / damage or discovery / protection of cultural, historic and industrial heritage features.	SSW, Historic England	Historic England monitor the condition of all statutorily protected monuments. If unexpected significant effects are found during monitoring: • Immediately identify root cause through detailed investigation. • Upon determination, cease activity deemed to be the cause. • Identify remedial actions. • Identify elimination and mitigation measures to enable activity to recommence with. • Increase monitoring to demonstrate effectiveness of remedial actions If this is not possible, alternative activities would be assessed in order to deliver the requirements without significant effects
17. To conserve, protect and enhance landscape and townscape character and visual amenity.	Loss or damage to landscape character and features of designated sites.	SSW	SSW could record the number and size of infrastructure built within designated landscape sites. If unexpected significant effects are found during monitoring: • Immediately identify root cause through detailed investigation. • Upon determination, cease activity deemed to be the cause. • Identify remedial actions. • Identify elimination and mitigation measures to enable activity to recommence with. • Increase monitoring to demonstrate effectiveness of remedial actions If this is not possible, alternative activities would be assessed in order to deliver the requirements without significant effects

SEA requires that monitoring must enable appropriate remedial action to be taken[47]. For the monitoring programme to be effective, there must therefore be a mechanism in place to detect trends and to ensure that action is taken where trends are progressively adverse.

Five-yearly assessment of monitoring and any measures taken would be included within the SEA for the subsequent draft WRMP development. Through the proposed monitoring and analysis of the results obtained over the five-year period, the SEA will inform and influence the development of the WRMP for future periods.

[47] Office of the Deputy Prime Minister (ODPM), Scottish Executive, Welsh Assembly Government and Department of the Environment Northern Ireland (2005) A Practical Guide to the SEA Directive and European Commission (2001) Assessment of plans and projects significantly affecting Natura 2000 sites and Welsh Government (2015) Strategic Environmental Assessment (SEA) in Wales

Glossary

Term	Definition
Adaptive plan	An adaptive plan is one which responds to future uncertainties by setting out a sequence of manageable steps or decision-points over time. At each decision-point the plan could follow two or more different *pathways*. Each pathway would specify the options needed and implementation dates to meet the objectives in a particular future state. The full range of pathways in an adaptive plan can then be shown to allow stakeholders to understand how different options could be needed in the future.
Alternative plans	A plan, within the context of a WRMP, is a selection of options with a schedule of implementation dates which meet the objectives required. Different plans can be compared through consultation and they would usually be presented as a preferred plan and alternative plans.
Average Incremental Cost (AIC)	Average Incremental Cost. A unit cost used to compare different water resources options. Calculated from the option's future costs, discounted over time, and divided by the supply demand benefits similarly discounted. Normally expressed in units of pence per cubic metre of water.
Constrained options	The list of options remaining after two stages of screening: *high-level screening* and *detailed screening.* These options are suitable candidates for selection and are part of the *preferred plan* or *alternative plans*.
Decision making metrics	Decision making metrics are properties of each water resources option which are given a numerical value to indicate how well the option performs. Metrics are specified in relation to the objectives to be achieved in the plan. For example, they might include measures of cost, supply demand benefits and environmental benefits. Each metric is a criterion when multi-criteria analysis is used.
Detailed screening	A step following *high-level screening* and the completion of the determination of the AIC to further reduce the number of *feasible options* being considered in detail through the decision making. Its purpose is to reduce complexity, resource requirements and computational burden without affecting the final plan. It therefore seeks to remove those options which would not in any case be selected as part of the best value plan. The output of detailed screening is the set of constrained options.
Feasible options	A set of options that are considered to be suitable to assess for inclusion in the preferred plan. Feasible options are identified from a longer list of *unconstrained options* by a process of *high-level screening* to remove options with unalterable constraints that make them unsuitable for promotion.
High-level screening	The process where unconstrained options are filtered using a set of screening criteria. Any options with unalterable constraints that make them unsuitable for promotion are identified and removed from the list. Defined screening criteria are used to ensure options are screened consistently. The output of high-level screening is the set of feasible options.
Multi-criteria analysis (MCA)	Multi-criteria analysis is a structured approach to determine overall preferences among alternative options, where the options accomplish several objectives. It can also be used to explicitly explore the trade-offs between different candidate plans to inform the selection of preferred or *alternative plans*.
Plan pathway	A pathway within an *adaptive plan*.
Preferred options	The set of water resources options included in the *preferred plan*.

Term	Definition
Preferred plan	Comprises a set of options and a schedule of dates for implementing these options. These options have been selected through the planning process and evidence provided as to why they perform better against the objectives of the plan. Sometimes also referred to as the preferred programme of options.
Unconstrained list of options	All the possible options that could reasonably be used in the plan. This will include all the options considered in the previous planning round, as well as any options that have been identified since.
Water Resource Zone	Section 4.4. of the draft WRPG defines a water resource zone as “an area within which the abstraction and distribution of water to meet demand is largely self-contained (with the exception of agreed bulk transfers)”.

APPENDICES

Appendix A: Quality Assurance Checklist

Appendix B: Schedule of Consultation Response

Appendix C: Review of Plans and Programmes

Appendix D: Baseline Analysis

Appendix E: Definitions of Significance

Appendix F: Feasible Options Assessment Matrices

Appendix G: Preferred Plan Options Assessment Matrices

APPENDIX A: QUALITY ASSURANCE CHECKLIST

The Government's Guidance on SEA[48] contains a quality assurance checklist to help ensure that the requirements of the SEA Regulations are met. Those requirements relevant to the scoping stage of the SEA of rdWRMP24 have been set out below.

Quality Assurance Checklist	
Objectives and Context	
The plan's or programme's purpose and objectives are made clear.	The purpose of the rdWRMP24 is set out in **Section 1.3** of this Environmental Report. The objectives of the rdWRMP24 are set out in **Section 1.3.**
Environmental issues and constraints, including international and EC environmental protection objectives, are considered in developing objectives and targets.	Key environmental issues identified through a review of relevant plans and programmes (see **Section 2** and **Appendix C** of this report) and analysis of baseline conditions (see **Section 3 and Appendix D**) have informed the development of the assessment framework presented in **Section 4.3**.
SEA objectives, where used, are clearly set out and linked to indicators and targets where appropriate.	SEA objectives and guide questions are set out in **Section 4.3** of this report. Quantitative and qualitative thresholds of effects provide values for neutral, minor, moderate and significant effects (**Appendix E**).
Links with other related plans, programmes and policies are identified and explained.	Links are identified in **Section 2** and **Appendix C**.
Conflicts that exist between SEA objectives, between SEA and plan objectives and between SEA objectives and other plan objectives are identified and described.	The relationships between the SEA, WRMP24 and other plan objectives have been identified in the review of plans and programmes included in **Appendix B**.
Scoping	
Consultation Bodies are consulted in appropriate ways and at appropriate times on the content and scope of the Environmental Report.	The SEA Scoping Report was consulted upon and responses to this are included in this Environmental Report (see **Appendix B**).
The assessment focuses on significant issues.	The scope of the assessment reflects the geographic extent of the WRMP24 area and provides a comprehensive approach to assessment (reflecting the large number of interactions dependent on the continued supply of water). This enables the assessment to determine which impacts will be considered significant.
Technical, procedural and other difficulties encountered are discussed; assumptions and uncertainties are made explicit.	General difficulties, limitations and assumptions are set out in **Section 4.6** of this report. Baseline data limitations are discussed in **Section 3.3**.
Reasons are given for eliminating issues from further consideration.	The proposed scope of the assessment is set out in **Section 4.2**. All SEA topics have been scoped in to the assessment.
Alternatives	
Realistic alternatives are considered for key issues, and the reasons for choosing them are documented.	All options were assessed as set out in **Section 6** and **Appendix F** of this report.
Alternatives include 'do minimum' and/or 'business as usual' scenarios wherever relevant.	A 'do minimum' and/or 'business as usual' scenario is not appropriate for the WRMP24 due to the need to provide sufficient water to customers.
The environmental effects (both adverse and beneficial) of each alternative are identified and compared.	This is included in **Section 6** and **Appendix F** of this report.
Inconsistencies between the alternatives and other relevant plans, programmes or policies are identified and explained.	No inconsistencies were identified.

[48] Office of the Deputy Prime Minister (2005) *A Practical Guide to the Strategic Environmental Assessment Directive.*

Quality Assurance Checklist	
Reasons are given for selection or elimination of alternatives.	This is set out in **Section 1.3 and 6.3** of this report.
Baseline Information	
Relevant aspects of the current state of the environment and their likely evolution without the plan or programme are described.	**Section 3** and **Appendix D** of this report characterises the current environmental baseline conditions, along with how these are likely to change in the future.
Environmental characteristics of areas likely to be significantly affected are described, including areas wider than the physical boundary of the plan area where it is likely to be affected by the plan.	The environmental characteristics of the WRMP24 area are described in **Section 3** and **Appendix D** of this report.
Difficulties such as deficiencies in information or methods are explained.	Baseline data limitations are discussed in **Section 3.3**. Further difficulties and limitations are set out in **Section 4.5**.
Prediction and Evaluation of Likely Significant Environmental Effects	
Effects identified include the types listed in the Directive (biodiversity, population, human health, fauna, flora, soil, water, air, climate factors, material assets, cultural heritage and landscape), as relevant; other likely environmental effects are also covered, as appropriate.	The potential effects of the options are identified in **Section 6** and **Appendix F and G**.
Both positive and negative effects are considered, and the duration of effects (short, medium or long-term) addressed.	The nature and duration of potential effects has been set out in the detailed assessment matrices contained in **Appendix F and G** of this report.
Likely secondary, cumulative and synergistic effects are identified where practicable.	Information on secondary, cumulative and synergistic effects is set out in **Section 6.4**.
Inter-relationships between effects are considered where practicable.	These relationships are identified where appropriate in the detailed assessment matrices contained in **Appendix F and G** of this report.
The prediction and evaluation of effects makes use of relevant accepted standards, regulations, and thresholds.	Relevant standards have been used where appropriate in undertaking the assessment.
Methods used to evaluate the effects are described.	Information on the methods used for evaluation of potential effects is included in **Section 4** and in the detailed assessment matrices contained in **Appendix F and G** of this report. The definitions of significance used in the assessment are set out in **Appendix E**.
Mitigation Measures	
Measures envisaged to prevent, reduce and offset any significant adverse effects of implementing the plan or programme are indicated.	Mitigation measures for potential negative effects are set out in **Section 6.6** and in the commentary to the matrices in **Appendix F and G**.
Issues to be taken into account in project consents are identified.	Issues to be taken into account in project consents, where relevant, are included in **Section 6.6** and in the commentary to the matrices in **Appendix F and G**.
The Environmental Report	
Is clear and concise in its layout and presentation.	We believe the report is clear and concise, reflective of the information in the draft WRMP.
Uses simple, clear language and avoids or explains technical terms.	The report uses accessible language wherever possible.
Uses maps and other illustrations where appropriate.	Maps and illustrations have been utilised in the report.
Explains the methodology used.	The method used is set out in the report in **Section 4**.
Explains who was consulted and what methods of consultation were used.	**Appendix B** of this report outlines the consultation that has been carried out to-date.
Identifies sources of information, including expert judgement and matters of opinion.	Sources of information are included throughout the report.

Quality Assurance Checklist	
Contains a non-technical summary covering the overall approach to the SEA, the objectives of the plan, the main options considered, and any changes to the plan resulting from the SEA.	A Non-Technical Summary has been included as part of the report.
Consultation	
The SEA is consulted on as an integral part of the plan-making process.	The previously issued SEA Scoping Report was consulted upon and responses are included in this Environmental Report (see **Appendix B**).
Consultation Bodies and the public likely to be affected by, or having an interest in, the plan or programme are consulted in ways and at times which give them an early and effective opportunity within appropriate time frames to express their opinions on the draft plan and Environmental Report.	Consultation on the draft WRMP and this Environmental Report was undertaken by the water company.
Decision-making and Information on the Decision	
The Environmental Report and the opinions of those consulted are taken into account in finalising and adopting the plan or programme.	The comments received during consultation have been incorporated into the updated rdWRMP24. These will be documented further in the SEA Post Adoption Statement which will be published following adoption of the final plan.
An explanation is given of how they have been taken into account.	This will be provided in the SEA Post Adoption Statement which will be published following adoption of the final plan.
Reasons are given for choosing the plan or programme as adopted, in the light of other reasonable alternatives considered.	This is set out in Section 5.3 and Section 6.4 of this Environmental Report and detailed further in the main SSW rdWRMP24.
Monitoring Measures	
Measures proposed for monitoring are clear, practicable and linked to the indicators and objectives used in the SEA.	The report sets out potential monitoring measures that could be used in **Section 7.4**.
Monitoring is used, where appropriate, during implementation of the plan or programme to make good deficiencies in baseline information in the SEA.	The suggestions for monitoring are included in **Section 7.4** of the report.
Monitoring enables unforeseen adverse effects to be identified at an early stage. (These effects may include predictions which prove to be incorrect.)	The suggestions for monitoring made in **Section 7.4** are for the water company to act on, with monitoring taking place following implementation of the WRMP24.
Proposals are made for action in response to significant adverse effects.	Mitigation methods are outlined for the preferred options in **Section 6.6** of this report and **Appendix G**.

APPENDIX B: SCHEDULE OF CONSULTATION RESPONSE

Consultation on the WRW Regional Plan and WRMP24s environmental assessment methodologies took place between the 8th April and the 13th May 2021.

To support the consultation, a series of method statements for the proposed approaches to undertaking the environmental assessments of the respective plans were issued and comments invited. These were for:

- Strategic Environmental Assessment (SEA) – SEA Scoping Report and four separate appendices presenting contextual information for DCWW, STW, SSW and UUW
- Habitats Regulations Assessment (HRA) – HRA Method Statement
- Water Framework Directive (WFD) Assessment – WFD Assessment Methodology Statement
- Natural Capital/Environmental Resilience – Assessment Methodology.

The method statements were issued to Cadw, the Environment Agency, Historic England, Natural England, Natural Resources Wales and Welsh Government.

A workshop was held on the 28th April 2021 to discuss the approaches to which all consultees were invited.

Responses were received to all Method Statements. The comments on the WFD Assessment Methodology Statement were material to the proposed approach, and in consequence, a revised Methodology was issued (for information) to the regulators on the 21st July 2021. Comments on the remaining three method statements did not require substantive revision. Each has then been summarised in a separate note. This note presents the responses to the SEA Scoping Report.

Responses to the SEA Scoping Report were received from Cadw, the Environment Agency, Natural England and Natural Resources Wales.

Table B.1, Error! Reference source not found.Table B.2, Table B.3 and **Table B.4** present a summary of these responses.

Table B.1 Responses to Cadw comments on the SEA Scoping Report

Consultation Question	Section of WRW and WRMP24 Scoping Report	Consultee Response	Response/Action	Where addressed in Environmental Report
Q1. Do you think that the Scoping Report sets out sufficient information to provide the context for the SEAs of the draft WRW Regional Plan and WRMP24s in terms of an overview of each plan, the review of relevant plans and programmes and baseline evidence and analysis? If not, what additional information should be included?	Section 2.2/Table 2.1/Section 2.3/Table 2.2/Appendix E	No Cadw is of the opinion that the following documents should be amended or added as stated. <u>Table 2.1 National Programmes</u> Change: • Welsh Government (2018) Planning Policy Wales (Edition 10) has been replaced by Welsh Government (2021) Planning Policy Wales (Edition 11). Add: • Welsh Government (2017) Technical Advice Note 24 The Historic Environment • Welsh Government (2018) Priorities for the Historic Environment of Wales • Welsh Government (2020) Historic Environment and Climate Change in Wales <u>Table 2.2 Cultural Heritage</u> Change: • Welsh Government (2018) Planning Policy Wales (Edition 10) has been replaced by Welsh Government (2021) Planning Policy Wales (Edition 11).	Comments noted. Welsh Government (2018) Planning Policy Wales (Edition 10) will be replaced by Welsh Government (2021) Planning Policy Wales (Edition 11) in the review of plans and programmes in the Environmental Report. The following additional national-level plans and programmes will be included in the relevant tables and appendix of the relevant Environmental Report issued to accompany the WRW Regional Plan and draft WRMP24s: • Welsh Government (2017) Technical Advice Note 24 The Historic Environment • Welsh Government (2018) Priorities for the Historic Environment of Wales • Welsh Government (2020) Historic Environment and Climate Change in Wales The following additional regional-level plans and programmes will be included in the relevant Environmental Report issued to accompany the WRW Regional Plan and draft WRMP24s: • Welsh Government (2018) Castles and Town Walls of King Edward in Gwynedd World Heritage Site: World Heritage Site Management Plan 2018 -28 • Wrexham County Borough Council British Waterways and the Royal Commission on the Ancient and Historical Monuments of Wales (2012) Pontcysyllte Aqueduct and Canal World Heritage Site – Management Plan • Torfaen County Borough Council (2011) Blaenavon Industrial Landscape World Heritage Site Management Plan	Section 2.2, Table 2.1 Appendix C

Consultation Question	Section of WRW and WRMP24 Scoping Report	Consultee Response	Response/Action	Where addressed in Environmental Report
		Add: • Historic Environment (Wales) Act • Welsh Government (2017) Technical Advice Note 24 The historic Environment • Welsh Government (2018) Priorities for the Historic Environment of Wales • Welsh Government (2020) Historic Environment and Climate Change in Wales The above documents should also be included and reviewed in Appendix E along with the documents below: <u>Regional Plans and Programmes</u> • Welsh Government (2018) Castles and Town Walls of King Edward in Gwynedd World Heritage Site: World Heritage Site Management Plan 2018 -28 • Wrexham County Borough Council British Waterways and the Royal Commission on the Ancient and Historical Monuments of Wales (2012) Pontcysyllte Aqueduct and Canal World Heritage Site – Management Plan • Torfaen County Borough Council (2011) Blaenavon Industrial Landscape World Heritage Site Management Plan		
Q2. Do you agree that the main environmental issues identified	N/A	Yes	Comment noted.	N/A

Consultation Question	Section of WRW and WRMP24 Scoping Report	Consultee Response	Response/Action	Where addressed in Environmental Report
are relevant to the SEAs of the draft of the draft WRW Regional Plan and WRMP24s? If not, which issues do you think need to be included or excluded?				
Q3. Do you agree with the proposed approach to the SEAs of the draft WRW Regional Plan and WRMP24s? Are the proposed SEA objectives, guide questions and significance thresholds appropriate for the scope of each plan assessment? If not, which objectives/guide questions should be amended and which other objectives/guide questions do you believe should be included?	N/A	Yes	Comment noted.	N/A

Table B.2 Responses to Environment Agency's comments on the SEA Scoping Report

Consultation Question	Section of WRW and WRMP24 Scoping Report	Consultee Response	Response/Action	Where addressed in Environmental Report
Q1. Do you think that the Scoping Report sets out sufficient information to provide the context for the SEAs of the draft WRW Regional Plan and WRMP24s in terms of an overview of each plan, the review of relevant plans and programmes and baseline evidence and analysis? If not, what additional information should be included?	Section 1.4	S 1.4.12 (p20) – good to see specific reference to RAPID SRO's, please replicate across all the environmental assessments	Comment noted.	
	Section 3.2/Table 3.1	Table 3.1 (p37) – needs to recognise the pressures on Public Water Supply in WR West patch as well as in WR East / WR South East. For example, our National Framework shows pressure equivalent to around 640 Ml/d in WR West and 570 Ml/d in WR East at 2050.	Comment noted. Reference to increased pressure on Public Water Supply in the WRW area will be included in the 'Summary of Key Issues' table in the Environmental Reports issued to accompany the WRW Regional Plan and draft WRMP24s.	Section 3.2 Table 3.1
	Section 4.4	S 4.4 (p47) – please add information to explain how interactions with environmental assessment work in neighbouring companies / regional groups will work.	Comment noted. Information explaining how interactions with environmental assessment work in neighbouring companies and regional groups will be included in the Environmental Reports issued to accompany the WRW Regional Plan and draft WRMP24s, as relevant and appropriate.	Section 4.4.5
Q2. Do you agree that the main environmental issues identified are relevant to the SEAs of the draft of the draft WRW Regional Plan and WRMP24s? If not, which issues do you think need to be included or excluded?	N/A	The SEA needs to recognise that we are in the midst of a climate emergency – every option and the overall plan(s) needs to be viewed through this lens. We need to consider the 2019 amends to the 2008 Climate Change Act and recent Government announcements to cut carbon emissions further and faster ie 78% by 2035. WR West plan and the core company WRMP's will need to demonstrate how their actions are helping us achieve this.	Comment noted. Climatic factors are scoped into the SEA, with international, national and regional plans and programmes reviewed, with the resultant issues identified relevant to the assessment of the WRW Regional Plan and the WRMPs. SEA objectives concerning the reduction in greenhouse gas emissions along with the improvement of climate resilience are included in the Assessment Framework, along with associated guide question and thresholds. The review of plans and programmes will be updated in the Environmental Report to reflect the 2019 updates to the Climate Change Act 2008.	Section 2.2, Table 2.1 Appendix C

Consultation Question	Section of WRW and WRMP24 Scoping Report	Consultee Response	Response/Action	Where addressed in Environmental Report
			The comment relating to the need for the WRW Regional Plan and the WRMPs to demonstrate how their actions will contribute to the achievement of carbon emissions reduction targets set by the government, relates to the WRW Regional Plan and WRMPs themselves, rather than the SEA of the plans, although where such effects occur, these may also be set out in the appropriate Environmental Report.	
	Appendix B Section 3. p34	It is stated on p34 that one of the key issues relevant to the WRMP is, 'The need to maintain and improve the quantity and quality of GW resources taking into account WFD status targets'. I have added the words and improve to the sentence as I believe this should also be the aspiration.	Agreed and will be updated in the relevant Environmental Report.	N/A
Q3. Do you agree with the proposed approach to the SEAs of the draft WRW Regional Plan and WRMP24s? Are the proposed SEA objectives, guide questions and significance thresholds appropriate for the scope of each plan assessment? If not, which objectives/guide questions should be amended and which other objectives/guide questions do you	Appendix F	most of the thresholds are not quantified and this means the outcomes will for the most part be subjective / qualitative. We'd expect demand for water to be quantifiable eg in Ml/d and/or % Distribution Input. We quantify flood risk in terms of properties protected and environmental enhancement by (say) km of river improved and/or improvements to Waterbody status (or improvements to elements within waterbody status). WR West should consider if more quantified thresholds can be used.	Comment noted. The 'Definitions and Thresholds of Significance' set out in Appendix F of the Scoping Report, are considered to provide a balance of both quantitative and qualitative measures (as per UKWIR Guidance) which help to ensure a consistent approach to interpreting the significance of effects and helps the reader understand the decisions made by the assessor. In developing the definitions and thresholds of significant effects, information has been drawn from: • the previous definitions and thresholds used in the SEAs of DCWW, SSW, STW and UUW's WRMP19s; • suggested definitions and thresholds for assessment scoring from the All Company Working Group (ACWG) for application to the SROs; • suggested definitions and thresholds detailed in the WRSE Scoping Report, for application to the SEA of the WRSE Regional Plan; and, • an evaluation of the range of quantitative values (such as yield, capex, embodied carbon, operational carbon and	N/A

Consultation Question	Section of WRW and WRMP24 Scoping Report	Consultee Response	Response/Action	Where addressed in Environmental Report
believe should be included?			material quantities) available for a selection of the DCWW, STW, SSW and UUW WRMP19 options for different option types (e.g., supply-side options such as reservoirs, transfers, boreholes, enhanced treatment). The proposed thresholds include reference to yield (Ml/d), design capacity (Ml/d), capex (£m), embodied and operational carbon (tCO2e), flood risk (% site in FZ3), air quality (AQMAs) and water quality (WFD status). These quantified measures address and go beyond the examples cited in the consultee response. However, in order to ensure, no opportunity is lost to take into account the point made, consideration will be given to whether any additional quantifiable measures can be utilised in the assessment and any additional measures that are identified will be highlighted in the Environmental Reports to accompany the WRW Regional Plan and draft WRMP24s, as relevant and appropriate.	
	Table 4.2/Appendix F	Under SEA Table 4.2 & Appendix F there is no mention specifically of geomorphology. Flow abstraction and associated infrastructure is likely to affect fluvial sediment transport regime (transport, erosion, deposition), channel character (morphology) and river behaviour (morpho-dynamics). Objective 5 - Request that the following question be included in relation to water resource pressures on geomorphic/sediment systems: • Will it alter the sediment transport regime of the surface waters? (i.e. Will it result in a change in fine sediment deposition? Will it result in a change in sediment flux?)	Comment noted. Whilst absent from Table 4.2 of the Scoping Report, geomorphology is highlighted as a key issue in WRMP specific baselines e.g., Appendix A, where the "*the need to protect, maintain and enhance geomorphological functions and services*" is identified. To ensure it is appropriately reflected in the SEA, and to minimise any unintended duplication, the following guide question will be added to the Assessment Framework under Objective 1 (Biodiversity): *Will it alter geomorphological forms and processes which underpin physical habitat for aquatic ecosystems?* The WFD Assessment (Stage 3 Impact Assessment) also includes consideration of geomorphology through the source-pathway-receptor approach to identifying effects. The source of change would be the construction or operational activity. The pathway	Appendix E

Consultation Question	Section of WRW and WRMP24 Scoping Report	Consultee Response	Response/Action	Where addressed in Environmental Report
			would include physical environment changes such as water level change, flow velocity change, morphological change. The receptor would be the WFD status element or the WFD protected area. Where relevant, such information will be used to inform the assessment of any options against the above guide question.	
	Table 4.2/Appendix F/ Section 3.1 (Appendix D)	Appendix F, Objective 3 talks about preventing the spread/introduction of INNS. Would it also be possible to include a guide question around eradication of INNS where they are already present and to do so is technically and economically feasible? Same applies to the key issues listed on page 19 of Appendix D.	Comment noted. The following guide question will be added to the assessment framework under Objective 3: *Will it contribute to the eradication of invasive and non-native species, where they are already present and it is technically and economically feasible to do so?* However, it may only be applicable in highly specific circumstances. The key issues relating to Biodiversity (set out in section 3.1 of Appendix D) will also be amended to highlight the need to eradicate INNS where already present.	Appendix E Appendix D, Biodiversity
	Table 4.2/Appendix F	Table 4.2 – there is no reference to impact on geomorphology. A question on this should be included to reflect potential changes in flow regimes.	Comment noted. Table 4.2 includes two guide questions under SEA Objective 5, that reference flow: • *Will it result in changes to river flows, wetted width or river levels?* • *Will it alter the flow regime of surface waters?* In response to a separate comment, the first guide question will be amended to the following '*Will it result in changes to river flows, channel morphologies, wetted width or river levels?*'	Appendix E

Consultation Question	Section of WRW and WRMP24 Scoping Report	Consultee Response	Response/Action	Where addressed in Environmental Report
			Whilst absent from Table 4.2 of the Scoping Report, geomorphology is highlighted as a key issue in WRMP specific baselines e.g., Appendix A, where the "*the need to protect, maintain and enhance geomorphological functions and services*" is identified. The WFD Assessment (Stage 3 Impact Assessment) also includes consideration of geomorphology through the source-pathway-receptor approach to identifying effects. Where relevant, such information will be used to inform the assessment of any options against the above guide questions.	
	Table 4.2/Appendix F	Appendix F, Objective 1. Request that the following question be included: Will it alter geomorphological forms and processes which underpin physical habitat for aquatic ecosystems?	Comment noted. To ensure it is appropriately reflected in the SEA, the following guide question will be added to the Assessment Framework under Objective 1 (Biodiversity): *Will it alter geomorphological forms and processes which underpin physical habitat for aquatic ecosystems?* The WFD Assessment (Stage 3 Impact Assessment) also includes consideration of geomorphology through the source-pathway-receptor approach to identifying effects. Where relevant, such information will be used to inform the assessment of any options against the above guide question.	Appendix E
	Table 4.4	Table 4.4 – we note that an option cannot be scored as "moderate impact" within the UU Sources SRO SEA work but this scoring (moderate) can be applied to the same option in WRW SEA. What is the reason for this difference, especially given WRW will be scoring some of the same options included in UU Sources SRO?	Comment noted. The UU Sources SRO Gate 1 SEA was undertaken in advance of the publication of the All Company Working Group (ACWG) guidance on SEA (2020) and the UKWIR Environmental Assessment Guidance for Water Resources Management Plans and Drought Plans (2021).	N/A

Consultation Question	Section of WRW and WRMP24 Scoping Report	Consultee Response	Response/Action	Where addressed in Environmental Report
			The approach to assessing the likely significant effects of the WRP24s and WRW Regional Plan includes the identification of minor, moderate and major/significant positive and negative effects, reflecting the guidance, not previously available to the UU Sources SRO. Definitions and thresholds for minor, moderate and major/significant effects, are included, which have used information drawn from: • the previous definitions and thresholds used in the SEAs of DCWW, SSW, STW and UUW's WRMP19s; • suggested definitions and thresholds for assessment scoring from the ACWG for application to the SROs; • suggested definitions and thresholds detailed in the WRSE Scoping Report, for application to the SEA of the WRSE Regional Plan; • an evaluation of the range of quantitative values (such as yield, capex, embodied carbon, operational carbon and material quantities) available for a selection of the DCWW, STW, SSW and UUW WRMP19 options for different option types (e.g., supply-side options such as reservoirs, transfers, boreholes, enhanced treatment). Where the WRMP24 assessment is of a SRO option or a revised WRMP19 option, the assessment will take into account, where appropriate, the previous assessment findings and any regulators and stakeholder feedback already received.	
	Table 4.2/Appendix F	Appendix F, Objective 5. Suggest amendment to question 2: • Will it result in changes to river flows, channel morphologies, wetted width or river levels?	Agreed. The second guide question under SEA Objective 5 of the assessment framework will be changed to: *Will it result in changes to river flows, channel morphologies, wetted width or river levels?*	Appendix E
	N/A	WR West should explain the scale being used to decide significance. For example, a 1 Ml/d demand saving option may be significant	Comment noted.	N/A

Consultation Question	Section of WRW and WRMP24 Scoping Report	Consultee Response	Response/Action	Where addressed in Environmental Report
		within a small water resource zone but relatively insignificant when viewed across WR West patch as a whole. A better explanation of this would be appreciated.	WRW is taking an integrated approach to preparing the Regional Plan and the WRMP24s. WRW member water companies are using a regionally consistent set of methodologies to reflect local, regional and national needs in the development of the plans. The definitions of significance have been developed so that they can apply to the SEA of each of the plans, whether the WRW Regional Plan or the individual WRMPs to ensure a consistent approach to interpreting the significance of effects. In developing the approach to thresholds, cognisance was taken of: • the previous definitions and thresholds used in the SEAs of DCWW, SSW, STW and UUW's WRMP19s; • suggested definitions and thresholds for assessment scoring from the ACWG for application to the SROs; • suggested definitions and thresholds detailed in the WRSE Scoping Report, for application to the SEA of the WRSE Regional Plan; • an evaluation of the range of quantitative values (such as yield, capex, embodied carbon, operational carbon and material quantities) available for a selection of the DCWW, STW, SSW and UUW WRMP19 options for different option types (e.g., supply-side options such as reservoirs, transfers, boreholes, enhanced treatment).	
	Table NTS.2/Table 4.2/Appendix F	Table 2 NTS – Proposed objectives – why only where required for INNS?	Comment noted. The use of the wording 'where required' is intended to reflect source options where INNS may be present, or where transfer methods, such as unenclosed water bodies could lead to INNS being introduced, and so requiring management and mitigation measures prior to the introduction into a new catchment. No change.	N/A
	Table 2.2/Table 4.2/Appendix F	No specific measurable objective to reduce operational or embodied carbon. This appears to a reoccurring theme with water company plans. Table 2.2 highlights the relevance of carbon reduction targets to the Plan(s),	Comment noted. Whilst there is no objective relating to the reduction of operational and embodied carbon specifically, it is considered that this is	N/A

Consultation Question	Section of WRW and WRMP24 Scoping Report	Consultee Response	Response/Action	Where addressed in Environmental Report
		however although the assessment questions in Table 4.2 reflects the need it would be good to see this reflected more specifically in the objectives.	already covered by Objective 9: *To reduce greenhouse gas emissions.* Furthermore, as noted in the comment, the need to reduce operational and embodied carbon emissions is reflected within the guide questions for Objective 9 and specific values/thresholds for assessing plan options/measures against this Objective, in terms of their embodied and operational carbon emissions (tCO2e and tCO2e/year respectively) are provided in Appendix F. No change.	
	Table 4.2/Appendix F	WFD – although implied in the objectives, it would be good to see "contributing to WFD objectives" reflected more specifically. Consider modifying the assessment questions in Table 4.2 to address this point.	Comment noted. Contribution to the achievement of WFD objectives is already specifically reflected in the guide questions for Objective 6 (Water Quality).	N/A
4. Have the consultants missed any key plans/programmes (our own or 3rd party ones like Rivers Trusts maybe?) from your local perspective?		Should options being proposed by WRW core companies for Ofwat "Green Recovery funding" be considered within the assessment?	Comment noted. WRW aims to provide a Regional Plan that is multi-sector and takes account of the water supply needs of non-public water supply (non-PWS) abstractors as well as public water supplies. All options being considered by the core member water companies for inclusion in the WRMP24s and Regional Plan will be assessed.	N/A
	Section 2 (Appendices A, B, C and D)	There is a lack of consistency between the core company lists of relevant plans/programmes that needs to be addressed. Focussing on the companies wholly/mainly in England, UU's list of relevant plans and programmes appears to be the most comprehensive and should be used as a guide for SvT and SSW too. As a minimum, reference needs to be made to a company's own WRMP and Drought Plan plus the WRMPs and Drought Plans of neighbouring companies. Natural England's Site	Comment noted. The lists of relevant plans and programmes within each of the core company appendices will be checked/cross referenced to ensure consistency in the Environmental Reports to accompany the WRW Regional Plan and draft WRMP24s.	Section 2.2, Table 2.1 Appendix C

Consultation Question	Section of WRW and WRMP24 Scoping Report	Consultee Response	Response/Action	Where addressed in Environmental Report
		Improvement Plans for Natura 2000 sites are also key documents to consider across the board.		
		Need to ensure consistency with SRO SEAs and other initial assessments. Gate 1 reports will help with this.	Comment noted. Where the WRMP24 assessment is of a SRO option or a revised WRMP19 option, the assessment will take into account, where appropriate, the previous assessment findings and any regulators and stakeholder feedback already received.	N/A
	Section 2/Table 2.1/Appendix E	Refers to some plans/strategies from early 2000's (eg BEIS, Defra) – are these still the best available on those topics?	Over 200 international/European, national, regional/sub-regional and local level plans were reviewed during the preparation of the Scoping Report. Whilst the review of plans and programmes contains some older plans and programmes, these have been included as they are still valid and are relevant to the SEA of the WRW Regional Plan and WRMPs. Should revised or updated plans/programmes become available during the preparation of the Environmental Report, they will be included.	Section 2.2, Table 2.1 Appendix C
	Section 2/Table 2.1/Appendix E	Some thoughts on important national plans/programmes/legislation that seemed to be missing…2020 Defra Drought Plan Direction; 2nd UK Climate Change Risk Assessment (CCRA2) 2017 (HM Gov); EA 2020 consultation on update to areas of water stress; EA/Ofwat/NRW WR Planning Guideline 2021; HM Gov 2020 National Infrastructure Strategy; CEFAS/EA/NRW assessment of salmon stocks and fisheries in Eng&Wales (2019). Not a comprehensive list but some key ones that sprung to mind that I couldn't see in the SEA Scoping Report.	Comment noted. The following additional plans and programmes will be included in the review of plans and programmes contained within the Environmental Report: • Defra (2020) Drought Plan Direction 2020 • HM Government (2017) 2nd UK Climate Change Risk Assessment (CCRA2) • Centre for Environment Fisheries and Aquaculture Science, Environment Agency and Natural Resources Wales (2019) Assessment of Salmon Stocks and Fisheries in England and Wales 2019	Section 2.2, Table 2.1 Appendix C

Consultation Question	Section of WRW and WRMP24 Scoping Report	Consultee Response	Response/Action	Where addressed in Environmental Report
			To avoid undue reliance on draft versions of plans and programmes that could be subject to change, consultation documents and draft legislation are not included in the plans and programmes reviewed, unless highly relevant e.g., the Water Resources Planning Guidelines.	
	Appendix E	See comments about plans/programmes under water company headings. We expect to see a greater degree of consistency in the plans / programmes being considered across the core water companies in WR West and the regional plan as a whole.	Comment noted. Plans and programmes will be reviewed to ensure consistency between the categories of plans considered, noting regional/sub-regional differences.	Section 2.2, Table 2.1 Appendix C
	N/A	A few further general points cutting across environmental assessments:- • Important to seek joint Flood and Coastal Risk Management and Water Resources options to improve cost benefit and collaboration. • WRW should actively work with non PWS stakeholders such as agriculture sector to promote storage techniques and improve overall resilience / adaptation to prolonged dry weather. • Objectives should include delivering more efficient and targeted use of available water banks, whether for purpose of regulation / abstraction, through improved modelling, monitoring, and control. This includes consideration of the use of new 5g technology. • Assessment methodology should include climatic risks to critical infrastructure. For example, greater	Comments noted. Where relevant, WRW and individual core member water companies will take such additional issues into account when developing their plans.	N/A

Consultation Question	Section of WRW and WRMP24 Scoping Report	Consultee Response	Response/Action	Where addressed in Environmental Report
		stress pressures from cyclic loading (fill / refill) of assets, including reservoirs, as well as direct impact of storm events and extreme temperatures. Severn Regulation reduces the risk of flow deficits to the Estuary and Bristol Water abstraction. • Would like to see more open inclusion of RSA/ AMP/ WINEP under the umbrella of WRW. Should waste water plans not be included at some point too? Feels a bit disconnected from the dirty water side.		

Table B.3 Responses to Natural Resources Wales comments on the SEA Scoping Report

Consultation Question	Section of WRW and WRMP24 Scoping Report	Consultee Response	Response/Action	Where addressed in Environmental Report
N/A	N/A	We welcome and support the development of your regional water resources plan and the individual Water Resource Management Plans, together with your commitment to SEA. We welcome the inclusion of the considerations and products of the Environment (Wales) Act 2016 and the Wellbeing of Future Generations (Wales) Act 2015 within your reports.	Comment noted.	N/A
	N/A	Whilst these considerations and the Welsh aspects of baseline assessment are more comprehensively included within Appendix A (Dŵr Cyrmu Welsh Water DCWW scoping), we feel that there are elements relating to Welsh data and legislation that should be strengthened within the other documents. A consistent baseline of evidence for Wales should be used across all plans considering these areas. As it stands the information presented in Appendix B and D does not provide meaningful context for strategic decision-making in Wales.	Comment noted. This will be considered at the Environmental Report stage to ensure a consistent baseline across these water companies.	N/A
Q1. Do you think that the Scoping Report sets out sufficient information to provide the context for the SEAs of the draft WRW Regional Plan and WRMP24s in terms of an overview of each plan, the review of relevant plans and		We welcome the comprehensive review of plans and programmes. We note some missing items and amendments below for further consideration. We recognise that the scope of this document lists the preferred water resource options and Strategic Resource Options (SRO) as separate items. We believe clarification is required as to where the SEA of the SROs will sit if not within the WRMP of the individual water companies.	Comment noted. The SRO options are being considered and assessed through the integrated options development programme and will be included in the will be included in the relevant WRMP and in the WRW Regional Plan. The SROs were identified as separate items covered by the scope of the assessment in S1.4 of the Scoping Report as we are aware that regulators have a substantial interest in these options, which are also being considered through the gated stages required by RAPID.	N/A
		Biodiversity, flora and fauna	Comment noted	N/A

Consultation Question	Section of WRW and WRMP24 Scoping Report	Consultee Response	Response/Action	Where addressed in Environmental Report
programmes and baseline evidence and analysis? If not, what additional information should be included?		When assessing the baseline evidence you should consider all of the elements of ecosystem resilience as set out in the Environment (Wales) Act 2016, taking account of the diversity between and within ecosystems, the connections between and within ecosystems, the scale of ecosystems, the condition of ecosystems (including their structure and functioning) and the adaptability of ecosystems. This should be included across all of the reports for areas within or affecting Wales.	Ecosystem resilience will be considered where relevant to the WRW&WRMP24 and in line with the developed SEA assessment methodology; particularly the SEA objectives under the Biodiversity, Flora and Fauna Topic: SEA Objective 1. To protect and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species, enhance ecosystem resilience and habitat connectivity and deliver a net biodiversity gain; and SEA Objective 2. To protect and enhance sustainable natural resources and the ecosystem services they provide. The Environment (Wales) Act 2016 requirements of Sustainable Management of Natural Resources are reflected in the WRW detailed screening criteria, applied to WRMP feasible options. They will also be addressed through the non-monetised elements of ecosystem resilience and enhancement opportunities evaluated as part of the Natural Capital Assessment (NCA) undertaken of the feasible options within each WRMP.	
		Biodiversity, flora and fauna It is also worth including non-statutory designations or information relating to biodiversity beyond Local Nature Reserves, such as Sites of Importance for Nature Conservation or other local information from Wildlife Trusts, Local Authorities or other conservation charities to help make an assessment of the ecological networks.	Comment noted. Regard will be given to non-statutory designations as per the objectives and guide questions of the SEA assessment methodology.	N/A
		Biodiversity, flora and fauna We welcome the inclusion of Section 7 species and Invasive and Non-Native Species (INNS). There is however no indication of their	Comment noted. The baseline data for these species are not readily included in reports at a strategic level.	N/A

Consultation Question	Section of WRW and WRMP24 Scoping Report	Consultee Response	Response/Action	Where addressed in Environmental Report
		baseline or trends and as such it is then difficult to make an assessment of change in the future.		
		Biodiversity, flora and fauna The Biodiversity and Water sections would be greatly improved with more information included to on freshwater habitats and species as these are those which are likely to be impacted, and the issues facing them such as water quality, flow and physical modifications. This would include reference to areas which are already impacted by water resource activities.	Comment noted. These issues will be considered in the HRA where European sites are designated for migratory species and to a certain extent in the WFD report. Where relevant it may also be included in the appropriate Environmental Report (to accompany either the WRW Regional Plan or WRMP24).	N/A
		Geology, land use and soils The reference given for the Agricultural Land Use data is for England only. Please include a reference for the Welsh data used, the most up-to-date being Predictive Agricultural Land Classification (ALC) Map 2.	Comment noted. Appendix A: Dŵr Cymru Welsh Water presents in Table A3.2 Agricultural Land Quality (as a percentage of land area) for each ALC category for Wales and England. Figure A3.11 Agricultural Land Classification presents ALC information for Wales. This will be updated with information from the Predictive Agricultural Land Classification (ALC) Map 2 (DataMapWales (2019).	N/A
		Water The reference given for the water availability mapping refers to an Environment Agency dataset. Refer to the NRW Abstraction Licensing Strategies published at Natural Resources Wales / Water available in our catchments. For updated national-scale water resource mapping please refer to: Lle - Water Resource Reliability Data (gov.wales) (http://lle.gov.wales/catalogue/item/WaterResourceReliabilityData) Lle - Water Resource Availability Data (gov.wales) http://lle.gov.wales/catalogue/item/WaterResourceAvailabilityData	Comment noted. This data appears to be publicly available via the Welsh data portal and will be used where applicable, included in updated baselines contained in relevant Environmental Reports.	N/A

Consultation Question	Section of WRW and WRMP24 Scoping Report	Consultee Response	Response/Action	Where addressed in Environmental Report
		Water UK CCRA2 is referenced in terms of projected water availability. Whilst UKCCRA3 is not yet publicly available the updated water availability research supporting this is https://www.ukclimaterisk.org/ccra-research/ . We recommend you use the most up-to-date information.	Comment noted. This will be updated as appropriate in the relevant Environmental Reports.	Section 2.2, Table 2.1 Appendix C
		Water Given the context of the plan(s) being assessed this section in all of the reports would benefit from further integrated with the biodiversity section, considering the full range of freshwater biodiversity and protected sites, including lakes and wetlands.	Comment noted. In undertaking the SEA assessments, regard is given to interrelationships across topics.	N/A
		Water We note in Section 1.7.3 and 1.7.4 pg. 23 the water companies' commitments to considering the requirements of the Water Framework Directive Regulations 2017 in the SEA is welcomed. It should be noted that this will be relevant to not just the water quality topic but to other topics as well, particularly in terms of water dependant protected areas.	Comment noted. The following stages of the SEA will continue to consider the inter-relationships across topics. The WFD Regulations 2017 mitigation measures will be considered during the Environmental Reporting stage.	N/A
		Water No information is presented on fluvial geomorphology or river dynamics. We recommend that you consider this within your SEA.	Comment noted. Geomorphology is highlighted as a key issue in WRMP specific baselines e.g., Appendix A, where the "*the need to protect, maintain and enhance geomorphological functions and services*" is identified. Given its strategic nature and the geographic extent covered, further additional information on fluvial geomorphology will not be provided in the baseline.	Appendix E

Consultation Question	Section of WRW and WRMP24 Scoping Report	Consultee Response	Response/Action	Where addressed in Environmental Report
			The following supplementary or amended guide questions will be included to permit consideration of geomorphology effects: • *Will it alter geomorphological forms and processes which underpin physical habitat for aquatic ecosystems? Objective 1.* • '*Will it result in changes to river flows, channel morphologies, wetted width or river levels?'* Objective 5. The WFD Assessment (Stage 3 Impact Assessment) also includes consideration of geomorphology through the source-pathway-receptor approach to identifying effects. Where relevant, such information will be used to inform the assessment of any options against the above guide questions.	
		Air quality We welcome the inclusion of data linking air quality to public health. However, a lack of information presented linking air pollution to the impacts on ecosystems.	Comment noted. Table 3.1 of the Scoping Report identifies key pressures and risks in respect of biodiversity and nature conservation that are relevant as including atmospheric pollution (acid precipitation, nitrogen deposition). This also includes reference to increases in transport movements and works associated with the construction and operation of nationally significant water resources infrastructure could affect air quality and lead to increased nitrogen deposition in sensitive habitats.	N/A
		Population and human health Whilst the DCWW report does use the 2019 Welsh Index of Multiple Deprivation (WIMD), the SVT report uses the 2015 version and the text of the UU report under deprivation makes no mention of Wales (nor are the Welsh areas under consideration	Comment noted.	N/A

Consultation Question	Section of WRW and WRMP24 Scoping Report	Consultee Response	Response/Action	Where addressed in Environmental Report
		mentioned within the rest of this section). Both SVT and UU should include Welsh data where relevant.	Data from the 2019 Welsh Index of Multiple Deprivation (WIMD) will be used, where relevant, within the Environmental Report.	
	Table 2.1/Appendix E	<u>Material assets and resource use</u> • The review of National Plans & Programmes (Appendix E) should refer to UK Governments 2020 Energy white paper: Powering our net zero future as the latest expression of UK energy policy. • There should be reference to UK Govts Offshore Energy Plan and Welsh Government's Marine Energy Programme (although worth checking with WG its exact status and timetable and intended outputs). Both include consideration of tidal range technologies • The National transport plan has been included however regional transport plans should also be included under local / regional plans.	Comments noted. The following plans/programme will be added to the review of plans and programmes in the Environmental Report: • HM Government (2020) Energy White Paper: Powering our net zero future The UK government issued a call for evidence on the scope for marine energy technologies, including floating offshore wind and wave and tidal energy. This fed into the energy white paper. The WG Marine Energy Programme for Wales is included in the review of plans and programmes and provides planning policy for offshore and tidal energy. Regional transport plans will also be included in the review of plans and programmes included within the Environmental Report accompany the relevant plan. Information will be provided proportionate to that provided for other generic plan types such as Local Planning Authority Land Use Plans.	Section 2.2, Table 2.1 Appendix C
	Table 2.1/Appendix E	<u>Cultural heritage and landscape</u> Only Appendix A (DCWW) contains the Welsh landscape and cultural baseline evidence and analysis we would expect. LANDMAP, Designated Landscapes, Tranquillity, Historic Landscape, Heritage Coast and Landscape Character Areas are missing from UUW and Severn Trent reports. Analysis of the issues is therefore weak for Wales in these two reports and should be reviewed.	Comment noted. These issues will be included in the relevant Environmental Report.	N/A

Consultation Question	Section of WRW and WRMP24 Scoping Report	Consultee Response	Response/Action	Where addressed in Environmental Report
		The review of plans and programmes is comprehensive for landscape.		
Q2. Do you agree that the main environmental issues identified are relevant to the SEAs of the draft of the draft WRW Regional Plan and WRMP24s? If not, which issues do you think need to be included or excluded?		<u>Biodiversity, flora and fauna</u> When looking at the key issues you should consider all of the elements of ecosystem resilience as set out in the Environment (Wales) Act 2016, we welcome the inclusion of some of the elements here and the explicit references to ecosystem resilience with DCWW's report. However, this is an element which requires strengthening within the other water company reports (Appendix B And D).	Comment noted. The elements of ecosystem resilience as set out in the Environment (Wales) Act 2016, will be considered in the baseline/key issues section for biodiversity within the relevant Environmental Report (to accompany the WRMP24s).	N/A
		<u>Biodiversity, flora and fauna</u> Key issues for biodiversity should explicitly reference issues faced by freshwater habitats including flow regime and physical modifications. The effects on migratory species, including effects on migratory fish from barriers to migration, changes in flow and gravel movement should be considered as these are currently missing.	These issues will be considered in the HRA where European sites are designated for migratory species and to a certain extent in the WFD report. Where relevant it may also be included in the appropriate Environmental Report (to accompany either the WRW Regional Plan or WRMP24).	N/A
	Section 3.2/Table 3.1	<u>Geology, land use and soils</u> Minimising loss of best and most versatile agricultural land has been included. We believe that you also need to consider the wider impacts on other land-uses (such as forestry operations).	Comment noted. An additional guide question will be added against the SEA Objective 4 for the 'Soils, Land Use and Geology' topic: *Will it avoid adverse effects on other land uses (such as forestry)?* In this way, where appropriate, wider impacts on other land-uses will considered in the relevant Environmental Report.	Appendix E

Consultation Question	Section of WRW and WRMP24 Scoping Report	Consultee Response	Response/Action	Where addressed in Environmental Report
	Section 3.2/Table 3.1	Water Requires strengthened links to freshwater habitats – as per previous comments.	Comments noted. Where relevant, revised information may be included in the appropriate Environmental Report. These issues will be considered in the HRA where European sites are designated for migratory species and to a certain extent in the WFD report.	N/A
		Water We would recommend that you consider any potential changes to 'fluvial geomorphology' (for example sediment loading) from your WRMP options and therefore any potential impacts to WFD status or impacts to freshwater ecology.	Comments noted. Geomorphology is highlighted as a key issue in WRMP specific baselines e.g., Appendix A, where the "*the need to protect, maintain and enhance geomorphological functions and services*" is identified. Given its strategic nature and the geographic extent covered, further additional information on fluvial geomorphology will not be provided in the baseline. The following supplementary or amended guide questions will be included to permit consideration of geomorphology effects: • *Will it alter geomorphological forms and processes which underpin physical habitat for aquatic ecosystems? Objective 1.* • '*Will it result in changes to river flows, channel morphologies, wetted width or river levels?'* Objective 5. The WFD Assessment (Stage 3 Impact Assessment) also includes consideration of geomorphology through the source-pathway-receptor approach to identifying effects. Where relevant, such information will be used to inform	Appendix E

Consultation Question	Section of WRW and WRMP24 Scoping Report	Consultee Response	Response/Action	Where addressed in Environmental Report
			the assessment of any options against the above guide questions.	
		Water We would recommend that you also refer to consideration of the implementation of WFD Regulations 2017 mitigation measures as many of the existing reservoirs and abstractions still have mitigation measures that need to be put in place.	Comments noted. These issues will be considered in the WFD report. Where relevant it may also be included in the appropriate Environmental Report (to accompany either the WRW Regional Plan or WRMP24).	N/A
	Table 3.1	Air quality Recommend a wording change from 'minimise emissions' to 'ensure that people and sensitive habitats are protected from emissions by enhancing air quality'.	Comment noted. It is considered that the existing wording (*The need to minimise emissions of pollutant gases and particulates and enhance air quality arising from the implementation of the WRMPs and WRW Regional Plan.*) is sufficiently broad, such that it already captures the need to enhance air quality to protect people and sensitive habitats and goes further by saying that emissions should be also be minimised. No change.	N/A
	Table 3.1	Climatic factors The climate change section of Table 3.1 refers to coastal change and cross references to the water -flood risk section. Whilst vulnerability to flooding and coastal change is recognised, the relevant key issue highlighted relates to resilience only. It is recommended that adaptation is also considered for coastal assets which are at flooding or erosion risk.	Comment noted. Table 3.1 includes the need to take into account, and where possible adapt to, the potential effects of climate change. Flood risk is also identified as a separate issue. Taking into account the nature and scope of the plans being assessed and the information already provided, the additional information suggested regarding coastal assets and erosion are considered to be appropriately covered within the assessment.	N/A

Consultation Question	Section of WRW and WRMP24 Scoping Report	Consultee Response	Response/Action	Where addressed in Environmental Report
	Table 3.1	<u>Landscape</u> Suggest adding Protect against wildfires (due to extreme weather events linked to climate change) as key issues throughout the reports.	Comment noted. ' Taking into account the nature and scope of the plans being assessed and the information already provided, the additional information suggested is considered outside of scope for the assessment.	N/A
Q3. Do you agree with the proposed approach to the SEAs of the draft WRW Regional Plan and WRMP24s? Are the proposed SEA objectives, guide questions and significance thresholds appropriate for the scope of each plan assessment? If not, which objectives/guide questions should be amended and which other objectives/guide questions do you believe should be included?		We welcome that a 'high-level' analysis of the impact that the draft WRW Regional Plan and WRMPs will have on the achievement of the seven well-being goals for Wales and that the objective for the 'Sustainable Management of Natural Resources' will be undertaken. The Sustainable Development principle and the SMNR principles should be built into your SEA process (in addition to the WRMP process) to ensure that these are fully embedded, and you are maximising your contributions to the well-being of Wales, as per the WRMP guidance. Please see our comments on HRA process with regards to boundaries for assessing impacts. Where specific quantified thresholds are given to determine impact, these should be considered in relation to the local context.	Comment noted. The high-level analysis of the impact that the draft WRW Regional Plan and WRMPs on the seven well-being goals for Wales and the objective for the SMNR will build on that completed for the relevant WRMP19s (informed by any available guidance from Welsh Government or the Future Generations Commissioner for Wales. It will be undertaken following mapping of the 17 SEA objectives against the seven well-being goals. WRW is taking an integrated approach to preparing the Regional Plan and the WRMP24s. WRW member water companies are using a regionally consistent set of methodologies to reflect local, regional and national needs into the development of the plans. The definitions of significance have been developed so that they can apply to the SEA of each of the plans, whether that be the WRW Regional Plan or the individual WRMPs to ensure a consistent approach to interpreting the significance of effects.	N/A
	Table 4.2/Appendix F	<u>Biodiversity, flora and fauna</u> • We believe that objective 1 and guide question should be amended to "Protect, restore and enhance". This would reflect the current need to work towards restoring many of our protected sites to favourable condition. There is a long legacy of damage to our protected sites and it takes	Agreed. The wording of Objective 1 (Biodiversity) and Objective 3 (INNS) and corresponding guide questions will be revised to reflect these comments.	Appendix E

Consultation Question	Section of WRW and WRMP24 Scoping Report	Consultee Response	Response/Action	Where addressed in Environmental Report
		time and considerable resources to tackle many of the complex issues. • Include minimise the "risk" of spread of Invasive and Non-Native Species.		
		Geology, land use and soils • You will need to consider all types of relevant land use (such as different types of agriculture, horticulture, forestry) within the local area and will need to consider what is important in the context. Currently these considerations are missing from SEA scoping document.	Comment noted. An additional guide question will be added against the SEA Objective 4 for the 'Soils, Land Use and Geology' topic: *Will it avoid adverse effects on other land uses (such as forestry)?* In this way, where appropriate, wider impacts on other land-uses will considered in the relevant Environmental Report. .	Appendix E
	Table 4.2/Appendix F	Water • There needs to be greater integration and consideration of how the guide questions and objectives work together for example in the Water topic, when referring to sustainable use of water. The use of water is not just for people as its vital to sustain biodiversity in the face of climate change. The Water quantity and quality topics should link the other topic objectives, such as Biodiversity and Climatic factors topics. These topics would benefit from having guide questions that relate to the sustainable use of water and SMNR principles. • Linked to comment on objective 1 above – you should consider whether the Regional Plans/WRMP options will contribute to restoration of species that are currently not achieving management objectives, including due to flow regime or physical modifications.	Comments noted. Schedule 2 (6) of the SEA Regulations requires the assessment and reporting of the likely significant effects on the following topics: "biodiversity; population; human health; fauna; flora; soil; water; air; climatic factors; material assets; cultural heritage, including architectural and archaeological heritage; landscape; and the inter-relationship between the issues." This will be undertaken through the assessment of cumulative effects of individual options which will also be informed by the findings of the HRA, WFD assessment and NCA. The wording of Objective 1 (Biodiversity) and Objective 3 (INNS) and corresponding guide	Appendix E

Consultation Question	Section of WRW and WRMP24 Scoping Report	Consultee Response	Response/Action	Where addressed in Environmental Report
		• Water quantity should also include the guide questions "Will it support the achievement of WFD protected area objectives?" and "Will it prevent the deterioration of Water Framework Directive (WFD) waterbody status (or potential)?" as listed in the Water quality topic, can these be added as guide questions? • These questions would benefit from the inclusion of lakes and wetlands. • • Flooding should also be considered as a key ecosystem function of rivers.	questions will be revised to include 'restoration', to ensure, where relevant effects are identified, described and assessed. These issues will be considered in the HRA and the WFD report. Contribution to the achievement of WFD objectives is already specifically reflected in the guide questions for Objective 6 (Water Quality. The guide questions for Objectives 5 (Water Quantity) and 6 (Water Quality) include reference to surface waters and water bodies, and to avoid unintended duplication, reference to 'lakes and wetlands' will not be included. Comment noted.	
	Table 4.2/Appendix F	<u>Air quality</u> • Please see comments from question 2 on air quality for suggested amendment.	Comment noted.	N/A
	Table 4.2/Appendix F	<u>Climatic factors</u> • The guide question "Will the option increase environmental resilience to the effects of climate change?" could be expanded to identify impacts on flood risk/water quality.	Comment noted. This guide question already includes reference to impacts on flood risk and water quality. No change.	N/A
	Table 4.2/Appendix F	<u>Population and human health</u> • Within the guide questions and thresholds further integration of the wellbeing goals should be considered	Comment noted.	N/A

Consultation Question	Section of WRW and WRMP24 Scoping Report	Consultee Response	Response/Action	Where addressed in Environmental Report
		to maximise the wellbeing benefits provided of any option, including enjoyment of green and blue space providing both mental and physical wellbeing benefits, social wellbeing factors and economic wellbeing.	SEA Objective 12 includes the following guide question "*Will it protect and enhance public access to, and enjoyment of, green and blue infrastructure, open space/recreational facilities and the natural and historic environment, and in doing so help promote healthy lifestyles including mental well-being?*" which along with SEA Objectives 1 (Biodiversity), 2 (Sustainable Natural Resources), 10 (Resilience), 11 (Economic and social well-being), 13 (Human health) and 16 (Cultural heritage) provide a broad framework to consider the effects on the well-being goals. Further review of the updated SEA framework following scoping consultation will be undertaken to ensure any opportunities to strengthen the assessment are identified and incorporated.	
	Table 4.2/Appendix F	<u>Landscape</u> • We would recommend an addition to one of the proposed guide questions on landscapes (which includes Designated Landscapes). Therefore, we suggest the addition of 'and the settings of Designated Landscapes'.	Agreed. The wording of the first guide question under Objective 17 (Landscape) has been amended to read: *Will it avoid adverse effects to, and enhance where possible, protected/designated landscapes <u>and the settings of designated landscapes</u> (including woodlands) such as National Parks or AONBs?*	Appendix E

Table B.4 Responses to Natural England comments on the SEA Scoping Report

Consultation Question	Section of WRW and WRMP24 Scoping Report	Consultee Response	Response/Action	Where addressed in Environmental Report
N/A	N/A	There is much in the Strategic Environmental Assessment (SEA) scoping report that is good and Natural England welcomes WRW's commitment to environmental assessment.	Comment noted.	N/A
Q1. Do you think that the Scoping Report sets out sufficient information to provide the context for the SEAs of the draft WRW Regional Plan and WRMP24s in terms of an overview of each plan, the review of relevant plans and programmes and baseline evidence and analysis? If not, what additional information should be included?	Section 2, Table 2.1, Appendix E	Natural England applauds the very thorough consideration of plans and programmes that underpin it's plan. Some additional plans that may be relevant: The Environment Bill 2020, although not yet finally published, should be as this includes long term targets set by the government relating the natural environment – and may be especially relevant to the environmental destination. The Land Drainage Act 1991 – ground water levels. The Conservation of Habitats and Species Regulations 2017 – current transposed directive in the UK of The Habitats Directive 1992. The Conservation (Natural Habitats, &c.) Regulations 1994 – imposed a duty on the IDB to develop WLMP for SSSI sites. The Nitrate Pollution Prevention Regulations 2015	Comment noted. The following additional plans and programmes will be included in the Environmental Report: • The Land Drainage Act 1991 • The Conservation (Natural Habitats, &c.) Regulations 1994 • The Nitrate Pollution Prevention Regulations 2015 • The Agriculture Act 2020 The Conservation of Habitats and Species Regulations 2017 is already included in the review of plans and programmes and also considered within section 1.6 of the Scoping Report. These 2017 regulations consolidate all the various amendments made to the Conservation (Natural Habitats) Regulations 1994 and in consequence, it is not proposed to include reference to the 1994 regulations. It is noted that changes to the 2017 Regulations came into force in January 2021, as a result of the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, reflecting the UK's exit from the EU. These changes will be reflected within the review of plans and programmes in the Environmental Report. To avoid undue reliance on draft versions of plans and programmes that could be subject to change, consultation documents and draft legislation are not included in the plans	Section 2.2, Table 2.1 Appendix C

Consultation Question	Section of WRW and WRMP24 Scoping Report	Consultee Response	Response/Action	Where addressed in Environmental Report
		Agriculture Act 2020 – changes to farm subsidies could have a significant impact on the farming industry & thus water usage.	and programmes reviewed, unless highly relevant e.g., the Water Resources Planning Guidelines.	
		We would like to see the key objectives for the Governments 25Year Plan to Improve the Environment highlighted more prominently, including the objectives for protected sites and the governments commitment to protect 30% of land by 2030.	Comment noted. The Government's 25 Year Environment Plan: 'A Green Future: Our 25 Year Plan to Improve the Environment', is one of over 200 international/European, national, regional/sub-regional and local level plans were reviewed during the preparation of the Scoping Report. It has been reviewed and summarised (in Appendix E). Each has a claim of importance and relevance. Key policy objectives have been summarised in Table 2.2 with the 25 Year Plan identified.	N/A
Q2. Do you agree that the main environmental issues identified are relevant to the SEAs of the draft of the draft WRW Regional Plan and WRMP24s? If not, which issues do you think need to be included or excluded?	Table 3.1	Table 3.1 sets out the key issues relating to Biodiversity Flora and Fauna. Natural England would like to see added to the list depletion and pollution of groundwater as we feel this has significantly impacted a large number of protected sites.	Comment noted. '*Depletion and pollution of* groundwater' is considered to be addressed in the revised key issues included under the water quality topic *'The need to maintain the quantity and quality of groundwater resources taking into account WFD objectives'* which in summary contains aspects of both groundwater quantity and quality.	N/A
	Table 3.1	Table 3.1 – section 5. Flood Risk – natural flood management (NFM) tools area key tool for improving the water resource infrastructure.	Comment noted.	N/A
	Table 3.1	Table 3.1 – section 5. Flood Risk – key issues include the lack of connectivity of our rivers to their floodplains, the channelisation and dredging of rivers, the historic conversion of rivers into drains, and historic land drainage acts.	Comment noted. The key issues summarised in Table 3.1 relate to the scope of the WRMPs and the assessment. The issues highlighted in the response will where appropriate be added to those taken forward for consideration within the SEA and subsequently presented in the relevant Environmental Report, accompany each plan.	N/A

Consultation Question	Section of WRW and WRMP24 Scoping Report	Consultee Response	Response/Action	Where addressed in Environmental Report
	N/A	We would also like to see specifically referenced the requirement to increase landscape resilience and ensure that our future dependence on the natural environment relies on us using it more sustainably. We would also highlight that many of the solutions that are required to reverse biodiversity loss and restore protected sites and meet other objectives are entirely compatible with other key strategies that could be seen as competing, such as the need to protect drinking supplies and prevent flooding. Nature Based Solutions work synergistically and can offer significant cost-benefit compared to more traditional approaches.	Comments noted. SEA Objective 1 'To protect and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species, enhance ecosystem resilience and habitat connectivity and deliver a net biodiversity gain' and SEA Objective 2 'To protect and enhance sustainable natural resources and the ecosystem services they provide' explicitly seeks to address many of the wide-ranging issues highlighted. WRW and its core members are seeking to develop an ambitious long-term, multi-sector adaptive water resources plan. This includes taking into account wider societal needs including flood risk considerations, environmental improvement and cross-sector working, where innovative approaches such as NBS could afford benefits.	N/A
	N/A	Reference should be made to opportunities to use nature based solution to deliver multiple benefits such as carbon sequestration, biodiversity, nutrient capture, urban cooling, flood risk mitigation in addition to improved infiltration and storage of water for resources.	Comment noted.	N/A
	N/A	One issue common to all SEAs is that separating the impacts into separate topics makes it more difficult to identify the synergistic impacts of schemes but also the multiple benefits from nature-based solutions.	Comment noted. Schedule 2 (6) of the SEA Regulations requires the assessment and reporting of the likely significant effects on the following topics: "biodiversity; population; human health; fauna; flora; soil; water; air; climatic factors; material assets; cultural heritage, including architectural and archaeological heritage; landscape; and the inter-relationship between the issues." This will be undertaken through the assessment of cumulative effects of individual options which will also be informed by the findings of the HRA, WFD assessment and NCA.	Section 6.5

Consultation Question	Section of WRW and WRMP24 Scoping Report	Consultee Response	Response/Action	Where addressed in Environmental Report
			Secondary, cumulative and synergistic effects of individual options, programmes of options within each of the WRZs in deficit, the WRW Regional Plan and WRMPs as a whole and the WRW Regional Plan and WRMPs in combination with other plans and programmes will be assessed as part of the SEA.	
Q3. Do you agree with the proposed approach to the SEAs of the draft WRW Regional Plan and WRMP24s? Are the proposed SEA objectives, guide questions and significance thresholds appropriate for the scope of each plan assessment? If not, which objectives/guide questions should be amended and which other objectives/guide questions do you believe should be included?	Table 4.2/Appendix F	Table 4.2 – Topic. Biodiversity, Flora and Fauna – bullet point 10 references as an example climate change adaptability. Suggest having a specific question referring to the impacts of climate change on protected / non protected sites / species e.g. – Will it provide opportunities for climate adaptation and protect the climate resilience of vulnerable and priority sites?	Comment noted. The following guide question will be added under Objective 2 of the assessment framework: *Will it provide opportunities for climate adaptation and protect the climate resilience of vulnerable and priority sites?*	Appendix E
	?	Table 4.1 – Topic. Water Quality - Highlight the issues of emerging substances (PCPs) & plastic pollution & knowledge gaps within this area.	Comment noted. Issues relating to water quality, in terms of emerging substances (PCPs) and plastic pollution, and knowledge gaps within this area will be highlighted within the Environmental Report.	Appendix D, Water
	Appendix F	Few semi-quantitative or quantitate metrics within the assessment to support guide questions. Do we think going forward that some less subjective 'measures' need to be included? How are we going to balance things against environmental impacts without quantifiable measures? UKWIR 2020 guidance suggests a mix of qualitative, semi-qualitative and quantitative measure might be used.	Comment noted. The 'Definitions and Thresholds of Significance' set out in Appendix F of the scoping report, are considered to provide a balance of both quantitative and qualitative measures (as per UKWIR Guidance) which help to ensure a consistent approach to interpreting the significance of effects and helps the reader understand the decisions made by the assessor. The proposed thresholds include reference to yield (Ml/d), design capacity (Ml/d), capex (£m), embodied and operational carbon (tCO2e), flood risk (% site in FZ3), air quality (AQMAs) and water quality (WFD status). Additional quantitative	Appendix E

Consultation Question	Section of WRW and WRMP24 Scoping Report	Consultee Response	Response/Action	Where addressed in Environmental Report
			measures for air quality and Material Assets – Waste and Resource Use have also now been added to ensure consistency between assessments. These will be set out in the relevant Environmental Reports.	

APPENDIX C: REVIEW OF PLANS AND PROGRAMMES

International / European Plans and Programmes	
Purpose of the Document, including Objectives and Targets relevant to the WRMP and SEA	**Relationships and Influences on the WRMP and the SEA**
Conservation of Migratory Species (CMS) (1979) *The Bonn Convention on the Conservation of Migratory Species of Wild Animals*	
The Convention on the Conservation of Migratory Species of Wild Animals (also known as the Bonn Convention or CMS) is an intergovernmental treaty under the United Nations Environment Programme. The convention was signed in 1979 ratified in the UK in 1985. The convention aims to ensure contracting parties work together to conserve terrestrial, marine and avian migratory species and their habitats (on a global scale) by providing strict protection for endangered migratory species. Overarching objectives set for the Parties are: • Should promote, co-operate in and support research relating to migratory species; • Shall endeavour to provide immediate protection for migratory species; • Shall endeavour to conclude Agreements covering the conservation and management of migratory species included in Appendix II. Setting targets is the responsibility of member states.	The WRMP should take into account the habitats and species that have been identified under this directive, and should include provision for their protection, preservation and improvement. The SEA assessment framework should include biodiversity, incorporating the importance of conserving migratory species.
Council of Europe (1979) *The Convention on the Conservation of European Wildlife and Natural Habitats (The Bern Convention)*	
The Convention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention) was adopted in Bern, Switzerland in 1979, and came into force in 1982. The principal objectives are: • To conserve wild flora and fauna and their natural habitats, especially those species and habitats whose conservation requires the co-operation of several States; • To promote such co-operation. Particular emphasis is given to endangered and vulnerable species, including endangered and vulnerable migratory species; • In order to achieve this the Convention imposes legal obligations on contracting parties, protecting over 500 wild plant species and more than 1000 wild animal species. Targets for Contracting Parties are: • Promoting national policies for the conservation of wild flora, wild fauna and natural habitats, with particular attention to endangered and vulnerable species, especially endemic ones, and endangered habitats, in accordance with the provisions of this Convention; • Undertaking in its planning and development policies, and in its measures against pollution, to have regard to the conservation of wild flora and fauna; Promoting education and disseminating general information on the need to conserve species of wild flora and fauna and their habitats.	The WRMP should take into account the habitats and species that have been identified under the Convention, and should include provision for the preservation, protection and improvement of the quality of the environment as appropriate. The SEA assessment framework should incorporate the conservation provisions of the Convention particularly the protection of wild flora, fauna and natural habitats.
Council of Europe (1985) *The Convention for the Protection of the Architectural Heritage of Europe (The Granada Convention)*	

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The main purpose of the convention is to reinforce and promote policies for the conservation and enhancement of Europe's heritage and to foster closer European co-operation in defence of heritage. Recognition that conservation of heritage is a cultural purpose and integrated conservation of heritage is an important factor in the improvement of quality of life.	The SEA assessment framework should include an objective on the conservation and enhancement of heritage and decision making criteria on architectural heritage.
Council of Europe (1992) *Convention on the Protection of Archaeological Heritage (The Valetta Convention)*	
Agreement that the conservation and enhancement of an archaeological heritage is one of the goals of urban and regional planning policy. It is concerned in particular with the need for co-operation between archaeologists and planers to ensure optimum conservation of archaeological heritage.	The SEA assessment framework should include an objective on the conservation and enhancement of heritage and decision making criteria on archaeological heritage.
Council of Europe (2000), *The European Landscape Convention (The Florence Convention)* (became binding March 2007)	
The European Landscape Convention was adopted on 20 October 2000 in Florence and came into force on 1 March 2004 (Council of Europe Treaty Series no. 176). It is open for signature by member states of the Council of Europe and for accession by the European Community and European non-member states. The UK Government signed the European Landscape Convention in 2006 and it became binding from March 2007. The aims of the Convention are to promote landscape protection, management and planning, and to organise European co-operation on landscape issues. Responsibility for implementation has been deferred to the signatories. Articles 5 (general measures) and 6 (specific measures) set out measures that the signatories will undertake, e.g. integrating landscape into policies with possible direct or indirect impact on landscape and to introduce instruments aimed at protecting, managing and/or planning the landscape.	The WRMP should take landscape into account. The SEA assessment framework should include an objective on landscape.
Council of Europe (2003) *European Soils Charter*	
Sets out common principles for protecting soils across the European Union area.	The WRMP should take soils into account. The SEA assessment framework should include an objective on soils.
European Commission (1991) *The Nitrates Directive 91/676/EEC*	
The Nitrates Directive is designed to reduce water pollution caused by nitrate from agriculture. The directive requires Defra and the Welsh Government to identify surface or ground waters that are, or could be high in nitrate from agricultural sources. Once a water body is identified as being high in nitrate all land draining to that water is designated a Nitrate Vulnerable Zone. Within these zones, farmers must observe an action programme of measures which include restricting the timing and application of fertilisers and manure and keeping accurate records.	The WRMP should be consistent with the aim to reduce water pollution caused by nitrates from agriculture. The SEA assessment framework should include water quality.
European Commission (1991) *Urban Waste Water Treatment Directive 1991/271/EEC*	
The aim of the Urban Waste Water Directive is to protect the environment from the adverse effects of waste water discharges. It sets out guidelines and legislation for the collection, treatment and discharge of urban waste water. The Directive was	The WRMP will need to reflect the guidelines and

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adopted by member states in May 1991 and is transposed into law in England and Wales by The Urban Waste Water Treatment (England & Wales) Regulations 1994 (as amended*). The Regulations require that all significant discharges are treated to at least secondary treatment. They also set standards and deadlines for the provision of sewage systems, the treatment of sewage according to the size of the community served by the sewage treatment works and the sensitivity of receiving waters to their discharges.	legislation set out in the directive. The SEA assessment framework should include water quality.
European Commission (1992) *The Habitats Directive 1992/43/EEC*	
The Habitats Directive seeks to conserve natural habitats. Conservation of natural habitats requires member states to identify special areas of conservation and to maintain where necessary landscape features of importance to wildlife and flora. It is required that each Member State propose a list of sites indicating which natural habitat types and which species the sites host. The information would include a map of the site, its name, location and its extent. The Commission will then establish, in agreement with each Member State, a draft list of sites of Community importance drawn from the Member States' lists identifying those which host one or more priority natural habitat types or priority species.	The WRMP should take into account the habitats and species that have been identified under this Directive, and include provision for the preservation, protection and improvement of the quality of the environment as appropriate. The SEA assessment framework should incorporate sites protected for their nature conservation importance.
European Commission (1998) *Drinking Water Directive 1998/83/EC*	
The Drinking Water Directive (DWD) concerns the quality of water intended for human consumption. The objective of the DWD is to protect the health of the consumers in the EU and to make sure the water is wholesome and clean. To do this, the DWD sets standards for 48 (microbiological and chemical) parameters that can be found in drinking water. The parameters must be monitored and tested regularly. In principle WHO guidelines for drinking water are used as a basis for the standards in the DWD. While translating the DWD into their own national legislation (transposition of the DWD), the Member States of the European Union can include additional requirements e.g. regulate additional substances that are relevant within their territory or set higher standards. However, Member States are not allowed to set lower standards as the level of protection of human health should be the same within the whole EU. Member States have to monitor the quality of the drinking water supplied to their citizens and of the water used in the food production industry. Member States report at three yearly intervals the monitoring results to the European Commission. Standards constitute legal limits. Sets limits for microbiological and chemical parameters in drinking water. Also gives indicator parameters.	The WRMP should seek to ensure the continuity of a safe and secure drinking water supply and protect or improve drinking water quality where possible. The SEA assessment should consider the effects on water and human health.
European Commission (1999) Directive on the *Landfill of Waste 99/31/EC*	
The Directive aims at reducing the amount of waste landfilled; promoting recycling and recovery; establishing high standards of landfill practice across the EU, and preventing the shipping of waste from one Country to another. The objective of the Directive is to prevent or reduce as far as possible negative effects on the environment (in particular on surface water, groundwater, soil, air and human health) from the land-filling of waste, by introducing stringent technical requirements for waste and landfills. The Directive requires the reduction of the amount of biodegradable municipal waste sent to landfill to 75% of the total generated in 1995 by 2006, 50% by 2009 and 35% by 2016.	The WRMP should take the effects on waste to landfill into account. The SEA assessment should consider the effects on water, soil, air, human health and waste

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European Commission (2000) *The Water Framework Directive 2000/60/EC*	
The purpose of this Directive is to establish a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwater and to achieve good qualitative and quantitative status of all water bodies (including marine waters up to one nautical mile from shore). The framework aims to: • Protect any further deterioration and enhance the status of aquatic ecosystems and, with regard to their water needs, terrestrial ecosystems and wetlands directly depending on the aquatic ecosystems; • Promote sustainable water use based on a long-term protection of available water resources; • Enhance protection and improvement of the aquatic environment, inter alias, through specific measures for the progressive reduction of discharges, emissions and losses of priority substances and the cessation or phasing-out of discharges, emissions and losses of the priority hazardous substances; • Ensure the progressive reduction of pollution of groundwater and prevent its further pollution; • Contribute to mitigating the effects of floods and droughts. Key targets and indicators relevant to the WRMP and SEA are: • Achievement of good ecological status and good surface water chemical status by 2015 unless alternative objectives have been identified; • Achievement of good ecological potential and good surface water chemical status for heavily modified water bodies and artificial water bodies; • Prevention of deterioration, including of each element, from one status class to another; • Achievement of water-related objectives and standards for protected areas; • Achievement of good groundwater quantitative and chemical status by 2015; • Reversal of any significant and sustained upward trends in pollutant concentrations and prevent or limit input of pollutants to groundwater; • Achievement of water related objectives and standards for protected areas and contributes to mitigating the effects of flood and droughts.	The WRMP needs to consider the implication of the Directive in terms of sustainable water use, protection and improvement of the aquatic environment, reducing and preventing pollution and mitigating the effects of flood and droughts. The SEA assessment framework should include water quality, water resources, sustainable water use, and biodiversity.
European Commission (2001) *Directive on the Assessment of the Effects of Certain Plans and Programmes on the Environment (The SEA Directive) 2001/42/EC*	
The objective of the SEA Directive 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 and programmes with a view of contributing towards sustainable development". Throughout the course of the development of the plan, policy or programme, the aim of SEA is to identify the potential impact of options proposed in the plan in terms of their environmental, economic and social effects. If any adverse effects are identified, these options can then be avoided or proposals modified to manage or mitigate adverse effects.	This directive is the driver for SEA. All topics identified in the SEA Directive should be considered within the scope of the assessment. Need to ensure that the subsequent Environmental Report meets the requirements of Annex I of the SEA Directive.

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European Commission (2002) *Directive on the Energy Performance of Buildings 2002/91/EC*	
The European Union Energy Performance of Buildings Directive was published in the Official Journal on the 4th January 2003. The overall objective of the Directive is to *promote the improvement of energy performance of buildings within the Community taking into account outdoor climate and local conditions as well as indoor climate requirements and cost effectiveness.* The Directive highlights how the residential and tertiary sectors, the majority of which are based in buildings, accounts for 40% of EU energy consumption.	The SEA should highlight any opportunities for new buildings associated with the WRMP to contribute to improved energy performance.
European Commission (2002) *The Environment Noise Directive (END) 2002/49/EC*	
The END aims to "define a common approach intended to avoid, prevent or reduce on a prioritised basis the harmful effects, including annoyance, due to the exposure to environmental noise". For that purpose several actions are to be progressively implemented. It furthermore aims at providing a basis the harmful effects, including annoyance, due to the exposure to environmental noise". For that purpose several actions are to be progressively implemented. It furthermore aims at providing a basis for developing EU measures to reduce noise emitted by major sources, in particular road and rail vehicles and infrastructure, aircraft, outdoor and industrial equipment and mobile machinery. The underlying principles of the Directive are similar to those underpinning other overarching environment policies (such as air or waste), i.e.: • Monitoring the environmental problem; by requiring competent authorities in Member States to draw up "strategic noise maps" for major roads, railways, airports and agglomerations, using harmonised noise indicators Lden (day-evening-night equivalent level) and Lnight (night equivalent level). These maps will be used to assess the number of people annoyed and sleep-disturbed respectively throughout Europe. • Informing and consulting the public about noise exposure, its effects, and the measures considered to address noise, in line with the principles of the Aarhus Convention. • Addressing local noise issues by requiring competent authorities to draw up action plans to reduce noise where necessary and maintain environmental noise quality where it is good. The directive does not set any limit value, nor does it prescribe the measures to be used in the action plans, which remain at the discretion of the competent authorities. • Developing a long-term EU strategy, which includes objectives to reduce the number of people affected by noise in the longer term, and provides a framework for developing existing Community policy on noise reduction from source. With this respect, the Commission has made a declaration concerning the provisions laid down in article 1.2 with regard to the preparation of legislation relating to sources of noise.	The WRMP will need to have regard to the requirements of the END. The SEA assessment framework should include for the protection against excessive noise.
European Commission (2004) *Environmental Liability Directive 2004/35/EC*	
The Directive establishes a framework for environmental liability based on the "polluter pays" principle, with a view to preventing and remedying environmental damage.	The SEA should take account of the need to ensure that proposals in the WRMP avoid causing direct or indirect damage to the aquatic environment or contamination of land that creates a

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	significant risk to human health.
European Commission (2005) *Thematic Strategy on Air Pollution*	
This strategy supplements legislation. It sets out objectives for air pollution and proposes measures for achieving them by 2020.	The WRMP should be in accordance with the requirements of the strategy. The SEA should take into account the need to improve air quality.
European Commission (2006) *The Bathing Waters Directive 2006/7/EC*	
The Bathing Waters Directive applies to surface waters that can be used for bathing except for swimming pools and spa pools, confined waters subject to treatment or used for therapeutic purposes and confined waters artificially separated from surface water and groundwater. The Directive is intended to: • Be based on scientific knowledge on protecting health and the environment, as well as environmental management experience, • Provide better and earlier information of citizens about quality of their bathing waters, including logos, • Move from simple sampling and monitoring of bathing waters to bathing quality management, and • Be integrated into all other EU measures protecting the quality of all our waters (rivers, lakes, ground waters and coastal waters) through the Water Framework Directive. Two main parameters for analysis (intestinal enterococci and escherichia coli) are defined, instead of nineteen in the previous Directive. These parameters will be used to monitor and assess the quality of bathing waters and to classify them. Other parameters could be taken into account, such as the presence of cyanobacteria or microalgae. Member States must monitor the bathing waters every year. The monitoring calendar should provide for at least four samples to be taken per season (except where the season is very short or where there are special geographic constraints). The sampling interval should not be longer than one month. Upon the monitoring results gathered in four years, Member States should assess the bathing waters at the end of every season. A shorter period may be acceptable in some cases. The waters are classified according to their level of quality: poor, sufficient, good or excellent, linked to clear numerical quality standards for bacteriological quality. The category "sufficient" is the minimum quality threshold that all Member States should attain by the end of the 2015 season at the latest. Where water is classified as "poor", Member States should take certain management measures, e.g. banning bathing or posting a notice advising against it, providing information to the public, and suitable corrective measures.	The WRMP will need to comply with set limits. The SEA assessment should include a guide question relating to the effects of options on the water quality at designated bathing waters.
European Commission (2006) *Directive on animal health requirements for aquaculture animals and products thereof, and on the prevention and control of certain diseases in aquatic animals 2006/88/EC*	
The Directive establishes:	The SEA should take account of the need to maintain or

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• Animal health requirements for the placing on the market, importation and transit of aquaculture animals and their products; • Minimum measures to prevent diseases in aquaculture animals; • Minimum measures to be taken in response to suspected or established cases of certain diseases in aquatic animals.	enhance the quality of habitats and biodiversity.
European Commission (2006) *Directive on the protection of groundwater against pollution and deterioration 2006/118EC*	
This Directive establishes specific measures as provided for in Article 17(1) and (2) of Directive 2000/60/EC (Water Framework Directive) in order to prevent and control groundwater pollution. This Directive is designed to prevent and combat groundwater pollution.	The SEA should take account of the need to maintain, protect and improve water quality across the WRMP area.
European Commission (2006) *Fresh Water Fish Directive 2006/44/EC*	
The Directive seeks to protect those fresh water bodies identified by Member States as waters suitable for sustaining fish populations. For those waters, it sets physical and chemical water quality objectives for salmonid waters and cyprinid waters. The Directive is designed to protect and improve the quality of rivers and lakes to encourage healthy fish populations.	The SEA should take account of the need to promote the protection of river and lake water quality in order to maintain and develop suitable environments that will sustain freshwater fish populations.
European Commission (2006) *Mining Waste Directive 2006/21/EC*	
The Directive aims to prevent or reduce as far as possible any adverse effects on the environment, and any resultant risks to human health, brought about as a result of the management of waste from the extractive industries. The Directive covers the management of waste resulting directly from prospecting, extraction, treatment and storage of mineral resources and from quarrying. Operators are required to use Best Available Techniques in the management of waste facilities and the prevention of major accidents.	The WRMP should have regard to the aim to avoid adverse effects from extractive waste. The SEA assessment framework should include consideration of waste.
European Commission (2006) *Thematic Strategy for Soil Protection*	
The *Thematic Strategy for Soil Protection* consists of a Communication from the Commission to the other European Institutions, a proposal for a framework Directive (a European law), and an Impact Assessment. It sets out an EU strategy for soil protection with an overall objective of the protection and sustainable use of soil, based on the following guiding principles: (1) Preventing further soil degradation and preserving its functions: • when soil is used and its functions are exploited, action has to be taken on soil use and management patterns; and • when soil acts as a sink/receptor of the effects of human activities or environmental phenomena, action has to be taken at source. (2) Restoring degraded soils to a level of functionality consistent at least with current and intended use, thus also considering the cost implications of the restoration of soil. The strategy proposes introducing a framework Directive setting out common principles for protecting soils across the EU, with Member States deciding how best to protect soil and how use it in a sustainable way on their own territory.	The WRMP should take potential effects on soil into account. The SEA assessment framework should include soils.

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European Commission (2007) *The Eel Directive 2007/1100/EC*	
The Eel Directive establishes measures for the recovery of the stock of European eel and requires member states to produce Eel management plans for each catchment.	The WRMP should ensure that there are no adverse impacts on eel as a result of water resource measures taken.
European Commission (2007) *Floods Directive 2007/60/EC*	
The Directive's aim is to reduce and manage the risks that floods pose to human health, the environment, cultural heritage and economic activity. The Directive shall be carried out in coordination with the Water Framework Directive, notably by flood risk management plans and river basin management plans being coordinated, and through coordination of the public participation procedures in the preparation of these plans.	The WRMP should take account of the flood risk management plans. The SEA assessment framework should include flood risk.
European Commission (2008) *Ambient Air Quality and Cleaner Air for Europe Directive 2008/50/EC Air Quality Framework Fourth Daughter Directive 2004/107/EC and previous directives (96/62/EC; 99/30/EC; 2000/69/EC & 2002/3/EC)*	
The Directive: • defines and establishes objectives for ambient air quality to avoid, prevent or reduce harmful effects on human health and the environment as a whole; • assesses the ambient air quality in Member States using common methods and criteria; • obtains information on ambient air quality in order to help combat air pollution and nuisance and to monitor long-term trends and improvements resulting from national and Community measures; • ensures that such information on ambient air quality is made available to the public; • seeks to maintain air quality where it is good and improving it in other cases; and • promotes increased cooperation between the Member States in reducing air pollution.	The WRMP should contribute towards achieving air quality standards set out in the Directive. The SEA assessment framework should include air quality.
European commission (2008) *Directive on Waste* (Directive 75/442/EEC, 2006/12/EC 2008/98/EC as amended)	
The essential objective of all provisions relating to waste management should be the protection of human health and the environment against harmful effects caused by the collection, transport, treatment, storage and tipping of waste. Some key objectives include: • The recovery of waste and the use of recovered materials as raw materials should be encouraged; • Member States should, in addition to taking responsible action to ensure the disposal and recovery of waste, take measures to restrict the production of waste; • It is important for the Community as a whole to become self-sufficient in waste disposal and desirable for Member States individually to aim at such self-sufficiency;	The WRMP should seek to ensure the protection of human health and the environment in relation to waste management. The SEA assessment should include objectives on the protection of human health and the environment.

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• Waste management plans should be drawn up in the Member States; • Movements of waste should be reduced; • Ensure a high level of protection and effective control; • Subject to certain conditions, and provided that they comply with environmental protection requirements, some establishments which process their waste themselves or carry out waste recovery may be exempted from permit requirements; • That proportion of the costs not covered by the proceeds of treating the waste must be defrayed in accordance with the 'polluter pays' principle.	
European Commission (2008) *Environmental Quality Standards Directive 2008/105/EC*	
The Directive aims to control the concentration of certain substances which pose a risk to the aquatic environment. The 33 'priority substances' addressed by the Directive are defined by the Water Framework Directive (2000/60/EC), including cadmium, lead, mercury, nickel, benzene and polyaromatic hydrocarbons. The Directive sets thresholds of concentration that must not be exceeded, with limits to average values over a year to ensure long-term water quality and maximum allowable concentrations to limit short term pollution peaks. Member States must comply with the water quality standards and record an inventory of emissions and discharges of all substances in the Directive.	The assessment framework should include assessment criteria relating to water quality.
European Commission (2008) *Marine Strategy Framework Directive 2008/56/EC*	
The Directive sets out a framework for an ecosystem-based approach to the management of human activities which supports the sustainable use of marine goods and services. The overarching goal of the Directive is to achieve 'Good Environmental Status' (GES) by 2020 across Europe's marine environment. The Directive establishes four European Marine Regions, based on geographical and environmental criteria. The North East Atlantic Marine Region is divided into four subregions, with UK waters lying in two of these (the Greater North Sea and the Celtic Seas). Each Member State is required to develop a marine strategy for their waters, in coordination with other countries within the same marine region or subregion. Marine strategies must be implemented to protect and conserve the marine environment, prevent its deterioration, and, where practicable, restore marine ecosystems in areas where they have been adversely affected. The marine strategies must contain: • An initial assessment of the current environmental status of that Member State's marine waters; • A determination of what Good Environmental Status means for those waters; • Targets and indicators designed to show whether a Member State is achieving GES; • A monitoring programme to measure progress towards GES; • A programme of measures designed to achieve or maintain GES. The Directive also requires Marine Protected Areas (MPAs) to be established to support the achievement of GES.	The SEA assessment framework should incorporate assessment criteria relating to the quality of the marine environment.
European Commission (2009) *Directive on the Conservation of Wild Birds 2009/147/EC* (codified version of Council Directive 79/409/EEC as amended)	

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The Directive provides a framework for the conservation and management of, and human interactions with, wild birds in Europe. The main provisions of the Directive include: • The maintenance of the populations of all wild bird species across their natural range (Article 2) with the encouragement of various activities to that end (Article 3). • The identification and classification of Special Protection Areas (SPAs) for rare or vulnerable species listed in Annex I of the Directive, as well as for all regularly occurring migratory species, paying particular attention to the protection of wetlands of international importance (Article 4). (Together with Special Areas of Conservation designated under the Habitats Directive, SPAs form a network of European protected areas known as Natura 2000). • The establishment of a general scheme of protection for all wild birds (Article 5). • Restrictions on the sale and keeping of wild birds (Article 6). • Specification of the conditions under which hunting and falconry can be undertaken (Article 7). (Huntable species are listed on Annex II of the Directive). • Prohibition of large-scale non-selective means of bird killing (Article 8). • Procedures under which Member States may derogate from the provisions of Articles 5-8 (Article 9) — that is, the conditions under which permission may be given for otherwise prohibited activities. • Encouragement of certain forms of relevant research (Article 10 and Annex V). Requirements to ensure that introduction of non-native birds do not threatened other biodiversity (Article 11).	The WRMP should seek to protect and enhance biodiversity, particularly designated sites. The SEA assessment framework should include objectives, indicators and targets that cover biodiversity.
European Commission (2009) *Promotion of the use of energy from renewable sources Directive 2009/28/EC*	
This Directive establishes a common framework for the use of energy from renewable sources in order to limit greenhouse gas emissions and to promote cleaner transport. It encourages energy efficiency, energy consumption from renewable sources and the improvement of energy supply. The Member States are to establish national action plans which set the share of energy from renewable sources consumed in transport, as well as in the production of electricity and heating, for 2020. These action plans must take into account the effects of other energy efficiency measures on final energy consumption (the higher the reduction in energy consumption, the less energy from renewable sources will be required to meet the target). These plans will also establish procedures for the reform of planning and pricing schemes and access to electricity networks, promoting energy from renewable sources. Each Member State has a target calculated according to the share of energy from renewable sources in its gross final consumption for 2020. The UK is required to source 15 per cent of energy needs from renewable sources, including biomass, hydro, wind and solar power by 2020. From 1 January 2017, biofuels and bioliquids share in emissions savings should be increased to 50%.	The WRMP should seek to contribute towards increasing the proportion of energy from renewable energy sources. The SEA assessment framework should include consideration of use of energy from renewable energy sources.
European Commission (2010) *Industrial Emissions Directive (integrated pollution prevention and control) 2010/75/EU*	

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This Directive brings together the IPPC Directive (2008/1/EC) and six other Directives on titanium dioxide, VOCs and waste incineration, with the aim of reducing pollutant emissions. It covers industries with high polluting potential such as energy, production and processing of metals, minerals, chemicals, waste management and rearing of animals. It defines the obligations to be met by industrial activities with a major pollution potential. This includes establishing a permit procedure, requirements for Best Available Techniques (BAT) and setting out requirements for discharges.	The SEA assessment framework should include criteria that ensure the protection of the environment through the prevention of pollution.
European Commission (2011) *Directives on Environmental Impact Assessment* (Codified Directive 2011/92/EU and Revised Directive 2014/52/EU)	
The Directive, as enacted in 1985, amended, codified in 2011 and revised in 2014, sets out procedural requirements for certain development proposals to undergo an Environmental Impact Assessment (EIA) before being granted consent through the town and country planning or other consenting regimes. The UK Government is obliged to transpose the Revised EIA Directive by May 2017.	The SEA should recognise that certain development proposals require an EIA to be undertaken, resulting in the identification of any likely significant environmental effects and associated mitigation measures.
European Commission (2011) *A Roadmap for Moving to a Competitive Low Carbon Economy in 2050*	
The EU already has short term targets in place to reduce its emissions to 20% below 1990 levels by 2020; to increase the share of renewable energy to 20%; and to make a 20% improvement in energy efficiency. The 2050 roadmap looks beyond 2020 at longer term objectives. The roadmap suggests that by 2050, the EU should cut its emissions to 80% below 1990 levels through domestic reductions alone. It sets out milestones which form a cost-effective pathway to this goal - reductions of 40% by 2030 and 60% by 2040. It also shows how the main sectors responsible for Europe's emissions - power generation, industry, transport, buildings and construction, as well as agriculture - can make the transition to a low-carbon economy most cost-effectively.	The WRMP should seek to contribute to the reduction of the amount of carbon produced as much as possible and help towards achievement of the carbon reduction objectives. The SEA should have an objective relating to the need to reduce greenhouse gas emissions.
European Commission (2012) *A Blueprint to Safeguard Europe's Water Resources*	
This strategy aims to ensure that enough good quality water is available to meet the needs of people, the economy and the environment. The strategy includes: Improving implementation of current EU water policy; Increasing the integration of water policy objectives into other relevant policy areas such as agriculture, fisheries, renewable energy, transport and the Cohesion and Structural Funds; and Filling the gaps of the current framework, particularly in relation to the tools needed to increase water efficiency.	The commitment to conserving biological diversity must be considered in any options and the SEA should seek to promote the protection and enhancement of biodiversity
European Commission (2012) *Energy Efficiency Directive 2012/27/EU as amended by Directive (EU) 2018/2002*	
The 2012 Directive establishes a set of binding measures to help the EU reach its 20% energy efficiency target by 2020. Under the Directive, all EU countries are required to use energy more efficiently at all stages of the energy chain from its production to final consumption. Specific measures relate to: • energy distributors achieving 1.5% energy savings per year through energy efficiency measures; • improving the efficiency of heating systems, installing double glazed windows or insulating roofs;	The WRMP should seek to contribute towards targets for energy efficiency. The SEA assessment framework should include consideration of energy consumption and efficiency.

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• purchasing energy efficient buildings, products and services, and performing energy efficient renovations; • access to data on consumption; • large companies to audit energy consumption (implemented in the UK through the Energy Savings Opportunity Scheme Regulations 2014); • national incentives for SMEs to undergo energy audits; and • monitoring efficiency levels in new energy generation capacities. The new amending Directive on Energy Efficiency (2018/2002) was agreed to update the policy framework to 2030 and beyond. The key element of the amended directive is a headline energy efficiency target for 2030 of at least 32.5%. The target, to be achieved collectively across the EU, is set relative to the 2007 modelling projections for 2030. In absolute terms, this means that EU energy consumption should be no more than 1273 Mtoe (million tonnes of equivalent) of primary energy and/or no more than 956 Mtoe of final energy. After the UK no longer applies EU law (following its withdrawal from the EU), the equivalent target should be no more than 1128 Mtoe of primary energy and no more than 846 Mtoe of final energy. The directive allows for a possible upward revision in the target in 2023, in case of substantial cost reductions due to economic or technological developments. It also includes an extension to the energy savings obligation in end use, introduced in the 2012 directive. Under the amending directive, EU countries will have to achieve new energy savings of 0.8% each year of final energy consumption for the 2021-2030 period Other elements in the amended directive include: • stronger rules on metering and billing of thermal energy by giving consumers - especially those in multi-apartment building with collective heating systems – clearer rights to receive more frequent and more useful information on their energy consumption, also enabling them to better understand and control their heating bills • requiring Member States to have in place transparent, publicly available national rules on the allocation of the cost of heating, cooling and hot water consumption in multi-apartment and multi-purpose buildings with collective systems for such services • monitoring efficiency levels in new energy generation capacities • updated primary energy factor (PEF) for electricity generation of 2.1 (down from the current 2.5) • a general review of the Energy Efficiency Directive (required by 2024).	
European Commission (2013) *Towards Social Investment for Growth and Cohesion 2014-2020*	
The Communication aims to directing Member States' policies towards social investment throughout life, with a view to ensuring the adequacy and sustainability of budgets for social policies. It also provides guidance to help reach the Europe 2020 targets by establishing a link between social policies, the reforms to reach the Europe 2020 targets and the relevant EU funds.	The WRMP should have regard of the Europe 2020 targets.
European Commission (2014) *The EU Regulation on invasive alien (non-native) species 1143/2014/EU*	

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This Regulation seeks to address the problem of invasive alien species in a comprehensive manner so as to protect native biodiversity and ecosystem services, as well as to minimize and mitigate the human health or economic impacts that these species can have.	The SEA assessment framework should include guide questions relating to invasive species
European Commission (2014) *A Policy Framework for Climate and Energy in the Period from 2020 to 2030*	
The 2030 climate and energy framework was adopted in 2014 and builds on the 2020 targets. It sets three key targets for 2030: • at least 40% cuts in greenhouse gas emissions (from 1990 levels); • at least 27% share for renewable energy; and • at least 27% improvement in energy efficiency. The greenhouse gas emissions and renewable energy targets are binding, while the energy efficiency target will be reviewed in 2020.	The WRMP should support longer term targets for reducing greenhouse gas emissions, increasing renewable energy and energy efficiency. The SEA assessment framework should include the consideration of energy and greenhouse gas emissions.
European Commission (2015) *'Closing the loop - An EU Action Plan for the Circular Economy' policy package*	
This document sets out actions to implement the European Commission's long-term vision of significantly reducing waste landfilling and increasing recycling.	The SEA should consider opportunities for the WRMP to contribute/enable the circular economy. The SEA assessment framework should contain an objective/guide question relating to material/resource use and waste.
European Commission (2016) *National Emissions reduction Commitments (NEC) Directive 2016/2284/EU*	
The National Emission reduction Commitments Directive sets national emission reduction commitments for Member States and the EU for five important air pollutants: nitrogen oxides (NOx), non-methane volatile organic compounds (NMVOCs), sulphur dioxide (SO2), ammonia (NH3) and fine particulate matter (PM2.5). The NEC Directive highlights the importance of Member States regularly reporting air pollutant emission inventories for assessing progress in reducing air pollution in the EU and for ascertaining whether Member States are in compliance with their commitments. The directive introduces a number of new reporting requirements for Member States. These include annual information on emissions of a number of pollutants: • the five main air pollutants NOx, NMVOCs, SO2, NH3 and PM2.5 as well as carbon monoxide (CO); • in addition to PM2.5, also PM10 particulate matter and, if available, black carbon (BC) and total suspended particulate matter (TSP); • heavy metals cadmium (Cd), lead (Pb) and mercury (Hg) and, if available, the additional heavy metals arsenic, chromium, copper, nickel, selenium and zinc);	The WRMP should seek to reduce the emissions of the pollutants listed under the directive, where possible. The SEA assessment framework should include an objective and guide questions relating to air pollution/pollutant emissions.

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persistent organic pollutants (POPs) including selected polycyclic aromatic hydrocarbons (PAHs), dioxins and furans, polychlorinated biphenyls (PCBs) and hexachlorobenzene (HCB).	
European Commission (2020) *Biodiversity strategy for 2030*	
The EU's biodiversity strategy for 2030 is a comprehensive, ambitious and long-term plan to protect nature and reverse the degradation of ecosystems. The strategy aims to put Europe's biodiversity on a path to recovery by 2030, and contains specific actions and commitments. The strategy contains specific commitments and actions to be delivered by 2030. • Establishing a larger EU-wide network of protected areas on land and at sea • Launching an EU nature restoration plan • Introducing measures to enable the necessary transformative change • Introducing measures to tackle the global biodiversity challenge.	The WRMP should seek to protect and enhance biodiversity, particularly designated sites. The SEA assessment framework should include objectives, indicators and targets that cover biodiversity.
European Commission (2022) *Eighth Environmental Action Programme*	
The 8th EAP anchors the Member States' and Parliament's commitment to environmental and climate action until 2030, guided by a long-term vision to 2050 of wellbeing for all, while staying within the planetary boundaries. The agreed 8th EAP has six priority objectives related to climate neutrality, climate adaptation, circular economy, zero pollution, protecting and restoring biodiversity, and reducing environmental and climate pressures related to production and consumption. In addition, the programme sets out an enabling framework and a monitoring framework to measure progress towards the required systemic change.	The SEA assessment framework should, where relevant, reflect the objectives of the proposal for the programme.
European Commission (2021) *EU strategy on adaptation to climate change*	
The strategy sets out how the European Union can adapt to the unavoidable impacts of climate change and become climate resilient by 2050. The Strategy has four principle objectives: • to make adaptation smarter; • to make adaption swifter; • to make adaption more systemic, and; • to step up international action on adaptation to climate change.	The WRMP should seek to contribute towards climate change adaption. The SEA assessment framework should include an objective relating to climate change and consideration of climate change adaption.
ICOMOS (2011) *Guidance on Heritage Impact Assessments for Cultural World Heritage Properties*	
This document provides guidance on the process of Commissioning Heritage Impact Assessments (HIAs) for World Heritage properties in order to evaluate effectively the impact of potential development on the Outstanding Universal Value (OUV) of properties. The guidance is addressed at managers, developers, consultants and decision-makers and is also intended to be relevant to the World Heritage Committee and States Parties. The concept of OUV underpins the whole World Heritage Convention and all activities associated with properties inscribed on the List.	The SEA Framework should include an objective on the conservation and enhancement of heritage.
IUCN (2013) *World Heritage Advice Note: Environmental Assessment*	

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This Advice Note provides States Parties and other stakeholders with guidance on how to identify, evaluate, avoid and mitigate potential impacts of development proposals on World Heritage values, before decisions are taken. It provides guidance on integrating natural World Heritage Sites within Environmental Assessments. It includes a set of World Heritage Impact Assessment Principles that can be applied to all types of environmental Assessments, a list of key questions to ask concerning World Heritage during the assessment as well as step-by-step guidance.	The WRMP should seek to contribute towards the protection of World Heritage Sites. The SEA assessment framework should include objectives and guide questions relating to the conservation of World Heritage Sites. The SEA assessment should also reflect/incorporate the principles of the guidance, where relevant.
UNEP (1973) *Convention on International Trade in Endangered Species of Wild Fauna and Flora*	
CITES is an international agreement between governments which aims to ensure that international trade in wild animals and plants does not threaten their survival. It subjects international trade to certain controls, and all import, export, re-export and introduction (by sea) of species covered by the Convention has to be authorized through a licensing system. Species are listed in three Appendices according to the degree of protection needed, with differing controls for each.	The WRMP should seek to ensure the protection of vulnerable species. The SEA assessment framework should incorporate the protection of animal and plant species.
UNESCO (1971) *Ramsar Convention on Wetlands of International Importance*	
The Convention on Wetlands of International Importance was signed in Ramsar, Iran in 1971. It is an intergovernmental treaty which provides the framework for national action and international co-operation for the conservation and wise use of wetlands and their resources, as a means to achieving sustainable development throughout the world. The original emphasis was on the conservation and wise use of wetlands primarily to provide habitat for water birds, however over the years the Convention has broadened its scope to incorporate all aspects of wetland conservation and wise use, recognising wetlands as ecosystems that are extremely important for biodiversity conservation and for the well-being of human communities. 'The Convention's mission is the conservation and wise use of all wetlands through local, regional and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world' (Ramsar COP8, 2002). The Fourth Ramsar Strategic Plan 2016-2024 has been adopted to provide guidance on how efforts for implementing the Convention on Wetlands should be focussed. The strategy has three strategic goals and one operational goal: • Strategic Goal 1: Addressing the Drivers of Wetland Loss and Degradation • Strategic Goal 2: Effectively Conserving and Managing the Ramsar Site Network • Strategic Goal 3: Wisely Using All Wetlands • Operational Goal 1: Enhancing Implementation The plan also contains 19 targets which fall under each of the goals. Implementing each of these will also contribute to the achievement of the Sustainable Development Goals (SDGs) and targets.	The WRMP should ensure the protection and wise use of wetlands. The SEA assessment framework should incorporate the protection of wetland sites listed under the Ramsar convention.

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UNESCO (1972) *Convention Concerning the Protection of the World Cultural and Natural Heritage*	
The Convention defines the kind of natural or cultural sites which can be considered for inscription on the World Heritage List. In addition to this, countries are required to: • Ensure that measures are taken for the protection, conservation and presentation of cultural and natural heritage • Adopt a general policy that gives cultural and natural heritage a function in the life of the community • Integrate the protection of heritage into comprehensive planning programmes	The WRMP should seek to protect cultural heritage sites. The SEA assessment framework should include an objective on heritage and archaeological issues.
UNESCO (2001) *Convention on the Protection of Underwater Cultural Heritage*	
The Convention sets a common standard for the protection of submerged cultural heritage, with a view to preventing its being looted or destroyed. The Convention sets out basic principles for the protection of underwater cultural heritage; provides a detailed State cooperation system; and provides widely recognised practical rules for the treatment and research of underwater cultural heritage. This includes obligations to preserve such heritage, a preference for in situ preservation, and no commercial exploitation.	The WRMP should seek to protect cultural heritage sites. The SEA assessment framework should include an objective relating to cultural heritage.
United Nations (1992) *Convention on Biological Diversity (The Rio Convention)*	
The Convention on Biodiversity called for the development and enforcement of national strategies and associated action plans to identify, conserve and protect existing biological diversity, and to enhance it wherever possible. In the UK, the UK Biodiversity Action Plan was then established to conserve and enhance biodiversity in the UK through the use of Habitats and Species Action Plans to help the most threatened species and habitats to recover and to contribute to the conservation of global biodiversity.	The WRMP should seek to protect and enhance biodiversity. The SEA assessment framework should include protection and enhancement of biodiversity
United Nations (1997) *The Kyoto Protocol to the UN Framework Convention on Climate Change*	
The Kyoto Protocol was adopted in Kyoto, Japan, on 11 December 1997 and entered into force on 16 February 2005. It is an international agreement linked to the United Nations Framework Convention on Climate Change. The major feature of the Kyoto Protocol is that it sets binding targets for industrialized countries for reducing greenhouse gas (GHG) emissions. These amounted to an average of five per cent against 1990 levels in the first commitment period (2008 to 2012). The Protocol is planned to be extended to 2020 (the Kyoto second commitment period), pending ratification of the Doha Agreement.	The WRMP should aim to reduce greenhouse gas emissions. The SEA assessment framework should include objectives/guide questions related to reducing greenhouse gas emissions.
United Nations Economic Commission for Europe (1998), *Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (The Aarhus Convention)*	
To contribute to the protection of present and future generations to live in an environment adequate to his or her health and well-being. This will be achieved through each Party subject to the convention guaranteeing the rights of access to information, public participation in decision-making, and access to justice in environmental matters in accordance with the provisions of this Convention. To establish and maintain a clear, transparent and consistent framework to implement the provisions of this Convention. This will be achieved through each Party taking the necessary legislative, regulatory and other measures, including measures to achieve compatibility between the provisions implementing the	The development of the WRMP needs to be a transparent process. The SEA should show a strong sense of safeguarding the lives of future generations and ensure that enough time is provided for consultation on the SEA documents in line

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information, public participation and access-to-justice provisions in this Convention, as well as proper enforcement measures. Responsibility for implementation is deferred to the member states.	with the Aarhus convention of establishing and maintaining a transparent clear framework.
United Nations (2002) *The World Summit on Sustainable Development*	
The World Summit resulted in the Johannesburg Declaration on Sustainable Development and a Plan of Implementation. The declaration reaffirms principles already agreed upon at the Rio Earth Summit UNCED in 1992 and the UN Millennium Summit in 1999. It recognises that poverty eradication is a key condition for sustainable development and addresses issues such as cultural diversity, patterns of production and consumption, health issues, armed conflicts, the new dimension created by globalisation, gender issues and financing for development. The implementation plan sets out actions to achieve sustainable development such as poverty eradication, changing unsustainable patterns of consumption and production, protecting and managing the natural resource base of economic and social development, sustainable development in a globalizing world and health and sustainable development. Sustainable development in England is delivered through the sustainable development strategy, Securing the Future, and in Wales through One Wales: One Planet, The Sustainable Development Scheme of the Welsh Assembly Government.	The WRMP should promote sustainable development. The SEA should help to deliver sustainable development through the balanced assessment of the WRMP.
United Nations (2016) *The Paris Agreement*	
The Paris Agreement was adopted at the 2015 UN Climate Change Conference, which aims to limit global temperature rises to 2 degrees, and to pursue efforts to limit the temperature increase even further to 1.5 degrees. It was adopted by 195 countries at the Conference, and came into force in November 2016, following ratification by sufficient parties.	The WRMP should aim to reduce greenhouse gas emissions. The SEA assessment framework should include greenhouse gas emissions.
United Nations Framework Convention on Climate Change (UNFCCC) (2011) *The Cancun Agreements*	
The Cancun Agreements were a set of significant decisions by the international community to address the long-term challenge of climate change collectively and comprehensively over time, and to take concrete action immediately to speed up the global response to it. The agreements, reached on December 11 in Cancun, Mexico, at the 2010 United Nations Climate Change Conference, represented key steps forward in capturing plans to reduce greenhouse gas emissions, and to help developing nations protect themselves from climate impacts and build their own sustainable futures. The Cancun Agreements' main objectives cover: • Mitigation • Transparency of actions • Technology • Finance • Adaptation • Forests • Capacity building	The WRMP should aim to reduce greenhouse gas emissions and support climate change mitigation and adaption. The SEA assessment framework should include greenhouse gas emissions and climate change.

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World Commission on Environment and Development (1987) *Our Common Future (The Brundtland Report)*	
The Brundtland Report is concerned with the world's economy and its environment. The objective is to provide an expanding and sustainable economy while protecting a sustainable environment. The Report was a call by the United Nations: • to propose long-term environmental strategies for achieving sustainable development by the year 2000 and beyond; • to strengthen co-operation among developing countries and between countries at different stages of economic and social development to achieve common and mutually supportive objectives which take account of the interrelationships between people, resources, environment and development; • to consider ways and means by which the international community can deal more effectively with environment concerns; and • to help define shared perceptions of long-term environmental issues and the appropriate efforts needed to deal successfully with the problems of protecting and enhancing the environment, a long term agenda for action during the coming decades, and aspirational goals for the world community.	The SEA and WRMP should seek to contribute to sustainable development.
World Health Organisation (2004) *Children's Environment and Health Action Plan for Europe*	
The action plan aims to address the causes of environment-related diseases in children, including the state of the physical environment, socio-economic conditions and behaviour. Key actions include: • primary prevention, i.e. policies, programmes and plans aimed at improving the state of the physical environment (air, water, soil, noise), in particular through the integration of children's needs into housing, transport, infrastructure and planning; • equity, i.e. giving priority to protection of children at highest risk, and particularly of children who are neglected, abandoned, disabled, institutionalized or exploited, by improving access to preventive health and social protection services; • poverty reduction, i.e. policies addressing the multidimensional aspects of poverty among children; • health promotion, i.e. actions aimed at preventing and reducing exposures to environmental health hazards by adopting healthy lifestyles, achieving sustainable consumption patterns and helping to create healthy and enabling human settlements.	The WRMP should have regard to the requirements of the Action Plan. The SEA assessment framework should include for the protection of human health and vulnerable members of the community.

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BEIS (2011*) National Policy Statements for Energy Infrastructure*	
The energy National Policy Statements (NPSs) set out national policy against which proposals for major energy projects will be assessed and decided on by the Infrastructure Planning Commission. The following six NPSs have been designated:	The WRMP may need to consider the potential impact of major energy proposals

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• Overarching NPS for Energy (EN1); • Fossil Fuel Electricity Generating Infrastructure NPS (EN2); • Renewable Energy Infrastructure NPS (EN3) ; • Gas Supply Infrastructure & Gas and Oil Pipelines NPS (EN4); • Electricity Networks Infrastructure NPS (EN5); • Nuclear Power Generation NPS (EN6). The Overarching NPS for Energy sets out that the purpose of the NPSs is to develop a clear, long-term policy framework which facilitates investment in the necessary new infrastructure (by the private sector) and in energy efficiency. The NPS highlights that the construction, operation and decommissioning of this infrastructure can lead to increased demand for water, involve discharges to water and cause adverse ecological effects resulting from physical modifications to the water environment. The NPSs expect applicants to undertake an assessment of the existing status of, and impacts of the proposed project on, water quality, water resources and physical characteristics of the water environment. The NPSs reiterate and are underpinned by the target to cut greenhouse gas emissions by at least 80% by 2050, compared to 1990 levels.	water resources in the plan area. The SEA should consider the cumulative effects of the WRMP and any major energy proposals.
BEIS (2013) *UK Renewable Energy Roadmap*	
The Renewable Energy Roadmap outlines the UK's framework for delivering 15% of energy demand from renewable sources by 2020 (as mandated by the EU Renewable Energy Directive). Although starting from a low-level of renewable generation, eight technologies were identified that have the potential to generate 90% of the renewable target by 2020. These are: onshore wind, offshore wind, marine energy, biomass electricity, biomass heat, ground source and air source heat pumps and renewable transport. The Roadmap includes an indication from the Welsh Government that it has the potential to double the amount of renewable energy consumption by 2025, and to deliver 4GW of power from marine energy. The 2013 update highlights that offshore wind and marine energy have the potential to make significant contributions to meeting the UK's future energy needs	The WRMP should contribute towards increasing the proportion of energy from renewable energy sources. The SEA assessment framework should include consideration of the use of energy from renewable energy sources.
BEIS (2015) *Future Electricity Networks*	
Overall aims: • ensure the timely, cost-effective and reliable connection of electricity generation to demand • support a low-carbon, secure and affordable national system Specific objectives for future electricity networks: • maintain electricity network reliability • ensure new generation (renewables, nuclear and fossil fuels) and new demand (including electric vehicles and heat pumps) receive timely and affordable connection to the network • use regulation to make sure networks are cost effective, competitive and using smarter technology	The WRMP should consider if it can support the delivery of the aims of the strategy. The SEA should include objectives and guide questions relating to energy use.

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BEIS (2020) *Energy white paper: Powering our net zero future*	
The Energy White Paper sets out how the UK will clean up its energy system and reach net zero emissions by 2050, building on the Prime Minister's ten-point plan for a green industrial revolution The paper addresses the transformation of our energy system, promoting high-skilled jobs and clean, resilient economic growth as we deliver net-zero emissions by 2050.	Options from the WRMP should consider utilisation of green energy. The SEA should include objectives and guide questions relating to energy use and carbon emissions.
BEIS (2021) *Heat and buildings strategy*	
This strategy sets out how the UK will decarbonise our homes, and our commercial, industrial and public sector buildings, as part of setting a path to net zero by 2050. The heat and buildings strategy sets out the government's plan to significantly cut carbon emissions from the UK's 30 million homes and workplaces in a simple, low-cost and green way whilst ensuring this remains affordable and fair for households across the country. Like the transition to electric vehicles, this will be a gradual transition which will start by incentivizing consumers and driving down costs. There are about 30 million buildings in the UK. Heating these buildings contributes to almost a quarter of all UK emissions. Addressing the carbon emissions produced in heating and powering our homes, workplaces a public buildings can not only save money on energy bills and improve lives, but can support up to 240,000 skilled green jobs by 2035, boosting the economic recovery, levelling up across the country and ensuring we build back better.	The WRMP should consider the impact of water supply and usage on carbon emissions from buildings. The SEA should include objectives and guide questions relating to energy use and carbon emissions.
BEIS (2021) *Net Zero Strategy: Build Back Greener*	
The Net Zero Strategy sets out policies and proposals for keeping the UK on track for carbon budgets, the Nationally Determined Contribution (NDC), and sets out our vision for a decarbonised economy in 2050. The Strategy sets out a delivery pathway showing indicative emissions reductions across sectors to meet targets up to the sixth carbon budget (2033-2037).	The WRMP should consider if it can support the delivery of the aims of the strategy. The SEA should include objectives and guide questions relating to energy use and carbon emissions.
Canal & River Trust (2015) *Living Waterways Transform Places & Enrich Lives: Our 10 Year Strategy*	
The strategy sets out goals for the organisation for the next ten years. These are themed under: • Waterways, including: '*To encourage and grow the number of people boating, using and enjoying the waterways*' and '*To look after the heritage and wildlife on our canals and rivers for people to enjoy now and in the future'*; • Place, including: '*To provide havens for people to escape to away from the pressures of modern life*' and '*Enhance wildlife habitats and the natural landscape'*; • Prosperity, including: '*Our waterways to drive and be a catalyst for regeneration and developments that make a difference to the local area'* and '*To contribute to local economies and to provide opportunities and livelihoods for local people'*; and	The WRMP should avoid causing detrimental effects on canals and rivers. The SEA assessment framework should include objectives which take into account the goals of the strategy and the protection of rivers and canals.

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• People, including: '*Communities to feel ownership of, and get involved with caring for, their local waterway*' and '*To offer something for everyone to enjoy*'. These are in addition to goals relating to Influence and Resources.	
Canal and River Trust (2015) *Water Resources Strategy 2015 – 2020*	
The Strategy sets out the Canal and River Trust's overarching vision for the period 2015 – 2020 for how it intends to manage water resources across the inland waterway network that it manages. The strategy is focused on delivering long-term security of water supply for the Canal & River Trust to achieve its vision of living waterways that transform places and enrich lives.	The WRMP should take into consideration the potential impact on the supply of water to the inland waterway network within the SSW operational area. The SEA should consider the effects of the WRMP on the long-term supply of water to the canal network.
Centre for Environment Fisheries and Aquaculture Science and Natural Resources Wales (2021) Assessment of Salmon Stocks and Fisheries in England and Wales 2020	
Annual reports on the status of salmon stocks and fisheries in England and Wales have been produced since 1997. These reports present a preliminary assessment for the most recent year to assist the International Council for the Exploration of the Sea (ICES) in providing scientific advice to the North Atlantic Salmon Conservation Organisation (NASCO) and to provide early feedback to fishery managers and anglers.	The WRMP should consider the information on salmon stocks and fisheries and the potential effects of WRMP measures on stocks and fisheries. The SEA should consider the effects of the WRMP on salmon stocks and fisheries and should include objectives and guide questions relating to the protection of salmon stocks and fisheries.
Climate Change Committee (2020) *The path to Net Zero and progress on reducing emissions in Wales*	
These documents are a series of reports on Wales's net zero carbon targets and ways in which Wales will achieve these targets. The December 2020 Advice Report: The path to a net zero Wales recommends that the Welsh Government revise targets and seek to reduce all greenhouse gas emissions to net zero by 2050. One of the reports looks into how Wales is progressing against previous requirements to reduce its carbon footprint. Key to achieving these targets is: • Adopting low-carbon solutions; • Expanding low-carbon energy supplies; • Reduce demand for high-carbon activities; and • Transforming land away from agriculture.	The WRMP should seek to contribute to the reduction of the amount of carbon produced as much as possible and help towards achievement of net zero greenhouse gas emissions by 2050. The SEA should have an objective relating to sustainable development that references the need to reduce greenhouse gas emissions.
Department for Culture, Media and Sport (DCMS) (2001) *The Historic Environment – A Force for the Future*	

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This strategy outlines the Governments policy regarding the historic environment. The strategy has key aims and objectives that demonstrate the contribution the historic environment makes to the country's economic and social well-being.	The WRMP and the SEA should seek to ensure any adverse effects on heritage assets are minimised or avoided.
DCMS and Welsh Government (2007) *Heritage Protection for the 21st Century*	
The document has three core principles: • Developing a unified approach to the historic environment; • Maximising opportunities for inclusion and involvement; and • Supporting sustainable communities by putting the historic environment at the heart of an effective planning system.	The assessment framework should include objectives which take into account the White Paper's principles.
DCMS (2013) *Scheduled Monuments & Nationally Important but Non-Scheduled Monuments*	
This policy statement sets out Government policy on the identification, protection, conservation and investigation of nationally important ancient monuments, under the provisions of the Ancient Monuments and Archaeological Areas Act 1979. It includes principles relating to the selection of scheduled monuments and the determination of applications for scheduled monument consent.	The WRMP should seek to avoid adverse impacts on scheduled and non-scheduled monuments. The SEA assessment framework should include specific objectives relating to cultural heritage
DCMS (2016) *The Culture White Paper*	
This white paper sets out how the government will support the cultural sectors over the coming years and how culture will play an active role in building a fairer and more prosperous nation. It includes four key themes: • everyone should enjoy the opportunities culture offers, no matter where they start in life; • the riches of our culture should benefit communities across the country; and • the power of culture can increase our international standing. The white paper includes objectives relating to the development of the historic environment sector, and the protection of world heritage.	The WRMP should seek to protect cultural heritage assets. The SEA assessment framework should include an objective relating to cultural heritage.
Defra (2004) *Rural Strategy*	
The strategy sets out rural and countryside policy, and draws upon from lessons learnt following the rural white paper. Objectives include supporting economic and social regeneration across rural England and enhance the value of the countryside and protect the natural environment for this and future generations.	The implementation of certain Plan options may have an effect upon rural communities and the countryside. The SEA should also seek to ensure that the quality of the region's landscapes, natural resources and biodiversity are maintained or enhanced.
Defra (2005) *Making space for water: taking forward a new government strategy for flood and coastal erosion risk management in England*	
The programme seeks to embed flood and coastal erosion risk management across a range of Government policies, including planning, urban and rural development,	The WRMP should seek to support the objectives of the strategy, where possible.

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agriculture, transport, nature conservation and conservation of the historic environment. The main objectives of the strategy are: • To reduce the threat of flooding to people and their property, and • To deliver the greatest environmental, social and economic benefit, consistent with the Government's sustainable development principles. There are no formal targets or indicators.	The SEA should seek to ensure that coastal erosion in the region is not adversely affected by the implementation of the WRMP.
Defra (2006) *Shoreline Management Plan Guidance*	
A shoreline management plan (SMP) is a coastal defence management tool. It is a large-scale assessment of the risks associated with coastal processes and helps to reduce these risks to people and the developed, historic and natural environment. This guidance document sets out Defra's and the Welsh Government's strategy for managing flooding and coastal erosion. The guidance includes the following objectives: • set out the risks from flooding and erosion to people and the developed, historic and natural environment within the SMP area; • identify opportunities to maintain and improve the environment by managing the risks from floods and coastal erosion; • identify the preferred policies for managing risks from floods and erosion over the next century; • identify the consequences of putting the preferred policies into practice; • set out procedures for monitoring how effective these policies are; • inform others so that future land use, planning and development of the shoreline takes account of the risks and the preferred policies; • discourage inappropriate development in areas where the flood and erosion risks are high; and, • meet international and national nature conservation legislation and aim to achieve the biodiversity objectives.	The WRMP should seek to align with the objectives of the guidance where appropriate. The SEA should take into account the effects of the WRMP on areas with a SMP.
Defra (2007) *The Air Quality Strategy for England, Scotland, Wales and Northern Ireland*	
The Air Quality Strategy sets out air quality objectives and policy options to further improve air quality in the UK to benefit public health, quality of life and help to protect our environment. The strategy sets out objectives relating to particles, nitrogen dioxide, ozone, sulphur dioxide, polycyclic aromatic hydrocarbons, benzene, 1,3-butadiene, carbon monoxide, lead, nitrogen oxides and sulphur dioxide.	The WRMP should take account of air quality objectives in the strategy. The SEA should include objectives and guide questions relating to air quality, human health and environmental protection.
Defra (2009) *Safeguarding our Soils – A Strategy for England*	
The new Soil Strategy for England – Safeguarding our Soils outlines the Government's approach to safeguarding our soils for the long term. It provides a clear vision to guide future policy development across a range of areas and sets out the practical steps that we need to take to prevent further degradation of our soils,	The SEA should seek to ensure that the quality of the region soils and their management is protected or enhanced.

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enhance, restore and ensure their resilience, and improve our understanding of the threats to soil and best practice in responding to them. The Government's vision is that: By 2030, all England's soils will be managed sustainably and degradation threats tackled successfully. This will improve the quality of England's soils and safeguard their ability to provide essential services for future generations.	
Defra, Department of the Environment (NI), Scottish Government and Welsh Assembly Government (2010) *Air Pollution: Action in a Changing Climate*	
This document highlights the health benefits that can be achieved through closer integration of air quality and climate change policies. Air pollution often originates from the same activities that contribute to climate change (notably transport and electricity generation), so linkages between these policy areas could help ensure that they are managed most effectively. Air quality/climate change co-benefits can be realised through actions such as promoting low-carbon vehicles and renewable sources of energy that do not involve combustion. The document aims to set ambitious but realistic air quality targets, and to ensure that climate and air quality targets are better aligned in future.	The WRMP should seek to ensure that air quality, climate change and human health are not adversely affected by the options/measures set out in the plan. The SEA should include guide questions relating to the effects of options on human health and the environment.
Defra (2010) *Making Space for Nature: A Review of England's Wildlife Sites and Ecological Network*	
This independent review of England's wildlife sites and the connections between them sets objectives and recommendations to help achieve a healthy natural environment that will allow our plants and animals to thrive.	The SEA should seek to maintain and enhance the quality of habitats and biodiversity, where possible.
Defra (2011) *UK National Ecosystem Assessment* and Defra (2014) *UK National Ecosystems Assessment Follow on, Synthesis of Key Findings*	
Ecosystems services from natural capital contribute to the economic performance of the nation. Information and tools to enable decision makers to understand the wider value of ecosystems and their associated services.	For the purposes of the readership integrating an ecosystems services approach into the SEA is not being undertaken. However, it is realised that through the 'Objective-led' approach, many of the services relevant to the WRMP can be considered through the objectives and guide questions for example: • Provisioning Services: Freshwater • Provisioning Services: Biodiversity • Regulating Services: Water Regulation • Cultural services: Recreation and ecotourism • Cultural services: Cultural heritage values

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	• Cultural services: Aesthetic The SEA should ensure the WRMP affects the related provisioning services in the least damaging way through informing the WRMP formulation and selection of options. In the event of further guidance being issued on incorporating ESA into SEA, the anticipated approach is sufficiently flexible that it should be able to accommodate this (subject to timing).
Defra (2011) *Water for Life - Water White Paper*	
Water for Life describes a vision for future water management in which the water sector is resilient, in which water companies are more efficient and customer focused, and in which water is valued as the precious and finite resource it is. The White Paper includes several proposals for deregulating and simplifying legislation, to reduce burdens on business and stimulate growth. Ofwat's proposals for reducing its regulatory burdens complement these.	The WRMP should ensure that future water resources are resilient, efficient and customer focused The SEA should consider resilience to climate change and should consider the human environment to ensure the WRMP remains customer focused.
Defra (2011) *Biodiversity 2020: A Strategy for England's Wildlife and Ecosystem Services*	
This new biodiversity strategy for England provides a comprehensive picture of how we are implementing our international and EU commitments. It sets out the strategic direction for biodiversity policy for the next decade on land (including rivers and lakes) and at sea. The strategy sets 20 targets across 5 strategic goals: • Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society; • Reduce the direct pressures on biodiversity and promote sustainable use; • Improve status of biodiversity by safeguarding ecosystems, species and genetic diversity; • Enhance the benefits to all from biodiversity and ecosystem services; and Enhance implementation through participatory planning, knowledge management and capacity building.	The WRMP should contribute towards meeting the targets and objectives within the strategy where possible. The SEA should include objectives to improve status of biodiversity and enhance benefits of biodiversity and its ecosystem services, and reduce pressures on ecosystems.
Defra (2011) *Mainstreaming Sustainable Development*	
This document sets out the Government's vision for mainstreaming sustainable development in relation to the operation of its buildings and estates, including the goods and services that it buys and the policies it makes. It builds on the principles that underpinned the UK's 2005 sustainable development strategy, and highlights	The WRMP should seek to be aligned with the principles of sustainable development. The SEA assessment framework should include

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that long term economic growth relies on protecting and enhancing the environmental resources that underpin it, and paying due regard to social needs. It sets out measures to achieve the mainstreaming of sustainable development, which include ministerial leadership and oversight; leading by example; embedding sustainable development in government policy; and transparency and independent scrutiny.	objectives relating to the principles of sustainable development, including communities, economy and environment.
Defra (2011) *The Natural Choice: Securing the Value of Nature*	
The paper addresses the Government's approach to valuing economic and social benefits of a healthy natural environment while continuing to recognise nature's intrinsic value. It describes the vision of the Government for this to be the first generation to leave the natural environment of England in a better state than it inherited, requiring placing the value of nature at the heart of decision-making – in Government, local communities and businesses. Approaches to mainstream the value of nature across society include: Facilitating greater local action to protect and improve nature; Creating a green economy, in which economic growth and the health of our natural resources sustain each other, and markets, business and Government better reflect the value of nature; Strengthening the connections between people and nature to the benefit of both; and Showing leadership in the European Union and internationally, to protect and enhance natural assets globally.	Ecosystem services may include: Provisioning Services: Biodiversity Regulating Services: Water Regulation Cultural services: Recreation and ecotourism Cultural services: Cultural heritage values Cultural services: Aesthetic. The SEA should ensure the WRMP meets provisioning services in the least damaging way through WRMP options.
Defra (2011) *Natural Environment White Paper*	
The Natural Environment White Paper (2011) recognises that nationally, the fragmentation of natural environments is driving continuing threats to biodiversity. It sets out the Government's policy intent to: • improve the quality of the natural environment across England; • move to a net gain in the value of nature; • arrest the decline in habitats and species and the degradation of landscapes; • protect priority habitats; • safeguard vulnerable non-renewable resources for future generations; • support natural systems to function more effectively in town, in the country and at sea; and • create an ecological network which is resilient to changing pressures. By 2020, the Government wants to achieve an overall improvement in the status of the UK's wildlife including no net loss of priority habitat and an increase of at least 200,000 hectares in the overall extent of priority habitats. Under the White Paper, the Government has also put in place a clear institutional framework to support nature restoration which includes Local Nature Partnerships creating new Nature Improvement Areas (NIAs).	The WRMP should reflect the Government's policy intent set out in the White Paper. The SEA assessment framework should include objectives, indicators and targets that reflect the Government's policy intent set out in the White Paper.
Defra (2012) *National Policy Statement for Waste Water*	
This National Policy Statement (NPS) sets out Government policy for the provision of major waste water infrastructure. It will be used by the Infrastructure Planning Commission (IPC) to guide its decision making on development consent applications for waste water developments that fall within the definition of Nationally Significant Infrastructure Project (NSIP) as defined in the Planning Act 2008.	The WRMP should be compliant with the policies set out within the National Policy Statement. The WRMP should also consider any unforeseen NSIP proposals that come forward prior to adoption which may affect

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	water resource management in SSW area. The SEA should consider the cumulative effects of the WRMP and any unforeseen NSIP proposals that come forward which may affect water resource management in the SSW area.
Defra (2013) *The National Adaptation Programme – Making the Country Resilient to a Changing Climate*	
This Programme contains a mix of policies and actions to help adapt successfully to future weather conditions, by dealing with the risks and making the most of the opportunities. It sets out a number of objectives, including: • To provide a clear local planning framework to enable all participants in the planning system to deliver sustainable new development, including infrastructure that minimises vulnerability and provides resilience to the impacts of climate change. • To increase the resilience of homes and buildings by helping people and communities to understand what a changing climate could mean for them and to take action to become resilient to climate risks. To ensure infrastructure is located, planned, designed and maintained to be resilient to climate change, including increasingly extreme weather events.	The WRMP should ensure that proposals are resilient to the effects of climate change. Where possible, options should be considered that enhance resilience. The SEA should consider the effects of options on climate change resilience.
Defra (2013) *What nature can do for you*	
This guide is designed to help policy makers across Government to understand: • The value of what nature does for you now, • The costs and risks we are leaving ourselves open to if we fail to take the value of its services into account in our decisions, • How you can work with natural systems to help you deliver efficiently in the future. The guide is focussed on helping policy makers to put this into practice and includes: • A clear explanation of the principles of an ecosystems approach • Details on how an ecosystems approach can help policy makers to take account of the value of the natural environment at every stage of the policy making process • 1 hour of essential reading to help readers quickly get up to speed on this issue • A 'self-assessment' to help policy makers to see how they are doing already and what could be gained by doing more to understand how the natural environment interacts with their policy issue • Sign-posting to a range of detailed resources, case-studies and further reading on specific topics such as valuation and systematic thinking.	The WRMP should consider how to work with natural systems to provide efficient solutions with multiple benefits where possible, aiming to implement an ecosystems approach. The SEA should consider the effects of the WRMP on nature.
Defra (2015) *The government's response to the Natural Capital Committee's Third State of Natural Capital report*	

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This provides a number of recommendations such as: Agreement for the development of a 25 year plan for a healthy natural economy. This includes helping organisations understand the economic, social and cultural value the impact their actions have on it and how to use the knowledge for better decisions; identify most important and threatened environmental assets; protection of designated areas; address outstanding monitoring and data issues to enable better decisions about strategic investments in natural capital. Assigning institutional responsibility for monitoring the state of natural capital. Organisations that manage land and water assets should create a register of natural capital for which they are responsible.	Outputs from the SEA process will help to inform any future potential development by SSW of Natural Capital Accounting (NCA) approaches to assessing environmental asset performance. Government (led by HM Treasury and Defra) is increasingly using NCA to support future environmental policy and decision making, and there may be future expectations on water companies to follow suit.
Defra (2015) *The Great Britain Invasive Non-native Species Strategy*	
The strategy sets out key aims and actions for addressing the threats posed by invasive non-native species, including the prevention of invasive species arriving in Britain, early detection and monitoring, eradication and control. It also aims to: • get people to work better together, including the government, stakeholders, land managers and the general public; and • improve co-ordination and co-operation on issues at a European and international level. The strategy covers the period 2015 to 2020.	The WRMP should seek to avoid the spread of invasive species. The SEA should consider the effects of the WRMP on biodiversity.
Defra (2016) *Guiding principles for water resources planning for water companies operating wholly or mainly in England*	
The document sets out the key policy priorities the government expects water resources management plans (WRMP) to address. The four key principles are: • Take a long term, strategic approach to protecting and enhancing resilient water supplies; • Consider every option to meet future public water supply needs; • Protect and enhance our environment, acting collaboratively; and • Promote efficient water use and reduce leakage.	The WRMP should consider the guiding principles.
Defra (2017) *Air Quality Plan for Nitrogen Dioxide (NO2) in UK*	
This plan sets out how the Government will improve air quality in the UK by reducing nitrogen dioxide emissions in towns and cities. The air quality plans set out targeted local, regional and national measures across 37 zone plans (areas which have identified air quality issues with nitrogen dioxide), a UK overview document and a national list of measures. Measures relate to freight, rail, sustainable travel, low emission vehicles and cleaner transport fuels, among others.	The WRMP should have regard to the air quality plans and specific local measures. The SEA should consider the effects of the WRMP on air quality.
Defra (2018) *The National Adaptation Programme and the Third Strategy for Climate Adaptation Reporting*	
The National Adaptation Programme (NAP) sets the actions that government and others will take to adapt to the challenges of climate change in the UK. It sets out key actions for the next 5 years. Flooding and pressure on water services are considered to be cross cutting risks. The report also details how the third cycle of adaptation	The WRMP should ensure that proposals are resilient to the effects of climate change. Where possible, options

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reporting will be managed, forming part of the five-yearly cycle of requirements laid down in the Climate Change Act 2008.	should be considered that enhance resilience. The SEA should consider the potential to include adaptive measures for climate change.
Defra (2020) *Drought Plan Direction 2020*	
Sets out the timescales for water companies to develop and consult on Drought Plans.	The WRMP SEA will take account of the statutory requirements of this Direction, where relevant.
Defra (2020) *National food strategy for England*	
This independent report looks at the entire food chain, from field to fork. This includes production, marketing, processing, sale and purchase of food (for consumption in the home and out of it). It also looks at the consumer practices, resources and institutions involved in these processes. The report makes recommendations for government, which has promised to respond formally with a White Paper within 6 months.	The implementation of the WRMP may have some indirect links with the food industry, through ensuring the availability of water for food based activities. The SEA should also seek to promote the most effective use of the region's natural resources
Defra (2020) *Natural Capital Committee's Seventh Annual Report*	
The government published its 25 Year Environment Plan (25 YEP) in 2018, setting out how it will deliver on its commitment to leave the environment in a better state for the next generation: as first made in the 2011 White Paper, The Natural Choice. Progress on the Agriculture and Fisheries Bills has been limited, but the Natural Capital Committee (NCC) welcomes the legislation for a target of net-zero greenhouse gas emissions by 2050. Nature based interventions will be critical in meeting this target.	Outputs from the SEA process will help to inform any future potential development by SSW of Natural Capital Accounting (NCA) approaches to assessing environmental asset performance. Government (led by HM Treasury and Defra) is increasingly using NCA to support future environmental policy and decision making, and there may be future expectations on water companies to follow suit.
Defra (2020) *The Path to Sustainable Farming: An Agricultural Transition Plan 2021 to 2024*	
The path to sustainable farming is aiming to achieve: • a renewed agricultural sector, producing healthy food for consumption at home and abroad, where farms can be profitable and economically sustainable without subsidy • farming and the countryside contributing significantly to environmental goals including addressing climate change	The implementation of the WRMP may have some indirect links with the food industry, through ensuring the availability of water for food based activities. The SEA should also seek to promote the most effective use of the region's natural resources, including soil, biodiversity and energy resources.

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Defra (2020) *Water abstraction plan: Environment*	
This document sets out how the government will reform water abstraction management over the coming years and how this will protect the environment and improve access to water. The plan states that the current approach to managing abstraction has three main issues: • some older licences allow abstraction that can damage the environment; • the current approach is not flexible enough to cope with the pressures of increasing demand for water and climate change in the long term, or to allow abstractors access to additional water when it is available; and, • the abstraction service is outdated and paper-based. The plan explains how approaches identified to address these issues will be implemented. The Government's approach to addressing these issues has three main elements: • making full use of existing regulatory powers and approaches to address unsustainable abstraction and move around 90% of surface water bodies and 77% of groundwater bodies to the required standards by 2021 • developing a stronger catchment focus – bringing together the Environment Agency, abstractors and catchment groups to develop local solutions to existing pressures and to prepare for the future. These local solutions will: o protect the environment by changing licences to better reflect water availability in catchments and reduce the impact of abstraction o improve access to water by introducing more flexible conditions that support water storage, water trading and efficient use • supporting these reforms by modernising the abstraction service, making sure all significant abstraction is regulated and bringing regulations in line with other environmental permitting regimes The supplementary *Environment* provides further information on the work to address unsustainable abstraction set out in the abstraction plan. The supplementary *Catchment Focus* document provides further information on proposals set out in the abstraction plan to develop a stronger catchment focus. This is about bringing together the Environment Agency, abstractors and catchment partnerships to identify and implement local solutions to existing pressures and to prepare for the future. The supplementary *Abstraction Licencing Service* document provides further information on the planned reforms to the abstraction licensing service set out in the abstraction plan.	The WRMP should consider if it can help to address the issues set out in the plan. The SEA should consider the effects of the WRMP on the environment, climate change and the sustainability of options.
Defra (2021) *Waste Management Plan for England*	
The Waste Management Plan for England is an analysis of the current waste management situation in England. The plan does not introduce new policies or change how waste is managed in England. Its aim is to bring current waste management policies together under one national plan.	The WRMP may involve the generation of waste (e.g. either through construction requirements or operation of options). The SEA should seek to enhance recycling and

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	minimise the amount of waste going to landfill.
Defra and the Environment Agency (2018) *Resources and Waste Strategy for England*	
This white paper outlines a package of reforms so that by 2030 there will be a flexible, smart and responsive electricity system, powered by a range of low carbon sources of electricity. This includes engaging with consumers on energy use. Decarbonisation is important in meeting the 2050 targets.	The implementation of the WRMP may have an influence upon SSW total energy use. The SEA should seek to promote energy efficiency, as well as seeking to reduce the effects of climate change through greenhouse gas emissions. The SEA should also promote the use of renewable energy, where relevant.
Defra, Environment Agency, Natural England, Forestry Commission England (2016) *Creating a great place for living*	
In 2016 Defra produced a report that set out objects to great a great place for living. The objectives are related to the following topics: • Environment – a cleaner, healthier environment, benefiting people and the economy; • Food and farming – a world-leading food and farming industry; • Rural – a thriving rural economy, contributing to national prosperity and wellbeing; • Protection – a nation better protected against floods, animal and plant diseases and other hazards, with strong response and recovery capabilities; • Excellent Delivery – Excellent delivery, on time and to budget with outstanding value for money; An outstanding organisation – an organisation striving to be the best, focused on outcomes and constantly challenging itself.	The SEA must take into account impacts of plan options (construction and operation) on the environment, as well as the population and human health and land use (which will impact on the food and farming and rural objectives).
Defra and the Law Commission (2018) *Draft National Policy Statement for Water Resources Infrastructure*	
The Government has laid before Parliament a draft National Policy Statement for water resources infrastructure. The NPS summarises the water infrastructure funding process. This would streamline the planning process for certain types of large-scale water supply project, under the regime for nationally significant infrastructure established in the Planning Act 2008. The draft NPS proposes that, if a nationally significant infrastructure project is identified in a company's final water resources management plan (WRMP), then the need for that project will have been established as part of a fast-tracked development consent application.	The draft NPS will influence implementation of large scale options identified by the WRMP. The SEA should consider the impacts of these large scale options on various environmental criteria.
Defra, Scottish Government, Welsh Government (2015) *The Great Britain Invasive Non-native Species Strategy*	
The strategy sets out key aims and actions for addressing the threats posed by invasive non-native species, including the prevention of invasive species arriving in Britain, early detection and monitoring, eradication and control. It also aims to: • get people to work better together, including the government, stakeholders, land managers and the general public; and	The WRMP should seek to avoid the spread of invasive species.

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• improve co-ordination and co-operation on issues at a European and international level. The strategy covers the period 2015 to 2020.	The SEA should consider the effects of the WRMP on biodiversity.
Defra and Welsh Government (2014) *River Basin Planning Guidance*	
Aims to give guidance on practical implementation of the Water Framework Directive (WFD). The river basin planning process involves setting environmental objectives for all groundwater and surface waters (including estuaries and coastal waters) within the river basin district, and devising programmes of measures to meet those objectives.	The WRMP should take into account the contents of this statutory guidance
Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government) (2014) *National Planning Policy for Waste*	
Sets out detailed waste planning policies for local authorities. States that planning authorities need to: • Need to use a proportionate evidence base in preparing Local Plans • Identify sufficient opportunities to meet the identified needs of their area for the management of waste streams • Identify suitable sites and areas for waste facilities.	The WRMP may need to consider the potential impact of options on waste generation and on waste management facilities in the WRMP area. The SEA should consider the effects of the WRMP on waste generation and management capacity.
Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government (2015) *Renewable and Low Carbon Energy*	
Increasing the amount of energy from renewable and low carbon technologies will help to make sure the UK has a secure energy supply, reduce greenhouse gas emissions to slow down climate change and stimulate investment in new jobs and businesses. Planning has an important role in the delivery of new renewable and low carbon energy infrastructure in locations where the local environmental impact is acceptable.	The WRMP should, where possible, contribute towards increasing the proportion of energy from renewable energy sources. The SEA assessment framework should include consideration of the use of energy from renewable energy sources.
Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government (2015) *Strategic environmental assessment and sustainability appraisal*	
This guidance provides clarity on the need for sustainability appraisal and strategic environmental assessment in relation to plan development. Strategic environmental assessment considers only the environmental effects of a plan, whereas sustainability appraisal considers the plan's wider economic and social effects in addition to its potential environmental impacts. Sustainability appraisal should meet all of the requirements of the Environmental Assessment of Plans and Programmes Regulations 2004, so a separate strategic environmental assessment should not be required.	The SEA should consider the environmental effects of the WRMP.
Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local (2021) *National Planning Policy Framework 2021*	
The National Planning Policy Framework (NPPF) sets out the Government's planning policies for England and how these are expected to be applied. The National Planning Policy Framework constitutes guidance for local planning	The WRMP and SEA should take account of the key components of sustainable development and consider the

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authorities and decision-takers both in drawing up plans and as a material consideration in determining applications. At the heart of the NPPF is a presumption in favour of sustainable development, which should be seen as a golden thread running through both plan-making and decision-taking. The NPPF requires that the planning system should be genuinely plan-led and that plans should: a) be prepared with the objective of contributing to the achievement of sustainable development b) be prepared positively, in a way that is aspirational but deliverable; c) be shaped by early, proportionate and effective engagement between planmakers and communities, local organisations, businesses, infrastructure providers and operators and statutory consultees; d) contain policies that are clearly written and unambiguous, so it is evident how a decision maker should react to development proposals; e) be accessible through the use of digital tools to assist public involvement and policy presentation; and f) serve a clear purpose, avoiding unnecessary duplication of policies that apply to a particular area (including policies in this Framework, where relevant).	three dimensions to sustainable development: economic, social and environmental.
Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local (various) Planning Practice Guidance	
Planning Practice Guidance (PPG) is designed to support the NPPF. It reflects the objectives of the NPPF which are not repeated here. PPG provides additional planning guidance on a number of topics. Those that are particularly relevant to the WRMP24 include: • Air quality; • appropriate assessment; • climate change; • effective use of land; • flood risk and coastal change; • healthy and safe communities; • historic environment; • natural environment; • open space, sports and recreation facilities, public rights of way and local green space; • strategic environmental assessment and sustainability appraisal; and, • water supply, wastewater and water quality.	The WRMP should take into consideration guidance set out in the PPG insofar as it relates to the area covered by the WRMP.
Department for Transport (2022) *UK Electric Vehicle Infrastructure Strategy*	
This strategy sets out the Department for Transport's vision and action plan for the rollout of electric vehicle charging infrastructure in the UK, ahead of the phase out dates. They intend: • to end the sale of new petrol and diesel petrol and diesel vehicles by 2030	The WRMP should consider use of zero emission vehicles when delivering options where applicable.

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• for all new cars and vans to be fully zero emission at the tailpipe by 2035	The SEA should also promote the use of renewable energy, where relevant.
Environment Agency (2004) *Catchment Flood Management Plans: Guidelines – Volume 1 Policy*	
These guidelines support the Environment Agency's strategy for flood risk management and work towards achieving the government's strategy for flood and coastal erosion flood risk management. The aims of Catchment Flood Management Planning are: • To promote sustainable flood risk management measures • To reduce the sources of flooding and harm to people, and the natural, built and historic environment caused by floods • To support the delivery of the Government's and others' policies and targets, and the Environment Agency's environmental vision.	The WRMP should seek to support the aims of the plan. The SEA should consider how the WRMP may affect flood risk across the region.
Environment Agency (2007) *Soil: A Precious Resource*	
The soil strategy identifies the Environment Agency's priorities, sets out their role and says what action is to be taken to protect, manage and restore soil. Damaged soil structure can lead to flooding, water pollution and can affect the landscape and archaeological features. The strategy also outlines the part managing soils can play in mitigating climate change.	The WRMP should ensure the sustainable management of soil resources. SEA objectives should reflect and consider relevant priorities from the Soil: A Precious Resource publication.
Environment Agency (2008) *Better Sea Trout and Salmon Fisheries: Our Strategy for 2008-2021*	
The strategy has the goal of more sea trout and more salmon in more rivers bringing more benefit. This goal is to be brought about through achieving three broad targets: 1. Self-sustaining sea trout and salmon in abundance in more rivers 2. Economic and social benefits optimised for sea trout and salmon fisheries 3. Widespread and positive partnerships, producing benefits There are twelve more detailed targets lying below these broad goals which relate to salmon and fisheries.	The WRMP should take the strategy into account where it may have an effect on salmon and trout, e.g. where an option may involve inserting or removing a barrier to fish. The SEA should include a guide question in relation to the effects of options on recreation (i.e. recreational angling) and also appropriate targets in monitoring proposals.
Environment Agency (2009) *Water for People and the Environment - Water Resources Strategy for England and Wales*	
Environment Agency's water resources strategy sets out how Environment Agency believe water resources should be managed England and Wales to 2050 and beyond to ensure that there will be enough water for people and the environment. It sets out how water resources should be managed within Defra frameworks in its water strategy for England 'Future Water', and in Wales, the Welsh Government's 'Environment Strategy for Wales'. Objectives in the strategy are set out under four broad themes: adapting to and mitigating climate change; a better water environment; sustainable planning and management of water resources; and, water and the water environment are valued.	The objectives for the WRMP should reflect these objectives, where relevant. The SEA should seek to promote the protection and enhancement of water resources and to encourage sustainable management of the resource.

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This strategy sets out the following objectives: • Ecology is more resilient to climate change because abstraction pressures have been reduced and a diverse network of habitats has been allowed to develop; • The resilience of supplies and critical infrastructure is increased to reduce the impacts of climate change; • Flexible and incremental solutions in water resources management allow adaptation to climate change as it happens; • Everyone is able to make more informed decisions and choices about managing water resources, protecting the environment and choosing options to avoid security of supply problems; • Greenhouse gas emissions from using water resources are minimised and properly considered in future decisions; • Measures will be in place to make sure that water bodies achieve Water Framework Directive objectives; • Abstraction is sustainable, the environment is protected and improved, and supplies remain secure; • Environmental problems caused by historic unsustainable abstractions are resolved; • Catchment management is integrated so that impacts on water resources and the water environment are managed together; • The twin track approach of resource development with demand management is adopted in all sectors of water use; • In England, the average amount of water used per person in the home is reduced to 130 litres each day by 2030; • The Environment Agency targets and adapts its approach to reflect the location and timing of pressures on water resources; • In England, water companies implement near-universal metering of households, starting in areas of serious water stress; • Leakage from mains and supply pipes is reduced; • New and existing homes and buildings are more water efficient; • Water resources are allocated efficiently and are shared within regions where there are areas of surplus; • Water pricing for the abstraction and use of water acts as an incentive for the sustainable use of water resources; • Abstractors and users make informed choices to use water more efficiently; • Innovative tariffs are adopted by water companies to maximise savings and minimise issues of affordability; • The needs of wildlife, fisheries, navigation and recreation, as well as the environment and abstractors, are fully taken into account when allocating water resources; • Innovative technology is developed to improve water efficiency by all water users.	

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The strategy includes a number of actions for Environment Agency and others to develop targets for water reduction and efficiency.	
Environment Agency (2010) *Water Resources Action Plan for England and Wales*	
The strategy has four main aims: • Adaptation to and mitigation of climate change; • A better water environment; • Sustainable planning and management of water resources; • People valuing water and the water environment.	The SEA should seek to ensure that strategy objectives are also reflected in the SEA objectives particularly regarding the sustainable management of water resources and protecting the environment.
Environment Agency (2013) *Areas of Water Stress: Final Classification*	
The report is the Environment Agency's formal advice on which areas in England are of serious water stress.	The WRMP should seek to contribute to addressing the requirements of water stressed areas. The SEA assessment framework should consider the effects of the WRMP on water resources and the associated socio- economic and environmental receptors.
Environment Agency (2013) *Climate Change Approaches in Water Resources Planning: New Methods*	
This research paper examines how climate change has been built into water resource management plans and recommends best and appropriate practice for the future, with reference to the use of the detailed tools and probabilistic climate data in UKCP09.	The WRMP should take into account climate projections and suggestions for best practice. The SEA should consider the effects of the WRMP on climate change
Environment Agency (2013) *Managing Water Abstraction*	
Managing Water Abstraction sets out how the Environment Agency manage water resources in England and Wales. It is the overarching document that links together the abstraction licensing strategies. The availability of water resources for abstraction is assessed through a Catchment Abstraction Management Strategy (CAMS) approach.	The SEA should include a guide question relating to the sustainable use of water resources.
Environment Agency (2017) *Drought response: our framework for England*	
This policy paper outlines how the Environment Agency works with government, water companies and others to manage water resources during a drought in England. It does this by setting out: • how drought affects different parts of England in different ways • which organisations are involved in managing drought and how they work together	The WRMP should consider how drought affects different areas and how it can act to mitigate the impacts of drought. The SEA should outline the impacts of potential WRMP options on drought.

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Purpose of the Document, including Objectives and Targets relevant to the WRMP and SEA	**Relationships and Influences on the WRMPs and the SEA**
• how the Environment Agency and others make decisions and decide on actions to take • how the Environment Agency monitors and measures the impacts of drought • how the Environment Agency reports on drought and communicates with others	
Environment Agency (2017) *Groundwater Protection Technical Guidance*	
This guidance is for planners, applicants for environmental permits and abstraction licences, and landowners concerned with the quality and quantity of groundwater. The guidance helps to understand: • inputs of substances and pollutants to groundwater • discernibility of hazardous substances • when geological formations can be determined permanently unsuitable for other purposes	The WRMP should follow the guidance where groundwaters/abstraction are concerned. The SEA should consider the impact of the WRMP on groundwater quality and quantity.
Environment Agency (2018) *The Environment Agency's Approach to Groundwater Protection*	
This document updates Groundwater protection: Principles and practice (GP3). It contains position statements which provide information about the Environment Agency's approach to managing and protecting groundwater. They detail how the Environment Agency delivers government policy for groundwater and adopts a risk-based approach where legislation allows. Many of the approaches set out in the position statements are not statutory but may be included in, or referenced by, statutory guidance and legislation. This document will be of interest to developers, planners, environmental permit applicants and holders, abstractors, operators and anyone whose current or proposed activities have an impact on, or are affected by groundwater. Each section is focused on different activities or sectors. Environment Agency staff will use these position statements as a framework to make decisions. This clear approach aims to remove uncertainty and potentially inconsistent decision-making. The Environmental Permitting (England and Wales) Regulations 2016 (EPR) require permitting of activities that may lead to the input into groundwater of hazardous substances or non-hazardous pollutants. Groundwater resources are primarily managed by abstraction licensing. The primary aim of all of the position statements is the prevention of pollution of groundwater and protection of it as a resource. Groundwater protection is long term, so these principles and position statements aim to protect and enhance this valuable resource for future generations	The WRMP should aim to protect groundwater resources and use the document to aid decision making where groundwaters are concerned. The SEA should consider the impact of the WRMP on groundwater quality and quantity.
Environment Agency (2020) *EA2025 creating a better place*	
The plan sets out the Environment Agency's ambition for how they plan to create better places for people, wildlife and the environment, up to 2025. This document includes the Environment Agency's purpose, priorities, culture and values as well as how they will help to deliver the 25 year environment plan. It includes the metrics that the Environment Agency will be measured against so they know when they are succeeding in our ambitions. The plan sets out 3 long term goals:	The SEA and the WRMP should consider the Environment Agency's priorities.

National Plans and Programmes	
Purpose of the Document, including Objectives and Targets relevant to the WRMP and SEA	**Relationships and Influences on the WRMPs and the SEA**
• A nation resilient to climate change • Healthy air, land and water • Green growth and a sustainable future	
Environment Agency (2020) *Meeting our future water needs: a national framework for water resources*	
The national framework report marks a move to strategic regional planning. It sets out the principles, expectations and challenges for 5 regional groups (including Water Resources West, which the SSW area forms part of) made up of the 17 English water companies and other water users. The framework explores England's long term water needs for: • public water supplies • agriculture • the power and industry sectors • environmental protection For the Water Resources West Region the framework estimates that additional public water supply needs between 2025 and 2050 are 639 Ml/d. The framework states that the Water Resources West Region will face pressures in the future. However, it has a significant surplus, the potential to reduce demand further and options to supply more water. The framework states that the options identified in the water company WRMPs are enough to meet the higher need estimate. If greater reductions in water use can be achieved or further options identified, there is potential to transfer more water to other regions. The plan sets out that the regional groups will each produce one plan and states that it must consider how the region will be resilient to a range of uncertainties and future scenarios. It must identify a set of options that provide the best value to customers, society and the environment rather than simply the least cost. Together the 5 plans must meet the national need. The plans need to address the following: • Increasing resilience to drought • Greater environmental improvement • Reducing long term water usage • Reducing leakage • Reducing the use of drought permits and orders • Increasing supplies. The framework states that plans must include: • an initial resource position – a resource assessment which looks at future scenarios and explores the main challenges and sensitivities • a statement of ambition, including the regional policies and principles • a list of the options considered – to meet the regional need and contribution to the national need	The WRMP should seek to support the achievement of the aims of the framework. The SEA should include an objective/guide question relating to water resources.

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Purpose of the Document, including Objectives and Targets relevant to the WRMP and SEA	**Relationships and Influences on the WRMPs and the SEA**
• the preferred plan – identifying the best value options to meet all future water needs across multiple sectors and users. The framework also sets out a number of criteria that the plans must fulfil as well as things that the plans should or could achieve or include.	
Environment Agency (2020) *National Flood and Coastal Erosion Risk Management Strategy for England*	
This strategy describes what needs to be done by all organisations involved in flood and coastal erosion risk management. These include local authorities, internal drainage boards, water and sewerage companies, highways authorities, and the Environment Agency. They all act to reduce the risk of flooding and coastal erosion and manage its consequences. The strategy sets out a statutory framework that will help communities, the public sector and other organisations to work together to manage flood and coastal erosion risk. It supports local decision-making and engagement in FCERM, making sure that risks are managed in a co-ordinated way across catchments and along each stretch of coast. This includes the development of local flood risk management strategies by lead local flood authorities, as well as our strategic overview of all sources of flooding and coastal erosion. This strategy's long-term vision is for: a nation ready for, and resilient to, flooding and coastal change – today, tomorrow and to the year 2100. It has 3 long-term ambitions, underpinned by evidence about future risk and investment needs. They are: • climate resilient places: working with partners to bolster resilience to flooding and coastal change across the nation, both now and in the face of climate change • today's growth and infrastructure resilient in tomorrow's climate: making the right investment and planning decisions to secure sustainable growth and environmental improvements, as well as infrastructure resilient to flooding and coastal change • a nation ready to respond and adapt to flooding and coastal change: ensuring local people understand their risk to flooding and coastal change, and know their responsibilities and how to take action.	The WRMP should be prepared in line with the strategy. The SEA framework should consider flooding and coastal erosion.
Environment Agency (2020) *Water Company Drought Plan guideline*	
This guidance, written in conjunction with Defra, outlines the legislative requirements for a drought plan. This document also provides a timeline for the drought planning process.	The WRMP and the SEA should consider the guideline, where relevant.
Environment Agency (2022) *Water resources planning guideline supplementary guidance – Environment and society in decision-making*	
This document supports the water resources planning guideline. It provides guidance on how to consider the environment and society in decision-making for water resources management plans and regional plans. It is applicable to England only. There is separate guidance for Wales available from Natural Resources Wales. This supplementary guidance sets out how the environment and society should be considered through: • Strategic Environmental Assessment (SEA) • biodiversity net gain assessment	The WRMP and SEA should take into account the supplementary guidance.

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• natural capital assessments	
Environment Agency (undated) *Hydroecology: Integration for modern regulation*	
This paper describes clear way forward in terms of hydroecology and a strategic direction to its development and application.	The WRMP should ensure relevant ecological considerations are integral to water resource management decisions across the range of temporal and spatial scales.
Environment Agency (undated) *Restoring Sustainable Abstraction Programme*	
Environment Agency note that there is evidence to suggest that unsustainable abstraction of groundwater and surface water could be contributing to environmental damage of rivers and wetlands in England and Wales, including sites of national and international conservation importance. In May 1997, at the Government's Water Summit, a commitment was made to reverse the damage caused by past decisions. Environment Agency investigates where over-abstraction has occurred and work with local people to restore sustainable supplies.	The WRMP should aim to maintain and implement sustainable abstraction practises. The SEA will assess the impacts of the WRMP and any associated abstraction on water quality and quantity.
Environment Agency (undated) *WFD River Basin Characterisation Project: Technical Assessment Method - River abstraction and flow regulation*	
This paper describes the method used to assess the likelihood of river water bodies achieving the relevant WFD objectives as a result of artificial influences on low river flows.	Implementation of the WRMP may impact river water quality. The SEA should seek to promote the protection and enhancement of biodiversity and river water quality across the region.
Environment Agency, Natural Resources Wales and The Water Services Regulation Authority (2021) *Water Resources Planning Guideline*	
The water resources planning guideline provides an update to the framework for water companies to follow in developing and presenting their water resources plans. It sets out good practice behind the composition of a plan, the approaches to developing a plan and the information that a plan should contain. The guideline states that where feasible water and sewerage companies should ensure that their long-term planning for wastewater and water supply are aligned. Along with highlighting any linkages and, or interdependencies (or both). The guideline states that water/sewerage companies should consider alignment in their growth forecasts, climate change scenarios and timetable for delivering solutions.	The WRMP should align with the WRMP as suggested in the guideline. The SEA should seek to ensure that water supplies and resources are maintained or enhanced in line with the Water Resources Planning Guidelines.
English Heritage (2008) *Climate Change and the Historic Environment*	
Sets out the current thinking on the implications of climate change for the historic environment. It is intended both for the heritage sector and also for those involved in the wider scientific and technical aspects of climate change; in the development of strategies and plans relating to the impact of climate change; or in projects relating to risk assessment, adaptation and mitigation.	The SEA should seek to assess the implications of the WRMP in combination with climate change and the potential impacts on heritage and the historic environment.
English Heritage (2010) *Heritage at Risk*	
Heritage at Risk is a national project that aims to identify the endangered sites (historic buildings and places with increased risks of neglect and decay) and then	The SEA should seek to protect and enhance heritage

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help secure them for the future. Regional Heritage at Risk Registers were most recently published in 2017.	and landscape and the assessment framework should include an objective relating to cultural heritage.
Historic England (2015) *The Setting of Heritage Assets, Historic Environment Good Practice Advice in Planning 3*	
This document sets out guidance, against the background of the NPPF, on managing change within the settings of heritage assets, including archaeological remains and historic buildings, sites, areas, and landscapes. It gives general advice on understanding setting, and how it may contribute to the significance of heritage assets and allow that significance to be appreciated, as well as advice on how views contribute to setting.	The WRMP and SEA should take account of the need to protect and enhance the setting of heritage assets.
Historic England (2016) *Historic England Advice Note 8: Sustainability Appraisal and Strategic Environmental Assessment*	
This Historic England Advice Note supersedes previous advice issued on this subject in 2013. It seeks to provide advice on historic environment considerations as part of the Sustainability Appraisal/Strategic Environmental Assessment process. This document is aimed at all relevant local planning authorities, neighbourhood groups, developers, consultants, landowners and other interested parties. It identifies the recommended list of plans, programmes and policies for review, approach to baseline review, potential sustainability issues.	The SEA should consider the potential effects of the WRMP on the historic environment, particularly designated assets and their settings, and to important wetland areas with potential for paleo-environmental deposits. Historic characterisation can supplement information about designations. Sustainability issues, objectives and indicators identified in this document should be taken into account in the SEA.
The Historic Environment Group (2018) *Historic Environment and Climate Change Sector Adaption Plan*	
The sector adaptation plan (SAP) is a high-level, strategic document intended to identify climate change risks, opportunities and adaptation needs for the historic environment. Its aim is to stimulate action through strategies, programmes and partnerships.	The WRMP should seek to reduce its contribution to climate change and aim to assist in the protection of the historic environment within the operational area. The SEA assessment framework should consider the effects of the WRMP on climate change and associated effects on the historic environment.
HM Government (1975) *Salmon and Freshwater Fisheries Act 1975*	
The act encompasses fishing regulation, as well as illegal obstruction of migratory pathways and prohibited modes of destroying fish. The act allows the salmon to maintain an environmentally stable population and support the fishing industry.	The SEA and WRMP should consider the protection of salmon and freshwater fish.
HM Government (1975) *Reservoirs Act*	

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Purpose of the Document, including Objectives and Targets relevant to the WRMP and SEA	**Relationships and Influences on the WRMPs and the SEA**
The Reservoirs Act 1975 provides a legal framework to ensure the safety against failure of large raised reservoirs. The act applies to reservoirs that hold at least 25,000 cubic metres of water above natural ground level. Safety legislation for reservoirs in the United Kingdom was introduced in 1930 after several reservoir disasters had resulted in loss of life. This law was superseded by the Reservoirs Act 1975. Under the Reservoirs Act 1975 reservoir owners (undertakers) have ultimate responsibility for the safety of their reservoirs. Reservoir owners must appoint a panel engineer (a specialist civil engineer who is qualified and experienced in reservoir safety) to supervise the design and construction of the reservoir, to continuously supervise the reservoir when built (supervising engineer) and to carry out periodic inspections (inspecting engineer).	The WRMP should consider any effects of options on reservoirs capacity, functioning and downstream flows.
HM Government (1979) *Ancient Monuments and Archaeological Areas Act 1979*	
The Act defines sites that warrant protection as ancient monuments. They can be a Scheduled Monuments or "any other monument which in the opinion of the Secretary of State is of public interest by reason of the historic, architectural, traditional, artistic or archaeological interest attaching to it".	The WRMP should consider if there are ways in which they can contribute to the protection of Scheduled Monuments. The SEA assessment framework should include consideration of Scheduled Monuments.
HM Government (1981) *Wildlife and Countryside Act 1981*	
The Act makes it an offence (with exceptions) to; • Intentionally kill, injure or take any wild bird or their eggs or nests; • Intentionally kill, injure, or take, possess, or trade in any wild animal listed in Schedule 5; • Prohibits interference with places used for shelter or protection, or intentionally disturbing animals; and • Pick, uproot, trade in, or possess (for the purposes of trade) and wild plant listed in Schedule 8. The Act also provides for the notification of Sites of Special Scientific Interest (SSSI) and require surveying authorities to maintain up to date definitive maps and statements, for the purpose of clarifying public rights of way.	The WRMP must ensure full compliance with the Act. The SEA should ensure a positive contribution to the wildlife within the operational area.
HM Government (1990) *Environmental Protection Act*	
The Act defines the legal framework for England, Wales and Scotland regarding environmental protection, including the duty of care for waste, contaminated land, and statutory nuisance. Under the Act, Local Authorities or private individuals may take action to secure abatement of any such nuisance, such as noise, and only one person need be affected for action to be possible. It also specifies offences related to the storage, movement, treatment or disposal of controlled waste, and sets out the regime for identifying and remediating contaminated land.	The WRMP must ensure compliance with the Act. The SEA assessment framework should include waste and nuisance.
HM Government (1990) *Planning (Listed Buildings and Conservation Areas) Act 1990*	

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The Planning (Listed Buildings and Conservation Areas) Act 1990 provides specific protection for buildings and areas of special architectural or historic interest. The Act introduced the listing of buildings for buildings which possess special architectural or historic interest and the designation of conservation areas for areas of special architectural or historic interest the character or appearance of which it is desirable to preserve or enhance.	The WRMP should seek to avoid adverse impacts on cultural heritage assets. The SEA assessment framework should include specific objectives relating to cultural heritage.
HM Government (1990) *Town and Country Planning Act 1990*	
The Town and Country Planning Act controls and consents development, which is defined as building, engineering, mining or other operations in. on, over or under land, or the making of any material change in the use of any building or land.	The WRMP must ensure full compliance with the Act. The SEA should include objectives and guide questions relating to biodiversity, land use, and landscape.
HM Government (1991 and 1994) Land Drainage Act	
The Land Drainage Act 1991 requires that a watercourse be maintained by its owner in such a condition that the free flow of water is not impeded. The riparian owner must accept the natural flow from upstream but need not carry out work to cater for increased flows resulting from some types of works carried out upstream, for example a new housing development. If a riparian owner fails to carry out his responsibilities under the Land Drainage Act, or if anyone else causes a watercourse to become blocked or obstructed, the County and District Councils have powers of enforcement by serving a notice under the Act. If this is ignored, the Council concerned may carry out the necessary itself and then recharge the person responsible for the full cost incurred. The District Council normally implements these powers but the County Council will deal with problems that affect the highway. The person responsible may also be prosecuted for nuisance under the Public Health Act 1936. The 1994 Act amends the Land Drainage Act of 1991 in relation to the functions of internal drainage boards and local authorities.	The WRMP should be prepared in accordance with the act.
HM Government (1991) *Water Industry Act 1991* (as amended by the *Flood and Water Management Act 2010*)	
The Water Industry Act sets out the regulatory, competition and consumer representation frameworks for the water sector in England and Wales including the duty for water companies to prepare WRMPs.	The WRMP should be prepared in accordance with the Water Industry Act 1991, where relevant.
HM Government (1991) *Water Resources Act 1991*	
The Water Resources Act applies to England and Wales and established the National Rivers Authority (now the Environment Agency) to regulate water pollution, water resources, flood defence, fisheries and navigation. The Act covers water abstraction and impounding and discharges to surface and ground waters and coastal waters.	The WRMP must ensure full compliance with the Act
HM Government (1994) The Conservation (Natural Habitats, &c.) Regulations 1994	

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Purpose of the Document, including Objectives and Targets relevant to the WRMP and SEA	**Relationships and Influences on the WRMPs and the SEA**
These regulations transposed European Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (Habitats Directive) into national law. The Regulations provide for the designation and protection of 'European sites', the protection of 'European protected species', and the adaptation of planning and other controls for the protection of European Sites.	The WRMP should seek to protect European sites and species. The SEA assessment framework should include objectives and guide questions relating to the protection of European sites and species, as well as biodiversity more generally.
HM Government (1994) *UK Biodiversity Action Plan*	
The aim of the action plan is to conserve and enhance biological diversity in the UK and to contribute to the conservation of national and global biodiversity and include the follow aims to maintain and, where practicable, to enhance: • The overall populations and natural ranges of native species and the quality and range of wildlife habitats and ecosystems; • Internationally and nationally important and threatened species, habitats and ecosystems; • Species, habitats and natural and managed ecosystems that are characteristic of Kent; • The biodiversity of natural and semi-natural habitats, where this has diminished over 3 recent decades, and • Public awareness of, and involvement in, conserving biodiversity.	Ensure that the WRMP and SEA encourage conservation and offer protection to areas and species of high conservation importance as identified in this action plan.
HM Government (1994) *Urban Waste Water Treatment (England and Wales) Regulations 1994*	
The Regulations transposed the requirements of the Urban Waste Water Treatment Directive 91/271/EEC (as amended). The Regulations impose requirements for: collection systems for treated urban waste wate; discharges from treatment plants, and sets out methods for monitoring; and makes provisions with regard to discharges of industrial wastewater and the dumping of sludge from ships.	The WRMP should reflect the requirements set out in the regulations.
HM Government (1995) *Environment Act 1995*	
The Act seeks to protect and preserve the environment and guard against pollution to air, land or water. The Act adopts an integrated approach to environmental protection and outlines where authorisation is required from relevant authorities to carry out certain procedures as well as outlining the responsibilities of the relevant authorities. It established the Environment Agency, the Scottish Environment Protection Agency and the National Park authorities. The Act also includes provisions relating to remediation of contaminated land, waste and the designation of Air Quality Management Areas.	The WRMP must ensure compliance with the Act. The SEA assessment framework should include waste and air quality.
HM Government (2000) *The Countryside and Rights of Way (CROW) Act 2000*	
This act extends the public's ability to enjoy the countryside and safeguards landowners and occupiers. The Act creates a new statutory right of access to open county and registered common land, modernise the right of way system, give greater protection to Sites of Special Scientific Interest (SSSIs), provide greater protection arrangements for Areas of Outstanding Natural Beauty (AONBs) and strengthen wildlife enforcement legislation.	The SEA must make sure that the Act is supported and that public rights of way and access to the countryside are maintained and where possible enhanced.
HM Government (2002) *The National Heritage Act 2002*	

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Purpose of the Document, including Objectives and Targets relevant to the WRMP and SEA	**Relationships and Influences on the WRMPs and the SEA**
This Act builds on the preceding National Heritage Acts of 1980, 1983 and 1997. All four Acts define the way in which National heritage assets are managed and protected. The 2002 Act extended the powers of the Historic Buildings and Monuments Commission to include underwater archaeology within the territorial waters of the United Kingdom.	The WRMP should be compliant with the Act. The SEA should include objectives relating to the protection of heritage features.
HM Government (2003) *The Water Act 2003*	
The four broad aims of the Act are: • the sustainable use of water resources; • strengthening the voice of consumers; • a measured increase in competition; and • the promotion of water conservation. It amends the Water Industry Act 1991 so that water companies: • are given a duty to prepare and publicise drought plans; • are placed under a duty to agree and publicise water resource management plans; and • are placed under an enforceable duty to further water conservation. As part of the Act the Water Services Regulation Authority (Ofwat) became the economic regulator of the water and sewage industry in England and Wales.	The WRMP should support the achievement of the aims of the act, where possible. The SEA should include objectives relating to water quality, water resources and sustainable water use.
HM Government (2004) *The Environmental Assessment of Plans and Programmes Regulations 2004*	
These regulations only apply to plans and programmes within England and set out the procedures required when undertaking an environmental assessment.	The SEA should take the regulations into account when assessing the WRMP.
HM Government (2005) *Securing the Future; Delivering UK Sustainable Development Strategy*	
The strategy for sustainable development aims to enable all people to satisfy their basic needs and enjoy a better quality of life without compromising the quality of life of future generations. The strategy places a focus on protecting natural resources and enhancing the environment.	The SEA must seek to ensure that objectives relating to sustainable development, sustainable resource use and protecting the natural environment, are considered when assessing the potential impacts of the WRMP
HM Government (2006) *Climate Change and Sustainable Energy Act 2006*	
The Act was enacted after the publication of the UK Climate Change Programme (2006). It places an obligation on the government to report to Parliament on greenhouse gas emissions in the UK and action taken by Government to reduce these emissions.	The WRMP should take into account carbon emissions associated with the measures. The SEA could include an objective/guide question in the assessment framework to reduce greenhouse gas/carbon dioxide emissions. Consider whether the monitoring arrangements can

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Purpose of the Document, including Objectives and Targets relevant to the WRMP and SEA	**Relationships and Influences on the WRMPs and the SEA**
	be utilised to monitor the effects of the WRMP.
HM Government (2006) *Natural Environment and Rural Communities Act 2006*	
The Act: • makes provision about bodies concerned with the natural environment and rural communities; • makes provision in connection with wildlife, sites of special scientific interest, National Parks and the Broads; • amends the law relating to rights of way; • makes provision as to the Inland Waterways Amenity Advisory Council; and provides for flexible administrative arrangements in connection with functions relating to the environment and rural affairs and certain other functions; and for connected purposes.	The WRMP and SEA should have regard to protected wildlife sites and species, landscapes and rights of way.
HM Government (2007) *Water Resources Management Plan Regulations 2007*	
These Regulations set out the process for the preparation of WRMPs.	The WRMP should considered these regulations, where relevant.
HM Government (2008) *The Climate Change Act 2008 and The Climate Change Act 2008 (2050 Target Amendment) Order 2019*	
This Act aims: • to improve carbon management and help the transition towards a low carbon economy in the UK; and • to demonstrate strong UK leadership internationally, signalling that the UK is committed to taking its share of responsibility for reducing emissions in the context of ratifying the global Paris Agreement. The UK Climate Change Act 2008 sets legally binding targets for the UK to reduce greenhouse gas emissions by at least 80% by 2050, and CO2 emissions by at least 26% by 2020, against a 1990 baseline. Further the Act provides for a carbon budgeting system which caps emissions over five year periods to set out our trajectory to 2050. Budgets have been set covering the periods 2008-12, 2013-17, 2018-22, 2023-27 and 2028-32, equivalent to 22%, 28%, 34%, 50% and 57% reductions in carbon emissions compared to 1990 levels respectively.	The WRMP should seek contribute towards increasing the proportion of energy from renewable energy sources. The SEA assessment framework should include consideration of greenhouse gas emissions and use of energy from renewable energy sources.
HM Government (2008) *The Energy Act 2008*	
The Energy Act 2008 contains the legislative provisions required to implement UK energy policy following the publication of the Energy Review 2006 and the Energy White Paper 2007. The key elements of the Act: • Strengthens the regulatory framework for offshore gas supply infrastructure to enable private sector investment; • Creates a regulatory framework to enable private sector investment in Carbon Capture and Storage projects; • Strengthens the Renewables Obligation to drive greater and more rapid deployment of renewables in the UK;	The WRMP should have regard to the provisions in the Act. The SEA should include objectives relating to energy and resource use.

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Purpose of the Document, including Objectives and Targets relevant to the WRMP and SEA	**Relationships and Influences on the WRMPs and the SEA**
• Strengthens statutory decommissioning provisions for offshore renewables and oil and gas installations to minimise the risk of liabilities falling to the Government; • Improves the offshore oil and gas licensing regime in response to changes in the commercial environment and enable the Department for Business Enterprise and Regulatory Reform to carry out its regulatory functions more effectively; • Ensures the operators of new nuclear power stations accumulate funds to meet the full costs of decommissioning and their full share of waste management costs; and • Introduces amending powers such that Ofgem is able to run the offshore electricity transmission licensing regime more effectively. The subsequent Energy Acts (2010, 2011, 2013, 2016) contain provisions relating to carbon capture and storage, decarbonisation, fuel poverty, reductions in carbon emissions, security of energy supply, nuclear regulation and the Oil and Gas Authority, amongst others.	
HM Government (2008) *Planning Act 2008*	
This Act introduced a new system for nationally significant infrastructure planning, alongside further reforms to the Town and Country Planning system.	The WRMP should consider any unforeseen NSIP proposals that come forward prior to adoption which may affect water resources in the region. The SEA should consider the cumulative effects of the WRMP and any unforeseen NSIP proposals that come forward which may affect water resources in the region.
HM Government (2009) *The Eels (England and Wales) Regulations 2009* (as amended 2011)	
These regulations were introduced in 2009 and amended in 2011. They afford powers to the Environment Agency to implement measures for the recovery of European eel stocks and have important implications for operators of abstractions and discharges.	The SEA and WRMP should have regard to eel populations.
HM Government (2009) *The Groundwater (England and Wales) Regulations 2009*	
The Groundwater Regulations are designed to implement a daughter directive to the European Water Framework Directive and prevent or limit the inputs of polluting substances into groundwater. Substances controlled under these regulations fall into two categories: a) Hazardous substances, defined as those which are toxic, persistent or liable to bioaccumulate must be prevented from entering groundwater. Substances in this list may be disposed of to the ground, under a permit, but must not reach groundwater. They include pesticides, sheep dip, solvents, hydrocarbons, mercury, cadmium and cyanide. b) Non-hazardous pollutants are less dangerous, and can be discharged to groundwater under a permit, but must not cause pollution. Examples include sewage, trade effluent and most wastes. Non-hazardous pollutants	The WRMP will need to comply with the requirements of the Regulations where appropriate. The SEA assessment should include an objective relating to the effects of options on groundwater quality.

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include any substance capable of causing pollution and the list is much wider than the previous List 2 substances.	
HM Government (2009) *Marine and Coastal Access Act 2009*	
The Marine and Coastal Access Act sets out a number of measures including the establishment of Marine Conservation Zones (MCZs) and Marine Spatial Plans. It also includes amendments to the Salmon and Freshwater Fisheries Act, 1975.	The WRMP should take into account its effects on coastal areas, where appropriate. The SEA assessment should take into account the effects of the actions on the coast where relevant.
HM Government (2009) *Water Resources Act 1991 (Amendment) (England and Wales) Regulations 2009 SI 3104*	
Amends Water Resources Act 1991 by extending the use of Water Protection Zones and Works Notices, in particular to deal with harm to aquatic ecosystems caused by the physical characteristics of a water course or lake, such as quantity, structure and substrate of river/lake bed. Aligns the Water Resources Act with the hydromorphological requirements of the WFD	The SEA should include objectives that cover hydromorphological aspects and seek to ensure that hydromorphological features within the plan are maintained or enhanced.
HM Government (2009) *The UK Renewable Energy Strategy*	
The Strategy sets out to: • Put in place the mechanisms to provide financial support for renewable electricity and heat worth around £30 billion between up to 2020; • Drive delivery and clear away barriers; • Increase investment in emerging technologies and pursue new sources of supply; and Create new opportunities for individuals, communities and business to harness renewable energy.	The WRMP should contribute towards increasing the proportion of energy from renewable energy sources, where possible. The SEA assessment framework should include consideration of the use of energy from renewable energy sources.
HM Government (2010) *Flood and Water Management Act 2010*	
The Flood and Water Management Act 2010 aims to provide better, more sustainable management of flood risk for people, homes and businesses, help safeguard community groups from unaffordable rises in surface water drainage charges and protect water supplies to the consumer. The Act will also implement recommendations made by Sir Michael Pitt in his review of the 2007 floods. This will include giving water companies new powers to better control non-essential domestic uses of water during periods of water shortage. The Act places a number of statutory duties on water companies including: • a duty to act consistently with the National Strategy; and a duty to have regard to the content of the Local Flood Risk Management Strategies. Does not contain any targets.	The WRMP should be in conformity with the Act. The SEA should include objectives relating to flood risk and water use.
HM Government (2011) *Localism Act 2011*	
The Localism Act provides greater devolved powers to councils and neighbourhoods and gives local communities more control over housing and planning decisions.	The WRMP and the SEA Environmental Report will be subject to public consultation.
HM Government (2011) *UK Marine Policy Statement*	

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The Marine Policy Statement (MPS) sets out the framework for preparing Marine Plans and taking decisions affecting the marine environment, supporting the delivery of the following high-level marine objectives: • Achieving a sustainable marine economy; • Ensuring a strong, healthy and just society; • Living within environmental limits; • Promoting good governance; • Using sound science responsibly. Does not contain any targets.	The WRMP should take into account its effects on coastal areas. The SEA assessment should take into account the effects of the actions on the coast/marine environment where relevant.
HM Government (2011) *Water for Life: White Paper*	
Water for Life describes a vision for future water management in which the water sector is resilient, in which water companies are more efficient and customer focused, and in which water is valued as the precious and finite resource it is. Water for Life includes several proposals for deregulating and simplifying legislation, to reduce burdens on business and stimulate growth. Ofwat's proposals for reducing its regulatory burdens complement these.	The WRMP should help to contribute to the resilient and efficient management of water. In order to ensure future water management is resilient SEA should consider resilience to climate change and should consider the human environment.
HM Government (2013) *The Energy Act 2013*	
The Act established a legislative framework for delivering secure, affordable and low carbon energy. At its core is the need to ensure that, as older power plants are taken offline, the United Kingdom remains able to generate enough energy to meet its needs even if demand increases. The Act sets out provisions for: • Decarbonisation • Electricity Market Reform (EMR) • Nuclear Regulation • Government Pipeline and storage system • Strategy and policy statement • Customer protection	The WRMP should comply with the act, where relevant. The SEA should include guide questions relating to energy use and carbon emissions.
HM Government (2014) *Water Act 2014*	
The purpose of the Act was to make provision about the water industry; about compensation for modification of licences to abstract water; about main river maps; about records of waterworks; for the regulation of the water environment; about the provision of flood insurance for household premises; about internal drainage boards; about Regional Flood and Coastal Committees; and for connected purposes.	The WRMP help to ensure that future water management is resilient, efficient and customer focused
HM Government (2015) *The Environmental Damage (Prevention and Remediation) (England) Regulations 2015*	
These regulations amend the 2009 regulations and provide additional protection to habitats and species identified on Annexes 1 and 2 of the EC Habitats Directive (92/43/EEC), SSSIs and, in some cases, classified waterbodies from environmental damage where an operator has intended to cause damage or been negligent to the potential for damage.	The SEA should seek to ensure that the guidance provided by the regulations is considered when assessing the WRMP.

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Applies to the most serious categories of environmental damage, including: • Contamination of land that results in a significant risk of adverse effects on human health • Adverse effects on surface water or groundwater consistent with a deterioration in the water's status • Adverse effects on the integrity of a Site of Special Scientific Interest (SSSI) or on the conservation status of species and habitats protected by EU legislation outside SSSIs.	
HM Government (2015) *Infrastructure Act 2015*	
The Infrastructure Act (inter alia) gives environmental authorities new powers to require landowners to take action on invasive non-native species or permit others to enter the land and carry out those operations.	The SEA assessment framework should include guide questions relating to invasive species.
HM Government (2015) *The Nitrate Pollution Prevention Regulations 2015*	
These regulations consolidate and revoke previous regulations on Nitrate Pollution Prevention (namely the 2008 Nitrate Pollution Prevention Regulations and subsequent amendments). The continue to provide for the implementation of EU Directive 91/676/EEC on the protection of waters against pollution by nitrates from agricultural sources, and Decision 2009/431/EC granting a derogation under that directive, in England. The regulations: provide for the designation of land as nitrate vulnerable zones; impose annual limits on the quantity of nitrogen from organic manure that may be applied or spread in a holding in a nitrate vulnerable zone; establish requirements relating to the amount of nitrogen to be spread on a crop, and requires an occupier to plan in advance how much nitrogen fertiliser will be spread; require an occupier to provide a risk map of the holding; impose conditions on the spreading of nitrogen fertiliser; establish closed periods during which the spreading of nitrogen fertiliser is prohibited; and, makes provision for requirements for storage of nitrogen fertiliser and the keeping of records.	The WRMP should have regard to the requirements of the regulations. The WRMP and the SEA should consider potential effects of WRMP plan measures on Nitrate Vulnerable Zones (NVZs).
HM Government (2015) *Ozone-Depleting Substances Regulations 2015*	
The 2015 ODS Regulations implementation of EU Ozone Depleting Substances Regulations (1005/2009). The principle objective is to phase out and control remaining uses of ozone depleting substances (ODS). ODSs commonly include chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs) and halons, which were typically used as refrigerants, air-conditioning systems, and fire-fighting equipment. The Regulations place controls and phase-out dates on the manufacture and supply of ODSs. The Regulations also require ODSs to be removed from refrigeration equipment before such appliances are scrapped. The Regulations specify minimum qualifications for those working on the recovery, recycling, reclamation or destruction of ODS.	The WRMP should have regard to the requirements of the regulations. The SEA assessment framework should include emissions to air.
HM Government (2016) *Environmental Permitting (England and Wales) Regulations 2016 (as amended 2018)*	
Provides a system for environmental permits and exemptions for industrial activities, mobile plant, waste operations, mining waste operations, water discharge activities, groundwater activities and radioactive substances activities. It also sets out the powers, functions and duties of the regulators.	The WRMP should accord with these Regulations.

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HM Government (2017) *Conservation of Habitats and Species Regulations 2017* and the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019	
These regulations consolidate all the various amendments made to the Conservation (Natural Habitats) Regulations 1994 in respect of England and Wales. The 1994 Regulations transposed Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (EC Habitats Directive) into national law. The Regulations provide for the designation and protection of 'European sites', the protection of 'European protected species', and the adaptation of planning and other controls for the protection of European Sites. Under the Regulations, competent authorities i.e. any Minister, government department, public body, or person holding public office, have a general duty, in the exercise of any of their functions, to have regard to the EC Habitats Directive. New provisions implement aspects of the Marine & Coastal Access Act 2009. These provisions provide for: • the transfer of certain licensing functions from Natural England to the Marine Management Organisation (MMO); • Marine Enforcement Officers to use powers under the Marine Act to enforce certain offences under the Habitats Regulations. The 2019 (EU Exit) amendment to the Regulations ensures that the habitat and species protection and standards derived from EU law will continue to apply after Brexit.	The WRMP must ensure full compliance with the Regulations. The SEA should take into account the effects of the actions on biodiversity.
HM Government (2017) *The Water Environment (WFD) (England and Wales) Regulations 2017*	
These regulations transpose the Water Framework Directive into law in England and Wales (see Water Framework Directive 2000/60/EC above).	The WRMP should be aligned with the requirements of the Water Framework Directive. The SEA should include objectives relating to water quality, water resources, sustainable water use, and biodiversity.
HM Government (2017) *UK Climate Change Risk Assessment 2017 (CCRA2)*	
This policy paper is published as part of the UK's commitment to the Climate Change Act 2008. The paper documents the assessment of risks for the UK arising from climate change and highlights opportunities for the UK in response to these.	The WRMP may result in increased emissions and contribute to climate change. The SEA should include objectives relating to climate change and adaptation.
HM Government (2017, updated 2019) *UK Clean Growth Strategy: Leading the way to a low carbon future*	
This document affirms the UK's need to pursue de-carbonisation and provides information on how the UK is performing against its targets to become carbon neutral. The document highlights that continued emission reduction needs to continue in the fields of: • Power Sector; • Buildings; • Industry;	The SEA should have an objective/guide questions relating to sustainable development that references the need to reduce carbon emissions across all sectors.

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• Natural Resources; • Transport; and, • Devolved Administrations.	
HM Government (2018) *A Green Future: Our 25 Year Plan to Improve the Environment*	
This plan sets out government action to help the natural world regain and retain good health. It aims to deliver cleaner air and water in cities and rural landscapes, protect threatened species and provide richer wildlife habitats using a natural capital approach to better-inform policy. By adopting the plan, the government aims to achieve clean air; clean and plentiful water; thriving plants and wildlife; a reduced risk of harm from environmental hazards such as flooding and drought; using resources from nature more sustainably and efficiently; and, enhanced beauty, heritage and engagement with the natural environment. In addition, the plan will set out to manage pressures on the environment through; mitigating and adapting to climate change, minimising waste, managing exposure to chemicals and enhancing biosecurity. The six key areas for action are: • Using and managing land sustainably, which includes embedding an 'environmental net gain' principle for development (including housing and infrastructure) • Recovering nature and enhancing the beauty of landscapes • Connecting people with the environment to improve health and wellbeing • Increasing resource efficiency, and reducing pollution and waste • Securing clean, productive and biologically diverse seas and oceans • Protecting and improving the global environment	The WRMP may influence the environmental benefits and pressures identified in the Environment Plan, such as: • Clean air • Clean and plentiful water • Thriving plants and wildlife • Reducing risks of harm from environmental hazards • Using resources from nature more sustainably and efficiently • Enhancing beauty, heritage and engagement with the natural environment • mitigating and adapting to climate change • minimising waste • managing exposure to chemicals • enhancing biosecurity The SEA should ensure that the impacts of any options on the 25-year goals set out in the Environment Plan are fully considered, whilst taking into account environmental net gain and natural capital approach, which the government have identified as principle themes.
HM Government (2018) *The Water Supply (Water Quality) Regulations 2018*	
These regulations address the quality of water supplied by water undertakers, who supply areas mainly or wholly in England. The new Regulations implement Directive 98/83/EC on the quality of water intended for human consumption. Under these Regulations, water undertakers are required to identify the areas that are to be water supply zones on an annual basis. A water supply zone cannot	The WRMP should consider the Regulations. The SEA should take into account potential effects of

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exceed 100,000 in terms of population before the beginning of each year of the supply. The standards of wholesomeness are set out, in respect of water for human consumption, be that through drinking, washing, food preparation or cooking and food production. In order to qualify as wholesome, the water cannot contain any: • micro-organism, other than those listed in the full text of Schedule 1 to the Regulations, or parasite; or • substances, other than those listed in the full text of Schedule 1 to the Regulations.	the measures on drinking water quality.
HM Government (2019) *the Invasive Alien species (Enforcement and Permitting) Order 2019*	
This Order allows for the enforcement of the EU Invasive Alien Species Regulation 1143/2014 on the prevention and management of invasive alien plant and animal species in England and Wales, including the relevant licenses, permits and rules for keeping invasive alien species.	The SEA should seek to address any potential issues or effects on existing measures to address invasive alien species.
HM Government (2020) The Agriculture Act 2020	
The Bill provides the legislative framework for replacement agricultural support schemes to replace the European schemes after UK's exit from the EU and the EU's Common Agricultural Policy (CAP). The Bill provides powers to implement new approaches to farm payments and land management. In England, farmers will be paid to produce 'public goods' such as environmental or animal welfare improvements. The Bill also includes wider measures, including on improving fairness in the agricultural supply chain and on the operation of agricultural markets.	The WRMP should consider the implications of the act.
HM Government (2020) *Energy White Paper: Powering our Net Zero Future*	
The White Paper follows on from the Prime Minister's Ten Point Plan and the National Infrastructure Strategy. The Energy White Paper provides further clarity on the Prime Minister's measures and puts in place a strategy for the wider energy system that: • Transforms energy, building a cleaner, greener future for the country, its people and the planet • Supports a green recovery, growing the economy, supporting green jobs across the country in new green industries and leveraging new green export opportunities • Creates a fair deal for consumers, protecting the fuel poor, providing opportunities to save money on bills, providing warmer, more comfortable homes and balancing investment against bill impacts	The WRMP should consider if it can support the delivery of the aims of the white paper. The SEA should include objectives and guide questions relating to energy use and carbon emissions.
HM Government (2021) *The Environment Act*	
The Act seeks to set legislation to improve air and water quality, tackle waste, increase recycling, halt the decline of species, and improve the natural environment. Amongst its provisions, The Act places a duty enshrined in law to ensure water companies secure a progressive reduction in the adverse impacts of discharges from storm overflows. New duties will also require the government to publish a plan to reduce sewage discharges from storm overflows by September 2022 and report to Parliament on the progress towards implementing the plan. The Environment Act also includes a legally binding target on species abundance for 2030, to help reverse declines of species like the hedgehog, red squirrel and water vole.	The WRMP should seek to protect and enhance the natural environment, taking into consideration the principals and guidance set out through the Environment Bill.
HM Government (2022) *UK Climate Change Risk Assessment 2022*	

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This report outlines the UK government and devolved administrations' position on the key climate change risks and opportunities that the UK faces today. As required by the Climate Change Act 2008, the UK government has undertaken the third five-year assessment of the risks of climate change on the UK. This is based on the Independent Assessment of UK Climate Risk, the statutory advice provided by the Climate Change Committee (CCC), commissioned by the UK government and devolved administrations. The risk assessment considers sixty-one UK-wide climate risks and opportunities cutting across multiple sectors of the economy and prioritises eight risk areas for action in the next two years.	The WRMP and the SEA should take into consideration the climate risks identified by the assessment.
HM Treasury (2016) *National Infrastructure Delivery Plan*	
This document is the Government's updated National Infrastructure Delivery Plan. It sets out the plan to 2021 and beyond and takes a targeted approach to infrastructure investment and delivery across different sectors. It contains major commitments to improve the UK's transport, energy, communications, waste, water, housing and flood and coastal erosion, as well as steps to attract new private sector investment. It includes reference to the production of Water Resources Management Plans and the Ofwat price review.	The WRMP should consider the content and commitments of the plan.
JNCC and Defra (2012) *UK Post-2010 Biodiversity Framework*	
The framework sets out UK priorities for work on the Convention on Biological Diversity, and follows on from the 1994 UK Biodiversity Action Plan. It sets out a vision that, 'by 2050, biodiversity is valued, conserved, restored and wisely used, maintaining ecosystem services, sustaining a healthy planet and delivering benefits essential for all people'. The goals and activities to meet this aim are grouped under the categories of International / European context; facilitating and contributing to common country approaches and solutions; evidence provision; and reporting.	The WRMP should support the protection and enhancement of biodiversity. The SEA assessment should include criteria relating to the protection of species and habitats.
National Assembly for Wales (2015) *Well-being of Future Generations Act (2015)*	
The Well-being of Future Generations Act requires public bodies in Wales to think about the long-term impact of their decisions, to work better with people, communities and each other, and to prevent persistent problems such as poverty, health inequalities and climate change. The Act puts in place seven well-being goals and makes it clear that public bodies must seek to achieve all seven of the goals: • A prosperous Wales • A resilient Wales • A more equal Wales • A healthier Wales • A Wales of cohesive communities • A Wales of vibrant culture and thriving Welsh language • A globally responsive Wales	The WRMP should seek to contribute towards the achievement of the seven wellbeing goals, where relevant. The SEA assessment framework should include objectives and guide questions relating to the economic effects, human health and wellbeing and climate change.
National Assembly for Wales (2016) *Environment (Wales) Act 2016*	
The Environment (Wales) Act 2016 introduced a new legislative approach for the Sustainable Management of Natural Resources (SMNR). The Act seeks to maintain and enhance the resilience of Wales' ecosystems and the services and benefits they	The WRMP should seek to enhance biodiversity, promote resilience in ecosystems and

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provide and, in so doing, meet the needs of the present generation without compromising the ability of future generations to meet their needs. The overarching aims of the Act are to enable Wales' resources to be managed in a more proactive, sustainable and joined-up way and to establish the legislative framework necessary to tackle climate change. Some of the specific provisions in the Act include: • Helping to plan and manage Wales' natural resources at a national and local level, through a State of Natural Resources Report, a National Natural Resources Policy and area statements. • Providing Natural Resources Wales (NRW) with a general purpose that aligns fully with the statutory principles for the sustainable management of natural resources. • Providing NRW with powers to undertake land management agreements and experimental schemes. • Providing public authorities with a reshaped requirement to seek to maintain and enhance biodiversity and promote resilience of ecosystems. • Placing statutory emission reduction targets and carbon budgeting to support their delivery. • Enabling improvements to the existing scheme for single use carrier bags. • Providing the Welsh Ministers with powers to take action to achieve higher levels of recycling for business waste, food waste treatment and energy recovery. • Clarifying the law for a number of existing environmental regulatory regimes including marine licensing, shellfisheries management, land drainage and flood risk management.	maintain and enhance biodiversity The SEA framework should include consideration of resilience in ecosystems and the maintenance and enhancement of biodiversity and resource use.
National Infrastructure Commission (2018) *Preparing for a Drier Future, England's Water Infrastructure Needs*	
This paper sets out a range of measures that the NIC believe government, water companies and the regulator should take to increase investment in supply infrastructure and encourage more efficient use of water, with the aim to halve leakage by 2050, extend metering and develop plans for a national water network.	The WRMP should take these measure into account where possible and aim to improve water efficiency.
Natural England (2011) *UK Geodiversity Action Plan*	
The UKGAP sets out a framework for enhancing the importance and role of geodiversity across the UK, and provides a shared context and direction for geodiversity action through a common aim, themes, objectives and targets which link national, regional and local activities. The themes (on which the plan's objectives are based) include: furthering our understanding of geodiversity; gathering and maintaining information on our geodiversity; conserving and managing our geodiversity; inspiring people to value and care for our geodiversity; and sustaining resources for our geodiversity. It also aims to influence planning policy, legislation and development design.	The WRMP should take into account the aims of the UKGAP. The SEA assessment should consider effects of options on geodiversity and outline enhancement and mitigation opportunities where these are identified.
Natural England (2016) *A narrative for conserving freshwater and wetland habitats in England*	
This narrative provides an overview of circumstances relating to the conservation of freshwater and wetland habitats in England, considering their ecological function, the natural and anthropogenic factors affecting them, the principles that should be applied to their management, and the respective roles of the main policy	The WRMP should take into account the findings of the

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mechanisms involved in their conservation. It covers all running and standing water habitats, of whatever size, and terrestrial wetland habitats including bogs, fens, swamp and wet woodland.	narrative relating to conservation. The SEA should note the impact of the WRMP on various habitats.
Natural England (2016) *Conservation 21: Natural England's conservation strategy for the 21st century*	
Conservation 21 sets out how Natural England will work to protect England's nature and landscapes for people to enjoy and for the services they provide, in support of Defra's ambitions for the environment.	The WRMP24 should take into account the contents of this strategy.
Natural England and the Environment Agency (2014) *Protected Species and Development: Advice for Local Planning Authorities*	
This guidance from Natural England and Defra outlines how to assess a planning application when there are protected species on or near a proposed development site. Natural England must be consulted if a development proposal: • might affect a site of special scientific interest (SSSI) • needs an environmental impact assessment • needs an appropriate assessment under the Habitats Regulations	The WRMP and SEA should consider the impact of any proposed developments on protected species.
Natural Resources Wales (2020) *The State of Natural Resources Report (SoNaRR) for Wales 2020*	
SoNaRR2020 builds on a number of Welsh, UK and global assessments of the status and trends of natural resources. It looks at the risks those trends pose to Welsh ecosystems and to the long-term social, cultural and economic well-being of Wales, in terms defined by the Well-Being of Future Generations (Wales) Act 2015 and opportunities for integrated solutions that provide multiple benefits (social, cultural, environmental and economic).	The WRMP should have regard to opportunities to address risks and threats identified in the report and identify integrated solutions. The SEA should have regard to the risks, threats and opportunities identified in the report and the extent to which opportunities for integrated solutions can be incorporated in the WRMP.
Ofwat (2016) *Water 2020*	
This document sets out Ofwat's decisions on the design of its water and wastewater services regulatory framework in England and Wales. The approach aims to deliver the following benefits: • Greater customer engagement and understanding • A sustainable investment model and a fair balance of risk and reward • Choice where possible, and ensuring markets are effective for customers • A focus on the long-term, targeted and risk-based • Support for sustainable improvements in the environment.	The WRMP should take account of the regulatory framework. The SEA assessment should include criteria relating to the provision of water to customers and environmental protection.
Ofwat (2017) *Resilience in the Round*	
The report identifies that the water sector has historically invested in options which enhance capacity, especially operational capacity and that whilst additional capacity has an important role in delivering resilience against some threats, companies	The WRMP should consider the content of the report.

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should start looking at a wider set of factors in order to deliver "smarter" options for the future, including: • Addressing multiple threats through a single intervention. For example, enhancing network connectivity to reduce the number of customers reliant on a single source of supply. This type of approach can provide water supply resilience to multiple threats such as outages, drought and contamination. • Recognising that any intervention will have its own embedded vulnerabilities to future threats. Understanding the vulnerabilities of option types will be critical to planning respective roles in delivering the planned level of resilience. For example, water transfers between areas of surplus and deficit can be a good option but might be vulnerable to wider scale drought impacts and/or contamination.	
UKCP (2018) *UK Climate Projections UKCP18*	
The UKCP18 Projections provide a basis for studies of impacts and vulnerability and decisions on adaptation to climate change in the UK over the 21st century. Projections are given of changes to climate, and of changes in the marine and coastal environment; recent trends in observed climate are also discussed. The methodology gives a measure of the uncertainty in the range of possible outcomes; a major advance beyond previous national scenarios. The Projections will allow planners and decision-makers to make adaptations to climate change. In order to do so they need as much good information as possible on how climate change will evolve. They are one part of a UK government programme of work to put in place a new statutory framework on, and provide practical support for, adaptation.	The WRMP should take account of UKCP18 projections in its formulation, taking account of climate change in its projections. The SEA should also use UKCP18 projections in the broader assessment of climate change effects and any potential cumulative effects. For example, the ecological requirements of aquatic habitats that may be affected by the WRMP will also be influenced by climate change.
UKTAG: Phase 3 Review of Environmental Standards	
UKTAG prepares technical guidance designed to facilitate consistent implementation of the WFD in the UK. This report identifies standards for certain chemicals known as specific pollutants, developments in assessments of risk to groundwater, non-native species, standards for flows in rivers, standards for levels in lakes, standards for acidity in rivers and standards in intermittent discharges.	The SEA should seek to ensure that the guidance provided by the plan are considered when assessing the WRMP, especially with respect to objectives relating to ecology, water quality and water quantity. The SEA should also ensure the guidance in the plan is used in relation to other related regulations for example the Habitats Directive. The guidance could contribute to the formulation of any criteria for assessing significance of effects.
Waterwise (2017) *Water Efficiency Strategy for the UK*	
The document sets out a strategy for achieving the vision of a water efficient UK. It suggests policy, regulatory and practical actions that can help in the process of achieving water efficiency.	The WRMP should take into account their possible impacts on water efficiency and aim to improve water efficiency.

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	The SEA objectives should reflect the need improve water efficiency.
Water UK (2016) *Water Resources Long-term Planning Framework (2015 – 2065)*	
This research modelled the possible effects of climate change, population growth, environmental protection measures and trends in water use to produce a wide range of future scenarios. The results suggest that, in some scenarios, the United Kingdom is facing longer, more frequent and more acute droughts than previously thought. To contain the risk of drought extensive measures to manage demand and enhance supplies of water are needed such as (pp. 194-195): • promoting more efficient water use in homes and businesses, through improved building standards and widespread use of smart metering, as well as more ambitious reduction in leakage from water mains; • moving more water from one region to another through existing waterways and new pipelines, building new reservoirs, treating more water for re-use and building desalination plants to make use of sea water.	Measures identified in the framework should be considered as part of the WRMP. The SEA should assess the impact of the WRMP on water resource and availability.
Welsh Government (2017) *Technical Advice Note 24 the Historic Environment*	
This technical advice note sets out guidance on how to consider the historic environment in development plans and planning decisions. It includes guidance on the following: • world heritage sites • scheduled monuments • archaeological remains • listed buildings • conservation areas • historic parks and gardens • historic landscapes • historic assets of special local interest	The WRMP and SEA should consider the impact of any proposed developments on the historic environment of Wales.
Welsh Government (2018) *Priorities for the Historic Environment of Wales*	
This document outlines Welsh Government's plans to protect our unique historic sites, in partnership with others, and to encourage more people to visit them.	The WRMP and SEA should consider the impact of any proposed developments on the historic environment of Wales.
Welsh Government (2020) *Historic Environment and Climate Change in Wales*	
Some of Wales' most iconic historic sites and landscapes are threatened by warmer temperatures, rising sea levels, changing rainfall patterns and more frequent extreme weather events. The plan highlights the need for collaboration and action across all sectors that will improve understanding; build adaptive capacity and increase the resilience of the historic environment – so that it can be enjoyed by future generations.	The WRMP and SEA should consider the impact of any proposed developments on climate change and the historic environment of Wales.
Welsh Government (2021) *Planning Policy Wales (Edition 11)*	

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Planning Policy Wales (PPW) sets out the land use planning policies of the Welsh Government. It is supplemented by a series of Technical Advice Notes (TANs), Welsh Government Circulars, and policy clarification letters, which together with PPW provide the national planning policy framework for Wales. PPW, the TANs, MTANs and policy clarification letters comprise national planning policy. The primary objective of PPW is to ensure that the planning system contributes towards the delivery of sustainable development and improves the social, economic, environmental and cultural well-being of Wales, as required by the Planning (Wales) Act 2015, the Well-being of Future Generations (Wales) Act 2015 and other key legislation and resultant duties such as the Socio-economic Duty.	Measures recommended in the WRMP will need to confirm to LDPs and the policies of the PPW. The SEA objectives should reflect the Welsh Government's commitments to sustainable development.

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Historic England (2021) *Heritage at Risk Register*	
Heritage at Risk is a national project that aims to identify the endangered sites (historic buildings and places with increased risks of neglect and decay) and then help secure them for the future. Historic England Corporate Plan 2015-2018 is reducing the risk to heritage assets. In order to achieve this aim Historic England are working to: • Better understand the nature and extent of risk • Encourage others to save and re-use heritage at risk • Build the capacity of the sector to deliver solutions for heritage at risk • Provide advice and grants to help remove heritage from the register	The SEA should seek to protect and enhance heritage and landscape.
Natural Resources Wales (2017) *Drought Plan*	
Natural Resources Wales produces a drought plan which describes the indicators currently used to classify the different stages of drought.	The SEA assessment framework should include a guide question on the effects of the WRMP on water resources and commentary on whether they affect the ability to manage drought.
South Staffs (2022) *Final Drought Plan 2022*	
Drought Plans set out the steps that each water company will take through the stages of developing drought, drought, severe drought and recovery from drought to ensure their supply of water resources. Drought Plans must be produced by all water companies to fulfil their requirements under the Water Act 2003. SSW published its Final Drought Plan in August 2022. The Drought Plan provides a comprehensive statement of the actions that SSW will consider implementing during drought conditions in order to protect essential water supplies for customers and to minimise environmental impact. The Plan includes a range of drought management actions (linked to drought triggers), that can be broadly categorised as: • operational actions; • communication actions;	The WRMP will need to be in accordance with SSW' Drought Plan. The SEA assessment framework should include a guide question on the effects of the WRMP on water resources and commentary on whether they affect the water resource zones' ability to manage drought.

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• demand side actions (water efficiency campaigns, campaign for voluntary water use restraint, Temporary Use Ban, drought order to ban non-essential use); • leakage control actions; • resource management actions (non-commissioned sources; tankering); and • drought permit/order actions.	
South Staffs Water (2019) *Final Water Resources Management Plan 2019*	
Water Resources Management Plans (WRMPs) have been produced by all water companies to fulfil their requirements under the Water Act 2003. WRMPs set out how companies will manage the balance between supply and demand for water. Where supply demand deficits occur, water companies are required to identify options to address these deficits to ensure security of supply.	The SEA should include an objective/guide question relating to water resources.
Water Company (various) *Drought Plans*	
Drought Plans set out the steps that each water company will take through the stages of developing drought, drought, severe drought and recovery from drought to ensure their supply of water resources. Drought Plans must be produced by all water companies to fulfil their requirements under the Water Act 2003. Those Drought Plans relevant to the SSW's WRMP (in addition to the SSW Drought Plan identified above) are: • Dwr Cymru Welsh Water Final Drought Plan 2020 • Severn Trent Draft Drought Plan 2019-2024	The WRMP will need to consider and be in accordance with the drought plans of neighbouring companies, where relevant. The SEA assessment framework should include a guide question on the effects of the WRMP on water resources and commentary on whether they affect the water resource zones' ability to manage drought. The baseline should, where appropriate, take into account relevant information from neighbouring plans.
Water Company (various) *Water Resources Management Plans* (published and draft)	
Water Resources Management Plans (WRMPs) have been produced by all water companies to fulfil their requirements under the Water Act 2003. WRMPs set out how companies will manage the balance between supply and demand for water. Where supply demand deficits occur, water companies are required to identify options to address these deficits to ensure security of supply. Those published and draft neighbouring Water Resource Management Plans relevant to the plan are: • Dwr Cymru Welsh Water Final Water Resources Management Plan 2019 • Severn Trent Final Water Resources Management Plan 2019	The WRMP should take account of neighbouring plans where appropriate. The SEA should include an objective/guide question relating to water resources.
Welsh Government (2018) *Castles and Town Walls of King Edward in Gwynedd World Heritage Site: World Heritage Site Management Plan 2018 – 28*	
In 2004, Cadw published its first comprehensive management plan for the World Heritage Site to help look after the site for the benefit of future generations. Since then, many of the objectives and actions have been achieved, including significant conservation work, installation of new visitor	The WRMP and SEA should consider the impact of any proposed developments on the Castles and

Regional Plans and Programmes	
Purpose of the Document, including Objectives and Targets relevant to the WRMP and SEA	**Relationships and Influences on the WRMP and the SEA**
facilities, and new interpretation. Also during this period there have been several wider strategic developments such as updated local and unitary development plans, and new primary legislation in respect of the historic environment and the well-being of future generations in Wales. A new management plan has therefore been prepared to provide a clear strategy and vision for the World Heritage Site, and guide its management for the next ten years. This has been prepared following extensive stakeholder consultation.	Town Walls of King Edward in Gwynedd World Heritage Site.
Wrexham County Borough Council British Waterways and the Royal Commission on the Ancient and Historical Monuments of Wales (2012) *Pontcysyllte Aqueduct and Canal World Heritage Site – Management Plan*	
The Management Plan provide the framework by which the Outstanding Universal Value of a World Heritage Site will be maintained, sustained and communicated.	The WRMP and SEA should consider the impact of any proposed developments on the Pontcysyllte Aqueduct and Canal World Heritage Site.

Sub-Regional/Local Plans and Programmes	
Purpose of the Document, including Objectives and Targets relevant to the WRMP and SEA	**Relationships and Influences on the WRMP and the SEA**
Area of Outstanding Natural Beauty (AONB) Management Units (various) *AONB Management Plans*	
There are two AONBs present in the SSW area. The management plans for AONBs contain actions to ensure the protection and enhancement of the landscape.	WRMP options within AONBs should be consistent with the management plan. The SEA assessment framework should consider the effects of options on landscapes, including designated landscapes.
Birmingham City Council (2010) *Core Strategy 2026 Consultation Draft*	
This strategy is the key strategic overarching planning policy document for development in the city of Birmingham up until 2026. The strategy sets out wide ranging policies that include economic growth, new housing construction, retail growth, employment provision, the environment, transportation, sport, education and health.	The implementation of the WRMP may have an effect upon community cohesion, well being and continued prosperity within a sustainable environment. The SEA should seek to maintain and improve welfare and community infrastructure and maximise positive social impacts.
Birmingham City Council (2017) *Adopted Birmingham development Plan 2031*	
The Birmingham Development Plan (BDP) outlines the spatial vision and strategy for the sustainable growth of Birmingham to 2031 and will be used to guide decisions on planning, development and regeneration. Objectives of the BDP include: • To develop sustainable neighbourhoods that are safe, diverse and inclusive with locally distinctive character. • To make provision for the city's expanding population. • To create a prosperous, successful and enterprising economy.	The WRMP should ensure sustainable management of water resources. SEA objectives should reflect and consider relevant objectives from the Core Strategy.

Sub-Regional/Local Plans and Programmes	
Purpose of the Document, including Objectives and Targets relevant to the WRMP and SEA	**Relationships and Influences on the WRMP and the SEA**
• To provide high quality transport connections throughout the city. • To create a more sustainable city and minimise Birmingham's carbon footprint and waste generation. • To take measures to encourage better health and well-being. • To conserve and enhance the City's heritage assets and historic environment. • To conserve and enhance natural environments and allow biodiversity and wildlife to flourish. • To guarantee infrastructure for future growth and prosperity,	
Black Country Councils (2012) *Core Strategy to 2026*	
The Black Country Core Strategy was produced by the four Black Country Local Authorities (Dudley, Sandwell, Walsall and Wolverhampton) in partnership with the community and other key organisations such as voluntary and private sector bodies and businesses. The strategy was adopted in February 2011. The strategy consists of three major directions of change; 1. Sustainable Communities 2; Environmental Transformation and 3. Economic Prosperity. Relevant Objectives of the Strategy are as follows: • Focussed investment and development in four Strategic Centres: Brierley Hill, Walsall, West Bromwich and Wolverhampton, to retain and increase their share of economic activity and meet the increasing aspirations of their catchment areas. • Model sustainable communities on redundant employment land in the Regeneration Corridors. • Enhancements to the character of the Black Country's existing housing areas by protecting and improving high quality residential areas and pursuing a sustained and focussed programme of housing renewal in low quality residential areas. • A network of vibrant and attractive town, district and local centres across the Black Country. The historic character of these centres will be protected and enhanced through sensitive development. • A high quality environment fit for the future, and a strong Urban Park focussed on beacons, corridors and communities; respecting, protecting and enhancing the unique biodiversity, geodiversity and heritage of the Black Country. • A first-class transport network providing rapid, convenient and sustainable links between the Strategic Centres, existing and new communities, and employment sites. • A sustainable network of community services, particularly high quality lifelong learning, health care and sport and recreation facilities, which are easily accessible to all residents at a neighbourhood level, resulting in an increase in levels of qualifications, skills, health and well-being, a decrease in deprivation indicators and improved perception of residential neighbourhoods across the Black Country. • Sufficient and sustainable recycling and waste management facilities in locations that are the most accessible and have the least environmental impact.	The WRMP should ensure the sustainable management of water resources. SEA objectives should reflect and consider relevant objectives from the Core Strategy.

Sub-Regional/Local Plans and Programmes	
Purpose of the Document, including Objectives and Targets relevant to the WRMP and SEA	**Relationships and Influences on the WRMP and the SEA**
• Safeguard and make the most sustainable use of the Black Country's mineral resources including primary, secondary and recycled materials, without compromising environmental quality.	
Black Country Councils (2017) *Review of Black Country Plan*	
During summer 2017, an Issues and Options consultation formed the first phase of the formal review of the Black Country Plan. Dudley, Sandwell, Walsall and Wolverhampton councils worked together to find out what local people thought about proposals to develop and improve the black country to meet future needs up to 2036.	The WRMP should ensure the sustainable management of water resources. SEA objectives should reflect and consider relevant objectives from the Black Country Plan
Biodiversity Action Plans.	
Local Biodiversity Action Plans (LBAPs) identify priority habitats and species at a local level, setting targets for their conservation and outlining the mechanisms for achieving these targets. The following BAPs are relevant to the SSW area: • Staffordshire BAP • Peak District LBAP	The WRMP may have an effect on BAP objectives. The SEA should include objectives that take into account the objectives of the BAP where relevant (e.g., conservation designation status).
Cannock Chase Area of Outstanding Natural Beauty (AONB) Partnership (2019) Cannock Chase AONB Management Plan 2019-2024	
The plan sets out the agenda for the management of Cannock Chase. Its focus is on delivering the statutory purpose of AONB designation: conserving and enhancing natural beauty with considerations relating to wider environmental issues, the rural economy, communities and recreation dealt within the context of delivering this purpose. The objectives of the plan include: • To maintain the quality and distinctiveness of Cannock Chase AONB. • To enhance the landscape setting. • To improve conditions for nature, and enlarge and connect habitats. • To conserve the Chase's historic environment and connect communities with the AONB's heritage. • To sustainably manage recreate in the Chase. • To promote natural benefits for the community and harness enterprise.	The WRMP may have the potential to affect several of the objectives for managing the Cannock Chase AONB. The SEA will include objectives that take into account for this where relevant.
Defra (2010) *Eel Management Plans* (various)	
A total of 15 Eel Management Plans have been prepared covering the UK's 15 river basin districts. The Plans set out actions aimed at reversing the decline in eel numbers, to ensure that at least 40% of potential adult eels will return to the sea to spawn.	The WRMP should take account of relevant Eel Management Plan actions, where relevant.
Environment Agency (various) *Catchment Flood Management Plans*	
Catchment Flood Management Plans (CFMPs) give an overview of the flood risk across each river catchment. They recommend ways of managing those risks now and over the next 50-100 years. CFMPs consider all types of inland flooding, from rivers, ground water, surface water and tidal flooding, but not flooding directly from the sea, (coastal flooding), which is covered in Shoreline Management Plans. They also take into account the likely impacts of climate change, the effects of how we use and manage the land, and how areas could	The WRMP should take the CFMPs into account. The SEA should include a guide question relating to flood risk.

Sub-Regional/Local Plans and Programmes	
Purpose of the Document, including Objectives and Targets relevant to the WRMP and SEA	**Relationships and Influences on the WRMP and the SEA**
be developed to meet our present day needs without compromising the ability of future generations to meet their own needs.	
Environment Agency (2004) *River Trent Salmon Action Plan (SAP)*	
The Plan details the threats facing the salmon population of the River Trent and aims and objectives for improving the situation. Key objectives are as follows; • Restore a self-sustaining run of salmon to the River Trent by 2028. • Monitoring populations in headwaters to capture increase in salmon production. • Habitat improvements along the river corridors.	The WRMP may have the potential to impact fish migration. The SEA should cover fish passage as an element of at least one sustainability objective.
Environment Agency (2013) (various) *Abstraction Licensing Strategies (CAMS process)*	
CAMS set out how much water is available for abstraction within each key river catchment, under different flow regimes and taking into account the needs of the environment and existing abstractors. They specify whether water is available to abstract, whether the catchment is over-licensed, or whether it is over-abstracted. They provide catchment specific abstraction licensing strategies. A water abstraction licence is required to remove more than 20 cubic metres (4,400 gallons) of water per day from a river or stream, reservoir, lake or pond, canal or spring. The strategies aim to meet the water needs of the environment and to allow water users to sustainably exploit any surplus. Within the South Staffordshire area the following CAMS are in place: • Lower Trent & Erewash CAMS • Tame, Anker & Mease CAMS • Worcestershire middle Severn CAMS • Staffordshire Trent Valley CAMS • Dove CAMS	The Regional Plan and WRMP should take the CAMS into account. The SEA assessment should consider the effects of options on the availability and sustainability of water supply.
Environment Agency and Scottish Environment Protection Agency (2021) *Draft River Basin Management Plans: 2021 (Various)*	
River Basin Management Plans (RBMPs) set out how the water environment will be managed and provides a framework for more detailed decisions to be made. RBMPs set out a more integrated approach to river basin management based on the following principles: • Integrate and streamline plans and processes; • Set out a clear, transparent and accessible process of analysis and decision-making; • Focus at the river basin district level; • Work in partnership with other regulators; • Encourage active involvement of a broad cross-section of stakeholders; • Make use of the alternative objectives to deliver sustainable development;	The WRMP should reflect the broad targets set out in the RBMPs. The SEA objectives should reflect the need to manage water resources on a catchment basis in a sustainable manner to help improve the quality of water resources.

Sub-Regional/Local Plans and Programmes	
Purpose of the Document, including Objectives and Targets relevant to the WRMP and SEA	**Relationships and Influences on the WRMP and the SEA**
• Use Better Regulation principles and consider the cost-effectiveness of the full range of possible measures; • Seek to be even handed across different sectors of society and sectors of industry; • Seek to be even handed and transparent in the management of uncertainty; • Develop methodologies and refine analyses as more information becomes available. Plans include: Part 1: Severn River Basin District River Basin Management Plan Part 1: Humber River basin District River Basin Management Plan	
Environment Agency, Defra, Natural Resources Wales and Natural Scotland (2015) (various) *River Basin Management Plans*	
River Basin Management Plans (RBMPs) set out how the water environment will be managed and provides a framework for more detailed decisions to be made. RBMPs set out a more integrated approach to river basin management based on the following principles: • Integrate and streamline plans and processes; • Set out a clear, transparent and accessible process of analysis and decision-making; • Focus at the river basin district level; • Work in partnership with other regulators; • Encourage active involvement of a broad cross-section of stakeholders; • Make use of the alternative objectives to deliver sustainable development; • Use Better Regulation principles and consider the cost-effectiveness of the full range of possible measures; • Seek to be even handed across different sectors of society and sectors of industry; • Seek to be even handed and transparent in the management of uncertainty; • Develop methodologies and refine analyses as more information becomes available.	The WRMP should reflect the broad targets set out in the RBMPs. The SEA objectives should reflect the need to manage water resources on a catchment basis in a sustainable manner to help improve the quality of water resources.
Environment Agency, Natural Resources Wales and SEPA (2016) *Flood Risk Management Plans (various)*	
Flood Risk Management Plans (FRMPs) give an overview of the flood risk across each river catchment. They recommend ways of managing those risks now and over the next 50-100 years. FRMPs consider all types of inland flooding, from rivers, groundwater, surface water and tidal flooding. They also take into account the likely impacts of climate change, the effects of how we use and manage the land, and how areas could be developed to meet our present day needs without compromising the ability of future generations to meet their own needs. Policies for managing flood risk and proposed actions for implementation are set out for each of sub-areas within the FRMPs.	The WRMP should take FRMPs into account. The SEA should include a guide question relating to flood risk.

Sub-Regional/Local Plans and Programmes	
Purpose of the Document, including Objectives and Targets relevant to the WRMP and SEA	**Relationships and Influences on the WRMP and the SEA**
Plans include: Humber River Basin District Flood Risk Management Plan	
Local and Strategic Flood Risk Management Strategies (FRMs)	
Relevant schemes and strategies encompassed by the West Midlands Flood Risk Area • Perry Barr and Witton flood risk management scheme (last updated 2021) • River Tame flood risk management strategy (2011) • The Black Country Local Flood Risk Management Strategy (2015) • Bromsgrove Flood Risk Management Plan (2018)	The SEA should include objectives that take into account the existing flood risk at the local level.
Local Planning Authority (various) Land Use Plans	
The SSW area covers a number of Local Planning Authorities. The preferred options cover four LPA's; Stafford, East Stafford, Lichfield and South Derbyshire. Additionally, Local Development Plans prepared by local authorities in Wales may also be relevant to the WRMP and SEA. The main objectives of the existing and emerging Land Use Plans in these areas are related to the sustainable development of the area.	The SEA should seek to ensure the WRMP options should be consistent with the Land Use Plans of those local authorities that will be affected by the option.
Local Geodiversity Action Plans (LGAPs)	
Local Geodiversity Action Plans (LGAPs) set out actions to conserve and enhance the geodiversity of a particular area. In general they aim to identify, conserve and enhance the best sites that represent the geological history of an area. They also aim to promote geological sites, provide a local geodiversity audit and influence local planning policy.	The WRMP options should take into account the aims of the LGAPs. The SEA assessment should consider effects of options on geodiversity and outline enhancement and mitigation opportunities where these are identified.
Local Planning Authority (various) Local Plans/Local Development Plans	
The SSW area covers a number of Local Planning Authorities. The preferred options cover four LPA's; Stafford, East Stafford, Lichfield and South Derbyshire. Additionally, Local Development Plans prepared by local authorities in Wales may also be relevant to the WRMP and SEA. The main objectives of the existing and emerging Local Plans in these areas are related to the sustainable development of the area.	The WRMP should have regard of the Local Plans and emerging Local Plans. The SEA assessment framework should consider the effects of the WRMP on the achievement of the Plans' visions and the effects of options on sustainable land use.
Local Wildlife Trust Strategies (various)	
The objectives/outcomes of the plans are largely related to the conservation of wildlife and wild places and enjoyment of wildlife by the public, as well as ensuring the effectiveness of the Trust as an organisation.	The WRMP should have regard to the protection of local wildlife. The SEA assessment framework should consider the effects of the options on biodiversity.
National Park Management Plans (various)	
There are no National Parks present in the SSW supply area.	WRMP options within the National Parks should be consistent with the respective management plan.

Sub-Regional/Local Plans and Programmes	
Purpose of the Document, including Objectives and Targets relevant to the WRMP and SEA	**Relationships and Influences on the WRMP and the SEA**
The management plans for National Parks contain actions to ensure the protection and enhancement of the landscape and natural environment of these areas.	The SEA assessment framework should consider the effects of options on landscapes and the natural environment, including designated areas. Proposed extensions to the National Park boundaries should also be recognised where appropriate.
Natural England, Site Improvement Plans (SIPs) for Natura 2000 Sites (various)	
Site Improvement Plans (SIPs) have been developed for each Natura 2000 site in England as part of the Improvement Programme for England's Natura 2000 Sites (IPENS). The plan provides a high level overview of the issues (both current and predicted) affecting the condition of the Natura 2000 features on the site(s) and outlines the priority measures required to improve the condition of the features. It does not cover issues where remedial actions are already in place or ongoing management activities which are required for maintenance.	The WRMP should seek to avoid contributing to any issues affecting the condition of Natura 2000 site features and contribute to their improvement where appropriate. The SEA should include and objective and guide questions related to the protection of biodiversity and designated species and habitats.
Natural England National Character Area (NCA) Profiles (various)	
Each NCA has an individual objective relating to specific landscapes, habitats and species. Generalised objectives for each of these include: • Conserve characteristic historic structures • Protect the area's rich and diverse archaeology • Protect the area's high levels of tranquility • Protect, manage and enhance the good rights of way network • Manage and enhance existing habitats • Encourage the maintenance of traditional land management practices • Protect, and encourage sympathetic management • Protect and manage geological features • Plan for climate change mitigation and adaptation	The WRMP may have an effect on NCAs. The SEA should include objectives that take into account the objectives of the NCAs where relevant (e.g. manage and enhance existing habitats).
Natural England and Environment Agency (various) River Restoration and Water Level Management Plans	
River restoration interventions reinstate natural river processes that provide benefits to both people and wildlife.	The WRMP should seek to support the delivery of the aims of the strategy, where appropriate. The SEA should include and objective and guide questions related to the protection of biodiversity, designated species and habitats and restoration of rivers.
Outline Water Cycle Studies	
Water cycle studies identify tensions between growth proposals, particularly housing development, and environmental requirements, and identify potential	The WRMP should take into account any water cycle studies

Sub-Regional/Local Plans and Programmes	
Purpose of the Document, including Objectives and Targets relevant to the WRMP and SEA	**Relationships and Influences on the WRMP and the SEA**
solutions to addressing them. The strategic objectives for Outline Water Cycle Studies are to: • Identify whether environmental resources can cope with further development, with particular reference to Water Framework Directive targets and UKCP09 climate change projections (i.e. can growth be accommodated without breaching water quality and abstraction limits); • Identify any potential impacts of development on the specially designated conservation sites and watercourses in the specified areas and other sites or features of significant nature conservation importance resulting from additional abstraction and wastewater discharge.	completed for identified growth areas. The SEA assessment framework should include an objective relating to the efficient management of water.
Public Rights of Way Improvement Plans (ROWIP)	
These plans are prepared by local authorities to describe how improvements to the public rights of way network will be undertaken to provide a better experience for a range of users. ROWIPs are reviewed every ten years.	The WRMP may affect public rights of way (PRoW) for example due to construction. The SEA should include an objective that covers PRoW.
West Midlands Combined Authority (2016) *Movement for Growth: The West Midlands Strategic Transport Plan*	
The West Midlands Combined Authority (WMCA) has set out an ambitious plan for growth in its Strategic Economic Plan and has established a 20 year vision for the transport system needed to support this. The Movement for Growth strategic transport plan (MfG) articulates this vision and provides a high level policy framework and overall long term approach for improving the transport system serving the West Midlands.	There may be some effects on transport with the implementation of the WRMP. This may have an impact upon some of the strategic ambitions set out in the objectives of the transport plan. The SEA should include objectives that take into account the objectives of the transport plan where relevant.

APPENDIX D: BASELINE ANALYSIS

Biodiversity, Flora and Fauna

Baseline Characteristics

Biodiversity comprises the variety of plants (flora) and animals (fauna) in an area, and their associated habitats. The importance of preserving biodiversity is recognised from an international to a local level. Biodiversity has importance in its own right and has value in terms of quality of life and amenity[49].

The assessment area includes a variety of sites that are designated at a European, national or local level as important for biodiversity, flora and fauna (see **Figure D.1** and **Table D.1**), including:

- 5 Special Areas of Conservation (SAC)[50]
- 98 Sites of Special Scientific Interest (SSSI)[51]
- 5 National Nature Reserves (NNR)[52]
- 72 Local Nature Reserves (LNR)[53]
- 1 Ramsar site, which lies on the edge of the study area[54]

No Special Protection Areas (SPA) sites[55] have been identified in the SSW assessment area.

Ancient woodlands in England and Wales are important habitats that should be protected. An ancient woodland is any wooded area that has contained woodland continuously since at least 1600 AD. They tend to be more ecologically diverse and of a higher nature conservation value than those developed recently, or where cover on the site has been intermittent. They often also have cultural importance. There are a total of 93.36 km2 of ancient woodlands within the SSW's SEA assessment area. The distribution of European sites, SSSIs, NNRs, LNRs and ancient woodlands is shown on **Figure D.1.**

Natural England has defined a series of 160 National Character Areas (NCAs) as a means to conserve nature in England[56]. These are areas of countryside identified by the unique combination of physical attributes, wildlife, land use and culture.

Table D.1 List of Designated Sites within/hydrologically connected to the SEA Assessment Area

Designation	Designated Site Name
SAC	River Mease Cannock Chase Cannock Extension Canal Fens Pools Lyppard Grange Ponds
SSSI	Alvecote Pools Alveley Grindstone Quarry Areley Wood

[49] Well-being of Future Generations (Wales) Act 2015

[50] Special Areas of Conservation (SACs) are strictly protected sites designated under the EC Habitats Directive. Article 3 of the Habitats Directive requires the establishment of a European network of important high-quality conservation sites that will make a significant contribution to conserving the 189 habitat types and 788 species identified in Annexes I and II of the Directive (as amended). www.jncc.org.uk

[51] Natural England now has responsibility for identifying and protecting the SSSIs in England under the Wildlife and Countryside Act 1981 (as amended by the Countryside and Rights of Way Act 2000).

[52] NNRs are protected under Sections 16 to 29 of the National Parks and Access to the Countryside Act, 1949 and the Wildlife and Countryside Act, 1981.

[53] LNRs – places with wildlife or geological features that are of special interest locally.

[54] A Ramsar site is the land listed as a Wetland of International Importance under the Convention on Wetlands of International Importance Especially as Waterfowl Habitat (the Ramsar Convention) 1973

[55] SPA are protected areas for birds in the UK classified under the Wildlife & Countryside Act 1981 (as amended) and the Conservation (Natural Habitats, & c.) Regulations 2010 (as amended)

[56] Natural England (2014) Natural Character Area Profiles. https://www.gov.uk/government/publications/national-character-area-profiles-data-for-local-decision-making/national-character-area-profiles

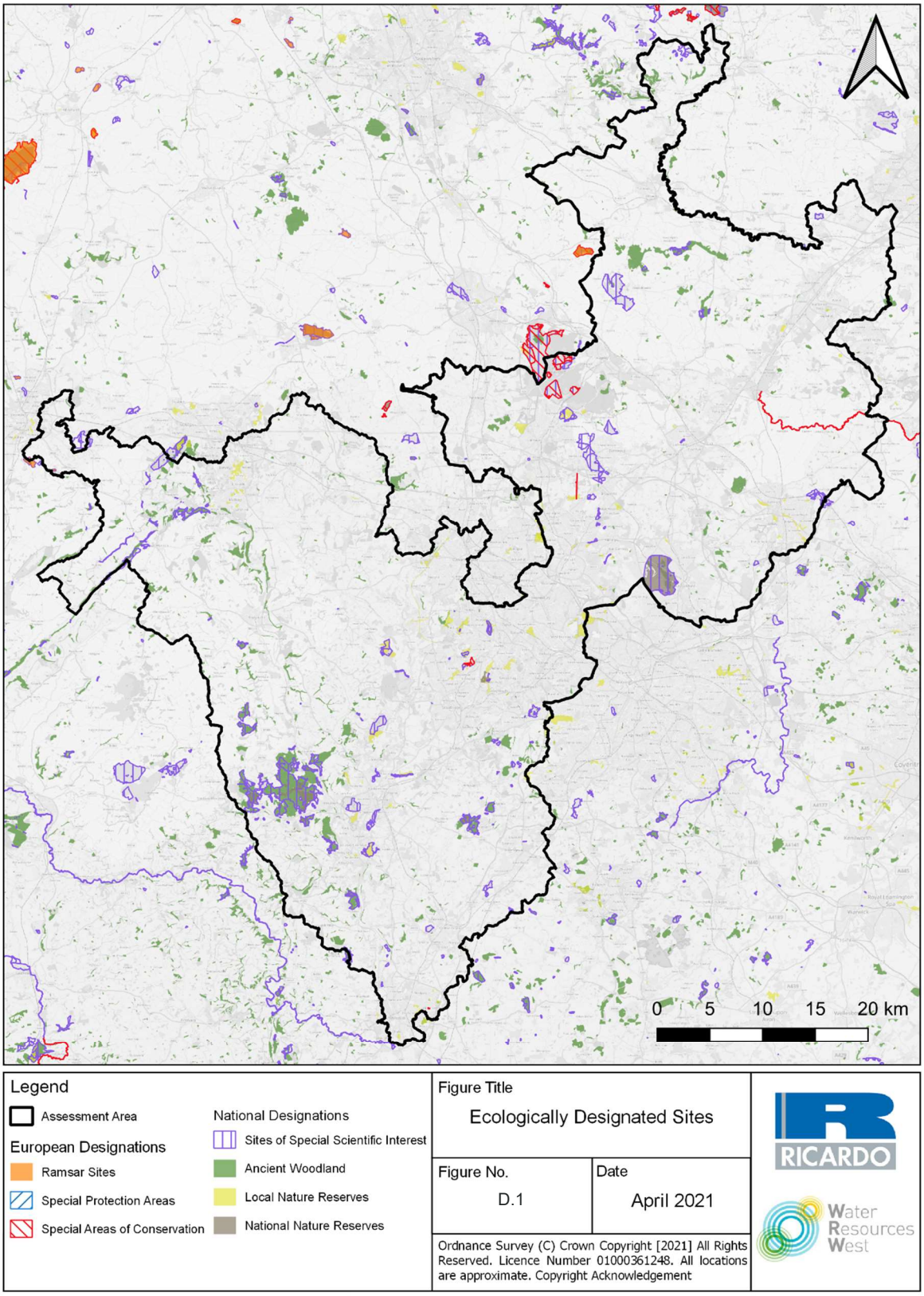
Designation	Designated Site Name
	Attingham Park
	Barrow Hill And Tansey Green
	Berrington Pool, Shropshire
	Bliss Gate Pastures
	Blithfield Reservoir
	Bomere, Shomere and Betton Pools
	Braken Hurst
	Brewin's Canal Section
	Bromsgrove Road Cutting, Tenterfields
	Brown's Close Meadow
	Buckeridge Meadow
	Buildwas River Section
	Buildwas Sand Quarry
	Burcot Lane Cutting
	Bush Wood and High Wood
	Cannock Chase
	Cannock Extension Canal
	Chasewater And The Southern Staffordshire Coalfield Heaths
	Checkhill Bogs
	Chermes Dingle
	Chorley Covert and Deserts Wood
	Claverley Road Cutting
	Clayhanger
	Daw End Railway Cutting
	Devil's Hole, Morville
	Devil's Spittleful
	Doulton's Claypit
	Eymore Railway Cutting
	Farley Dingle
	Feckenham Forest
	Fens Pools
	Forest Banks
	Four Ashes Pit
	Gentleshaw Common
	Goat Lodge
	Gospel End Road Cutting
	Grimley Brick Pits
	Hartlebury Common and Hillditch Coppice
	Hay Head Quarry
	Highgate Common
	Hilton Gravel Pits
	Hughley Brook
	Hurcott and Podmore Pools
	Hurcott Pasture
	Hurst Farm Pasture
	Illey Pastures
	Jockey Fields
	Ketley Claypit
	Kingsbury Brickworks

Designation	Designated Site Name
	Kinver Edge
	Lincoln Hill
	Little Royal Farm Pastures
	Lydebrook Dingle
	Lyppard Grange Ponds
	Madeley Heath Pit
	Middleton Pool
	Monk Wood
	Monkwood Green
	Northwick Marsh
	Oakland Pasture
	Oakley Pool
	Old River Dove, Marston on Dove
	Penorchard & Spring Farm Pastures
	Pipershill Common
	Puxton Marshes
	Ranters Bank Pastures
	River Mease
	River Stour Flood Plain
	Romsley Hill
	Romsley Manor Farm
	Sheinton Brook
	Showground Meadow, Callow Hill
	Shrawley Wood
	Sling Gravel Pits
	Stanton Pastures & Cuckoocliff Valley
	Stourvale Marsh
	Stowe Pool and Walk Mill Clay Pit
	Stubbers Green Bog
	Sutton Park
	Swan Pool & The Swag
	Teddon Farm
	Thatchers Wood and Westwood Covert
	The Leasowes
	The Wilderness & Vermin Valley
	The Wrekin & The Ercall
	Tick Wood and Benthall Edge
	Turner's Hill
	Upton Warren Pools
	Wenlock Edge
	Westwood Great Pool
	Whitwell Coppice
	Wilden Marsh and Meadows
	Wollaston Ridge Quarry
	Wren's Nest
	Wyre Forest
LNR	Badgers Hollow, Coton Park
	Baggeridge Country Park
	Barrow Hill, Dudley

Designation	Designated Site Name
	Blakemarsh
	Branston Water Park
	Broad Meadow
	Buckpool and Fens Pool
	Bumble Hole
	Burlish Top
	Cherry Orchard
	Christian Fields
	Codsall Coppice
	Cotwall End
	Cuckoo's Nook and The Dingle
	Donington & Albrighton
	Dosthill Park
	Forge Mill Lake
	Gorse Hill & Elbury Mount
	Habberley Valley
	Half Crown Wood
	Hartlebury Common/Hillditch Pool
	Hay Head Wood
	Hazel Slade
	Hednesford Hills Common
	Highgate
	Hill Hook
	Hodge Lane
	Hollywood
	Hurcott Wood
	Kettle Brook
	Kingfisher Trail
	Kingsford Forest Park
	Lodge Field
	Lyppard Grange
	Madebrook and Stirchley Dingle
	Madeley
	Merrion's Wood
	Mill Lane
	Moorcroft Wood
	Mousesweet Brook
	Offerton Wetlands
	Park Lime Pits
	Pelsall North Common
	Perry Wood
	Plantsbrook Reservoirs
	Priory Woods
	Quinton Meadows
	Redstone
	Roberts Primary School
	Ronkswood Hill Meadows
	Rough Wood Chase
	Saltwells

Designation	Designated Site Name
	Scalpcliffe Hill Sheepwash Shire Oak Park Shoal Hill Common Smestow Valley Sot's Hole with Bluebell Wood South Staffordshire Railway Walk Spennells Valley Tameside Telford Town Park Tenterfields The Beeches Warndon Woodlands Warren's Hall Country Park Warwickshire Moor Waseley Hills Country Park Wom Brook Walk Woodgate Valley Wren's Nest Wyrley & Essington Canal
NNR	Chaddesley Woods Saltwells Sutton Park Wren's Nest Wyre Forest
Ramsar	Midland Meres & Mosses - Phase 1

Figure D.1 Biodiversity – European sites, SSSIs, NNRs, LNRs and Ancient Woodland



The Water Framework Directive (WFD) ecological status classification considers the condition of biological quality elements (e.g. aquatic invertebrates, plants and fish), the morphology of the habitat available in each water body (e.g. a defined stretch of river), and concentrations of supporting physico-chemical elements (e.g. oxygen or ammonia and concentrations of specific pollutants).

Water abstraction and associated infrastructure can sometimes result in adverse effects on water-related sites. Impacts on biodiversity may include the drying out of wetland habitats, lower water levels and slower flows in watercourse, deterioration in water quality, change in water temperature, or the transfer or proliferation of invasive species.

The relevant WFD River Basin Management Plans (RBMPs) for the assessment area identify pollution from rural areas (including sediment bound phosphorus and nitrates) as one of the major issues affecting the ecology of rivers. Other major pressures affecting the rivers in the assessment area include treated effluent discharges from wastewater treatment works, untreated discharges from intermittent sewer overflows and physical modifications to natural waterbodies[57].

A large proportion of the designated sites within the assessment area are water dependent and therefore changes in the water regime (surface or groundwater) through abstraction, discharges and pollution could potentially affect the integrity and condition of these designated sites. The main potential effects that the SEA needs to consider with regard to designated sites include:

- Groundwater level impacts on terrestrial habitats as a result of abstraction from surface water or groundwater.
- Flow/level impacts on aquatic habitats as a result of abstractions.
- Water pollution (point and diffuse sources).
- Effects on species or habitats associated with the increased occurrence of eutrophication where freshwater levels are insufficient to dilute sewage discharges or agricultural runoff. This is also an issue in estuaries where high tides lead to the re-suspension of organic matter and solids.
- Increased turbidity and concentration of other pollutants due to reductions in freshwater dilution.
- Changes in channel morphology leading to the loss, fragmentation or disturbance of habitats.

In addition to the abstraction of water and discharges to water, the construction of infrastructure associated with the distribution of water around the SSW region (e.g. pipelines and pumping stations) and the management of water resources (e.g. water levels in reservoirs) can also have adverse effects on designated sites of nature conservation importance.

European Protected Species (EPS) are those which are afforded protection under the Habitats Regulations. Under these Regulations it is a criminal offence to deliberately kill, capture, or disturb an EPS, or to damage or destroy the breeding site or resting place of such an animal. Thus, EPS are protected wherever they occur and not just within designated sites. EPS are different to those species for which SACs are designated. The specific list of EPS within the regulations is more limited than the list of species for which SACs can be designated. The following is a list of aquatic species, found in Annex II of the Habitats Directive, that are found in the assessment area:

- Freshwater pearl mussel
- White clawed crayfish
- Brook lamprey
- River lamprey
- Allis shad
- Twaite shad
- Bullhead
- Atlantic salmon
- Great crested newt
- Otter
- Floating water plantain

In addition to the Habitats Regulations, some species are also afforded protection at a national level under the Wildlife and Countryside Act 1981 (as amended). As well as covering some species that are listed in Annex II of the Habitats Directive, this Act also includes other species that are of national conservation importance. For example, water vole is one of the species listed in Schedule 5 of the Wildlife and Countryside Act 1981 that are found in assessment area. Although the WRMP is water focused, terrestrial as well as aquatic species need to be considered as they may be affected, for example through the construction of pipelines.

[57] Department for Environment, Food & Rural Affairs and Environment Agency (DEFRA), (2016) Water for life and livelihoods. Part 1: Severn River Basin District River basin management plans: 2015 https://www.gov.uk/government/collections/river-basin-management-plans-2015

There are a number of species and habitats that have been identified as being of conservation importance under Natural Environmental and Rural Communities (NERC) Act Section 41 (Section 42 in Wales). Some of these NERC species and habitats are present in the assessment area, including:

- Acidic Dwarf Heath Scrub
- Lowland fens
- Lowland meadows
- Lowland heathland
- Lowland calcareous grassland
- Lowland dry acid grassland
- Purple moor grass and rush pastures
- Deciduous woodland
- Coastal and floodplain grazing marsh
- Good quality semi-improved grassland
- Traditional orchard
- Quarry
- Valley bog

Likely Evolution of the Baseline without the WRMP

It is not known if additional sites will be designated under international or national legislation; with the focus therefore on achieving the conservation objectives set for each of these sites. A range of measures are included in the management plans for each designated site which contribute to achieving the conservation objectives. Assuming sufficient resources are in place, it is likely that the condition of these sites will improve over the next two or three decades to reach the objectives. These timescales recognise the time required for environmental changes to arise following positive interventions. A similar trend is likely for achievement of objectives associated with the NERC habitats.

The Natural Environment White Paper, 'Biodiversity 2020' as well as the more recent Well-being for Future Generations Act (2015) for Wales place significant emphasis on the importance of enhancing people's personal connection with wildlife and nature and better understanding of the value of nature's services.

The Defra 25 Year Environment Plan[58] includes a commitment to restoring 75% terrestrial and freshwater protected sites to favourable condition and to create or restore 500,000 hectares of wildlife-rich habitat outside the protected site network, focusing on priority habitats as part of a wider set of land management changes providing extensive benefits. The 25 Year Plan also proposed an adoption of 'Biodiversity Net Gain' approach to development, an approach introduced into national planning policy in 2019 and which will be mandated by the upcoming Environment Bill.

The 25 Year Plan also includes a commitment to support land management at landscape and catchment level and to support the adoption of long-term sustainable land management practices to significantly expand wildlife habitat and provide opportunities for species and ecosystem recovery.

Climate change is anticipated to have an impact on wildlife in the future by exacerbating existing pressures such as changes to the timing of seasonal activity, and water scarcity. It is acknowledged that there is a need to allow wildlife to adapt to the impacts of climate change. Climate may limit species' distributions indirectly though the impact of invasive species on native species along climatic gradients[59]. It will affect the abundance and diversity of natural enemies, competitors and species that constitute resources, as well as a species' ability to compete for resources or resist natural enemies.

Key Issues Relevant to the WRMP

The key sustainability issues arising from the baseline assessment for biodiversity are:

- The need to protect or enhance the region's biodiversity, particularly protected sites designated for nature conservation
- The need to avoid and, mitigate against, where necessary, activities likely to cause damage to natural heritage.
- The need to take opportunities to improve connectivity between fragmented habitats to create functioning habitat corridors
- The need to recognise the importance of allowing wildlife to adapt to climate change

58 https://www.gov.uk/government/publications/25-year-environment-plan

59 Pateman & Hodgson (2015) Biodiversity Climate change impacts report card technical paper. Available from: http://www.nerc.ac.uk/research/partnerships/lwec/products/report-cards/biodiversity/papers/source06/

- The need to control the spread of Invasive Non-Native Species (INNS) and eradicate them where already present
- The need to engage more people in biodiversity issues so that they personally value biodiversity and know what they can do to help, including through recognising the value of ecosystem services.
- The depletion and pollution of groundwater.

Geology, Land Use and Soils

Baseline Characteristics

Geology

The assessment area is geologically diverse and includes a number of major aquifers including aquifers in the West Midlands and smaller limestone aquifers in the Derbyshire. There are a number of SSSIs listed in the area, designated due to their geological interest. There are also several Geological Conservation Review (GCR) sites containing geological and geomorphological features of national and international importance[60].

England has been divided into areas with similar landscape character, which are called National Character Areas (NCAs), previously known as Joint Character Areas (JCAs). Character descriptions for each of the NCAs were produced and published in regional volumes to highlight the influences determining the character of the landscape, including surface geology. Landscape Character Maps for Wales include 48 regional scale landscape character areas. Each area has a distinctive sense of place that enables it to be recognised as a single area. This is described for each area, according to its geological, habitats, historic, cultural and perceptual characteristics. Relevant NCA and Welsh regional landscape character area boundaries are discussed later in the report. A brief description of the key land use characteristics of each of the main National Character Areas is included in **Table D.2.**

Land Use and Soil

The Soil Map of England and Wales61 identifies dominant soil subgroups. In terms of agricultural land quality, planning policy seeks to protect best and most versatile agricultural land (defined as land in Grades 1, 2 and 3a of the Agricultural Land Classification). In terms of agricultural land quality, planning policy seeks to protect the best and most versatile agricultural land (defined as land in Grades 1, 2 and 3a of the Agricultural Land Classification). The majority of land in the assessment area is farmed and agricultural practices have a major influence on soil quality. There is also a large proportion of urban land use in the south of the assessment area (around Birmingham and Wolverhampton). Good soil structure is beneficial to water retention and crop yield. It can be seen from **Figure D.2** that the majority of agricultural land in the assessment area is classified as Grade 3. Pockets of higher-grade soils (Grade 2) can be found towards the centre as well as the east of the assessment area. Soil quality and structure is affected by changes in land use, groundwater levels and farming practices. Soil quality can influence run-off rates and therefore flooding and water quality.

Catchment Sensitive Farming (CSF) is a joint project between the Environment Agency and Natural England that began in 2006. It delivers practical solutions and targeted support to enable farmers and land managers to take voluntary action to reduce diffuse water pollution from agriculture to protect waterbodies and the environment. SSW is working with farmers to implement catchment management solutions to water quality issues in the Midlands Region. Catchment investigations and management measures have been agreed with landowners to deliver raw water quality protection improvements. SSW's landholdings and land management within these areas can have influence over some upland catchments.

Contaminated land is defined as land where substances could cause significant harm to people or protected species; or significant pollution of surface waters or groundwaters. Some types of contaminated land can be designated as special sites for a variety of reasons, including land that seriously affects drinking water, surface waters (e.g. lakes and rivers) and important groundwater sites. Data on contaminated land are compiled for the Government by the British Geological Survey[62].

Minerals Safeguarding Areas (MSAs) are a further important designated area. These areas are designated by Mineral Planning Authorities and include known deposits of minerals which are desired to be kept safeguarded from unnecessary sterilisation by non-mineral development.

Likely Evolution of the Baseline without the WRMP

The vision of Defra's Soils Strategy for England[63] is for all England's soils to be managed sustainably and degradation threats tackled successfully by 2030. This will improve the quality of England's soils and safeguard their ability to provide essential services for future generations.

[60] Geological Conservation Review (GCR) sites contain geological and geomorphological features of national and international importance

[61] Produced by the Soil Survey of England and Wales

[62] Gov.uk (not dated) Contaminated land https://www.gov.uk/contaminated-land

[63] Defra (2009) Safeguarding our soils – A Strategy for England

The Water White Paper described the Government's intentions to take forward a catchment-based approach to water quality and diffuse pollution and work towards Common Agricultural Policy reforms that will promote the farming industry's role as custodian of the natural environment[64]. The Water White Paper also identified that the strategic policy statement for Ofwat and revised social and environmental guidance would give a strong steer on Government support for approaches that offer good value for customers and the potential to prevent and manage future risks to drinking water quality. These policy objectives were reflected in regulatory guidance from Government for the 2014 water resources management planning process and the 2014 water company price review process. The catchment-based approach has now been implemented across England, with catchment partnerships now in place across most of the assessment area to take forward the approach over the coming years.

One of the core planning principles of the NPPF is to encourage the effective use of land by reusing land that has been previously developed (brownfield land), provided that it is not of high environmental value. The NPPF also places great importance on Green Belt policy, the aim of which is to prevent urban sprawl by keeping land permanently undeveloped. Green Belt serves five purposes: to check the unrestricted sprawl of large built-up areas; to prevent neighbouring towns merging into one another; to assist in safeguarding the countryside from encroachment; to preserve the setting and special character of historic towns; and to assist in urban regeneration, by encouraging the recycling of derelict and other urban land. Although the NPPF promotes a presumption in favour of sustainable development, this does not apply where proposed developments may affect European or other designated sites covered by specific policies.

Soil quality and structure is affected by changes in land use, groundwater levels and farming practices. Soil quality can influence run-off rates and therefore flooding and water quality. To this end, SSW has continued the SPRING Environmental Protection Scheme which aims to support local arable farmers in the Blithe catchment area willing to explore catchment friendly alternatives[65]. As of 2019, farmers in the Blithe area have been able to apply for a grant of up to £10,000 per farm towards the costs of voluntary on-farm infrastructural improvements and land management options designed to protect the environment and improve water quality. Other examples of improvements that might qualify for a grant include Ferric Phosphate applied to high risk fields, contour cropping and under sown spring cereal.

Key Issues Relevant to the WRMP

The key sustainability issues arising from the baseline assessment for geology, land use and soil are:

- The need to protect geological features of importance and maintain and enhance soil function and health.
- The need to manage the land more holistically at the catchment level, benefitting landowners, other stakeholders, the environment and sustainability of natural resources (including water resources).
- The need to make use of previously developed land (brownfield land) and to reduce the prevalence of derelict land in the region.

Table D.2 Landscape Character Areas: Geology, Land use and Soil Characteristics

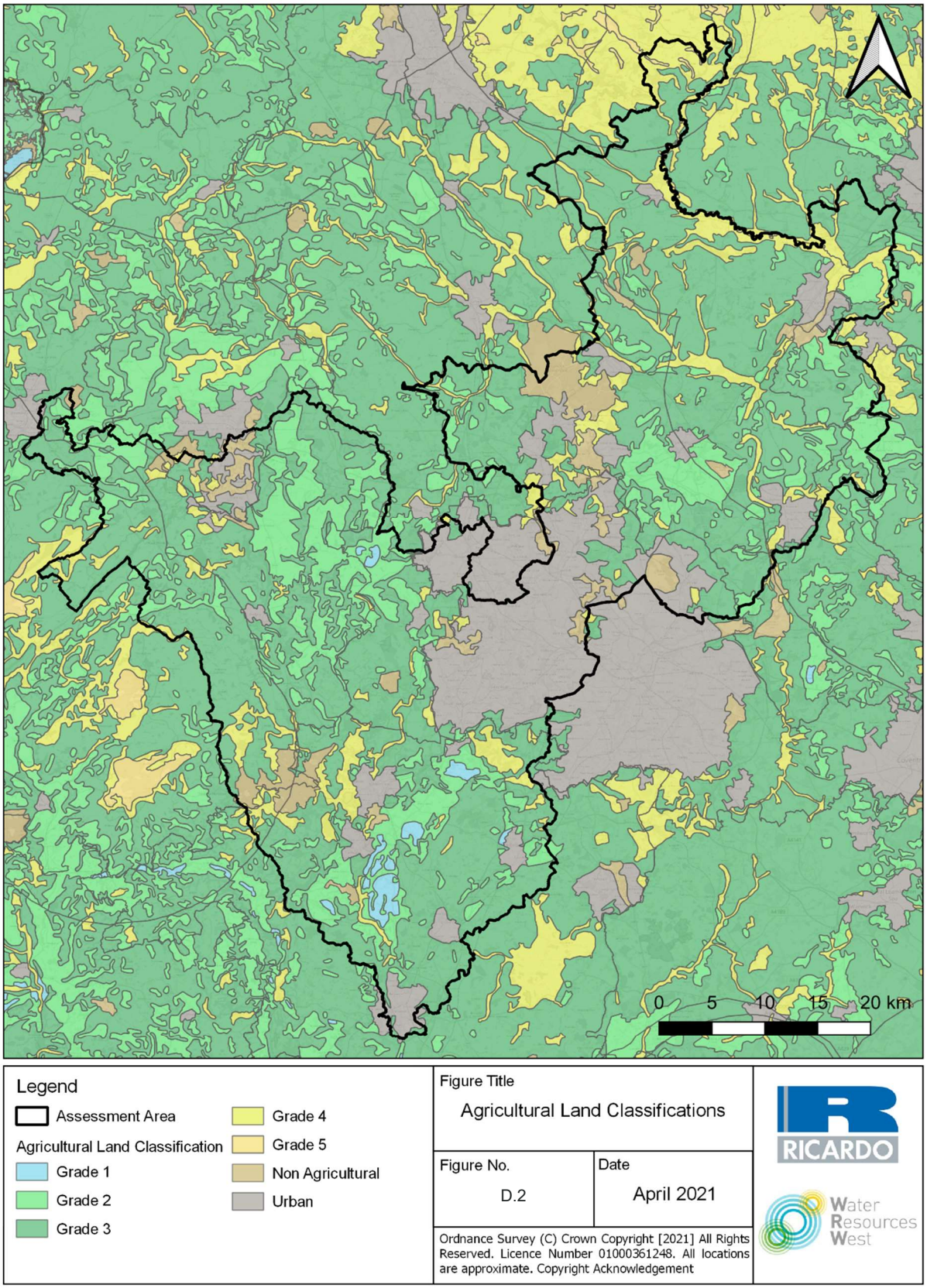
Area	Characteristics
Arden	The Birmingham plateau comprises two uplifted blocks of older Palaeozoic strata. These are separated by an area of Triassic rocks, the Knowle Basin, which is mostly covered by glacial drift. The central area (Knowle Basin) is underlain by Mercia Mudstones and covered by glacial sands, gravels or till. The eastern area is a dissected plateau consisting of uplifted Carboniferous and older Palaeozoic and 'Precambrian' rocks. The southern part of the area is underlain by Mercia Mudstones, with outcrops of Arden Sandstone forming prominent escarpments. Light, sandy soils predominate in the north. Heavier clay soils and loams occur extensively in central and southern Arden. North-eastern industrial area based around former Warwickshire coalfield, with distinctive colliery settlements.
Cannock Chase and Cank Wood	A varied landscape ranging from the open heathlands and plantations of Cannock Chase, through towns, reclaimed mining sites and new developments, to dense urban areas. The

[64] Defra (2011) Water for Life - Water White Paper
[65] SSW (2019) SPRING: Ideas for Nurturing Growth

Area	Characteristics
	dominant rounded central plateau is mainly formed of the Coal Measures of the South Staffordshire Coalfield, with other prominent hills in the south at Wren's Nest, Castle Hill, Rowley Hills and Barr Beacon.
Leicestershire & South Derbyshire Coalfields	The landscape is unenclosed with shallow valleys, subdued sandstone ridges and a gently undulating plateau. There are heavy, poorly draining soils over the Coal Measures and mudstones of the Mercia Mudstone Group, and free-draining soils on the sandstone ridges.
Mease/Sence Lowlands	A gently rolling landscape with rounded clay ridges and shallow valleys, with a more undulating landform in the north-west. This is a well-ordered agricultural landscape of open views, with a relatively tranquil character. Triassic Mercia Mudstones underlie this area and give rise to productive clay soils; outcrops of sandstone extend across the area southwards and westwards from the edge of the adjacent coalfield.
Melbourne Parklands	Melbourne Parklands is a landscape of rolling farmland, ancient and plantation woodland and, as the name suggests, a cluster of landscaped parklands with grand country houses, one of which, Calke Abbey, boasts a Grade II* listed historic park and garden. The NCA is predominantly rural, although there are strong and often abrupt contrasts with the urban areas on its peripheries. The M1 and A42 cross the NCA and East Midlands Airport is sited on the central plateau in an otherwise undulating area.
Mid Severn Sandstone Plateau	The Mid Severn Sandstone Plateau is predominantly rural and important regionally for food production, with large arable fields in the central and eastern areas, and remnant areas of characteristic lowland heathland. The plateau is drained by fast-flowing tributaries of the rivers Worfe and Stour which have incised the Permian and Triassic sandstones and conglomerate resulting in many steep-sided, wooded dingles throughout the NCA. The main river is the fast-flowing Severn, entering the NCA through the Ironbridge Gorge.
Needwood & South Derbyshire Claylands	A rolling glacial till plateau that slopes south eastwards from the southern edge of the Peak District to the valley of the River Trent. There is a distinctive scarp to the south of the Dove, whose broad flood plain divides the Staffordshire and Derbyshire elements. The south is dominated by heavy, seasonally waterlogged soils derived from glacial till. In the north, red and pink soils underlain by Mercia Mudstones and Sherwood Sandstone are more amenable to cultivation.
Potteries and Churnet Valley	The core of this area are the hills, heavily dissected by the Churnet Valley, which are associated with Carboniferous and Triassic sandstones, overlain in the main with brown earth and podzols. To the north-west, towards Biddulph Moor and Mow Cop, outlying sandstone outcrops of the high Millstone Grit moors, with stagnogley and peaty soils which give rise to deeply dissected moorland plateaux.
Severn and Avon Vales	The lower valleys of the rivers Severn and Avon dominate this low lying open agricultural vale landscape made up of distinct and contrasting vales, including Evesham, Berkeley, Gloucester, Leadon and Avon, with Cotswold outliers like Bredon Hill punctuating the otherwise flat vale landscape. The M5 Motorway runs through the centre and the eastern edge of the area.
Shropshire Hills	The Shropshire Hills National Character Area (NCA) is a landscape of rugged and mostly bare-topped hills, contrasting with mixed agriculture in intervening valleys and dales. This tranquil landscape of national importance flows almost seamlessly into the neighbouring hills of Clun and North West Herefordshire Hills NCA to the south, but contrasts markedly with the flat and lowly undulating Shropshire, Cheshire and Staffordshire Plain NCA to the north. To the east, the Shropshire Hills stand above and overlook a complementary landscape of rolling landform, intricate field patterns, and the parklands and numerous woodlands of the Mid-Severn Sandstone Plateau.
Shropshire, Cheshire and Staffordshire Plain	The Plain is formed from Triassic sandstones and marls but these are overlain by glacial deposits, largely consisting of boulder clay, with local deposits of silt, peat, sand and gravels. Close by are the sandstones of the Carboniferous Coal Measures which have been affected by glacial activity and have formed small-scale hummocky ridges and valleys, as around Maer. These sandstones run south-west from Newcastle towards Shrewsbury.
Teme Valley	The Teme Valley NCA lies primarily in northwest Worcestershire, but also extends into the counties of Shropshire and Herefordshire. The River Teme, which gives its name to this NCA, is nationally important for nature conservation. The undulating, deeply tranquil valley formed by the River Teme flows west to south, meandering its way through from the Herefordshire

Area	Characteristics
	Lowlands and beyond before flowing into the Severn and Avon Vales. The tranquil, rural character pervades the area, which has largely escaped the pressure of modern development and retained much of its historical built character in dispersed settlements, small villages and traditional buildings.
Trent Valley Washlands	Distinctly narrow, linear and low-lying landscape largely comprised of the flat flood plains and gravel terraces of the rivers and defined at its edges by higher ground. Geology dominated by superficial alluvium and gravel river terrace deposits underpins the contrast in arable and pastoral agricultural use, arable crops predominating on the free-draining soils of the river terraces, with grassland more commonly located along the alluvial river flood plains where soils are subject to frequent flooding or are naturally wet.
White Peak	The Carboniferous Limestone of the White Peak can be subdivided into three distinct types, each indicative of a different depositional environment and producing different landscapes today. The most common over much of the plateau area is the 'shelf' limestone, then, in the south-west of the area, is the 'basin' limestone and the least common is the 'reef' limestone, found within the wider basin limestone area, which is rich in fossils.

Figure D.2 Agricultural Land Classifications



Water

Baseline Characteristics

The baseline reflects inter-related nature of water quality, water resources (quantity) and flood risk with the overall water environment.

The Water Framework Directive (WFD) has been enacted into UK legislation as the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 in England and Wales. In the context of the WFD, the water environment includes rivers, lakes, estuaries, groundwater and coastal waters out to one nautical mile. The aquatic environment has been assessed and characterised by the Environment Agency in terms of its ecological, biological, and chemical status. The 2015 assessments remain the most up-to-date publicly available information on the waterbody classifications[66], although interim classification updates are available for interest only from 2019 on the waterbody classifications.

The WFD brings together the planning processes of a range of other European Directives. These Directives establish protected areas to manage water, nutrients, chemicals, economically significant species, and wildlife, and have been brought in line with the planning timescales of the WFD. The water bodies have been subject to classification, target setting and assessment since 2003 when the Directive was transposed into UK law.

The SSW area intersects two River Basin Districts and five individual river basins. Detailed information on current classifications and reasons preventing the achievement of Good Status are available on the Environment Agency's Catchment Data Explorer website.

There are five relevant RBMP catchments within the assessment area (Dove, Lower Trent & Erewash, Staffordshire Trent Valley, Tame & Anker Mease, Worcestershire Middle Severn). All these have 2015 targets for '% at good ecological status or potential', '% assessed at good or high biological status', '% at good chemical status', '% at good status overall'. One catchment (Worcestershire Middle Severn) also has 2021 targets for some or all of the catchment areas, which is shown in **Table D.3.**

Table D.3 2021 Targets for catchments within the assessment area (2015 data)

		% at good ecological status or potential	% assessed at good or high biological status	% at good chemical status	% at good status overall
		Target 2021	Target 2021	Target 2021	Target 2021
Severn	Worcestershire Middle Severn	9	28	98	9

Table D.4 summarises the scope of the water industry's impact on the Good Status targets, based on the number of issues identified, attributed to different catchment activities.

Table D.4 Indication of Water Industry Contribution to WFD Issues in River Basins within the assessment area

River Basin District	River Basinthe	Water Industry number of Issues contributing to failing to achieve good status	Dominant Issues
Severn	Severn middle Worcestershire	84 (28%)	Agriculture and rural land management (114, 38%)[67]
Humber	Dove	34 (26%)	Agriculture and rural land management (59, 46%)

[66] River basin management plans: 2015 - GOV.UK (www.gov.uk) (Last updated January 2021)

[67] Environment Agency Catchment Data Explorer (https://environment.data.gov.uk/catchment-planning/RiverBasinDistrict/9)

River Basin District	River Basinthe	Water Industry number of Issues contributing to failing to achieve good status	Dominant Issues
	Trent Lower and Erewash	136 (33%)	Water industry (136, 33%)
	Trent Valley Staffordshire	90 (30%)	Agriculture and rural land management (101, 33%)
	Tame Anker and Mease	150 (41%)	Water Industry (150, 41%)

Implementation of WFD Regulations 2017 mitigation measures will be considered where appropriate.

Surface Waters

The majority of the assessment area falls within the Humber River Basin District, with Severn River Basin District covering the southern parts. This includes the River Trent, River Tame, River Anker and River Mease as well as other smaller watercourses. There are also 6 lakes/reservoirs in the assessment area. **Figure D.3** shows the distribution of Main Rivers, lakes and reservoirs in the assessment area.

For surface waters, there are two separate status classifications for water bodies: ecological and chemical. For a water body to be in overall 'good' status/potential both ecological and chemical status must be at least 'good'. Biological status classification considers the condition of biological quality elements, e.g. aquatic invertebrates, plants and fish, the morphology of the habitat available, concentrations of supporting physico-chemical elements e.g. oxygen or ammonia and concentrations of specific pollutants.

Issues relating to water quality, in terms of emerging substances (PCPs) and plastic pollution, and knowledge gaps within this area will be highlighted within the Environmental Report.

Groundwater

The majority of groundwater that SSW abstracts is sourced from the Sherwood Sandstone aquifer. The Environment Agency considers that licensed groundwater abstraction is fully utilised over some areas while others still have water available for licensing. Both the quantity and quality of groundwater is extremely important in maintaining these resources. Groundwater is vulnerable to pollution from surface activities since aquifers underlie up to two-thirds of the land surface in the SSW supply area. Groundwater quality issues include high nitrate levels in some aquifers.

Under the WFD there are two separate classifications for groundwater bodies: chemical status and quantitative status. A groundwater body will be classified as having poor quantitative status in the following circumstances: where low groundwater levels are responsible for an adverse impact on rivers and wetlands normally reliant on groundwater; where abstraction of groundwater has led to saline intrusion; where it is possible that the amount of groundwater abstracted will not be replaced each year by rainfall. For a groundwater body to be at good status overall, both chemical status and quantitative status must be good. In addition to assessing status, there is also a requirement to identify and report where the quality of groundwater is deteriorating as a result of pollution and which may lead to a future deterioration in status. The main reasons for poor status were identified as high or rising nitrate concentrations, with some failures for pesticides and other chemicals. The main reason for poor quantitative status is that abstraction levels, mainly for public water supply, exceed the rate at which aquifers recharge[68].

In the assessment area, there are three groundwater waterbodies crossing SSW supply area (Tame Anker Mease-PT Sandstone Birmingham Litchfield, Staffordshire Trent Valley – PT Sandstone Staffordshire, Worcester Middle Severn – PT Sandstone) showing poor WFD quantitative status. According to the Environment Agency, the main reason for poor quantitative status in groundwater is that abstraction levels exceed the rate at which aquifers recharge. The main reasons for poor groundwater quality status are high or rising nitrate concentrations, with some failures for pesticides and other chemicals[69].

[68] Environment Agency (2015), Severn River Basin District River Basin Management Plan
[69] Environment Agency (2015) Severn River Basin District River Basin Management Plan

Source Protection Zones (SPZ) provide additional protection to safeguard drinking water quality. This is achieved through constraining the proximity of an activity that may impact upon drinking water abstraction. They are defined around large and public potable groundwater abstraction sites, and the groundwater travel time to an abstraction.

Water Resources

Water resources across England and Wales are under increasing pressure from the competing demands of a large and growing population, industry, and agriculture. The supply base is having to adjust to a new climatic regime for which the long-standing traditional water resource systems were not intended (more unpredictable and intense weather systems). In the last couple of decades the water industry has recognised and accepted that many water abstractions (including for public water supply) are not sustainable a situation further confirmed by WFD monitoring revealing further water bodies at risk of not meeting good status due to abstraction. Therefore, many previously licensed volumes have been or are in the process of being relinquished under the Restoring Sustainability Abstractions (RSA) system.

The Environment Agency updated the national Water Stress Determination in 2013 which at that time concluded that all water company areas in England and Wales (with the exception of Bournemouth) were either Moderately or Seriously water stressed (SSW was classified as Moderate)[70]. Since then a lot has changed, the industry as a whole has improved its understanding of water resources needs, and the updated approach to assessing water stress is currently undergoing consultation[71]. One of the priority areas identified in 2021 as a water stressed area is SSW.

Catchment Abstraction Management Strategies (CAMS), first initiated in the early 2000s continue to be updated periodically. Whilst the assessments are highly detailed, they generally support the understanding that whilst there are pockets of water availability in certain catchments, and under certain flow conditions, water resources are under stress and options to increase water supplies by simply abstracting more water from the environment are extremely limited.

Flood Risk

Flooding can result from rivers and the sea, directly from rainfall on the ground surface and rising groundwater, overwhelmed sewers and drainage systems, and from reservoirs, canals and lakes and other artificial sources. Climate change may have a significant effect upon future flood risk in the region. **Table D.5** presents the numbers of properties in England Wales at risk of river and sea flooding, by risk category.

The extreme floods of 2007 prompted the Pitt Review (2008) and the subsequent Flood Risk Regulations 2009. Under these regulations the Environment Agency and Natural Resources Wales must produce and publish flood risk management plans at the river basin district scale.

Since then there has been significant investment in flood defence schemes and other flood risk management measures, but during the same period the number and intensity of flooding incidents has also increased. Collated updated regional data is not yet available but recently the Environment Agency has commented on its ongoing work “to identify and alleviate the risk of flooding that currently affects more than 5.2 million properties in England."

The SSW Operation Area stretches over two river basin districts; the Severn and the Humber. Relevant findings from these flood risk management plans are described below.

Humber River Basin District[72]

The Humber river basin district covers approximately 26,000km^2 from the North York Moors to Birmingham. Whilst much of the flood risk in this river basin district is posed by coastal erosion and flooding, within the SSW operational area the plan identifies a high risk of surface water flooding.

The plan discusses several measures for preventing risk including appropriate and safe development, an increased programme of monitoring and modelling and the development of opportunities for water storage

[70]Environment Agency (2013) Water stressed areas – final classification (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/244333/water-stressed-classification-2013.pdf)

[71] Updating the determination of water stressed areas in England - Environment Agency - Citizen Space (environment-agency.gov.uk)

[72] Environment Agency (2016) Humber river basin district flood risk management plan https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/507114/LIT_10204_HUMBER_FRMP_SUMMARY_DOCUMENT.pdf

upstream of town and cities. The Environment Agency will continue to invest in improving real-time rainfall and river level data to provide a quality flood warning service.

Severn River Basin District[73]

In the north of the Severn river basin district, the rivers Severn and Teme run through steep valleys. Here the rivers respond rapidly to rainfall, so flooding can happen relatively quickly. Risk management authorities have worked together to reduce flood risk in the region through investment in flood defence and flood alleviation schemes.

Measures in place to manage flood risk include maintenance of watercourses and existing flood defences, sustainable management of development, improving flood forecasting and warning, and the construction or improvement of flood defence schemes.

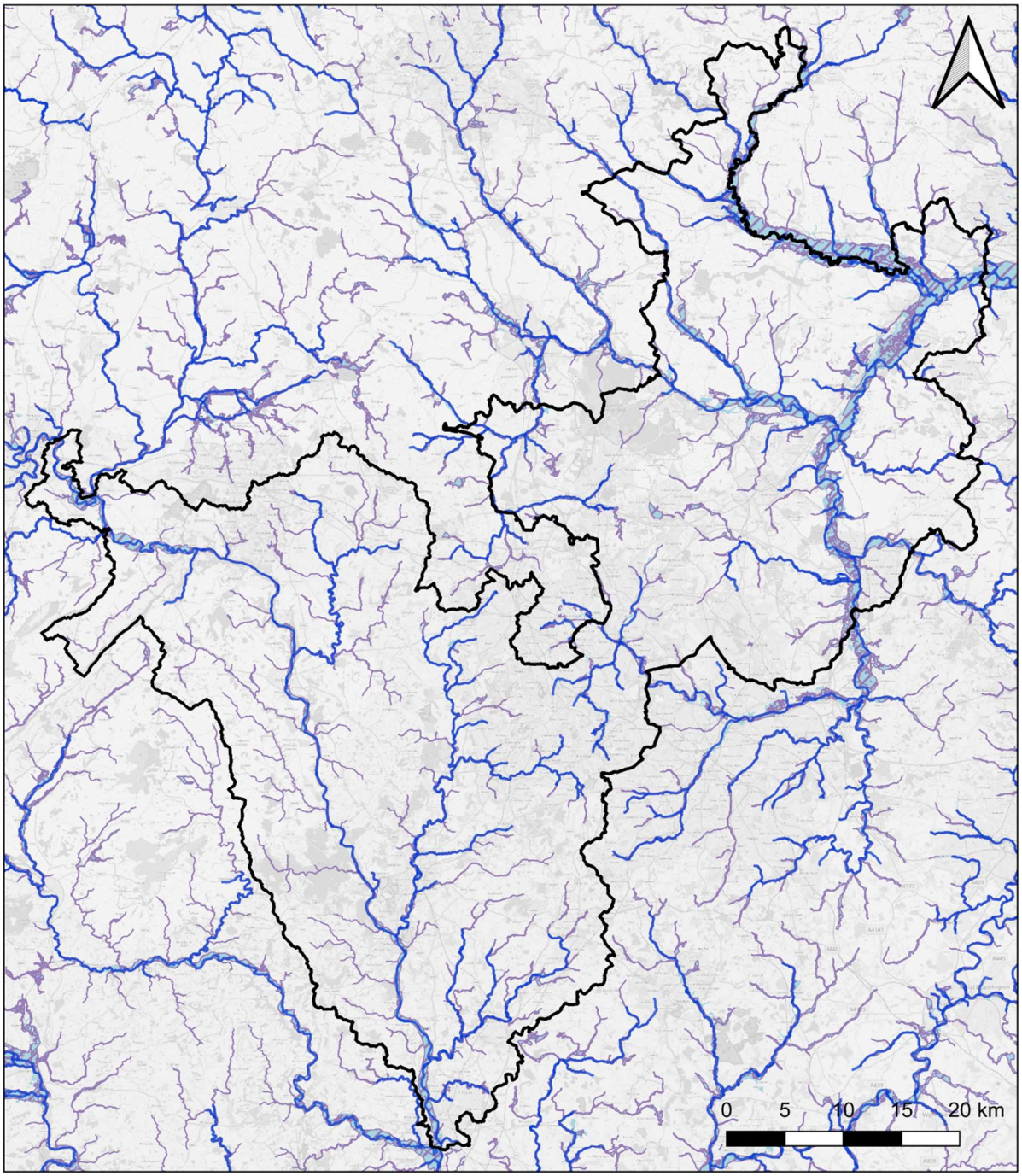
Table D.5 Properties in England and Wales at risk of river and sea flooding, by risk category[74]

Region	Number of properties at risk of flooding	Number of properties at significant risk of flooding
West Midlands	~190,000	~50,000
East Midlands	~475,000	~125,000
South West	~390,000	~125,000
Wales	220,000	64,000
England	2,400,000	500,000

[73] Environment Agency (2016) Severn river basin district flood risk management plan https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/507831/LIT_10212_SEVERN_FRMP_SUMMARY_DOCUMENT.pdf

[74] Environment Agency (2009) Flooding in England: A National Assessment of Flood Risk

Figure D.3 Flood Zones and Main Rivers



Legend

- Assessment Area
- Main Rivers
- Flood Zone 2
- Flood Zone 3

Figure Title

Flood Zones and Main Rivers

Figure No.	Date
D.3	April 2021

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Water Resources West

Likely Evolution of the Baseline without the WRMP

Water Quality

Originally, the WFD set a target of aiming to achieve at least 'good status' in all water bodies by 2015. However, any waterbody that had not already achieved good status by 2015 would have an extended target date, and if this hasn't been improved in 2021 then by 2027. This is the case for many river basins in the Midlands area. The primary objective in the short-term is to ensure no deterioration in status between status classes: the 2015 water body classification is the baseline from which deterioration between classes is to be assessed; no deterioration between status classes is permitted unless certain and specific conditions apply.

The UK WFD Regulations will continue to be statutory, and stakeholders across the region will continue collaborating on existing pollution control and land-use management plans to achieve the challenging 'Good Status' goals by 2027.

The future provision of safe, high quality drinking water is threatened by several factors including the risks from emerging contaminants and microplastics. Emerging contaminants, such as those found in personal care products (PCPs) and pesticides, threaten both the aquatic environment and human health due to their persistent nature and ability to adversely affect organisms who are exposed to them for long periods of time. Microplastics are also of concern as they persist in the environment and can have harmful effects on organisms. There is limited research with regards to microplastics and freshwater as most studies to date have focussed on the marine environment. The water industry must work to continuously review potential contaminants to understand where they originate, what effects they can have on the environment and population and how they can be removed.

Water Resources (Quantity)

Over the next 30 years, there will be an even higher demand for water due to increases in population and development. The Environment Agency's 2020 National Framework for Water Resources[75] makes it very clear that if we don't take action many areas of England will face water shortages by 2050. The framework is the result of collaboration across the water sector bringing in representatives from the water industry through Water UK and regional groups, agriculture, power generation, industry, drainage authorities, navigations, NGOs, regulators and government.

If no action is taken beyond that already planned for implementation to 2025 the models suggest that England could need up to 3,435 Ml/d extra by 2050 to meet public water supply needs (assumption based off a target drought resilience of 1 in 500 and a high population growth scenario). The need can be met by a combination of increasing supply, moving water (transfers) and reducing demand through water efficiency and reducing leakage. This need is likely to grow further by the end of the century. Projections beyond 2050 carry increasing uncertainty, however the analysis suggests something in the region of 5,500 to 6,000 Ml/d additional water may be needed between 2025 and 2100.

In the wider area covered by WRW increased consumption, driven by population increases, is the largest driver of additional water need. Increased public water supply drought resilience and increased protection for the environment also create a significant proportion of the pressures on water resources. The impact of climate change reducing water availability of existing supplies has a smaller, but still significant, impact.

The pressure on water resources extends across sectors that use water not supplied by water companies through direct abstraction. The current resilience to drought of sectors outside public water supply is far less well understood than the resilience of public water supply.

Consumptive water use outside of public water supply is very high in the WRW region, dominated by industrial abstraction from the chemicals and paper sectors, followed by agriculture. Similar to the previous Water Strategy Regional Action Plan for Midlands Region, the National framework has modelled a range of future baseline scenarios for both the public water supply and non public water supply demands, with demands increasing.

The framework identifies the main types of solutions that the regional water groups and their various stakeholders should consider including demand management, options to for example increase supply sustainably and connect transfers.

[75] Environment Agency (2020) Meeting our future water needs: a national framework for water resources (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/872759/National_Framework_for_water_resources_main_report.pdf)

Climate and Flood Risk

Climate change may have a significant effect upon future flood risk in the region.

The UK Climate Change Risk Assessment (CCRA) 2016 Evidence Report[76] draws together and interprets the evidence gathered by CCRA regarding current and future threats and opportunities for the UK posed by the impacts of climate change up until 2100. Findings of the assessment include:

- Increasing pressure on the UK's water resources due to changes in hydrological conditions, population growth and regulatory requirements to maintain good ecological status.
- Major supply-demand deficits were identified for five river basin regions including the Humber and Severn.
- Increases in water demand for irrigation of crops.
- Lower summer rivers flows across the UK due to warming and drying conditions.
- An increase in precipitation in winter months due to a combination of greater depths and more frequent heavy rainfall events - suggesting larger volumes of runoff with potential negative impacts on flood risk and sewer overflows in urban environments.
- Flash-flooding associated releases from combined sewer overflows (CSO) could in turn increase associated illnesses at the coast due to the varying occurrence of microbial pathogens in the marine environment.

The NPPF states that inappropriate development in areas at risk of flooding (in Flood Zone 1[77], Flood Zone 2[78], Flood Zone 3a[79] or Flood Zone 3b - the functional floodplain); should be avoided by directing development away from areas at highest risk (whether existing or future). The NPPF requires that where development is necessary, it should be made safe without increasing flood risk elsewhere, as defined in the Technical Guidance to the NPPF[80]. The NPPF requires the application of a sequential, risk-based approach (operated through Strategic Flood Risk Assessment) to the location of development to avoid where possible flood risk to people and property and to manage any residual risk, taking account of the impacts of current and future climate change.

Following application of the Sequential Test, if it is not possible, consistent with wider sustainability objectives, for the development to be located in zones with a lower probability of flooding, the Exception Test can be applied if appropriate. This includes development for water- compatible uses (e.g. water transmission infrastructure and pumping stations) and essential infrastructure (e.g. water treatment works that need to remain operational in times of flood).

The Government's 25 year Environment Plan looks to strengthen the relevant protections in the NPPF and, in addition, focus on using more natural flood management solutions, increase the uptake of sustainable drainage systems and improve resilience and recovery times of at risk properties.

The Environment Agency has produced 77 Catchment Flood Management Plans (CFMPs) for England and Wales. Through the CFMPs, inland flood risk across all of England and Wales has been assessed for the first time. The CFMP considers all types of inland flooding, from rivers, ground water, surface water and tidal flooding. The role of CFMPs is to establish flood risk management policies which will deliver sustainable flood risk management for the long term. This is essential if for effective investment decisions for the future and to help prepare ourselves effectively for the impact of drought events as a result of climate change. The CFMPs will help target the areas that are at greatest risk and provide information on the likely future flood risk, which will help establish the future baseline.

For the SSW region, the following CFMPs have been produced:

- River Trent Catchment Flood Management Plan
- River Severn Catchment Flood Management Plan

[76] Defra (2016) The UK Climate Change Risk Assessment 2016 Evidence Report

[77] Low probability of river or sea flooding (<0.1%) which has critical drainage problems

[78] Medium probability of river (1%-0.1%) or sea flooding (0.5%-0.1%)

[79] High probability of river (>1%) or sea flooding (>0.5%)

[80] Ministry of Housing, Communities & Local Government (2014) Flood risk and coastal change. https://www.gov.uk/guidance/flood-risk-and-coastal-change

Key Issues Relevant to the WRMP

The key issues arising from the baseline assessment for water are:

- The need to further improve the quality of the regions' river and estuarine waters taking into account WFD objectives.
- The need to maintain and improve the quantity and quality of groundwater resources taking into account WFD objectives
- The need to improve the resilience, flexibility and sustainability of water resources in the region, particularly in light of potential climate change impacts on surface water and groundwater
- The need to ensure sustainable abstraction to protect the water environment and meet society's needs for a resilient water supply
- The need to reduce and manage flood risk
- The need to ensure that people understand the value of water
- The need to address increased pressures on public water supply

Air Quality

Baseline Characteristics

Local Air Quality

Options in the WRMP may require construction, the operation of abstraction and treatment operations in new locations and changes to the operation of such processes in existing locations. These activities have the potential to lead to adverse effects on air quality through emissions associated with construction requirements or through the operation of the options.

The local air quality baseline situation can be described through reference to the number of designated Air Quality Management Areas (AQMA). A local authority declares an AQMA when UK National air quality objectives are unlikely to be met. There are 23 AQMAs within the assessment area, located in the more populous South West of the study area. The majority of the AQMAs in the UK have been declared because of emissions from road transport.

The Government published an updated air quality plan in 2017 along with individual zone plans for the 37 zones identified as having air quality issues with nitrogen dioxide (NO2)[81]. This plan identified 68 local authorities (in addition to London and the five cities included in the 2015 plan with NO2 breaches forecast to remain above legal limits unless additional measures were taken[82]. Of these, 29 local authorities with persistent exceedances were required to undertake local action to consider the best option to achieve statutory NO2 limit values within the shortest possible time [83]. The national NO2 air quality action plan however suffered legal challenges and was declared by the High Court as "unlawful"[84]. In response, the Government issued a more comprehensive Clean Air Strategy in January 2019 to deal with all sources of air pollution, which importantly supported the creation of additional Clean Air Zones[85] The Defra Clean Air Strategy 2019 includes an action to reduce emissions of the ozone precursors, nitrogen oxides and volatile organic compounds (ozone is not emitted, but rather forms in the air as a result of emissions of nitrogen oxides).

Likely Evolution of the Baseline without the WRMP

Government and international targets indicate significant cuts in greenhouse gas emissions will take place by 2027. Objectives are being achieved for many air pollutants (lead, benzene, 1,3-butadiene and carbon monoxide (CO)). However, measurements show that long-term reducing trends for NO2 and PM10[86] are flattening or even reversing at a number of locations, despite current policy measures.

For example, emissions of PM10 and PM2.5 have been relatively stable since 2009. The Government's aim is to reduce emissions of PM2.5 against the 2005 baseline by 30% by 2020, and 46% by 2030, emissions of NO2 against the 2005 baseline by 55% by 2020 and 73% by 2020 and to reduce emissions of sulphur dioxide against the 2005 baseline by 59% by 2020, increasing to 88% by 2030.[87].

Key Issues Relevant to the WRMP

The key sustainability issue arising from the baseline assessment for air quality is:

- The need to reduce air pollutant and greenhouse emissions and limit air emissions to comply with air quality standards.

Climatic Factors

Baseline Characteristics

SSW is a large user of energy due to the need to treat and pump water. SSW's operational carbon emissions per connected property were estimated to be 69kg in 2019/20[88].

[81] https://uk-air.defra.gov.uk/assets/documents/no2ten/2017-zone-plans/AQplans_UK0030.pdf

[82] Defra (2017) UK plan for tackling roadside nitrogen dioxide concentrations: Detailed Plan https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/633270/air-quality-plan-detail.pdf

[83] Defra (2017) UK plan for tackling roadside nitrogen dioxide concentrations.

[84] https://publications.parliament.uk/pa/cm201719/cmselect/cmenvfru/433/43310.htm

[85] Defra (2019) Clean Air Strategy 2019: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/770715/clean-air-strategy-2019.pdf

[86] Particulates with a diameter of 10µm or less

[87] Defra (2019), Clean Air Strategy 2019

[88] SSW (2019) SSW Final Business Plan 2020 to 2025

SSW have committed to saving 7kg of carbon per connected property by 2024/25 through leakage reduction, investment in the efficiency of their pumping assets, purchasing of more green energy from the wholesale market, review of alternative energy sources and the adoption of emission reducing innovation.

Future climate change is likely to influence processes within the hydrological cycle such as runoff and evapotranspiration. The potential impact of climate change on SSW's WRMP water supply and demand management schemes is summarised in **Table D.6.**

Table D.6 Potential Impact of Climate Change on Water Resources and Demand Management Schemes

Sector	Impact
Water Resources **(i) water supply**	Reduction in water source yield, either in total or at certain times of the year. Increased evaporation losses from surface water stores. Increased sediment and pollution runoff into watercourses caused by changes in farm management practices adopted to adapt to climate change. Increased risk of algal blooms and pollution in reservoirs.
(ii) water demand	Increase in demands in summer months leading to increase in average and peak requirements. Increased pressure on treatment and distribution system.
Flood management	Increased riverine flood risk and storm occurrence due to increased rainfall, leading to reduction in safety standards. Improvements and higher specifications required for flood defences, urban drainage and rainwater disposal.
Water quality management	Lowered water quality in lowland rivers, with implications for in-stream ecosystems and water abstractions. Altered potential for polluting incidents. Increased potential for combined sewer overflows.
Navigation	Lower summer flows leading to reduced navigation opportunities in rivers and canals.
Aquatic ecosystems	Altered habitat potential, with species at their environmental margins most affected.
Water-based recreation	Impacts through changes in river flows and water quality.

Climate monitoring and risk assessments have improved significantly over the last two decades but there are still limits to the understanding of future climate risks. Irrespective of future greenhouse gas emissions, there is already a certain amount of global warming "locked in" due to historic emissions and inertia and lags in the global climate system.

Mitigation through reduction in greenhouse gas emissions will contribute to risk reduction over the long term (100 years). Adaptation is however needing to start now to reduce the costs and damages of potential related impacts and to take advantage of opportunities that result from a changing climate.

The 2018 UK Climate Projections (UKCP18) estimate that summers in central England are likely, to be 0°C to 5.8°C warmer and 57% drier to 9% wetter[89]. These figures are more extreme than the UKCP09 projections detailed in **Table D.7.** These changes could affect the frequency and severity of drought events. **Table D.7** presents the key findings of UKCP09 projections using a high emissions scenario (the UKCP09 are the latest most readily useable data), which represents the worst case, and the best central estimate for a summary of the projected climate change in the region.

[89] Defra, BEIS, the Met Office and the Environment Agency (2018) – UKCP18 Climate Change Over Land: https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/ukcp/ukcp18-infographic-headline-findings-land.pdf

Adaptation to Climate Change

The UK Climate Change Risk Assessment (CCRA) Evidence Report[90] draws together and interprets the evidence gathered by CCRA regarding current and future threats and opportunities for the UK posed by the impacts of climate change up until 2100. Overall, the findings of the CCRA indicate that the greatest need for early adaptation action (i.e. within the next 5 years) is in the following areas:

- Flood and coastal erosion risk management
- Specific aspects of natural ecosystems, including managing productivity and biodiversity (the management of forest pests and diseases, low summer river flows and the movement of plants and animal species are all highlighted as high priorities for action)
- Managing water resources, particularly in areas with increasing water scarcity
- Overheating of buildings and infrastructure in the urban environment
- Health risks associated with heatwaves and other risks that may affect the NHS

Table D.7 Opportunities for the UK economy, particularly to develop climate adaptation products and services

Date	2020			2050			2080		
Variable	**Wales**	**West Midlands**	**East Midlands**	**Wales**	**West Midlands**	**East Midlands**	**Wales**	**West Midlands**	**East Midlands**
Summer mean temperature is likely to rise, with a change in °C of:	1.3	1.4	1.4	2.8	2.8	2.9	4.5	4.4	4.7
Summer mean precipitation is likely to decrease, with a percentage change of:	-4%	-4%	-4%	-17%	-16.6%	-17.1%	-26%	-25.1%	-25.8%
Winter mean temperature is likely to rise, with a change in °C of:	1.2	1.2	1.3	2.3	2.3	2.5	3.3	3.4	3.6
Winter mean precipitation is likely to decrease, with a percentage change of:	5%	6%	6%	13%	14%	16%	26%	23%	25%

Likely Evolution of the Baseline without the WRMP

Government and international targets, revised by the Paris Agreement (2016), indicate significant cuts in greenhouse gas emissions will take place by certain years (2017, 2022, 2027 and 2032). The UK met the first and second carbon budgets with headroom of 36 and 384 MtCO2e respectively and is currently projected to meet the third carbon budget with a headroom of around 26 MtCO2e (until 2022) but not to meet the targets for 2027[91]. SSW states that 'with falling emission factors our carbon emissions are set to fall by 43% by 2020 and a further 29% up to 2025'. Proposals for renewable energy schemes have been included to ensure a further reduction in carbon emissions albeit as a water only company, its opportunities to generate electricity are limited to wind and solar. SSW intends to install solar panels at some sites to reduce electricity taken from the electricity grid and further reduce emissions'[92].

In 2016 the CCRA considered more than 700 risks associated with climate change and selected 100 risks for detailed review. These included public water demand-supply deficit, lower summer river flows, number of

[90]Defra (2016) The UK Climate Change Risk Assessment 2017 Evidence Report

[91] DECC (2019) Updated energy and emissions projections 2018 https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/501292/eepReport2015_160205.pdf

[92] Carbon Emissions | South Staffs Water (south-staffs-water.co.uk)

unsustainable water abstractions (total), the northward spread of invasive non-native species, increased soil erosion due to heavy rainfall and an increase in water demand for irrigation of crops.

Key Issues Relevant to the WRMP

The key sustainability issues arising from the baseline assessment for climatic factors is:

- The need to reduce greenhouse gas emissions (all sectors)
- The need to mitigate against climate change through the reduction in greenhouse gas emissions in order to contribute to risk reduction over the long term
- The need to adapt to the impacts of climate change, for example, through, sustainable water resource management, water use efficiencies, specific aspects of natural ecosystems (e.g. connectivity), as well as accommodating potential opportunities afforded by climate change.

Population and Human Health

Baseline Characteristics

Population

The West Midlands region is projected to increase its population by 14% by 2043, based on the 2018 baseline figure of 5.9 million. The West Midlands Region contains one of the largest conurbations in England, as well as some of the country's most rural and sparsely populated counties. To provide context, the population in England as a whole is expected to increase by 10% by 2043. **Table D.8** shows the population statistics and projections for the regions that fall within the assessment area.

Table D.8 Population statistics and projections

Region	2018 population (millions)	2043 population (millions)	Population change (%)
West Midlands	5.9	6.7	14%
East Midlands	4.8	5.5	15%
South West	5.6	6.4	14%
Wales	3.1	3.1	0%
England	56.0	61.7	10%

The long-term issues relating to population growth and associated requirement for housing and water (and wastewater) infrastructure provision represent key issues for the strategies required within the long-term planning horizon of the WRMP.

Human Health and Deprivation

The WRMP has the potential to influence quality of life, including human health, well- being, amenity and community, through actions to maintain essential water supplies for public use. There could be beneficial (e.g. actions to provide additional supply of water will help safeguard public health) or adverse impacts (e.g. noise and disruption from the construction of infrastructure).

Water resources management and planning is of critical importance in maintaining water reliable and safe water supplies for health and wellbeing of the population supplied by SSW. Some established water resource schemes (e.g. reservoirs) can also provide benefits to quality of life through the provision of recreational (passive or active) opportunities[93].

It is difficult to quantify the extent to which existing operations and facilities are, or are not, influencing the local environmental quality and hence human health. The SEA will assess the potential effects of each option, programme and plan on the local environmental quality and the potential implications (adverse or beneficial) on human health.

It has been shown that, in some cases, people in disadvantaged areas experience greater exposure to negative impacts on human health including air pollution, flooding and proximity to large industrial and waste management sites[94]. The Index of Multiple Deprivation combines a number of indicators, chosen to cover a range of economic, social and housing issues[95], into a single deprivation score for each Lower Super Output Area[96] in the UK. This allows each area to be ranked relative to one another according to their level of deprivation. The Indices are used widely to analyse patterns of deprivation, identify areas that would benefit from special initiatives or programmes and as a tool to determine eligibility for specific funding streams. The

[93] Well-being for Future generations (Wales) Act 2015

[94] Defra (2006) Air Quality and Social Deprivation in the UK: an environmental inequalities analysis

[95] Income Deprivation, Employment Deprivation, Health Deprivation and Disability, Education Skills and Training Deprivation, Barriers to Housing and Services, Living Environment Deprivation, and Crime.

[96] Super Output Areas (SOAs) are a set of geographical areas developed following the 2001 census. The aim was to produce a set of areas of consistent size, whose boundaries would not change, suitable for the publication of data such as the Indices of Deprivation. They are an aggregation of adjacent Output Areas with similar social characteristics. Lower Layer Super Output Areas (LSOAs) typically contain 4 to 6 OAs with a population of around 1500

English Index of Multiple Deprivation (2015)[97] and the Welsh Index of Multiple Deprivation (2014)[98] have been developed slightly differently and cannot be compared directly. **Figure D.4** Indices of Multiple Deprivation in the Assessment Area shows the Index of Multiple Deprivation across the assessment area.

As is the case with the rest of the UK, most urban centres contain areas with high levels of deprivation. Birmingham, Wolverhampton and Stafford are in the immediate vicinity of the assessment area (but outside of the border of SSW Supply Area) which may have some potential adverse impact on air quality within the assessment area. However, there are also pockets of deprivation associated with smaller population centres within SSW Supply Area (e.g. Burton-on-Trent, Dudley, Kidderminster, Walsall, West Bromwich, Smethwick and Sandwell).

Data relating to drinking water quality, pollution incidents and air quality, which may have indirect effects on amenity and human health are covered in separate sections of this Scoping Report. The Consumer Council for Water report (2019)[99] on complaints and enquiries for the year 2018-19 shows that overall industry complaints decreased by 17% from 9,641 in 2017-18 to 11,254 in 2018-19. For the SSW area, the total number of complaints has reduced from 79 in 2017-2018 to 75 in 2018-2019[100]. With the average number of complaints for every 10,000 properties served standing at 1.25 in 2018-2019.

It should be noted that at £126, SSW has one of the lowest average household bills in England and Wales for water services; 25% below the national average. In the SWW area household customers will continue to receive one of the lowest combined water and sewerage bill in England and Wales, with the announcement of new water charges for 2020/21. Average household water and sewerage bills in England and Wales fell by around £17 (4%) in 2020/21.

Activities relating to the construction of new water service infrastructure assets, renewal or replacement of supply pipes, installation of metering/telemetry systems etc can result in physical inconvenience (blocking roads and footpaths etc), noise, and temporary reductions in water pressure, loss of supply. Other measures that may be included in the WRMP could potentially affect communities in terms of nuisance, loss of sense of place and other adverse effects on well-being. It is not possible to collect baseline data against which to assess such effects. These effects will need to be assessed in the SEA based on the specific effects identified at the option, programme and plan level taking account of any planned mitigation measures to be included.

In general, the health of the population in assessment area is good. Health-related sustainability indicators are reported in the ONS Sustainable Development Indicators report[101]. Data relating to drinking water quality and pollution incidents and air quality, which could also be affected by the WRMP, and as a result affect amenity and health are covered in separate sections of the baseline.

Affordability of Water

Nationally, approximately 24% of households spend more than 3% of their income (after housing costs) on water and sewerage bills, and 11% spend more than 5%102. Ofwat and government policy has focused on addressing this issue through continued incentives for water companies to drive out financial efficiencies in its operations and investment programmes, as well as consider the use of 'social tariffs' for those struggling to pay their water bills. In 2017-18 SSW provided over £166,000 support to struggling customers through the WaterSure scheme, and its number of customers registered on its social tariffs has increased significantly from 67.94 (per 10,000 metered household customers) in 2016-17 to 163.64 in 2017-18[103].

Ofwat and government policy has focused on addressing water affordability through continued incentives for water companies to drive out financial efficiencies in its operations and investment programmes, as well as consider the use of 'social tariffs' for those struggling to pay their water bills. It should be noted that SSW already has the third lowest household water bill within the water sector, 23% below the average[104].

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[97] http://www.communities.gov.uk/communities/research/indicesdeprivation/deprivation10/

[98] http://wales.gov.uk/topics/statistics/publications/wimd11guidance/?lang=en

[99] Consumer Council for Water (2016) End of Year Complaints and Enquiries Report – 1 April 2015-31 March 2016 http://www.ccwater.org.uk/wp-content/uploads/2016/07/Consumer-Council-For-Water-2015-16-Year-End-Report-on-Consumer-Complaints-and-Enquiries-1.pdf

[100] http://www.discoverwater.co.uk/complaints

[101] ONS (2015) Sustainable Development Indicators, July 2015: http://www.ons.gov.uk/ons/dcp171766_407238.pdf

[102]Ofwat (2015) Affordability and debt 2014-15. http://www.ofwat.gov.uk/wpcontent/uploads/2015/12/prs_web20151201affordability.pdf Ofwat's last review was in 2013-14 and further data is not available.

[103] Consumer Council for Water (2018) Affordability and vulnerability in the water sector (2017-18)

[104] SSW (2019) Making water count – business plan 2020/25

Water metering can help customers reduce their bills through improved water use efficiency. However, there are concerns that metering can disadvantage vulnerable and low income groups. SSW are moving toward compulsory metering in line with Cambridge Water's metering strategy.

Recreation and Tourism

WRMP options have the potential to affect areas with recreation value. Effects could arise as a result of scheme operation (for example on river water levels), or due to scheme construction (for example due to restricted access).

Figure D.6 shows some of the areas that may be used for recreation within the assessment area. This includes two AONBs (see Landscape topic), NNRs and LNRs (see Biodiversity, Flora and Fauna topic).

There are a variety of opportunities for recreation and tourism within assessment area. Many of the recreational and cultural offerings are represented in other topic areas in the baseline. For example, the water supply area includes a number of water resources of recreational importance including reservoirs for sailing or fishing and river reaches of particular importance with respect to angling.

Other, non-water based, recreational and cultural resources in the assessment area include a number of nature reserves presented earlier identifies the importance of the assessment area with respect to heritage assets, including 41 Registered Parks and Gardens.

Public areas of open space, National Parks, country parks[105], PRoW, walking routes and cycle routes are also important with respect to recreation and tourism. The NPPF for England states planning policies should protect and enhance public rights of way and access. All Local Authorities are required to prepare and publish ROWIPs. These plans explain how improvements made by local authorities to the PRoW network will provide a better experience for a range of users.

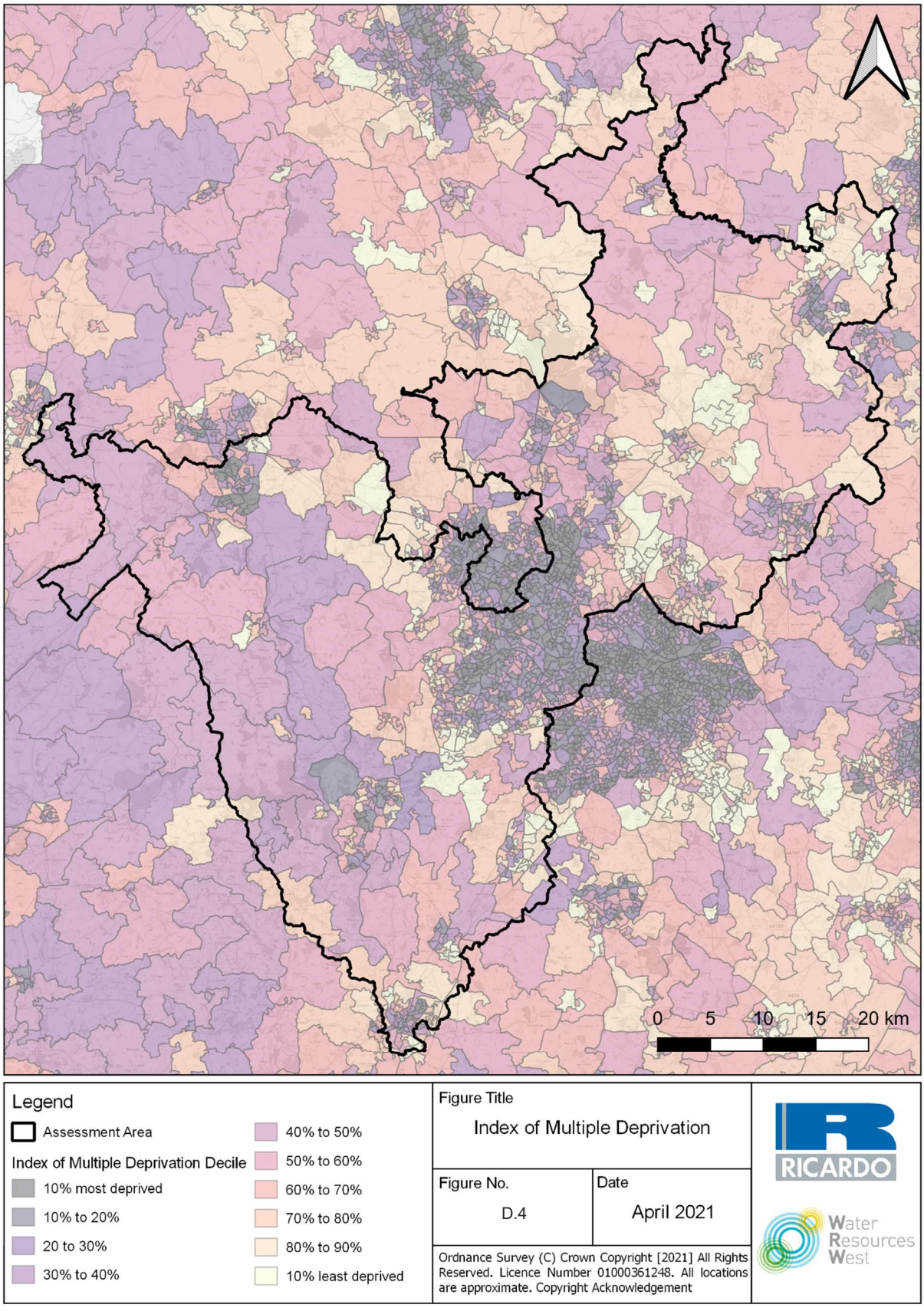
The NPPF defines green infrastructure as 'a network of multi-functional green space, urban and rural, which is capable of delivering a wide range of environmental and quality of life benefits for local communities' Local planning authorities are required to plan positively for strategic networks of green infrastructure and take account of the benefits of green infrastructure in reducing the risks posed by climate change. The majority of Local Authorities have therefore developed Green Infrastructure strategies or studies addressing these issues. Green infrastructure will often play a large part in local recreational resources. In 2019 £100.8 billion was spent on tourism across England. It is estimated that regional spending on tourism was £6.2 billion for the West Midlands area[106]. Visit England recorded a total of >4.2 million visitors to the top 20 paid attractions in the West Midlands[107].

[105] Area designated for people to visit and enjoy recreation in a countryside environment

[106] Visit England (2019) Tourism in England: Key Facts and Trends https://www.visitbritain.org/sites/default/files/vb-corporate/Documents-Library/documents/England-documents/ve_key_facts_and_trends_2019_csv.pdf

[107] Visit England (2019) Most visited paid attractions – West Midlands 2019 Annual Survey of Visits to Visitor Attractions: Latest results | VisitBritain

Figure D.4 Indices of Multiple Deprivation in the Assessment Area



Likely Evolution of the Baseline without the WRMP

The population in the assessment area is expected to grow at a rate of 14% (see **Table D.8**), with an increasing proportion of people at or above state pension age.

WaterUK reports that, as well as planning to cut bills in real terms during the 2020-2025 period, the water companies in England and Wales intend to spend at least £1 billion a year making substantial environmental enhancements[108].

Guidance from the Government was issued in 2012 on the introduction of social tariffs which enable water companies to offer more support to customers at risk of affordability problems[109]. It also ensures that water companies have the freedom to offer enhanced terms to WaterSure customers (a capped charge intended to help customers who pay for their water charges via a water meter who experience difficulties as a result of high water usage or low income) through their social tariffs from April 2013. SSW has already seen a large increase in customers obtaining support from the WaterSure scheme and Social Tariffs and this is expected to increase as more customers become aware of the support that is available.

In response to recent studies access to the recreational resources, green spaces and the historic environment will have greater importance in future planning[110]. The NPPF suggests a range of areas that should be taken into account, including the provision of appropriate facilities for recreation that preserve the openness of the green belt.

The National Ecosystem Assessment and the Marmot Review, Fair Society, Healthy Lives, demonstrate the positive impact that nature has on mental and physical health and as a result the Government intends to establish a Green Infrastructure[111] Partnership with civil society to support the development of green infrastructure in England.

The 'Natural Resources Policy[112]' framework has the aim to ensure that Wales has increasingly resilient and diverse ecosystems that deliver economic, environmental and social benefits. Improvements to the quality of the water environment and certain potential climate change impacts will present opportunities for an expanding tourist industry in the region[113].

Improvements to the quality of the water environment and certain potential climate change impacts will present opportunities for an expanding tourist industry in the region[114].

Key Issues Relevant to the WRMP

The key sustainability issues arising from the baseline assessment for population and human health are:

- The need to ensure water supplies remain affordable especially for deprived or vulnerable communities
- The need to ensure continued improvements in levels of health across the region, particularly in urban areas and deprived areas
- The need to ensure public awareness of drought conditions and importance of maintaining resilient, reliable public water supplies without the need for emergency drought measures
- The need to ensure water quantity and quality is maintained for other users including tourists, recreational users and other users such as farmers
- The need to ensure continuing safe, reliable and resilient provision of water and sewerage services to maintain health and wellbeing of the population
- The need to ensure a balance between different aspects of the built and natural environment that will help to provide opportunities for local residents and tourists, including opportunities for access to, protecting and enhancing recreation resources, green infrastructure and the natural and historic environment
- The need to accommodate an increasing population

[108] Average water and sewerage bills for England and Wales to fall by £17 in 2020/21 | Water UK
[109] Defra (2011) Water for Life - Water White Paper
[110] Defra (2011) The Natural Choice: securing the value of nature, The Natural Environment White Paper
[111] Green infrastructure is a term used to refer to the living network of green spaces, water and other environmental features in both urban and rural areas.
[112] Welsh Government (2017) Natural Resources Policy https://gov.wales/sites/default/files/publications/2019-06/natural-resources-policy.pdf
[113] Defra (2016) The UK Climate Change Risk Assessment 2016 Evidence Report.
[114] Defra (2012) The UK Climate Change Risk Assessment 2012 Evidence Report.

- The need to ensure that sites of nature conservation importance, heritage assets, water resources, important landscapes and public rights of way contribute to recreation and tourism opportunities, subsequently health, well-being, and the economy.

Material Assets and Resource Use

Baseline Characteristics

Water Use

In 2015/1641, SSW delivered around 330 million litres of water per day (Ml/d) into its supply system. SSW currently transfers around 30 Ml/d to Severn Trent Water from the River Severn and provides a number of other small bulk exports (less than 2 Ml/d) and imports no more than 1 Ml/d from Severn Trent Water. SSW has ongoing programmes to reduce leakage from its network and to encourage more efficient use of water by customers. Leakage levels from the water distribution system reported by SSW for 2018/2019 was 83.7 Ml/d[115], below the sustainable economic level of leakage of 84.0 Ml/d. Water consumption per person is lower in the SSW supply area compared to other parts of the country, with an average use per person per capita consumption (pcc) estimated at around 128 litres/day compared to a national average in England and Wales of around 142 litres/day (2019-2020)[116].

Resource use and waste

There is an ongoing need for society to reduce the amount of waste it generates, by using materials more efficiently, and improving the management of waste that is produced.

Waste going to landfill (England) has fallen from 67% of all waste in 2004/05 to just 10.8% in 2018/19 (19,822 thousand tonnes to 2,756 thousand tonnes); household recycling rates seem to have plateaued at around 43% since 2011/12. In 2018/19 household recycling rates in the West Midlands were at 39.9%[117]. Waste generated by businesses declined by 29% in the six years to 2009 but recycling from businesses is also relatively low, estimated to be around 35 to 40%[118]. **Table D.9** depicts the regional difference in the management of local authority waste for 2019/20. The proportion of waste recycled in the West Midlands is lower than the national average, whilst the percentage of waste incinerated is one the highest nationally[119].

Table D.9 Management of all local authority collected waste 2019/20

Region	Total	Landfill	Incineration	Recycled/ composted	Other
	Thousand tonnes	% of total	% of total	% of total	% of total
West Midlands	2,760	6.4	52.7	39.4	1.5
East Midlands	2,327	14.9	39.2	44.0	1.9
South West	2,598	14.0	34.1	49.3	2.5
England	25,568	8.5	45.5	42.8	3.2

Data on waste arisings is collected in a range of categories. The activities of the water industry contribute to construction, demolition and excavation waste (CDEW), through construction of new infrastructure. The water industry also contributes to several waste streams through the operation of facilities. Waste streams include

[115] PWC (2019) Funding approaches for leakage reduction https://www.ofwat.gov.uk/wp-content/uploads/2019/12/PwC-%E2%80%93-Funding-approaches-for-leakage-reduction.pdf

[116] CCW (2020) Water and Wastewater Resilience Report 2019/20 https://www.ccwater.org.uk/wp-content/uploads/2020/08/Water-Water-Everywhere-water-and-waste-water-resilience-report-2019-20.pdf

[117] Local authority collected waste generation from April 2000 to March 2020 (England and regions) and local authority data April 2019 to March 2020 (https://www.gov.uk/government/statistical-data-sets/env18-local-authority-collected-waste-annual-results-tables)

[118] Defra (2019) Waste and recycling: making recycling collections consistent in England (https://www.gov.uk/government/consultations/waste-and-recycling-making-recycling-collections-consistent-in-england/outcome/consistency-in-recycling-collections-in-england-executive-summary-and-government-response)

[119] Defra (2021) Statistics on waste managed by local authorities in England in 2019/20 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/966114/Statistics_on_waste_managed_by_local_authorities_in_England_in_2019v3_accessible.pdf

commercial and industrial waste (C&I) (statistics include waste arisings from the power and utilities sector, which includes water supply and sewage removal), and also hazardous wastes. In 2016, it is estimated that the commercial and industrial sectors contributed over 32 million tonnes of waste in England, meanwhile the CDE generated over 120 million tonnes, showing 4.7% and 3.0% increases, respectively, when compared to 2014 data[120].

Since 2009 Defra has worked extensively with industry experts (across industry) to modify the method for calculating CDEW and C&I statistics[121]. **Table D.10** shows the latest CDE data, (published in March 2020 but not updated since 2016) and C&I data (data for England updated in 2018). Data per water company is not available, and regional level data is no longer available (data from 2006 and 2009 is included for regional context).

Table D.10 Waste Arising by Region

Waste	UK	England	West Midlands
Non-hazardous construction and demolition waste – Generated (million tonnes) (2016)	66.25.2	59.66.3	(2006) 9.8
Non-hazardous construction and demolition waste - Recovered (million tonnes)(2016)	60.2 (91.0%)	55.0 (92.1%)	-
Commercial and Industrial (C&I) waste arisings (million tonnes)	(2016) Commercial: 27.5 Industrial: 13.	(2018) Commercial: 27.1 Industrial: 10.1	(2009) Total C&I 6.3

In line with the widely adopted 'waste hierarchy', best practice for waste management is to reduce, re-use, recycle and recover, and only then should disposal (or storage) in landfill be considered.

WRMP options that require infrastructure development may result in the use of raw materials and the production of waste. The operation of some WRMP options may result in additional chemical use and the production of waste.

Likely Evolution of the Baseline without the WRMP

The Government's national aspiration is to reduce water usage to an average of 130 litres per person per day by 2030[122]. Government, Ofwat and the Environment Agency expect that leakage will not rise in any water company area and leakage targets must be set that take account of customer priorities for reliable water supplies.

The Government's national aspiration has been to reduce water usage to an average of 130 l/p/d by 2030. In its 25-year plan, Defra confirms that it will continue to work with the industry to set an ambitious personal consumption target and agree cost-effective measures to meet it[123]. The revised target has not yet been decided but it is likely to be lower than 130 l/p/d.

The Government's National Infrastructure Strategy[124] (2020) includes visions to decarbonise the economy, rebuild the economy following the COVID-19 pandemic and to 'level-up' UK cities and regional powerhouses. Plans for green-growth clusters in formerly industrial areas and investment via the Towns Fund could benefit the West Midlands in terms of the economy, industry, resource usage and the built environment.

There is the potential for an increase in operational waste from the water sector as regional population rises and standards of treatment are increased through regulatory requirements.

[120] Defra (2020) UK Statistics on Waste

[121] Defra (2018) Commercial and Industrial Waste Arisings Methodology Revisions for England (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/873328/Commercial_and_Industrial_Waste_Arisings_Methodology_Revisions_Oct_2018_contact_details_update_v0.2.pdf)

[122] Defra (2011) Future Water: The Government's water strategy for England

[123] Defra (2018) A Green Future: Our 25 Year Plan to Improve the Environment. (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/693158/25-year-environment-plan.pdf)

[124] HM Treasury Infrastructure UK (2020). National Infrastructure Strategy https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/938539/NIS_Report_Web_Accessible.pdf

The Waste and Resources Strategy for England[125] identifies diminishing landfill capacity and a fast-growing waste recycling and recovery industry and the proportion of waste sent to recovery rather than landfill is set to continue to increase in the future. Targets included within the strategy include a 17% recycling rate for packaging by 2030, and for 10% or less municipal waste to be sent to landfill by 2035. The government's Resources and Waste Strategy (2018) has the ambition 'to eliminate avoidable waste of all kinds by 2050'.

Key Issues Relevant to the WRMP

The key sustainability issues arising from the baseline assessment for Material Assets and Resource Use are:

- The need to minimise the consumption of resources, including water and energy.
- The need to reduce the total amount of waste produced in the region, from all sources. The need to recognise waste as a potential resource and reuse waste productively where possible to support development of the circular economy.
- The need to reduce the proportion of waste sent to landfill.
- The need to continue to actively control leakage from the water supply system and promote the efficient use of water to help reduce future demand for water.

Cultural Heritage

Baseline Characteristics

Options in the WRMP could affect historic landscape character and historic structures associated with the water environment and the historical context of their setting. Archaeological remains are sensitive to changes in water quality, water levels (for example, waterlogged deposits), pollution and land use practices.

The NPPF[126] defines the historic environment as:

All aspects of the environment resulting from the interaction between people and places through time, including all surviving physical remains of past human activity, whether visible, buried or submerged, and landscaped and planted or managed flora.

Nationally important archaeological sites are statutorily protected as designated heritage assets. **Table D.11** lists the designated heritage asset count nationally, regionally and for the assessment area. These are shown in **Figure D.5.**

Table D.11 Designated Heritage Assets[127]

Asset	England	West Midlands	East Midlands	South West	SEA Assessment Area
World Heritage Sites	20	3	1	4	1
Scheduled Monuments	19,985	1,403	1,545	6,993	239
Listed Buildings	378,865	34,547	30,000	90,220	7,541
Registered Historic Parks and Gardens	1,670	155	146	304	41
Registered Historic Battlefields	47	6	6	10	1
Protected Historic Wrecks	54	0	0	27	0

[125] Defra (2018) Our waste, our resources: a strategy for England https://www.gov.uk/government/publications/resources-and-waste-strategy-for-england

[126] Ministry of Housing, Communities and Local Government (2021) National Planning Policy Framework. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/810197/NPPF_Feb_2019_revised.pdf

[127] English Heritage: Heritage counts 2020 (*designated assets were identified from GIS datasets available from English Heritage at http://services.english-heritage.org.uk/NMRDataDownload/)

The NCA described in the Landscape section include consideration of historic and cultural influences on the landscape. The key historic and cultural characteristics of each NCA are included in **Table D.12** below. Relevant landscape character area boundaries are shown in **Figure D.6**.

Conservation Areas are usually designated by the local planning authority. They are designated for their special architectural and historic interest. Conservation Areas can include historic town and city centres, fishing and mining villages, 18th and 19th century suburbs, model housing estates, country houses set in historic parks and/or historic transport links and their environment. There are over 8,000 conservation areas in England. Where relevant to the assessment, the SEA will consider data prepared by local authorities on Conservation Areas.

The National Heritage at Risk Register systematically checks the condition of problem buildings, initially focused on buildings at risk, but now adapted to serve other types of heritage asset. Nationally, 766 (3.4%) out of a total of 22,485 grade I and II* listed buildings (excluding places of worship) are on the Register. In the Midlands the percentage is 5.4% (198 listed secular buildings). In addition to this, of the 3,004 scheduled monuments in the Midlands, 59 (2.0%) structural scheduled monuments are on the Register[128]. The source of risk to Scheduled Monuments resulting from water abstraction or dewatering is 1.71% nationally. However, other assets such as those composed of organic material and preserved in waterlogged or anaerobic conditions are proportionately more at risk (e.g. palaeo-environmental deposits). Within the SSW operational area there are 88 assets identified as at risk according to 2020 data.

Nationally, in 2020 181 entries were removed from the Register for positive reasons, but 216 were added. 2020 saw an increase in the number of places of worship added to the register[129]. Possible explanations for this trend include the increase in metal theft, a reduction in the number of local people able to do maintenance, or lack of understanding about how valuable it is to do small maintenance and repair jobs to stave off decay.

In relation to unknown heritage assets, waterlogged conditions preserve waterlogged archaeology, such as wooden artefacts and structures such as trackways. Remains may be rain-fed or groundwater fed. If the latter, then clearly abstraction levels can be a critical factor in maintaining conditions in which preservation of the remains is viable. In addition, there are waterlogged deposits that are specifically associated with chalk, such as springs and their intimately associated wetlands which again can contain important archaeological information, especially palaeo-environmental evidence. Such water-dependent heritage assets will be considered during the environmental assessment.

Approximate locations of areas important for palaeo-environmental deposits were identified according to a spreadsheet supplied by Historic England[130]. This identified that there are a number sites within the assessment area which are either known or suspected to be of high importance for water level dependent archaeology. For example, a number of sites have been identified in north Shropshire. The dataset supplied by Historical England, or if available an updated version, will be used to support assessment of schemes.

Likely Evolution of the Baseline without the WRMP

The NPPF was introduced in 2012 to replace the Planning Policy Statements. The NPPF aimed to make the planning system less complex and more accessible and changed the emphasis on planning to have a presumption in favour of development. However, core planning principles include those aiming to protect heritage assets, including "*conserve heritage assets in a manner appropriate to their significance, so that they can be enjoyed for their contribution to the quality of life of this and future generations*"[131]. The 2019 update specifies that "*Plans should set out a positive strategy for the conservation and enjoyment of the historic environment, including heritage assets most at risk through neglect, decay or other threats*". It goes on to say that regarding designation of conservation areas "*local planning authorities should ensure that an area justifies such status because of its special architectural or historic interest, and that the concept of conservation is not devalued through the designation of areas that lack special interest*"[132].

[128] Historic England (2020) Heritage at Risk Register 2020, Midlands https://historicengland.org.uk/images-books/publications/har-2020-registers/mid-har-register2020/

[129] Heritage at Risk: Latest Findings (2020) Historic England https://historicengland.org.uk/advice/heritage-at-risk/findings/

[130] English Heritage (2015) National Monument Record Wetland Heritage List Data 111006

[131] CLG (2012) National Planning Policy Framework, Communities and Local Government. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf

[132] Ministry of Housing, Communities and Local Government (2021) National Planning Policy Framework. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/810197/NPPF_Feb_2019_revised.pdf

Recent and ongoing national economic difficulties may have a negative effect on removing heritage assets from the heritage at risk register. Climate change could have variable impacts on heritage assets in the future. Some types of assets and landscapes have already experienced and survived significant climatic changes in the past and may demonstrate considerable resilience in the face of future climate change. However, many more historic assets are potentially at risk from the direct impacts of future climate change[133].

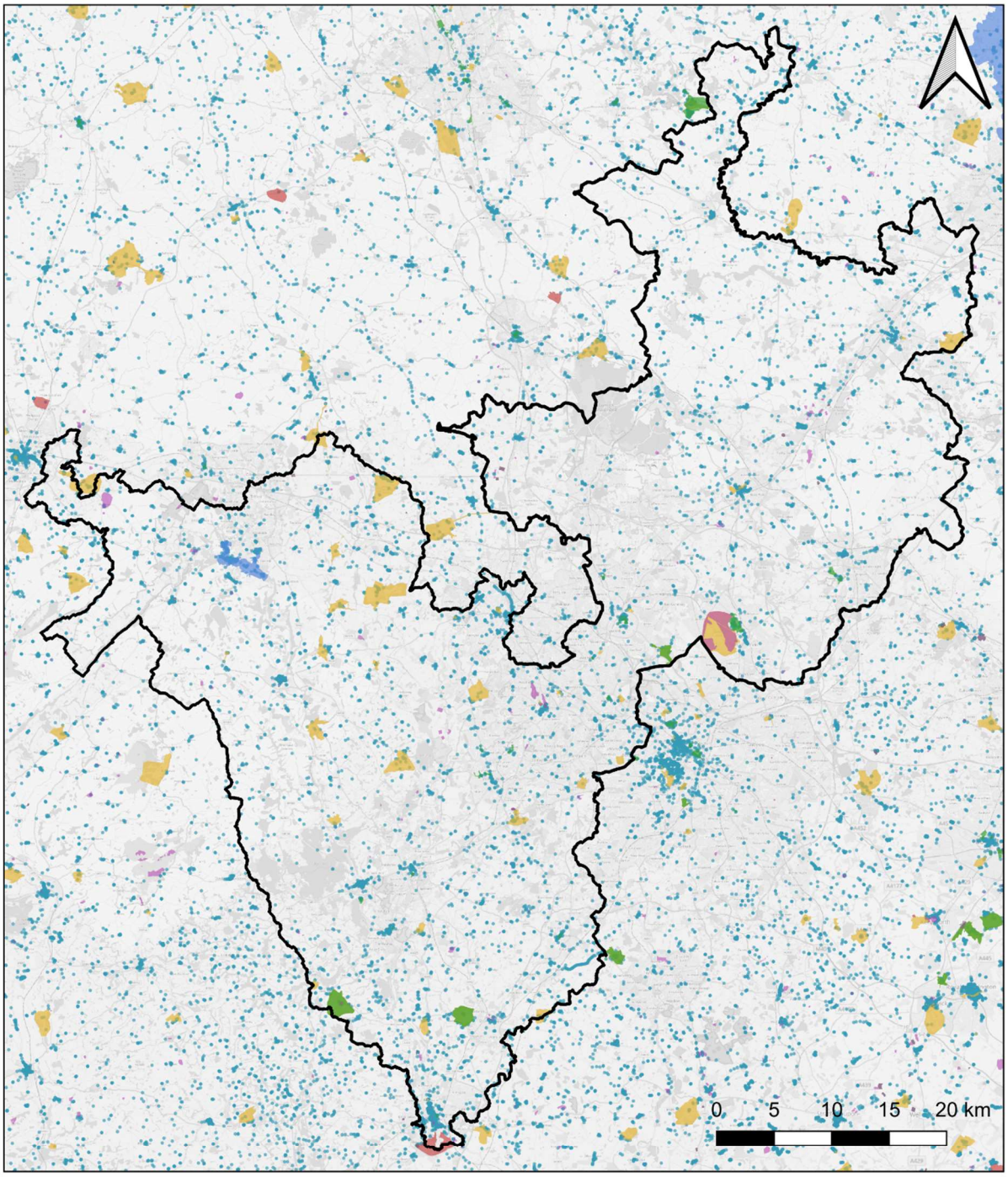
Key Issues Relevant to the WRMP

The key issue arising from the baseline assessment for archaeology and cultural heritage is:

- The need to conserve or enhance sites of archaeological importance and cultural heritage interest, and their settings, particularly those which are sensitive to the water environment.

[133] English Heritage (2010) Climate Change and the Historic Environment

Figure D.5 Heritage designations and heritage feature at risk



Legend

- Assessment Area
- World Heritage Sites
- Scheduled Monuments
- Heritage Features at Risk
- Registered Parks and Gardens
- Registered Battlefields
- Listed Buildings

Figure Title

Designated Sites for Cultural Heritage

Figure No.	Date
D.5	April 2021

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Water Resources West

Landscape

Baseline Characteristics

The assessment area has a diversity of urban and rural landscapes ranging rolling hills south of the Peak District to the agricultural plains of Shropshire and densely populated areas of the West Midlands conurbations. The landscape character network[134] defines landscape character as 'a distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another, rather than better or worse'. Some landscapes are special because they have a particular amenity value, such as those designated as AONB or National Parks. Others may have an intrinsic value as good examples or be the only remaining examples of a particular landscape type. Some landscapes are more sensitive to development whereas others have a greater capacity to accommodate development. Assessments of landscape character and landscape sensitivity enable decisions to be made about the most suitable location of development to minimise impacts on landscapes.

Nationally Designated Sites

AONBs are defined as 'precious landscapes whose distinctive character and natural beauty are so outstanding that it is in the nation's interest to safeguard them'135. They are designated under National Parks and Access to the Countryside Act, 1949, strengthened by the Countryside and Rights of Way Act, 2000. The primary purpose of an AONB is 'to conserve and enhance the natural beauty of the landscape. There are two AONBs partially within the assessment area, shown on **Figure D.6**.

Landscape Character

The visual landscape characteristics of the relevant NCA (shown in **Figure D.6)** area are included in **Table D.12** below.

Table D.12 Landscape Character Areas: Landscape Characteristics

Area	Characteristics
Arden	The Birmingham plateau comprises two uplifted blocks of older Palaeozoic strata. These are separated by an area of Triassic rocks, the Knowle Basin, which is mostly covered by glacial drift. The central area (Knowle Basin) is underlain by Mercia Mudstones and covered by glacial sands, gravels or till. The eastern area is a dissected plateau consisting of uplifted Carboniferous and older Palaeozoic and 'Precambrian' rocks. The southern part of the area is underlain by Mercia Mudstones, with outcrops of Arden Sandstone forming prominent escarpments. Light, sandy soils predominate in the north. Heavier clay soils and loams occur extensively in central and southern Arden. North-eastern industrial area based around former Warwickshire coalfield, with distinctive colliery settlements.
Cannock Chase and Cank Wood	A varied landscape ranging from the open heathlands and plantations of Cannock Chase, through towns, reclaimed mining sites and new developments, to dense urban areas. The dominant rounded central plateau is mainly formed of the Coal Measures of the South Staffordshire Coalfield, with other prominent hills in the south at Wren's Nest, Castle Hill, Rowley Hills and Barr Beacon.
Leicestershire & South Derbyshire Coalfields	The landscape is unenclosed with shallow valleys, subdued sandstone ridges and a gently undulating plateau. There are heavy, poorly draining soils over the Coal Measures and mudstones of the Mercia Mudstone Group, and free-draining soils on the sandstone ridges.
Mease/Sence Lowlands	A gently rolling landscape with rounded clay ridges and shallow valleys, with a more undulating landform in the north-west. This is a well-ordered agricultural landscape of open views, with a relatively tranquil character. Triassic Mercia Mudstones underlie this area and give rise to productive clay soils; outcrops of sandstone extend across the area southwards and westwards from the edge of the adjacent coalfield.
Melbourne Parklands	Melbourne Parklands is a landscape of rolling farmland, ancient and plantation woodland and, as the name suggests, a cluster of landscaped parklands with grand country houses, one of which, Calke Abbey, boasts a Grade II* listed historic park and garden. The NCA is predominantly rural, although there are strong and often abrupt contrasts with the urban areas on its peripheries. The M1

[134] www.landscapecharacter.org.uk

[87] http://www.landscapesforlife.org.uk/

Area	Characteristics
	and A42 cross the NCA and East Midlands Airport is sited on the central plateau in an otherwise undulating area.
Mid Severn Sandstone Plateau	The Mid Severn Sandstone Plateau is predominantly rural and important regionally for food production, with large arable fields in the central and eastern areas, and remnant areas of characteristic lowland heathland. The plateau is drained by fast-flowing tributaries of the rivers Worfe and Stour which have incised the Permian and Triassic sandstones and conglomerate resulting in many steep-sided, wooded dingles throughout the NCA. The main river is the fast-flowing Severn, entering the NCA through the Ironbridge Gorge.
Needwood & South Derbyshire Claylands	A rolling glacial till plateau that slopes south eastwards from the southern edge of the Peak District to the valley of the River Trent. There is a distinctive scarp to the south of the Dove, whose broad flood plain divides the Staffordshire and Derbyshire elements. The south is dominated by heavy, seasonally waterlogged soils derived from glacial till. In the north, red and pink soils underlain by Mercia Mudstones and Sherwood Sandstone are more amenable to cultivation.
Potteries and Churnet Valley	The core of this area are the hills, heavily dissected by the Churnet Valley, which are associated with Carboniferous and Triassic sandstones, overlain in the main with brown earth and podzols. To the north-west, towards Biddulph Moor and Mow Cop, outlying sandstone outcrops of the high Millstone Grit moors, with stagnogley and peaty soils give rise to deeply dissected moorland plateaux.
Severn and Avon Vales	The lower valleys of the rivers Severn and Avon dominate this low lying open agricultural vale landscape made up of distinct and contrasting vales, including Evesham, Berkeley, Gloucester, Leadon and Avon, with Cotswold outliers like Bredon Hill punctuating the otherwise flat vale landscape. The M5 Motorway runs through the centre and the eastern edge of the area.
Shropshire Hills	The Shropshire Hills NCA is a landscape of rugged and mostly bare-topped hills, contrasting with mixed agriculture in intervening valleys and dales. This tranquil landscape of national importance flows almost seamlessly into the neighbouring hills of Clun and North West Herefordshire Hills NCA to the south, but contrasts markedly with the flat and lowly undulating Shropshire, Cheshire and Staffordshire Plain NCA to the north. To the east, the Shropshire Hills stand above and overlook a complementary landscape of rolling landform, intricate field patterns, and the parklands and numerous woodlands of the Mid-Severn Sandstone Plateau.
Shropshire, Cheshire and Staffordshire Plain	The Plain is formed from Triassic sandstones and marls but these are overlain by glacial deposits, largely consisting of boulder clay, with local deposits of silt, peat, sand and gravels. Close by are the sandstones of the Carboniferous Coal Measures which have been affected by glacial activity and have formed small-scale hummocky ridges and valleys, as around Maer. These sandstones run south-west from Newcastle towards Shrewsbury.
Teme Valley	The Teme Valley National Character Area (NCA) lies primarily in northwest Worcestershire, but also extends into the counties of Shropshire and Herefordshire. The River Teme, which gives its name to this NCA, is nationally important for nature conservation. The undulating, deeply tranquil valley formed by the River Teme flows west to south, meandering its way through from the Herefordshire Lowlands and beyond before flowing into the Severn and Avon Vales. The tranquil, rural character pervades the area, which has largely escaped the pressure of modern development and retained much of its historical built character in dispersed settlements, small villages and traditional buildings.
Trent Valley Washlands	Distinctly narrow, linear and low-lying landscape largely comprised of the flat flood plains and gravel terraces of the rivers and defined at its edges by higher ground. Geology dominated by superficial alluvium and gravel river terrace deposits underpins the contrast in arable and pastoral agricultural use, arable crops predominating on the free-draining soils of the river terraces, with grassland more commonly located along the alluvial river flood plains where soils are subject to frequent flooding or are naturally wet.
White Peak	The Carboniferous Limestone of the White Peak can be subdivided into three distinct types, each indicative of a different depositional environment and producing different landscapes today. The most common over much of the plateau area is the 'shelf' limestone, then, in the south-west of the area, is the 'basin' limestone and the least common is the 'reef' limestone, found within the wider basin limestone area, which is rich in fossils.

Tranquillity is also considered to be a highly valued element with respect to the experience and enjoyment of the countryside. The Campaign for the Protection of Rural England (CPRE) has undertaken studies on

tranquillity levels in England using a rigorous set of indicators predominantly falling into two categories; seeing (e.g. naturalness, openness and visibility at night) and hearing indicators (e.g. level and attenuation of constant noise/occasional noise and feature specific noise - lapping water, running water, the sea, high altitude aircraft) both with numerous positive and negative attributes. The studies and data sets were modelled using Geographical Information Systems (GIS) to produce a tranquillity map for England in 2008 (this has not been updated since 2008)136. The tranquillity map presents a national tranquillity score or a relative scale for each 500m x 500m grid square in England at a snapshot time in 2006.

Likely Evolution of the Baseline without the WRMP

The intrinsic planning policy in the updated 2019 NPPF is enable and facilitate growth whilst aiming to protect the character of areas. The 2019 NPPF re-iterates 'great weight should be given to conserving landscape and scenic beauty in National Parks and AONBs', which have the highest status of protection in relation to landscape and scenic beauty. The NPPF identifies that planning permission should be refused for major developments in these designated areas except in exceptional circumstances and where it can be demonstrated they are in the public interest.

It states that planning policies and decisions should contribute to and enhance the natural and local environment by protecting and enhancing valued landscapes and recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services. The policy is clear that appropriate housing development is required and planning policies should identify opportunities for villages to grow and thrive. Existing Green Belts continue to be important, but new Green Belts should only be established in exceptional circumstances.

Climate change and land use change (e.g. due to agricultural reform associated with the UK's exit from the EU and Common Agricultural Policy) may also, in the longer term, lead to changes to landscape character.

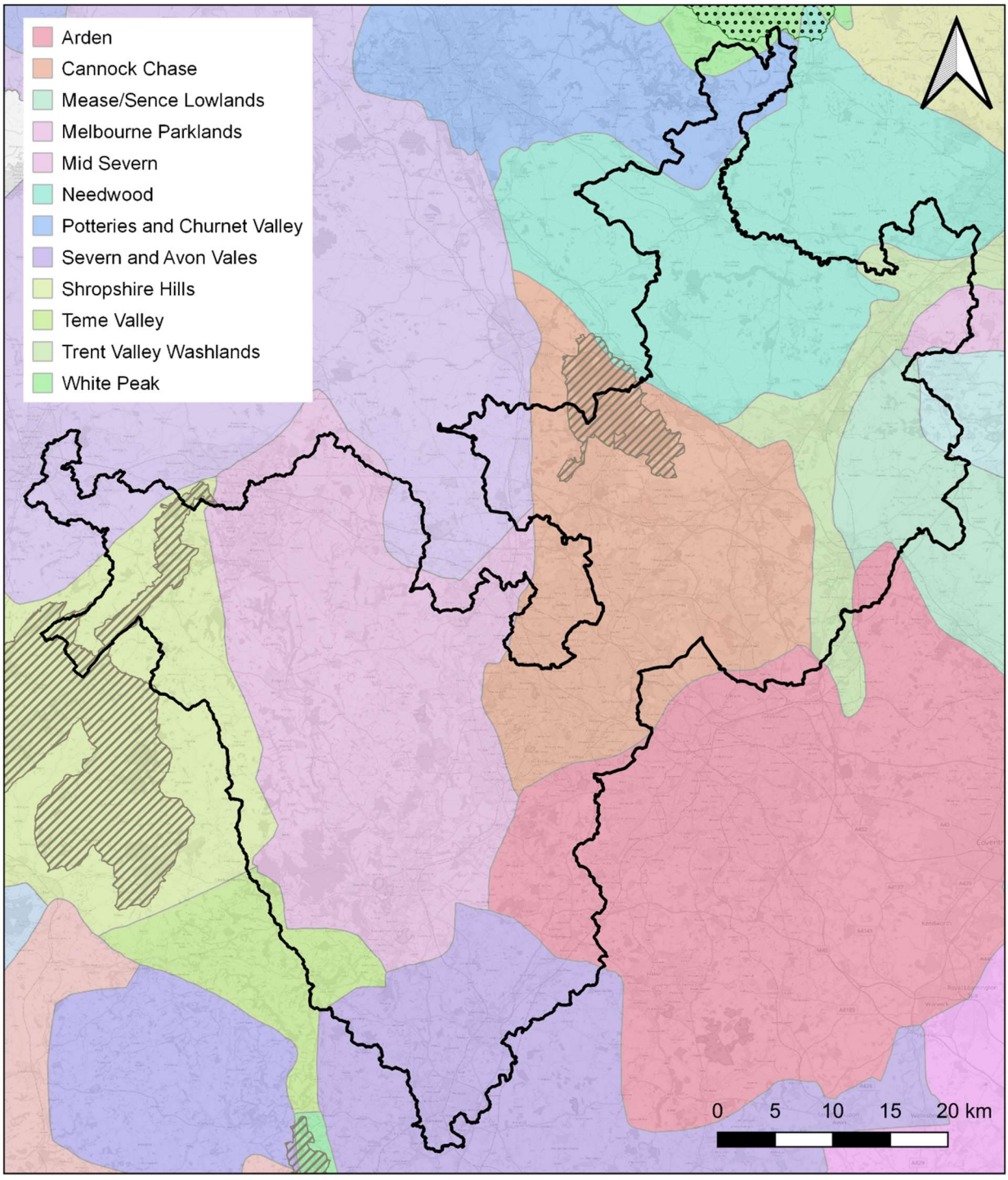
Key Issues Relevant to the WRMP

The key sustainability issues arising from the baseline assessment for landscape and visual amenity are:

- The need to protect and improve the natural beauty of the region's AONBs, and other areas of natural beauty.
- The need to protect the settings and improve the character of landscapes and townscapes.
- The need to maintain and enhance landscape and designated sites for the enjoyment of the public.

[136] CPRE (2008) Tranquillity Mapping - Short report on the methodology

Figure D.6 Landscape designations (NPs, AONB and Heritage Coast) and NCAs



Legend
- Assessment Area
- AONB
- National Parks

Figure Title: Landscape Designations

Figure No.: D.6

Date: April 2021

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Water Resources West

APPENDIX E: DEFINITIONS AND THRESHOLDS OF SIGNIFICANCE

Proposed SEA Objectives	Proposed Guide Questions	Score		Description
1. To protect, restore and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species, enhance ecosystem resilience and habitat connectivity and deliver a net biodiversity gain.	• Will it protect, restore and enhance where possible, the most important sites for nature conservation (e.g., internationally or nationally designated conservation sites such as SACs, SPAs, Ramsar and SSSIs)? • Will it protect, restore and enhance non-designated sites and local biodiversity? • Will it provide opportunities for new terrestrial and aquatic habitat creation or restoration and/or link existing habitats as part of the development process? • Will it provide opportunities to deliver biodiversity net gain? • Will it lead to a change in the ecological quality of habitats? • Will it protect, restore and enhance where appropriate, coastal and marine habitats and species? • Will it maintain and enhance the green infrastructure network and the biodiversity it supports? • Will it alter geomorphological forms and processes which underpin physical habitat for aquatic ecosystems?	+++	Major/Significant Positive	The option would result in a major enhancement on the quality of designated sites / habitats due to changes in flow or groundwater levels, water quality or habitat quality and availability. The option would result in a major increase in the population of, or habitats for, a priority species. Effects could be caused by beneficial changes in water flows/water quality, or large amounts of creation or enhancement of habitat, promoting a major increase in ecosystem structure and function.
		++	Moderate Positive	The option would result in a moderate enhancement on the quality of designated and/or non-designated sites / habitats due to changes in flow or groundwater levels, water quality or habitat creation and enhancement measures. The option would result in a moderate increase in the population of, or habitats for, a priority species. Effects could be caused by beneficial changes in water flows/water quality, or moderate amounts of creation or enhancement of habitat, promoting a moderate increase in ecosystem structure and function.
		+	Minor Positive	The option would result in a minor enhancement of the quality of designated and/or non-designated sites / habitats due to changes in flow or groundwater levels, water quality or habitat creation and enhancement measures. The option would result in a minor increase in the population of, or habitats for, a priority species. Effects could be caused by beneficial changes in water flows/water quality, or small amounts of creation or enhancement of habitat, promoting a minor increase in ecosystem structure and function.
		0	Neutral	The option would not result in any effects on designated or non-designated sites including habitats and/or species).
		-	Minor Negative	The option would result in a minor negative effect on the quality of designated and/or non-designated sites / habitats due to changes in flow or groundwater levels, water quality or habitat loss or degradation. The option would result in a minor decrease in the population of, or habitats for, a priority species. Effects could be caused by detrimental changes in flows/water quality, or small losses or degradation of habitat leading to a minor loss of ecosystem structure and function.
		--	Moderate Negative	The option would result in a moderate negative effect on the quality of designated and/or non-designated sites / habitats due to changes in flow or groundwater levels, water quality or habitat loss or degradation. The option would result in a moderate decrease in the population of, or habitats for, a priority species. Effects could be caused by detrimental changes in flows/water quality, or moderate loss or degradation of habitat leading to a moderate loss of ecosystem structure and function.
		---	Major/Significant Negative	The option would result in a major negative effect on the quality of designated and/or non-designated sites / habitats due to changes in flow or groundwater levels, water quality or habitat loss or degradation. The option would result in a major decrease in the population of, or habitats for, a priority species. Effects could be caused by detrimental changes in flows/water quality, or large losses or degradation of habitat leading to a major loss of ecosystem structure and function.

Proposed SEA Objectives	Proposed Guide Questions	Score		Description
		?	Uncertain	From the level of information available the effect that the option would have on this objective is uncertain.
2. To protect and enhance sustainable natural resources and the ecosystem services they provide.	• Will it protect or enhance natural capital and ecosystem services? • Will it maintain and enhance ecosystem resilience? • Will it contribute to the sustainable management of natural habitats and ecosystems, i.e., within their limits and capacities taking into account climate change adaptability? • Will it provide opportunities for climate adaptation and protect the climate resilience of vulnerable and priority sites	+++	Major/Significant Positive	The option would lead to a major increase in natural capital/ecosystem resilience and enhancement (as measured by the NCA). The option would lead to a biodiversity net gain of greater than 10% (as measured by the BNG assessment). The option would protect and enhance all the ecosystem services identified in the NCA (biodiversity and habitat, climate regulation, natural hazard regulation, water purification, water regulation, recreation and tourism, health and well-being and agricultural).
		++	Moderate Positive	The option would lead to a moderate increase in natural capital/ecosystem resilience and enhancement (as measured by the NCA). The option would lead to a biodiversity net gain of 10% (as measured by the BNG assessment). The option would protect and enhance at least three categories of ecosystem services identified in the NCA (with neutral effects on the remaining services).
		+	Minor Positive	The option would lead to a minor increase in natural capital/ecosystem resilience and enhancement (as measured by the NCA). The option would lead to a biodiversity net gain of less than 10% (as measured by the BNG assessment). The option would protect and enhance at least one category of ecosystem services identified in the NCA (with neutral effects on the remaining services).
		0	Neutral	The option would have no effect on natural capital, biodiversity net gain or ecosystem services.
		-	Minor Negative	The option would lead to a minor decrease in natural capital/ecosystem resilience (as measured by the NCA). The option would lead to a biodiversity net loss of less than 10% (as measured by the BNG assessment). The option would adversely affect at least one category of ecosystem services identified in the NCA (with neutral effects on the remaining services).
		--	Moderate Negative	The option would lead to a moderate decrease in natural capital/ecosystem resilience (as measured by the NCA). The option would lead to a biodiversity net loss of 10% (as measured by the BNG assessment). The option would adversely affect at least three categories of ecosystem services identified in the NCA (with neutral effects on the remaining services).
		---	Major/Significant Negative	The option would lead to a major decrease in natural capital/ecosystem resilience (as measured by the NCA). The option would lead to a biodiversity net loss of greater than 10% (as measured by the BNG assessment). The option would adversely affect all categories of ecosystem services identified in the NCA.

Proposed SEA Objectives	Proposed Guide Questions	Score		Description
		?	Uncertain	From the level of information available the effect that the option would have on this objective is uncertain.
3. To avoid and minimise the risk of spread of, and, where required, manage invasive and non-native species (INNS).	• Will it prevent or minimise the risk of spread/introduction of invasive and non-native species? • Will it contribute to the eradication of invasive and non-native species, where they are already present and it is technically and economically feasible to do so?	+++	Major/Significant Positive	The option would result in a major reduction or management of INNS.
		++	Moderate Positive	The option would result in a moderate reduction or management of INNS.
		+	Minor Positive	The option would result in a minor reduction or management of INNS.
		0	Neutral	The option would not result in any effects on INNS.
		-	Minor Negative	The option would result in a minor increase or spread of INNS.
		--	Moderate Negative	The options would result in a moderate increase or spread of INNS.
		---	Major/Significant Negative	The option would result in a major increase or spread of INNS.
		?	Uncertain	From the level of information available the effect that the option would have on this objective is uncertain.
4. To protect and enhance soil quantity, quality and functionality and geodiversity and ensure the appropriate and efficient use of land.	• Will additional land be required for the development or implementation of the option or will the option require below ground works leading to land sterilisation? • Will it avoid damage to, protect and enhance where possible protected sites designated for their geological interest (GCR sites, SSSI and	+++	Major/Significant Positive	The option would result in a major enhancement on the quality of soils as a result of remediation. implementation of catchment approaches, or other measures.
		++	Moderate Positive	The option would result in a moderate enhancement on the quality of soils as a result of remediation, implementation of catchment approaches, or other measures.
		+	Minor Positive	The option would be located on a brownfield site and has no effect on soils or existing land use. The option results in the remediation of contaminated land.

Proposed SEA Objectives	Proposed Guide Questions	Score		Description
	RIGS) and features of wider geodiversity interest? • Will it minimise the loss of best and most versatile agricultural land? • Will it minimise land contamination? • Will it ensure efficient use of land (e.g., make use of previously developed land)? • Will it contribute towards a catchment-wide approach to land management? • Will it avoid adverse effects on other land uses (such as forestry)?	**0**	Neutral	The option would not result in any effects on soils or land use.
		-	Minor Negative	The option would not be located on a brownfield site and/or results in a minor loss of best and most versatile agricultural land or is in conflict with existing land use. The option would result in land contamination. The option would result in a minor negative effect on a site designated for their geological interest.
		--	Moderate Negative	The option would result in a moderate loss of best and most versatile agricultural land or is in substantial conflict with existing land use. The option would result in land contamination. The option would result in a moderate negative effect on a site designated for their geological interest. The option would be partially overlying mineral resources leading to partial mineral sterilisation.
		---	Major/Significant Negative	The option would result in a major loss of best and most versatile agricultural land or is in substantial conflict with existing land use. The option would result in land contamination. The option would result in a major negative effect on a site designated for their geological interest. The option would be directly overlying mineral resources leading to mineral sterilisation.
		?	Uncertain	From the level of information available the effect that the option would have on this objective is uncertain.
5. To protect and enhance surface and ground water levels and flows.	• Will it minimise the demand for water resources? • Will it result in changes to river flows, channel morphologies, wetted width or river levels? • Will it result in changes to groundwater levels? • Will it support the achievement of relevant environmental objectives set out in River Basin Management Plans? • Will it alter the flow regime of surface waters?	**+++**	Major/Significant Positive	The option would result in major reduction in the demand for water.
		++	Moderate Positive	The option achieves savings through demand management and does not require abstraction to achieve yield. The option would result in moderate reduction in demand for water.
		+	Minor Positive	The option achieves savings through demand management and does not require abstraction to achieve yield. The option would result in minor reduction in the demand for water.
		0	Neutral	The option would have no discernible effect on river flows or on groundwater levels.

Proposed SEA Objectives	Proposed Guide Questions	Score		Description
	• Will it result in changes to river flows, channel morphologies, wetted width or river levels?	-	Minor Negative	The option would result in minor short-term decreases in river flows, wetted width, depth, and velocity over small distances. The option would result in minor decreases in groundwater levels. The option would result in minor increases in demand for water.
		--	Moderate Negative	The option would result in medium-term, moderate decreases in river flows, wetted width, depth, and velocity over moderate distances. The option would result in moderate decreases in groundwater levels. The option would result in moderate increases in demand for water.
		---	Major/Significant Negative	The option would result in major decreases in river flows over the long-term affecting significant stretches of river. The option would result in major decreases in groundwater levels. The option would result in major increases in demand for water.
		?	Uncertain	From the level of information available the effect that the option would have on this objective is uncertain.
6. To protect and enhance the quality of surface and groundwater resources.	• Will it prevent pollution and protect and improve surface, groundwater, estuarine and coastal water quality? • Will it prevent the deterioration of Water Framework Directive (WFD) waterbody status (or potential)? • Will it support the achievement of WFD protected area objectives? • Will it ensure a new activity or new physical modification does not prevent the future achievement of good status for a water body? • Will it support the achievement of relevant environmental objectives set out in River Basin Management Plans? • Will the option prevent nutrient loading in water bodies?	+++	Major/Significant Positive	The option would result in addressing failure of WFD Good Ecological Status / Good Ecological Potential.
		++	Moderate Positive	The option would contribute to addressing failure of WFD Good Ecological Status / Good Ecological Potential.
		+	Minor Positive	The option would contribute to a minor improvement in surface/coastal water quality or in groundwater quality.
		0	Neutral	The option would have no discernible effect on river flows or surface/coastal water quality or on groundwater quality. The option would not lead to a change in WFD classification.
		-	Minor Negative	The option would have a minor effect on river and/or coastal water quality and lead to short term or intermittent effects on receptors (e.g., designated habitats, protected species or recreational users of rivers and the coastline) that could not be avoided but could be mitigated. The option would result in minor decreases in groundwater quality.
		--	Moderate Negative	The option would have a moderate effect on river and/or coastal water quality and lead to long term or continuous effects on receptors (e.g., designated habitats, protected species or recreational users of rivers and the coastline) that could not reasonably be mitigated. The option would result in the likely deterioration of WFD classification. The option would result in moderate decreases in groundwater quality.
		---	Major/Significant Negative	The option would have a major effect on river and/or coastal water quality and lead to long term or continuous effects on receptors (e.g., designated habitats, protected species or recreational users of rivers and the coastline) that could not reasonably be mitigated. The option results in the deterioration of WFD classification. The option would result in major decreases in groundwater quality.

Proposed SEA Objectives	Proposed Guide Questions	Score		Description
		?	Uncertain	From the level of information available the effect that the option would have on this objective is uncertain.
7. To reduce or manage flood risk.	• Will the option be at risk of flooding now or in the future? • Will it have the potential to cause or exacerbate flooding in the catchment area including the risks to people and property, now or in the future? • Will it have the potential to help alleviate or mitigate flooding in the catchment area including to people and property now or in the future? E.g. will it avoid reducing flood plain storage, or provide opportunities to improve flood risk management? • Wil it promote the use of sustainable drainage systems? • Will it promote opportunities for collaborative working with other risk management authorities?	+++	Major/Significant Positive	The option would result in a major improvement to flood risk.
		++	Moderate Positive	The option would result in a moderate improvement to flood risk.
		+	Minor Positive	The option would involve the construction of above-ground water supply infrastructure which would help alleviate flooding in the catchment.
		0	Neutral	The option would involve the construction of above-ground water supply infrastructure, but is located outside floodplain areas. It is anticipated that the option would neither cause nor exacerbate flooding in the catchment.
		-	Minor Negative	The option would involve the construction of above-ground water supply infrastructure which would be wholly or partially located within Flood Zone 2.
		--	Moderate Negative	The option would involve the construction of above-ground water supply infrastructure which would be partially (but < 40% by area) located within Flood Zone 3 and/or site is at medium risk of surface water flooding.
		---	Major/Significant Negative	The option would involve the construction of above-ground water supply infrastructure which would be wholly or partially (≥40% of the site) within flood zone 3a or 3b and/or site is at high risk of surface water flooding.
		?	Uncertain	From the level of information available the effect that the option would have on this objective is uncertain.
8. To minimise emissions of pollutant gases and particulates and enhance air quality.	• Will it maintain or enhance ambient air quality, keeping pollution below Local Air Quality Management thresholds (e.g., in Air Quality Management Areas or sensitive habitats)?	+++	Major/Significant Positive	The option would result in a major enhancement of the air quality within one or more AQMAs.
		++	Moderate Positive	The option would result in a moderate enhancement of the air quality within one or more AQMAs.
		+	Minor Positive	The option would result in an enhancement of the air quality.

Proposed SEA Objectives	Proposed Guide Questions	Score		Description
		0	Neutral	The option would not result in any effects on Air Quality and AQMAs. Vehicle movements of < 1,000 per annum, assuming that this is equivalent to < 5 per day.
		-	Minor Negative	The option would result in a decrease of the air quality. Vehicle movements of 1000 to < 7,750, per annum assuming that this is an equivalent to 5 to <35 per day (so an average max of 5 per hour)
		--	Moderate Negative	The option would result in a decrease of the air quality within one or more AQMAs. Vehicle movements of 7,750 to <15,500 per annum assuming that this is an equivalent to 35 to <70 per day (so an average max of 10 per hour)
		---	Major/Significant Negative	The option would result in a major decrease in the air quality within one or more AQMAs. Vehicle movements > 15,500 per annum, assuming that this is an equivalent of ≥ 70 per day.
		?	Uncertain	From the level of information available the effect that the option would have on this objective is uncertain
9. To reduce greenhouse gas emissions.	• Will it reduce or minimise greenhouse gas emissions? • Will it have a low level of embodied carbon? • Will it provide new infrastructure that is energy efficient and/or minimises the use of energy? • Will it provide new infrastructure that could contribute or make use of renewable energy sources? • Will the option affect carbon sequestration?	**+++**	Major/Significant Positive	The option would reduce operational carbon emissions by more than 1,000 tonnes CO2e/year e.g., it would provide new infrastructure/assets that maximise the use of renewable energy sources. The option would result in a major increase in carbon sequestration.
		++	Moderate Positive	The option will reduce operational carbon emissions by between 100 and <1,000 tonnes CO2e/year. The option will result in a moderate increase in carbon sequestration
		+	Minor Positive	The option will reduce operational carbon emissions by less than 100 tonnes CO2e/year
		0	Neutral	The option would have no discernible effect on greenhouse gas emissions.
		-	Minor Negative	The construction of the option would use of materials with a minor amount of embodied carbon (100 to <1,000 tonnes CO2e). The option would result in a minor or temporary increase in operational carbon emissions (100 to <500 tonnes CO2e).
		--	Moderate Negative	The construction of the option would use of materials with a moderate amount of embodied carbon (1,000 to 7,500 tonnes CO2e). The option would result in a moderate increase in operational carbon emissions (500-2,000 tonnes CO2e). The option will result in a moderate release of previously sequestered carbon.

Proposed SEA Objectives	Proposed Guide Questions	Score		Description
		---	Major/Significant Negative	The construction of the option would use of materials with a major amount of embodied carbon (>7,500 tonnes CO2e). The option would result in major or long term increases in operational carbon emissions (>2,000 tonnes CO2e). The option would result in a major release of previously sequestered carbon.
		?	Uncertain	From the level of information available the effect that the option would have on this objective is uncertain.
10. To adapt and improve resilience to the threats of climate change.	• Will it improve resilience and/or adaptability to the likely effects of climate change, e.g., by increasing resilience of water supplies or catchments? • Will it increase environmental resilience to the effects of climate change including to impacts on flood risk and water quality? • Will coastal erosion have consequences on the operation of this option now or in the future, taking account of expected climate change sea level rise?	+++	Major/Significant Positive	The option would have a major positive effect on increasing the resilience/decreasing the vulnerability to climate change effects.
		++	Moderate Positive	The option would have a moderate positive effect on increasing the resilience/decreasing the vulnerability to climate change effects.
		+	Minor Positive	The option would have a minor positive effect on increasing the resilience/decreasing the vulnerability to climate change effects.
		0	Neutral	The option would have no effect on resilience/decrease vulnerability to climate change effects
		-	Minor Negative	The option would not increase resilience/decrease vulnerability to climate change effects.
		--	Moderate Negative	The option would have a moderate negative effect on resilience/decreasing vulnerability to climate change effects.
		---	Major/Significant Negative	The option would have a major negative effect on resilience/significantly decrease vulnerability to climate change effects.
		?	Uncertain	From the level of information available the effect that the option would have on this objective is uncertain
11. To promote a sustainable economy and maintain and enhance the economic and social well-being	• Will it ensure that sufficient water resources infrastructure is in place to support predicted population increases? • Will it ensure sufficient infrastructure is in place to sustain a seasonal influx of tourists?	+++	Major/Significant Positive	The option would provide an additional design capacity of ≥25Ml/d. The option would result in a significant increase in construction jobs (capital spend of ≥£25m).
		++	Moderate Positive	The option would provide an additional design capacity of 5Ml/d to<25Ml/d. The option would result in a moderate increase in construction jobs (capital spend £5m to <£25m).

Proposed SEA Objectives	Proposed Guide Questions	Score		Description
of local communities.	• Will it help to meet the employment needs of local people? • Will it ensure that an affordable supply of water is maintained, and vulnerable customers protected? • Will it contribute to sustaining and growing the local and regional economy? • Will it avoid disruption through effects on the transport network? • Will it avoid negative effects on built assets/ existing infrastructure including transport?	+	Minor Positive	The option would provide an additional design capacity of 1Ml/d to <5Ml/d. The option would result in a minor increase in construction jobs (capital spend £1m to <£5m).
		0	Neutral	The option would have no effect on local employment opportunities, the regional or local economy, or on recreational facilities. The option would provide an additional design capacity of <1Ml/d.
		-	Minor Negative	It is not expected that any options will have a negative effect on employment opportunities, the economy or design capacity. The option would result in a minor disruption on built assets and infrastructure, including transport.
		--	Moderate Negative	It is not expected that any options will have a negative effect on employment opportunities, the economy or design capacity. The option would result in a moderate disruption on built assets and infrastructure, including transport.
		---	Major/Significant Negative	It is not expected that any options will have a negative effect on employment opportunities, the economy or design capacity. The option would result in a major disruption on built assets and infrastructure, including transport.
		?	Uncertain	From the level of information available the effect that the option would have on this objective is uncertain.
12. To maintain and enhance tourism and recreation.	• Will it protect and enhance public access to, and enjoyment of, green and blue infrastructure, open space/recreational facilities and the natural and historic environment, and in doing so help promote healthy lifestyles including mental well-being?	+++	Major/Significant Positive	The option would provide new, and/or significantly enhances existing, recreational facilities, publicly accessible greenspace and/or tourism within the operational area.
		++	Moderate Positive	The option would have a moderate positive effect on existing, recreational facilities, publicly accessible greenspace and/or tourism within the operational area
		+	Minor Positive	The option would have a minor positive effect on existing, recreational facilities, publicly accessible greenspace and/or tourism within the operational area
		0	Neutral	The option would not result in any effects on existing recreational facilities and/or tourism.
		-	Minor Negative	The option would reduce the availability and quality of existing recreational facilities and/or tourism within the operational area.
		--	Moderate Negative	The option would result in the permanent removal of existing recreational facilities, publicly accessible greenspace and/or tourism within the operational area.

Proposed SEA Objectives	Proposed Guide Questions	Score		Description
		---	Major/Significant Negative	The option would result in the removal of existing recreational facilities, publicly accessible greenspace and/or tourism within the operational area.
		?	Uncertain	From the level of information available the effect that the option would have on this objective is uncertain
13. To protect and enhance human health and well-being.	• Will it ensure the continuity of a safe and secure drinking water supply? • Will it help to protect or improve drinking water quality? • Will it maintain surface water and bathing water quality within statutory standards? • Will it help to promote healthy communities and avoid risks to health and wellbeing (for example, due to noise resulting from construction traffic or disruption to safe and reliable water/sewerage services)? • Will it raise awareness of the importance and value of the water environment for health and well-being? • Will it be located in an area considered to be significantly more health deprived than others in the region? • Will it improve opportunities for social interaction and community cohesion?	+++	Major/Significant Positive	The option would lead to a major increase in design capacity (≥25 Ml/d) of drinking water, would have a sustained positive effect on the health of local communities and would ensure that surface water and bathing water quality is maintained within statutory limits.
		++	Moderate Positive	The option would lead to a moderate increase in design capacity (5Ml/d to <25Ml/d) of drinking water, would have a positive effect on the health of local communities and would ensure that surface water and bathing water quality is maintained within statutory limits.
		+	Minor Positive	The option would lead to a minor increase in design capacity (1Ml/d to <5Ml/d) of drinking water, would have a temporary positive effect on the health of local communities and would ensure that surface water and bathing water quality is maintained within statutory limits.
		0	Neutral	The option would not result in any effects on human health and existing recreational facilities and/or tourism.
		-	Minor Negative	The option would result in the deterioration of surface water or bathing water quality and would have a temporary effect on human health (e.g., noise or air quality).
		--	Moderate Negative	The option would have a moderate long-term negative effect on human health (e.g., noise or air quality).
		---	Major/Significant Negative	The option would have a significant long-term effect on human health (e.g., noise or air quality).
		?	Uncertain	From the level of information available the effect that the option would have on this objective is uncertain
14. To promote and enhance the sustainable and efficient use of resilient water resources.	• Will it lead to reduced leakage from the supply network? • Will it improve efficiency in water consumption? • Will it ensure sustainable abstractions, taking account of water resource availability?	+++	Major/Significant Positive	The option would involve a major reduction in leakage from the supply network or is a water efficiency option with a design capacity of >10 Ml/d. The option would result in a major improvement in water efficiency and resilience.
		++	Moderate Positive	The option would involve a moderate reduction in leakage reduction from the supply network or is a water efficiency option with a design capacity of 5 to 10Ml/d. The option would result in a moderate improvement in water efficiency and resilience.

Proposed SEA Objectives	Proposed Guide Questions	Score		Description
	• Will it enable efficient water resource management to help maintain a supply-demand balance? • Will it increase the resilience of water resources, now and into the future? • Will it contribute towards improving the awareness of water sustainability?	+	Minor Positive	The option would involve reducing leakage from the supply network or is a water efficiency option with a design capacity of <5 Ml/d. The option would result in a minor improvement in water efficiency and resilience.
		0	Neutral	The option will have no effect on sustainable and efficient use of resilient water resources.
		-	Minor Negative	The option would result in minor decreases in water efficiency and reduces resilience.
		--	Moderate Negative	The option would result in moderate decreases in water efficiency and reduces resilience.
		---	Major/Significant Negative	The option would result in major decreases in water efficiency and reduces resilience.
		?	Uncertain	From the level of information available the effect that the option would have on this objective is uncertain.
15. To minimise waste, promote resource efficiency and move towards a circular economy.	• Will it make use of existing infrastructure? • Will it promote the re-use and recycling of waste materials and reduce the proportion of waste sent to landfill? • Will it help to encourage sustainable design or use of sustainable materials (e.g., supplied from local resources)?	+++	Major/Significant Positive	The option would make extensive reuse of existing built assets and infrastructure. The option will re-use or recycle substantial quantities of waste materials and any new infrastructure will incorporate substantial sustainable design measures and materials.
		++	Moderate Positive	The option would make reuse of existing built assets and infrastructure. The option would re-use or recycle moderate quantities of waste materials and any new infrastructure would incorporate some sustainable design measures and materials.
		+	Minor Positive	The option would re-use or recycle limited quantities of waste materials and any new infrastructure would incorporate limited sustainable design measures and materials.
		0	Neutral	The option would largely rely on existing infrastructure and only require small quantities of additional materials to realise design capacity. Quantities of concrete required are estimated as < 100 tonnes.
		-	Minor Negative	The option would require new infrastructure. The quantities of concrete required are estimated as between 100 to <1,000 tonnes. The option would have limited opportunities for the re-use or recycling of waste materials. There would be limited opportunities for sustainable design or the use of sustainable materials.
		--	Moderate Negative	The option would require new infrastructure. The quantities of concrete required are estimated as between 1,000 to <15,000 tonnes. The option would have limited opportunities for the re-use or recycling of waste materials.

Proposed SEA Objectives	Proposed Guide Questions	Score		Description
		---	Major/Significant Negative	The option would require significant new infrastructure that cannot be provided through the re-use or recycling of waste materials. There are no opportunities for sustainable design or the use of sustainable materials. The quantities of concrete required are estimated as ≥ 15,000 tonnes.
		?	Uncertain	From the level of information available the effect that the option would have on this objective is uncertain.
16. To conserve and enhance the historic environment including the significance of heritage assets and their settings and archaeological important sites.	• Will it avoid damage to, conserve or enhance the historic environment, including heritage assets and their settings such as historic buildings, conservation areas, features, places and spaces, that enhance local distinctiveness? • Will it avoid or minimise damage to archaeologically important sites? • Will the hydrological setting of water-dependent assets be altered, such as important wetland areas with potential for paleo-environmental deposits? • Will it avoid damage to important wetland areas with potential for paleoenvironmental deposits? • Will it improve access, value, understanding or enjoyment of heritage assets and culturally/historically important assets in the region? • Will it protect or enhance (where relevant) Welsh language and culture?	+++	Major/Significant Positive	The option will result in enhancements to designated heritage assets and/or their setting, fully realising the significance and value of the asset, such as: Securing repairs or improvements to heritage assets, especially those identified in the Historic England Buildings/Monuments at Risk Register; Improving interpretation and public access to important heritage assets.
		++	Moderate Positive	The option will result in enhancements to designated heritage assets and/or their setting. Improving interpretation and public access to important heritage assets.
		+	Minor Positive	The option will result in enhancements to non-designated heritage assets and/or their setting.
		0	Neutral	The option will have no effect on cultural heritage assets or archaeology.
		-	Minor Negative	The option will result in the loss of significance of undesignated heritage assets and/or their setting, notwithstanding remedial recording of any elements affected. There will be limited damage to known, undesignated archaeology important sites with a consequent loss of significance only partly mitigated by archaeological investigation
		--	Moderate Negative	The option will result in the loss of significance of undesignated heritage assets and/or their setting, notwithstanding remedial recording of any elements affected. The option will diminish significance of designated heritage assets and/or their setting, notwithstanding remedial recording of any elements affected.
		---	Major/Significant Negative	The option would diminish the significance of designated heritage assets and/or their setting such as: • Demolition or further deterioration in the condition of designated heritage assets especially those identified in the Historic England Buildings/Monuments at Risk Register; • Loss of public access to important heritage assets and lack of appropriate interpretation. There would be major damage to known, designated archaeological sites/remains or geologically important sites with a consequent loss of significance only partly mitigated by archaeological investigation.
		?	Uncertain	From the level of information available the effect that the option would have on this objective is uncertain

Proposed SEA Objectives	Proposed Guide Questions	Score		Description
17. To conserve, protect and enhance landscape and townscape character and visual amenity.	• Will it avoid adverse effects to, and enhance where possible, protected/designated landscapes and the settings of designated landscapes (including woodlands) such as National Parks or AONBs? • Will it help to protect and improve non-designated areas of natural beauty and distinctiveness (e.g., woodlands) and avoid the loss of landscape features and local distinctiveness? • Will it protect and enhance landscape character, townscape, seascape and green infrastructure? • Will it minimise adverse visual impacts?	+++	Major/Significant Positive	The option results in new, above ground infrastructure that significantly enhances the local landscape, townscape or seascape.
		++	Moderate Positive	The option results in new, above ground infrastructure that has a moderate positive effect on the local landscape, townscape or seascape
		+	Minor Positive	The option results in new, above ground infrastructure that has a minor positive effect on the local landscape, townscape or seascape.
		0	Neutral	The option would not result in any effects on the local landscape, townscape or seascape
		-	Minor Negative	The option results in new, above ground infrastructure that has a minor negative effect on the local landscape, townscape or seascape.
		--	Moderate Negative	The option would have a moderate negative effect on a designated landscape or feature (i.e. significant visually intrusive infrastructure) whose effects could not be reasonably mitigated. The option results in new, above ground infrastructure that has a moderate negative effect on the local landscape, townscape or seascape.
		---	Major/Significant Negative	The option would have a negative effect on a designated landscape or feature (i.e. significant visually intrusive infrastructure) whose effects could not be reasonably mitigated. The option results in new, above ground infrastructure that has a major negative effect on the local landscape, townscape or seascape.
		?	Uncertain	From the level of information available the effect that the option would have on this objective is uncertain

APPENDIX F: FEASIBLE OPTIONS ASSESSMENT MATRICES

Option Assessment Information	
WRW Option ID	[If needed.]
Option ID	2.1.1.1
Option Name	40 Ml/d capacity raw water abstraction from the Trent to Blithfield
Water company	South Staffordshire Water
Option Description	Blithfield reservoir is the primary source of raw water for Seedy Mill WTW. Blithfield reservoir has a capacity of approximately 18,200 Ml and sources water from the River Blithe and Tad Brook. Output at Seedy Mill WTW is seasonally limited due to a lack of raw water availability and this option seeks to promote an alternative source of raw water into the reservoir from the River Trent. An existing abstraction point on the River Trent at Nethertown can be used by SST to support Seedy Mill WTW. This abstraction point can also be used to introduce River Trent water into Blithfield reservoir. However, the mode of operation to fill the reservoir requires flow reversal in the pipelines and causes restricted raw water transfer between Blithfield reservoir and Seedy Mill WTW for the duration of the reservoir filling. Any new water from the River Trent would be subject to a Hands-Off Flow at the Yoxall gauge, thereby limiting option yield. The proposed option is to provide a new 40Ml/d surface water abstraction on the River Trent, including: a river intake (380kW pump (760kW pumping station)) and raw water pumping station connected to a new dedicated pipeline to Blithfield reservoir (3.8km, 900mm). A new inlet into Blithfield reservoir will be installed. However, the abstraction on the Trent would be restricted for much of the summer by the Trent flow restrictions. The exact location of the new river intake will need to be determined through further investigation and third-party consultation; however, for the purpose of this option assessment a notional location to the north-west of Rugeley has been selected. Permanent land take would be required for the river intake and associated plant/building. The pump back capacity would also need to be established, as the option would not add extra water if it resulted in cutback to the existing Blithe pump back. The River Trent has a high proportion of treated sewage effluent, which gives rise to water quality concerns, particularly associated with introducing River Trent water to Blithfield reservoir which is also used for recreational activities. Similarly, there may be Invasive Non-Native Species (INNS) transfer implications which should be assessed during subsequent option development. The River Trent and Blithfield reservoir are likely to offer different types of habitat thereby presenting less opportunity for INNS populations to become established as a result of the transfer.
Yield	40Ml/d
WRZ	South Staffordshire Water WRZ

Option	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape
Option 2.1.1.1	Construction (negative)	--/?	-	-	--	0	-	-	-/?	--	0	-	-	-	0	--	-	--
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	++	0	0	0	+	0	0
	Operation (negative)	--/?	0	---	?	-	-	0	-/?	---	0	0	0	0	0	-/?	0	0
	Operation (positive)	0	+	0	0	0	0	0	0	0	++	+++	0	+++	++	0	0	0

Construction

Objective 1: Moderate negative uncertain effect - The Midland Meres and Mosses Ramsar and SAC is located 5.5km from the option. There are two further SACs (Cannock Chase 2.8km away and Pasture fields Salt Marsh 6km away). There are no SPAs within 10km of the option. The option is partly within Blithfield Reservoir SSSI, there are 3 further SSSIs within 5km of the option. There are no ancient woodland areas within 1km of the option. 1 NNR and 4 LNRs are located within 10km. There is no pathway for impact to any terrestrial site; Cannock Chase SAC is designated for European dry heaths and Northern Atlantic wet heaths and is not reliant on the River Trent for water supply despite it's proximity. No Likely Significant Effects (LSEs) have been identified within Pasture fields Salt Marsh SAC, West Midlands Mosses SAC and Midland Meres and Mosses – Phase 1 and 2 Ramsar; all three sites are located upstream of the works and are not considered to be exposed to water quality impacts and are sufficiently distanced such that noise and air quality impacts during construction are not considered to be an issue (based on standard distance thresholds). The Humber Estuary is considered sufficiently distant that construction impacts will not result in an adverse effect, with the Supplementary Advice on Conservation Objectives (SACO) stating that the River Trent does not support sea or river lamprey (Cromwell Weir impassable). There is uncertainty as to the distribution of mobile species of the River Mease SAC (spined loach in particular) and therefore whether impacts could occur during construction of the new abstraction. A Stage 2 Appropriate Assessment will be required to consider the mitigation measures necessary to avoid an adverse effect to the River Mease SAC. Pipeline construction activities and construction activities near water may result in minor loss or degradation of non-designated aquatic habitat associated with short-term changes in river flows, geomorphology or water quality. There could be a short term change in sediment dynamics associated with any construction activities near water, however, this is unlikely to alter geomorphological forms and processes which underpin physical habitat for aquatic ecosystems.

Objective 2: Minor negative effect - Construction of the pipeline will have a temporary minor negative effect on habitat.

Objective 3: Minor negative effect - Although extensive construction activities are required which result in increased distribution of terrestrial and aquatic INNS, the risk is considered as minor assuming best practice biosecurity measures will be adopted during construction.

Objective 4: Moderate negative effect - The vast majority of the option is with Grade 3 agricultural land, with some of the option within Grade 2. The option intersects a historic landfill site, thus there is potential for contamination. There is one further historic landfill site within 1km of the option. There are 2 permitted waste sites within 10km, with the closest site located 3.1km away.

Objective 5: Neutral effect - The option intersects with Moreton Brook. The River Trent and the Trent and Mersey Canal are within 1km of the option. No construction activities associated with this component would have a discernible effect on river flows or groundwater levels. There could be a short term change in sediment dynamics associated with the construction activities near water, however, this is expected to be minimal and is unlikely to result in a change in channel morphology.

Objective 6: Minor negative effect - Construction activities near watercourses may have a minor effect on water quality which result in short-term or intermittent effects on receptors. The component would not lead to a change in WFD classification.

Objective 7: Minor negative effect - Some of the option is within Flood Zones 2 and 3 (less than 10%). Construction of the option is unlikely to cause or exacerbate flooding in the catchment.

Objective 8: Minor negative uncertain effect - Five Ways Island AQMA is located 9.6km from the option. Impacts on AQMAs resulting from construction are considered unlikely. There will be an increase in vehicle movement associated with construction activities and will likely cause short-term deterioration in local air quality. The number of vehicle movements is unknown, thus the extent of impact is uncertain.

Objective 9: Moderate negative effect - Construction would involve the use of materials with embodied carbon as well as carbon emissions related to construction traffic. Using the total CAPEX value of £11,886,403 as a proxy the construction is deemed to have a moderate negative effect on GHG.

Objective 10: Neutral effect - It is not anticipated that the construction of this option would have any effect on climate resilience.

Objective 11: Moderate positive effect - There is potential for employment during construction. Using the total CAPEX value for the option of £11,886,403 as a proxy, construction of the scheme is deemed to have a moderate effect on the economy.

Objective 11: Minor negative effect - The option crosses a railway line and a road therefore effects on transport infrastructure are likely.

Objective 12: Minor negative effect - Construction works are not expected to have a significant impact on opportunities/facilities for recreation or tourism. There are 4 greenspace areas within 1km of the option, with the closest being a Cemetery 820m away. There are no national trails within 10km of the option. National cycle route 5 is within 10km. There are 2 Country Parks within 10km of the option (Cannock Chase 2.8km away and Brindley Heath 5.5km away).

Objective 13: Minor negative effect - Construction of the option is not expected to have a significant impact on health during the construction period due to the rural location of the option. Construction works may have a minor negative effect (e.g. noise disturbance, vibration, dust deposition and air quality impacts) on residential receptors in nearby Colton and Admaston.

Objective 14: Neutral effect - The construction phase of this option is not anticipated to have any effect on the sustainable and efficient use of resilient water resources.

Objective 15: Minor positive effect - Construction of this option will use the existing structure of the reservoir.

Objective 15: Moderate negative effect - The option requires new infrastructure and will result in the use of new materials. Infrastructure includes a river intake, pumping station and pipeline. Effects are expected to be moderate due to the options total CAPEX of £11,886,403.

Objective 16: Minor negative effect - There are no World Heritage Sites within 10km of the option. There are 7 Scheduled Monuments within 5km of the option, with the closest being 670m away. There are 13 Listed Buildings within 1km. There are 2 Registered Parks and Gardens within 10km of the option (Shugborough 3.1km away and German Military Cemetery 6.6km away). The Battle of Hopton Heath Battlefield is within 10km of the option. No significant impacts are expected as a result of construction.

Objective 17: Moderate negative effect - Cannock Chase AONB is located 1km from the option. The Birmingham greenbelt is 590m away. There are no National Parks within 10km of the option. The option requires the construction of a pipeline, construction works are likely to be visually intrusive to the rural landscape in the short term.

Operation

Objective 1: Moderate negative uncertain effect - A new 40Ml/d abstraction is required on the River Trent to fill Blithfield Reservoir. The proposed abstraction point is c.8km upstream of the River Mease SAC confluence with the River Trent. The distribution of functionally linked habitat within the River Trent and it's use by the mobile species of the River Mease SAC (bullhead, spined loach and WCC) is unknown. Similarly, a long-term change in flow could alter prey availability for otter within the wider catchment. LSEs cannot be ruled out due uncertainty over the operational regime and how this may affect fish species, and the extent of functionally linked habitat to be affected. Should this option be taken forward to the preferred options stage, scheme level investigations and Stage 2 Appropriate Assessment would need to be undertaken. Although hydrologically linked to the Humber Estuary SAC, qualifying features not known to be present on the River Trent. The SACO states the following:
- Sea lamprey: Distribution of sea lamprey in the River Trent is unknown however it is thought that distribution of the species is severely limited by Cromwell weir, which is considered as impassable.
- River lamprey: Distribution of river lamprey in the River Trent is severely limited by Cromwell weir, which is considered as impassable to river lamprey.
The reduction in flow is not considered to adversely affect the Humber Estuary SAC estuaries feature (SACO target for freshwater input) alone (based on WFD impact assessment). The operation of this options could result in effects on non-designated aquatic habitats or species. Flows in the River Trent would be reduced however a suitable hands-off flow condition will be required to ensure no significant impacts on biodiversity. As a result, there could be up to minor degradation of non-designated aquatic habitat as a result of any changes to flow, geomorphology or water quality associated with this component. Any operational impacts are unlikely to alter geomorphological forms and processes which underpin physical habitat for aquatic ecosystems.

Objective 2: Minor positive effect - It is assumed that operational biodiversity net gain would be greater than the net loss in construction; however, without quantification, it's magnitude is uncertain. In consequence, an equivalent positive score to the negative score in construction is provided.

Objective 3: Major negative effect - The scheme will establish a new pathway for the distribution of INNS. There is no existing pathway of transfer to Blithefield Reservoir from the River Trent, the transfer of water in an upstream direction will create a new pathway for transferring INNS which may not currently be present at the reservoir and within the downstream watercourse. Mitigation to prevent the transfer of INNS propagules during the transfer will be required in order to reduce the INNS transfer risk.

Objective 4: Uncertain negative effect - It is uncertain whether there would be any operational effects due to the construction works intersecting an historical landfill, unknown contaminants and potential effect on infrastructure.

Objective 5: Minor negative effect - Operational activities associated with this component may have a minor discernible effect on river flows or groundwater levels, however, hands-off flow conditions would be required to prevent this from being a significant impact. This flow change is insufficient to impact sediment dynamics and will not result in a change to channel morphology.

Objective 6: Minor negative effect - The reduction in flows associated with this component may reduce the rivers buffering capacity against point source pollutants, however, this would not be sufficient to cause WFD deterioration.

Objective 7: Neutral effect - The operation of this option is not expected to cause or exacerbate the risk of flooding in the vicinity of the scheme or elsewhere.

Objective 8: Minor negative uncertain effect - It is not anticipated that there would be any significant impact on traffic congestion during the operational period such that the option is expected to have a neutral effect on local air quality, however, as the number of vehicle movements required during the operation of the option is currently unknown, the effect against this objective has been scored as a minor negative uncertain.

Objective 9: Major negative effect - Throughout the options operational lifespan of 80 years it is expected that 9,345 tonnes of carbon will be emitted.

Objective 10: Moderate positive effect - Operation of the option will provide 40Ml/d of water resource, supporting community resilience to climate change wherein drought may otherwise have been a risk.

Objective 11: Major positive effect - Operation of this option will provide an additional 40Ml/d that can support economic activity.

Objective 12: Neutral effect - Operation of the option is not expected to have a negative impact on tourism and recreation.

Objective 13: Major positive effect - Operation of this option will provide an additional 40Ml/d that can support human health and wellbeing.

Objective 14: Moderate positive effect - The option is not a leakage reduction or water efficiency option and would have no impact on water efficiency. However, the option would increase the resilience of water resources within the South Staffordshire Water supply area by providing an additional 40Ml/d deployable output.

Objective 15: Minor negative uncertain effect - Operation of the option will require additional energy (600kWh/Ml) and may require the use of additional chemicals to treat raw water, however the effects in this regard are currently uncertain.

Objective 16: Neutral effect - Operation of this option is not expected to have any impact on cultural heritage sites.

Objective 17: Neutral effect - The option will require a control room building, however this is not expected to have any significant impact on the landscape as this will be within an existing built up area. Therefore impacts on the landscape are considered neutral.

Option Assessment Information	
WRW Option ID	[If needed.]
Option ID	2.2.1.1
Option Name	Blithfield Reservoir - 1m raising
Water company	South Staffordshire Water
Option Description	Blithfield Reservoir has a stated capacity of 18,172Ml and a surface area of 3,200,000m2 when full to its current top water level of 95.25mAOD. It is used for water supply and recreation and is built across the River Blithe and Tad Brook. The reservoir, built around 1953, is retained by an earth fill embankment with puddle clay core about 16m high and 856m long. The reservoir is crossed by a road embankment, 487m long, that is characterised by a causeway formed of a bridge approximately 70m long. This option intends raising the reservoir full supply level by approximately 1m. This will enlarge the actual storage volume of 18,172 Ml to provide an additional 3,180 Ml storage. It is envisaged that the main items included in the works will be as follows: · Raising of the main embankment dam by 1m by forming a reinforced concrete wall, connected to the clay core by interlocking plastic sheet piles, and earthworks to the downstream slope of the embankment. · Raising of the draw off tower, the footbridge and its piers, the main and auxiliary spillways, and the bridges over the spillways. To raise the main and auxiliary spillways a new fuse gate has been envisaged. A new set of props between the raised spillway side walls has been assumed. · Raising of the stilling basin side walls, and extension of the stilling basin approximately 3m downstream. · Raising of the road embankment on the upstream slope, including the existing causeway bridge. Consequently, the road would be shifted about 2.5m upstream. · Two borrow pits have been considered near both embankments in dry land outside of the reservoir. To be conservative, the volume of fill material borrowed was assumed to be twice the granular material needed for the raising of the embankments. · An allowance for land acquisition and compensation to affected landowners. It is currently assumed that there would be no change to abstraction licensing. Any additional land take would potentially be within existing SST land holding.
Yield	3.18Mld
WRZ	South Staffordshire Water WRZ

Option	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape
Option 2.2.1.1	Construction (negative)	---/?	0	-	--	0	-	--	-/?	---	0	-	---	-	0	---	-	--
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	+++	0	0	0	+	0	0
	Operation (negative)	--/?	0	-	0	-	0	0	-/?	0	0	0	0	0	0	-/?	-	-
	Operation (positive)	0	0	0	0	0	0	++	0	0	+	+	0	+	0	0	0	0

Construction

Objective 1: Major negative uncertain effect - The Midland Meres & Mosses Ramsar and SAC is located 2.7km away. There are 2 further SACs within 10km. There are no SPAs within 10km of the option. Blithfield reservoir itself is an SSSI, there are 8 further SSSIs within 10km of the option. Stansley Wood Ancient Woodland is adjacent to the reservoir. There is one NNR and one LNR within 10km of the option. There is no pathway for impact to any terrestrial sites from construction related issues such as noise and air quality (based on standard distance thresholds). The Blithfield Reservoir discharges to the River Blithe which connects to the River Trent downstream of the Cannock Chase SAC and Pasture fields Salt Marsh SACs. The Humber Estuary is considered sufficiently distant that construction impacts will not result in an adverse effect, with the Supplementary Advice on Conservation Objectives (SACO) stating that the River Trent does not support sea or river lamprey (Cromwell Weir impassable). There is uncertainty as to the distribution of mobile species of the River Mease SAC (spined loach in particular) and therefore whether impacts (sedimentation, pollution incidents) could occur during construction of the raised embankment (hydrological connectivity via the River Blithe). A Stage 2 Appropriate Assessment will be required to consider the mitigation measures necessary to avoid an adverse effect to the River Mease SAC. Construction activities near water may result in minor loss or degradation of non-designated aquatic habitat associated with short-term changes in river flows, geomorphology or water quality. There could be a short term change in sediment dynamics associated with any construction activities near water, however, this is unlikely to alter geomorphological forms and processes which underpin physical habitat for aquatic ecosystems within the reservoir environment or any receiving water courses.

Objective 2 : Neutral effect - The increasing of the dam height by 1m is expected to have a neutral construction impact.

Objective 3: Minor negative effect - Although extensive construction activities are required which result in increased distribution of terrestrial and aquatic INNS, the risk is considered as minor assuming best practice biosecurity measures will be adopted during construction.

Objective 4: Moderate negative effect - Approximately 30% of the option is within Grade 3 Agricultural land, there is Grade 2 agricultural land within 500m of the option. There are 3 historic landfill sites within 1km of the option, with the closest site 380m away. There are 4 permitted waste sites within 1km, with the closest site 5km away.

Objective 5: Neutral effect - The River Blithe and Tad Brook are tributaries to the Reservoir. No construction activities associated with this component would have a discernible effect on river flows or groundwater levels. There could be a short term change in sediment dynamics associated with the construction activities near water, however, this is expected to be minimal and is unlikely to result in a change in channel morphology in the receiving water course.

Objective 6: Minor negative effect - Construction activities near watercourses may have a minor effect on water quality which result in short-term or intermittent effects on receptors. The component would not lead to a change in WFD classification.

Objective 7: Moderate negative effect - The entire option site is within Flood Zones 2 and 3. Construction of the option could potentially cause or exacerbate flooding in the catchment.

Objective 8: Minor negative uncertain effect - There are no AQMA within 10km of the option. Impacts on AQMAs resulting from construction are considered unlikely. There will be an increase in vehicle movement associated with construction activities and will likely cause short-term deterioration in local air quality. The number of vehicle movements is unknown, thus the extent of impact is uncertain.

Objective 9: Major negative effect - Construction would involve the use of materials with embodied carbon as well as carbon emissions related to construction traffic. Due to the scale of construction and a total CAPEX value of £47,868,605 effects are considered major.

Objective 10: Neutral effect - It is not anticipated that the construction of this option would have any effect on climate resilience.

Objective 11: Major positive effect - There is potential for employment. Using the total CAPEX value for the option of £47,868,605 as a proxy, construction of the scheme is deemed to have a major positive effect on the economy.

Objective 11: Minor negative effect - There is potential for minor temporary disruption to local businesses and to the users of the road which crosses the reservoir.

Objective 12: Major negative effect - There is one greenspace area within 1km of the option (510m away). There is one national cycle route and no National trails within 10km of the option. There are two country parks within 10km of the option; Cannock Chase is 5.9km away and Brindley Heath is 8.7km away. As the reservoir itself is used for recreation, construction of the option is expected to have a short-term major negative effect on tourism and recreation.

Objective 13: Minor negative effect - Construction of the option is not expected to have a significant impact on health during the construction period due to the rural location of the option. Construction works may have a minor negative effect (e.g. noise disturbance, vibration, dust deposition and air quality impacts) on residential receptors in nearby Newton, Admaston and Abbots Bromley.

Objective 14: Neutral effect - The construction phase of this option is not anticipated to have any effect on the sustainable and efficient use of resilient water resources.

Objective 15: Minor positive effect - Construction of this option will use the existing structure of the reservoir. Objective 15: Major negative effect - The option requires new infrastructure and will result in the use of new materials. Effects are expected to be major due to the option's total CAPEX of £47,868,605.

Objective 16: Minor negative effect - There are no World Heritage Sites within 10km. There is one Scheduled Monument within 1km of the option (620m away). There are 34 Listed Buildings within 1km. There are 2 Parks and Gardens within 10km of the option; Shugborough is located 5.3km away and Sandon Park is located 9.4km away. The Battle of Hopton Heath Battlefield is within 10km of the option.

Objective 17: Moderate negative effect - Due to an AONB within 5km of the scheme and therefore potential visual effects. Cannock Chase AONB is 4.5km from the option location. There are no National Parks within 10km. The Birmingham Greenbelt is located 4.2km from the option. The option requires earthworks to construct the option therefore, construction works are likely to be visually intrusive to the rural landscape in the short term.

Operation

Objective 1: Moderate negative uncertain effect - Increasing the capacity of the reservoir may result in changes to hydrology within the River Blithe, a tributary of the River Trent, through a change in spill regime. The use of the River Blithe and River Trent by the mobile species of the River Mease SAC is unknown. Likely Significant Effects (LSEs) therefore cannot be ruled out due to uncertainty over the operational regime and how this may affect the extent of functionally linked habitat. Should this option be taken forward to the preferred options stage, scheme level investigations and Stage 2 Appropriate Assessment would need to be undertaken. Although hydrologically linked to the Humber Estuary SAC, qualifying features not known to be present on the River Trent. The SACO states the following:

- Sea lamprey: Distribution of sea lamprey in the River Trent is unknown however it is thought that distribution of the species is severely limited by Cromwell weir, which is considered as impassable.
- River lamprey: Distribution of river lamprey in the River Trent is severely limited by Cromwell weir, which is considered as impassable to river lamprey.

The reduction in flow is not considered to adversely affect the Humber Estuary SAC estuaries feature (SACO target for freshwater input) alone (based on WFD impact assessment). The operation of this options could result in effects on non-designated aquatic habitats or species. Flows in the River Trent would be reduced however a suitable hands-off flow condition will be required to ensure no significant impacts on biodiversity. As a result, there could be up to minor degradation of non-designated aquatic habitat as a result of any changes to flow, geomorphology or water quality associated with this component. Any operational impacts are unlikely to alter geomorphological forms and processes which underpin physical habitat for aquatic ecosystems.

Objective 2: Neutral effect - It is assumed that operational biodiversity net gain would be greater than the net loss in construction; however, without quantification, it's magnitude is uncertain. In consequence, an equivalent positive score to the negative score in construction is provided.

Objective 3: Minor negative effect - Increasing the capacity of Blithfield reservoir may in effect increase the potential habitat for aquatic and riparian INNS which in turn may increase the primary and secondary transfer risk. Provided the additional volume is utilised for the supply of Seedy Mill WTW and is not utilised for the downstream transfer and assuming best practice biosecurity measures (such as signs, wash down facilities for recreational users, .etc), the risk to the downstream catchment and INNS distribution overall is minor.

Objective 4: Neutral effect - It is not anticipated that there would be any operational effects on soil, land use or geodiversity.

Objective 5: Minor negative effect - This component may lead to minor changes in the level/spill regime of the Blithfield Reservoir. As a result, the operation of this component could lead to minor negative flow impacts on the water course downstream of these reservoirs.

Objective 6: Neutral effect - No operational activities of this component would have a discernible effect on surface water or groundwater quality. The component would not lead to a change in WFD classification.

Objective 7: Moderate positive effect - The dam is being raised by 1m to enlarge the reservoir and the option is located within flood zone 3 so has potential to help alleviate or mitigate flooding in the catchment.

Objective 8: Minor negative uncertain effect - It is not anticipated that there would be any significant impact on traffic congestion during the operational period such that the option is expected to have a neutral effect on local air quality, however, as the number of vehicle movements required during the operation of the option is currently unknown, the effect against this objective has been scored as minor negative uncertain.

Objective 9: Neutral effect - Throughout the option's operational lifespan of 80 years it is expected that no additional carbon will be emitted.

Objective 10: Minor positive effect - Operation of the option will provide 3.18Ml/d of water resource, supporting community resilience to climate change wherein drought may otherwise have been a risk.

Objective 11: Minor positive effect - Operation of this option will provide an additional 3.18Ml/d that can support economic activity.

Objective 12: Neutral effect - Operation of the option is not expected to have a negative impact on tourism and recreation.

Objective 13: Minor positive effect - Operation of this option will provide an additional 3.18Ml/d that can support human health and wellbeing.

Objective 14: Neutral effect - The option is not a leakage reduction or water efficiency option and would have no impact on water efficiency. Whilst the option would increase the resilience of water resources within the South Staffordshire Water supply area by providing an additional 3.18Ml/d deployable output, this is considered to be a neutral effect.

Objective 15: Minor negative uncertain effect - Operation of the option is likely to require additional energy and may require the use of chemicals, however, the effects in this regard are currently uncertain.

Objective 16: Minor negative effect - Operation of this option may have a minor negative effect on the setting of local cultural heritage sites due to permanent changes to the dam, reservoir and the road embankment.

Objective 17: Minor negative effect - There is likely to be a minor negative effect on the landscape during operation of the option due to permanent changes to the dam, reservoir and the road embankment.

Option Assessment Information	
WRW Option ID	[If needed.]
Option ID	2.2.2.1
Option Name	Blithfield Reservoir - 2m raising
Water company	South Staffordshire Water
Option Description	Blithfield Reservoir has a stated capacity of 18,172Ml and a surface area of 3,200,000m2 when full to its current top water level of 95.25mAOD. It is used for water supply and recreation and is built across the River Blithe and Tad Brook. The reservoir, built around 1953, is retained by an earth fill embankment with puddle clay core about 16m high and 856m long. The reservoir is crossed by a road embankment, 487m long, that is characterised by a causeway formed of a bridge approximately 70m long. This option is aimed to raise the reservoir full supply level by approximately 2m. This will enlarge the actual storage volume of 18,172 Ml to provide an additional 6,600 Ml storage. It is envisaged that the main items included in the works will be as follows: · Raising of the main embankment dam by 2m by forming a reinforced concrete wall, connected to the clay core by interlocking plastic sheet piles, and earthworks to the downstream slope of the embankment. · Raising of the draw off tower, the footbridge and its piers, the main and auxiliary spillways, and the bridges over the spillways. To raise the main and auxiliary spillways a new fuse gate has been envisaged. A new set of props between the raised spillway side walls has been assumed. · Raising of the stilling basin side walls, and extension of the stilling basin approximately 3m downstream. · Raising of the road embankment on the upstream slope, including the existing causeway bridge. Consequently, the road would be shifted about 2.5m upstream. · Two borrow pits have been considered near both embankments in dry land outside of the reservoir. To be conservative, the volume of fill material borrowed was assumed to be twice the granular material needed for the raising of the embankments. · An allowance for land acquisition and compensation to affected landowners. It is currently assumed that there would be no change to abstraction licensing. Any additional land take would potentially be within existing SST land holding.
Yield	6.6Mld
WRZ	South Staffordshire Water WRZ

Option	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape
Option 2.2.2.1	Construction (negative)	---/?	0	-	--	0	-	--	-/?	---	0	-	---	-	0	---	-	--
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	+++	0	0	0	+	0	0
	Operation (negative)	--/?	0	-	0	-	0	0	-/?	0	0	0	0	0	0	-/?	-	-
	Operation (positive)	0	0	0	0	0	0	++	0	0	+	++	0	++	+	0	0	0

Construction

Objective 1: Major negative uncertain effect - The Midland Meres & Mosses Ramsar and SAC is located 2.7km away. There are 2 further SACs within 10km. There are no SPAs within 10km of the option. Blithfield reservoir itself is an SSSI, there are 8 further SSSIs within 10km of the option. Stansley Wood ancient woodland is adjacent to the reservoir. There is one NNR and one LNR within 10km of the option. There is no pathway for impact to any terrestrial sites from construction related issues such as noise and air quality (based on standard distance thresholds). The Blithfield Reservoir discharges to the River Blithe which connects to the River Trent downstream of the Cannock Chase SAC and Pasture fields Salt Marsh SACs. The Humber Estuary is considered sufficiently distant at construction impacts will not result in an adverse effect, with the Supplementary Advice on Conservation Objectives (SACO) stating that the River Trent does not support sea or river lamprey (Cromwell Weir impassable). There is uncertainty as to the distribution of mobile species of the River Mease SAC (spined loach in particular) and therefore whether impacts (sedimentation, pollution incidents) could occur during construction of the raised embankment (hydrological connectivity via the River Blithe). A Stage 2 Appropriate Assessment will be required to consider the mitigation measures necessary to avoid an adverse effect to the River Mease SAC. Construction activities near water may result in minor loss or degradation of non-designated aquatic habitat associated with short-term changes in river flows, geomorphology or water quality. There could be a short term change in sediment dynamics associated with any construction activities near water, however, this is unlikely to alter geomorphological forms and processes which underpin physical habitat for aquatic ecosystems within the reservoir environment or any receiving water courses.

Objective 2: Neutral effect - The increasing of the dam height by 2m is expected to have a neutral construction impact.

Objective 3: Minor negative effect - Although extensive construction activities are required which result in increased distribution of terrestrial and aquatic INNS, the risk is considered as minor assuming best practice biosecurity measures will be adopted during construction.

Objective 4: Moderate negative effect - Approximately 30% of the option is within Grade 3 Agricultural land, there is Grade 2 agricultural land within 500m of the option. There are 3 historic landfill sites within 1km of the option, with the closest site 380m away. There are 4 permitted waste sites within 1km, with the closest site 5km away.

Objective 5: Neutral effect - The River Blithe and Tad Brook are tributaries to the Reservoir. No construction activities associated with this component would have a discernible effect on river flows or groundwater levels. There could be a short term change in sediment dynamics associated with the construction activities near water, however, this is expected to be minimal and is unlikely to result in a change in channel morphology in the receiving water course.

Objective 6: Minor negative effect - Construction activities near watercourses may have a minor effect on water quality which result in short-term or intermittent effects on receptors. The component would not lead to a change in WFD classification.

Objective 7: Moderate negative effect - The entire option site is within Flood Zones 2 and 3. Construction of the option could potentially cause or exacerbate flooding in the catchment.

Objective 8: Minor negative uncertain effect - There are no AQMA within 10km of the option. Impacts on AQMAs resulting from construction are considered unlikely. There will be an increase in vehicle movement associated with construction activities and will likely cause short-term deterioration in local air quality. The number of vehicle movements is unknown, thus the extent of impact is uncertain.

Objective 9: Major negative effect - Construction would involve the use of materials with embodied carbon as well as carbon emissions related to construction traffic. Due to the scale of construction and a total CAPEX value of £73,440,726 effects are considered major.

Objective 10: Neutral effect - It is not anticipated that the construction of this option would have any effect on climate resilience.

Objective 11: Major positive effect - There is potential for employment. Using the total CAPEX value for the option of £73,440,726 as a proxy, construction of the scheme is deemed to have a major positive effect on the economy.

Objective 11: Minor negative effect - There is potential for minor temporary disruption to local businesses and to the users of the road which crosses the reservoir.

Objective 12: Major negative effect - There is one greenspace area within 1km of the option (510m away). There is one national cycle routes and no National trails within 10km of the option. There are two country parks within 10km of the option; Cannock Chase is 5.9km away and Brindley Heath is 8.7km away. As the reservoir itself is used for recreational uses construction of the option is expected to have a short-term major negative effect on tourism and recreation.

Objective 13: Minor negative effect - Construction of the option is not expected to have a significant impact on health during the construction period due to the rural location of the option. Construction works may have a minor negative effect (e.g. noise disturbance, vibration, dust deposition and air quality impacts) on residential receptors in nearby Newton, Admaston and Abbots Bromley.

Objective 14: Neutral effect - The construction phase of this option is not anticipated to have any effect on the sustainable and efficient use of resilient water resources.

Objective 15: Minor positive effect - Construction of this option will use the existing structure of the reservoir.

Objective 15: Major negative effect - The option requires new infrastructure and will result in the use of new materials. Effects are expected to be major due to the option's total CAPEX of £73,440,726.

Objective 16: Minor negative effect - There are no World Heritage Sites within 10km. There is one Scheduled Monument within 1km of the option (620m away). There are 34 Listed Buildings within 1km. There are 2 Parks and Gardens within 10km of the option; Shugborough is located 5.3km away and Sandon Park is located 9.4km away. The Battle of Hopton Heath Battlefield is within 10km of the option.

Objective 17: Moderate negative effect - Due to an AONB within 5km of the scheme and therefore potential visual effects. Cannock Chase AONB is 4.5km from the option location. There are no National Parks within 10km. The Birmingham Greenbelt is located 4.2km from the option. The option requires earthworks to construct the option therefore, construction works are likely to be visually intrusive to the rural landscape in the short term.

Operation

Objective 1: Moderate negative uncertain effect - Increasing the capacity of the reservoir may result in changes to hydrology within the River Blithe, a tributary of the River Trent through a change in spill regime. The use of the River Blithe and River Trent by the mobile species of the River Mease SAC is unknown. Likely Significant Effects (LSEs) therefore cannot be ruled out due to uncertainty over the operational regime and how this may affect the extent of functionally linked habitat. Should this option be taken forward to the preferred options stage, scheme level investigations and Stage 2 Appropriate Assessment would need to be undertaken. Although hydrologically linked to the Humber Estuary SAC, qualifying features not known to be present on the River Trent. The SACO states the following:

- Sea lamprey: Distribution of sea lamprey in the River Trent is unknown however it is thought that distribution of the species is severely limited by Cromwell weir, which is considered as impassable.
- River lamprey: Distribution of river lamprey in the River Trent is severely limited by Cromwell weir, which is considered as impassable to river lamprey.

The reduction in flow is not considered to adversely affect the Humber Estuary SAC estuaries feature (SACO target for freshwater input) alone (based on WFD impact assessment). No operational activities of this component would result in effects on non-designated aquatic habitats or species. Any operational impacts are unlikely to alter geomorphological forms and processes which underpin physical habitat for aquatic ecosystems within the reservoir environment or any receiving water courses.

Objective 2: Neutral effect - It is assumed that operational biodiversity net gain would be greater than the net loss in construction; however, without quantification, it's magnitude is uncertain. In consequence, an equivalent positive score to the negative score in construction is provided.

Objective 3: Minor negative effect - Increasing the capacity of Blithfield reservoir may in effect increase the potential habitat for aquatic and riparian INNS which in turn may increase the primary and secondary transfer risk. Provided the additional volume is utilised for the supply of Seedy Mill WTW and is not utilised for the downstream transfer and assuming best practice biosecurity measures (such as signs, wash down facilities for recreational users, .etc), the risk to the downstream catchment and INNS distribution overall is Minor.

Objective 4: Neutral effect - It is not anticipated that there would be any operational effects on soil, land use or geodiversity.

Objective 5: Minor negative effect - This component may lead to minor changes in the level/spill regime of the Blithfield Reservoir. As a result, the operation of this component could lead to minor negative flow impacts on the water course downstream of these reservoirs.

Objective 6: Neutral effect - No operational activities of this component would have a discernible effect on surface water or groundwater quality. The component would not lead to a change in WFD classification.

Objective 7: Moderate positive effect - The dam is being raised by 2m to enlarge the reservoir and the option is located within flood zone 3 so has potential to help alleviate or mitigate flooding in the catchment.

Objective 8: Minor negative uncertain effect - It is not anticipated that there would be any significant impact on traffic congestion during the operational period such that the option is expected to have a neutral effect on local air quality, however, as the number of vehicle movements required during the operation of the option is currently unknown, the effect against this objective has been scored as a minor negative uncertain.

Objective 9: Neutral effect - Throughout the options operational lifespan of 80 years it is expected that no additional carbon will be emitted.

Objective 10: Minor positive effect - Operation of the option will provide 6.6Ml/d of water resource, supporting community resilience to climate change wherein drought may otherwise have been a risk.

Objective 11: Moderate positive effect - Operation of this option will provide an additional 6.6Ml/d that can support economic activity.

Objective 12: Neutral effect - Operation of the option is not expected to have a negative impact on tourism and recreation.

Objective 13: Moderate positive effect - Operation of this option will provide an additional 6.6Ml/d that can support human health and wellbeing.

Objective 14: Minor positive effect - The option is not a leakage reduction or water efficiency option and would have no impact on water efficiency. However, the option would increase the resilience of water resources within the South Staffordshire Water supply area by providing an additional 6.6Ml/d deployable output.

Objective 15: Minor negative uncertain effect - Operation of the option is likely to require additional energy and may require the use of chemicals, however, the effects in this regard are currently uncertain.

Objective 16: Minor negative effect - Operation of this option may have a minor negative effect on the setting of local cultural heritage sites due to permanent changes to the dam, reservoir and the road embankment.

Objective 17: Minor negative effect - There is likely to be a minor negative effect on the landscape during operation of the option due to permanent changes to the dam, reservoir and the road embankment.

Option Assessment Information	
WRW Option ID	[if needed.]
Option ID	2.3.1
Option Name	Chelmarsh Reservoir 15Ml/d
Water company	South Staffordshire Water
Option Description	This option is aimed to raise the reservoir full supply level by approximately 1 m. This will enlarge the actual storage volume of 3,063 Ml to provide an additional 420 Ml storage. Main Works: • Raising of the main embankment dam by 1 m by forming a reinforced concrete wall, connected to the clay core by interlocking plastic sheet piles, and earthworks to the downstream slope of the embankment. • Raising of the overflow and inlet towers, the footbridges, and their piers. • Extension of the culvert and stilling basin approx. 3 m downstream. • Raising of the subsidiary dams on the downstream slope. Consequently, the road would be shifted about 2.5m upstream. • Two borrow pits have been considered near the embankments in dry land outside of the reservoir. To be conservative, the volume of fill material borrowed was assumed to be twice the granular material needed for the raising of the embankments. Land acquisition and compensation to affected landowners.
Yield	15 Ml/d
WRZ	South Staffordshire Water WRZ

Option	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape
Option 2.3.1	Construction (negative)	--	0	-	--	0	-	0	-/?	--/?	0	0	--	-	0	--	0	--
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	++	0	0	0	+	0	0
	Operation (negative)	--	0	-	0	0	0	0	0	0	0	0	0	0	0	-	0	-
	Operation (positive)	0	0	0	0	0	+	+	0	0	+	++	0	++	+	0	0	0

Construction

Objective 1: Moderate negative effect - There are 12 SSSIs, 2 NNRs and 1 LNR within 10km of the reservoir and there is a large area of ancient woodland to the east of the reservoir within 1km however this is on the opposite bank of the River Severn and is unlikely to be impacted. There are no Ramsar, SAC or SPA designations within 10km of the site. Data supplied suggests presence of eels in Chelmarsh Reservoir. Construction works may have an impact upon migratory species associated with Severn Estuary SAC/Ramsar (sea lamprey and twaite shad SAC qualifying features; salmon, sea trout, eel Ramsar qualifying features) through damage to functionally linked habitat, pollution incidents, sedimentation processes. The reservoir is hydrologically linked to the River Severn by a small watercourse. A Stage 2 Appropriate Assessment will be required to consider the mitigation measures (standard and best practice for construction) necessary to avoid an adverse effect to the Severn Estuary SAC and Ramsar which would be mitigated through best practice measures. No functionally linked habitat for the SPA qualifying features has been identified at this distance from the estuary, and therefore no Likely Signifcant Effects (LSEs) to the SPA are anticipated. Construction activities near water may result in minor loss or degradation of non-designated aquatic habitat associated with short-term changes in river flows, geomorphology or water quality. There could be a short term change in sediment dynamics associated with any construction activities near water, however, this is unlikely to alter geomorphological forms and processes which underpin physical habitat for aquatic ecosystems within the reservoir environment or any receiving water courses.

Objective 2: Neutral effect - The increasing of the dam height by 1m is expected to have a neutral construction impact.

Objective 3: Minor negative effect - Although extensive construction activities are required which result in increased distribution of terrestrial and aquatic INNS, the risk is considered as minor assuming best practice biosecurity measures will be adopted during construction.

Objective 4: Moderate negative effect - As 98% of the option is within grade 3 agricultural land with the remaining 2% being grade 2 with potential of loss of best and most versatile land. There are two historic landfill sites within 1km of the reservoir and a further 13 historic sites within 10km. There is one permitted landfill site within 10km of the reservoir.

Objective 5: Neutral effect - The River Severn is within 1km of the reservoir. Water resource availability is less than 30% at the option location. No construction activities associated with this component would have a discernible effect on river flows or groundwater levels. There could be a short term change in sediment dynamics associated with the construction activities near water, however, this is expected to be minimal and is unlikely to result in a change in channel morphology in the receiving water course.

Objective 6: Minor negative effect - Construction activities near watercourses may have a minor effect on water quality which result in short-term or intermittent effects on receptors. The component would not lead to a change in WFD classification.

Objective 7: Neutral effect - The reservoir itself is not within a Flood Zone, although Flood Zones 2 and 3 are within 500m of the option. Construction of the option is unlikely to cause or exacerbate flooding in the catchment.

Objective 8: Minor negative uncertain effect - There are no AQMA within 10km of the option. Impacts on AQMA are unlikely to occur during construction of the option. However, there will be an increase in vehicle movements associated with construction activities which may cause some short-term deterioration in local air quality. The number of vehicle movements is unknown, therefore the impact is uncertain.

Objective 9: Moderate negative uncertain effect - Due to the scale of construction and a total CAPEX value of £11,469,609, it is expected that this option will have a moderate effect on greenhouse gas emissions. The construction would involve the use of materials with embodied carbon as well as carbon emissions related to construction traffic, however the associated volumes are unknown at this stage therefore the impact is uncertain.

Objective 10: Neutral effect - Construction of this option is not expected to have an effect on climate resilience.

Objective 11: Moderate positive effect - There is the potential for employment during construction. Using the total CAPEX value for the option of £11,469,609 as a proxy, construction of the scheme is deemed to have a moderate effect on the economy.

Objective 12: Moderate negative effect - There are several greenspace areas within 1km of the option with a golf course and religious grounds within 500m and a bowling green within 1km. The option is within 5km of the Severn Valley Country Park. There is a National Cycle Network route within 20m of the reservoir site and a CRoW (Recreational grounds and allotments) within 1km of the reservoir. The reservoir itself is used by the public for a range of activities and therefore construction of this option is expected to have a temporary moderate negative effect on tourism and recreation.

Objective 13: Minor negative effect - There are no built up areas within 1km of the option site. However, construction of this option is expected to have a minor impact on human health and wellbeing due to construction activities associated with heavy goods vehicle (HGV) movements, noise, dust and vibration, over the construction period (temporary).

Objective 14: Neutral effect - Construction of this option is not expected to have any impact on water resilience.

Objective 15: Minor positive effect - Construction of this option will use the existing structure of the reservoir.
Objective 15: Moderate negative effect - Construction of this option is likely to have a moderate negative effect on waste and resource use when using the CAPEX provided as a proxy; £11,469,609. The option will also use additional new materials to expand the existing structure.

Objective 16: Neutral effect - Dudmaston Hall Park and Garden is within 5km of the option. There are 7 Scheduled Monuments within 5km. Construction of the option is unlikely to have an effect on cultural heritage or archaeology.

Objective 17: Moderate negative effect - There is Greenbelt land within 1km of the option. There are no landscape designated areas within 10km. Construction of the option involves raising the main embankment dam as well as the reservoir towers, footbridges and piers. Therefore the construction works would be visually intrusive.

Operation

Objective 1: Moderate negative effect - Increasing the capacity of the reservoir may result in changes to hydrology within the tributary of the River Severn through reduction of water flow, water level and therefore further assessment would be required to understand the impact of these changes and if impacts are considered adverse upon the River Severn and migratory species (sea lamprey and twaite shad SAC qualifying features; salmon, sea trout, eel Ramsar qualifying features). If a release of water from the Lake Vyrnwy reservoir was required to support the scheme, impacts to the Severn Estuary EMS migratory fish life stages, and use of habitat within the upper River Vyrnwy, would need to be considered through a Stage 2 Appropriate Assessment. The increase in flows associated with this component may result in minor negative effects on non-designated aquatic habitats or species. As a result, there may be minor degradation of non-designated aquatic habitat as a result of any changes to flow, geomorphology or water quality associated with this component. Any operational impacts are unlikely to alter geomorphological forms and processes which underpin physical habitat.

Objective 2: Neutral effect - It is assumed that operational biodiversity net gain would be greater than the net loss in construction; however, without quantification, it's magnitude is uncertain. In consequence, an equivalent positive score to the negative score in construction is provided.

Objective 3: Minor negative effect - Increasing the capacity of Chelmarsh reservoir may in effect increase the potential habitat for aquatic and riparian INNS with in turn may increase the primary and secondary transfer risk. Provided the additional volume is utilised through the supply network and is not utilised for the downstream transfer and assuming best practice biosecurity measures (such as signs, wash down facilities for recreational users, etc). the risk to the downstream catchment and INNS distribution overall is minor.

Objective 4: Neutral effect - It is not anticipated that there would be any operational effects on soils, land use or geodiversity.

Objective 5: Neutral effect - Operational activities associated with this component would not lead to a reduction in river or groundwater flows. This flow increase associated with this component is likely to be insufficient to impact sediment dynamics and will not result in a change to channel morphology.

Objective 6: Minor positive effect - There may be minor positive impacts on the water quality in the River Vyrnwy/River Severn as the increased flow may dilute any point source water quality pressures.

Objective 7: Minor positive effect - During operation, this option has potential to increase flood resilience through the additional upstream retention of water as the dam will be raised by up to 1m.

Objective 8: Neutral effect - Operation of this option is not expected to have an noticeable impact on air quality.

Objective 9: Neutral effect - Throughout the options operational lifespan of 80 years it is expected that no additional carbon will be emitted.

Objective 10: Minor positive effect - Operation of the option will provide 15Ml/d of water resource, supporting community resilience to climate change where drought may otherwise have been a risk.

Objective 11: Moderate positive effect - Operation of this option will provide 15Ml/d that can support economic activity.

Objective 12: Neutral effect - Operation of this option is not expected to have any effects on tourism and recreation.

Objective 13: Moderate positive effect - Operation of this option will provide 15Ml/d that can support human health and wellbeing.

Objective 14: Minor positive effect - The option is not a leakage reduction or water efficiency option and would have no impact on water efficiency. However, the option will increase reservoir holding capacity by 15Ml/d, thereby increasing water resilience in the South Staffordshire Water Supply Area.

Objective 15: Minor negative effect - As the operation of this option will require use of additional chemicals.

Objective 16: Neutral effect - Operation of this option is not expected to have any impact on cultural heritage sites.

Objective 17: Minor negative effect - This option results in permanently altering the existing infrastructure and raising of the embankment which will have a minor effect on the local landscape.

Option Assessment Information	
WRW Option ID	[if needed.]
Option ID	2.3.2
Option Name	Chelmarsh Reservoir 30Ml/d - up to 2m raising
Water company	South Staffordshire Water
Option Description	This option is aimed to raise the reservoir full supply level by approximately 2 m. This will enlarge the actual storage volume of 3,063 Ml to provide an additional 890 Ml storage. Main works: • Raising of the main embankment dam by 2 m by earthworks to the crest and downstream slope of the embankment. • Raising of the overflow and inlet towers, the footbridges, and their piers. • Extension of the culvert and stilling basin approx. 10 m downstream. • Raising of the subsidiary dams on the downstream slope. Consequently, the road would be shifted about 5.0m upstream. • Two borrow pits have been considered near the embankments in dry land outside of the reservoir. To be conservative, the volume of fill material borrowed was assumed to be twice the granular material needed for the raising of the embankments. Land acquisition and compensation to affected landowners.
Yield	30 Ml/d
WRZ	South Staffordshire Water WRZ

Option	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape
Option 2.3.2	Construction (negative)	--	0	-	--	0	-	0	-/?	--/?	0	0	--	-	0	--	0	--
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	++	0	0	0	+	0	0
	Operation (negative)	--	0	-	0	0	0	0	0	0	0	0	0	0	0	-	0	-
	Operation (positive)	0	0	0	0	0	+	+	0	0	++	+++	0	+++	++	0	0	0

Construction

Objective 1: Moderate negative effect - There are 12 SSSIs, 2 NNRs and 1 LNR within 10km of the reservoir and there is a large area of ancient woodland to the east of the reservoir within 1km however this is on the opposite bank of the River Severn and is unlikely to be impacted. There are no Ramsar, SAC or SPA designations within 10km of the site. Data supplied suggests presence of eels in Chelmarsh Reservoir. Construction works may have an impact upon migratory species associated with Severn Estuary SAC/Ramsar (sea lamprey and twaite shad SAC qualifying features; salmon, sea trout, eel Ramsar qualifying features) through damage to functionally linked habitat, pollution incidents, sedimentation processes. The reservoir is hydrologically linked to the River Severn by a small watercourse. A Stage 2 Appropriate Assessment will be required to consider the mitigation measures (standard and best practice for construction) necessary to avoid an adverse effect to the Severn Estuary SAC and Ramsar which would be mitigated through best practice measures. No functionally linked habitat for the SPA qualifying features has been identified at this distance from the estuary, and therefore no Likely Significant Effects (LSEs) to the SPA are anticipated. Construction activities near water may result in minor loss or degradation of non-designated aquatic habitat associated with short-term changes in river flows, geomorphology or water quality. There could be a short term change in sediment dynamics associated with any construction activities near water, however, this is unlikely to alter geomorphological forms and processes which underpin physical habitat for aquatic ecosystems within the reservoir environment or any receiving water courses.

Objective 2: Neutral effect - The increasing of the dam height by 2m is expected to have a neutral construction impact.

Objective 3: Minor negative effect - Although extensive construction activities are required which result in increased distribution of terrestrial and aquatic INNS, the risk is considered as minor assuming best practice biosecurity measures will be adopted during construction.

Objective 4: Moderate negative effect - 98% of the option is within grade 3 agricultural land with the remaining 2% being grade 2 with potential of loss of best and most versatile land. There are two historic landfill sites within 1km of the reservoir and a further 13 historic sites within 10km. There is one permitted landfill site within 10km of the reservoir.

Objective 5: Neutral effect - The River Severn is within 1km of the reservoir. Water resource availability is less than 30% at the option location. No construction activities associated with this component would have a discernible effect on river flows or groundwater levels. There could be a short term change in sediment dynamics associated with the construction activities near water, however, this is expected to be minimal and is unlikely to result in a change in channel morphology in the receiving water course.

Objective 6: Minor negative effect - Construction activities near watercourses may have a minor effect on water quality which result in short-term or intermittent effects on receptors. The component would not lead to a change in WFD classification.

Objective 7: Neutral effect - The reservoir itself is not within a Flood Zone, athough Flood Zones 2 and 3 are within 200m of the option downstream of the dam wall. Construction of the option is unlikely to cause or exacerbate flooding in the catchment.

Objective 8: Minor negative uncertain effect - There are no AQMA within 10km of the option. Impacts on AQMA are unlikely to occur during construction of the option. However, there will be an increase in vehicle movements associated with construction activities which may cause some short-term deterioration in local air quality. The number of vehicle movements is unknown therefore the impact is uncertain.

Objective 9: Moderate negative uncertain effect - Due to the scale of construction and CAPEX construction value provided, £6,154,576, it is expected that this option will have a moderate effect on green house gas emissions. The construction would involve the use of materials with embodied carbon as well as carbon emissions related to construction traffic, however the associated volumes are unknown at this stage therefore the impact is uncertain.

Objective 10: Neutral effect - Construction of this option is not expected to have an effect on climate resilience.

Objective 11: Moderate positive effect - Due to the potential for employment during construction based on the total CAPEX value of £6,154,576.

Objective 12: Moderate negative effect - There are several greenspace areas within 1km of the option with a golf course and religious grounds within 500m and a bowling green within 1km. The option is within 5km of the Severn Valley Country Park. There is a National Cycle Network route within 20m of the reservoir site and a CRoW (Recreational grounds and allotments) within 1km of the reservoir. The reservoir itself is used by the public for a range of activities and therefore construction of this option is expected to have a temporary moderate negative effect on tourism and recreation.

Objective 13: Minor negative effect - There are no built up areas within 1km of the option site. However, construction of this option is expected to have a minor impact on human health and wellbeing due to construction activities associated with heavy goods vehicle (HGV) movements, noise, dust and vibration, over the construction period (temporary).

Objective 14: Neutral effect - Construction of this option is not expected to have any impact on water resilience.

Objective 15: Minor positive effect - Construction of this option will use the existing structure of the reservoir.

Objective 15: Moderate negative effect - Construction of this option is likely to have a moderate negative effect on waste and resource use with a total CAPEX value of £6,154,576 as the option will also use additional new materials to expand the existing structure.

Objective 16: Neutral effect - Dudmaston Hall Park and Garden is within 5km of the option. There are 7 Scheduled Monuments within 5km. Construction of the option is unlikely to have an effect on cultural heritage or archaeology.

Objective 17: Moderate negative effect - There is Greenbelt land within 1km of the option. There are no landscape designated areas within 10km. Construction of the option involves raising the main embankment dam as well as the reservoir towers, footbridges and piers. Therefore the construction works would be visually intrusive.

Operation

Objective 1: Moderate negative effect - Increasing the capacity of the reservoir may result in changes to hydrology within the tributary of the River Severn through reduction of water flow, water level and therefore further assessment would be required to understand the impact of these changes and if impacts are considered adverse upon the the River Severn and migratory species (sea lamprey and twaite shad SAC qualifying features; salmon, sea trout, eel Ramsar qualifying features). If a release of water from the Lake Vyrnwy reservoir was required to support the scheme, impacts to the Severn Estuary EMS migratory fish life stages, and use of habitat within the upper River Vyrnwy, would need to be considered through a Stage 2 Appropriate Assessment. The increase in flows associated with this component may result in minor negative effects on non-designated aquatic habitats or species. As a result, there may be minor degradation of non-designated aquatic habitat as a result of any changes to flow, geomorphology or water quality associated with this component. Any operational impacts are unlikely to alter geomorphological forms and processes which underpin physical habitat.

Objective 2: Neutral effect - It is assumed that operational biodiversity net gain would be greater than the net loss in construction; however, without quantification, it's magnitude is uncertain. In consequence, an equivalent positive score to the negative score in construction is provided.

Objective 3: Minor negative effect - Increasing the capacity of Blithfield reservoir may in effect increase the potential habitat for aquatic and riparian INNS with in turn may increase the primary and secondary transfer risk. Provided the additional volume is utilised through the supply network and is not utilised for the downstream transfer and assuming best practice biosecurity measures (such as signs, wash down facilities for recreational users, ,etc), the risk to the downstream catchment and INNS distribution overall is minor.

Objective 4: Neutral effect - It is not anticipated that there would be any operational effects on soils, land use or geodiversity.

Objective 5: Neutral effect - Operational activities associated with this component would not lead to a reduction in river or groundwater flows. This flow increase associated with this component is likely to be insufficient to impact sediment dynamics and will not result in a change to channel morphology.

Objective 6: Minor positive effect - There may be minor positive impacts on the water quality in the River Vyrnwy/River Severn as the increased flow may dilute any point source water quality pressures.

Objective 7: Minor positive effect - During operation, this option has potential to increase flood resilience through the upstream retention of water as the dam will be raised by up to 2m.

Objective 8: Neutral effect - Operation of this option is not expected to have an noticeable impact on air quality.

Objective 9: Neutral effect - Throughout the option's operational lifespan of 80 years it is expected that no additional carbon will be emitted.

Objective 10: Moderate positive effect - Operation of the option will provide 30Ml/d of water resource, supporting community resilience to climate change where drought may otherwise have been a risk.

Objective 11: Major positive effect - Operation of this option will provide 30Ml/d that can support economic activity.

Objective 12: Neutral effect - Operation of this option is not expected to have any effects on tourism and recreation.

Objective 13: Major positive effect - Operation of this option will provide 30Ml/d that can support human health and wellbeing.

Objective 14: Moderate positive effect - The option is not a leakage reduction or water efficiency option and would have no impact on water efficiency. However, the option will increase reservoir holding capacity by 30Ml/d, thereby increasing water resilience in the SSW Supply Area.

Objective 15: Minor negative effect - The operation of this option will require use of additional chemicals.

Objective 16: Neutral effect - Operation of this option is not expected to have any impact on cultural heritage sites.

Objective 17: Minor negative effect - This option results in permanently altering the existing infrastructure and raising of the embankment which will have a minor effect on the local landscape.

Option Assessment Information	
WRW Option ID	[if needed.]
Option ID	6.1.1
Option Name	40 Ml/d capacity treatment works on the Trent, with 6 month bankside storage.
Water company	South Staffordshire Water
Option Description	This option seeks to make use of the available water in the River Trent by installing a new 40 Ml/d capacity treatment works adjacent to the River Trent between Rugeley and Yoxall. Due to the likely summer season HoF restrictions to abstraction a new bankside storage reservoir will be required. Water quality on the River Trent is poor so treatment needs are expected to result in high cost for the option for both capital investment and the operational cost requirements. The proposed option is to install a new river abstraction (40Ml/d) on the River Trent which discharges via a new pipeline (0.1km, 900mm, 115kW) into a new bankside storage reservoir (8,052Ml, equating to 183 days at 40 Ml/d and 10% of 'dead' storage). The storage reservoir (161ha) is to be sized to provide 6 months storage to enable continued treatment works output when the River Trent is subject to HoF. There may be opportunity to use former gravel workings in the area, both for land and for first stage settlement of river water. However, it should be noted that abstractions from gravel aquifers or former quarry lakes will not be exempt from HoF restrictions, so a new dedicated storage reservoir is likely to be required. A new water treatment works (10ha) with design capacity of 40 Ml/d (1MW power supply) will be constructed. The exact works will need to be designed in accordance with water quality data which requires further investigation and study. A notional treatment plant comprising clarifiers, filters, GAC plant, Manganese contactor and chlorine disinfection has been included for the purpose of this option assessment. A new pipeline connection (0.2km, 900mm) will be required between the bankside storage and WTW. New pipelines will be required between the new treatment works and the existing SST distribution grid. It is proposed that two connections are installed. The first to the network supplying Burton on Trent (25 Ml/d, 4.7km, 750mm and a 210kW pump (420kW pumping station)) thereby reducing demand on Seedy Mill WTW, the second to Seedy Mill WTW for distribution into the rest of the SST grid (15 Ml/d, 5.0km, 600mm and new 90kW pump (180kW pumping station)). Further investigation is required to establish suitable sites for the proposed storage and treatment works. For the purpose of this option assessment, a notional location near to Kings Bromley has been suggested. Land acquisition will be required for this option for both the treatment works and bankside storage. Linear land compensation is also required for the construction of the new pipelines. New links into the power supply grid will be required at the abstraction point and at the new treatment works. An overall delivery period of 10 years.
Yield	40 Ml/d
WRZ	South Staffordshire Water WRZ

Option	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape
Option 6.1.1	Construction (negative)	---	--	-	--	0	-	--	--/?	---	0	-	--	---	0	---	---	--
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	+++	0	0	0	0	0	0
	Operation (negative)	--	0	-	-	-	-	0	-/?	---	0	0	0	0	0	--/?	0	--
	Operation (positive)	0	++	?	0	0	0	++	0	0	++	+++	0	+++	++	0	0	0

Construction

Objective 1: Major negative effect - The option pipeline intersects an ancient woodland area (Vicars Coppice), and there are a further 6 ancient woodland areas within 1km of the option. There are no Ramsar sites within 10km of the option. The River Mease SAC and SSSI is located 2.2km away and Cannock Chase SAC is located 8.3km away. There are no SPAs within 10km of the option. There are 2 further SSSIs within 5km of the option. Due to the distance between the option and Cannock Chase SAC (7.7km) and River Mease SAC (5.8km), and the lack of hydrological connectivity (Cannock Chase SAC is located upstream of the option along the River Trent; River Mease SAC is a downstream tributary of the River Trent), construction works are not anticipated to result in impacts through dust, air pollution, noise, pollution incidents. Construction works may have impact to River Mease SAC qualifying features through impact to supporting habitat for qualifying features in particular otters. The reservoir location, and potential pipeline crossings of the River Trent and Trent and Mersey Canal, all could result in sedimentation and pollution incidents during construction. The use of the River Trent by the qualifying features of the River Mease SAC is uncertain. A Stage 2 Appropriate Assessment will be required. Due to the distance between the Humber Estuary SAC/Ramsar and the option, construction works is not anticipated to have an adverse effect upon the features of the SAC/Ramsar. While distribution of sea lamprey in the River Trent is unknown (Supplementary advice), the Cromwell weir is considerable impassable and therefore the distribution of sea lamprey and river lamprey is considered very limited within the River Trent. Therefore, the option is not considered to have an adverse impact upon the SAC/Ramsar features (migratory fish species). Pipeline construction activities and construction activities near water may result in minor loss or degradation of non-designated aquatic habitat associated with short-term changes in river flows, geomorphology or water quality. There could be a short term change in sediment dynamics associated with any construction activities near water, however, this is unlikely to alter geomorphological forms and processes which underpin physical habitat for aquatic ecosystems.

Objective 2: Moderate negative effect - Construction of new pipelines and other infrastructure will cause a temporary, moderate, negative impact.

Objective 3: Minor negative effect - Although extensive construction activities are required which result in increased distribution of terrestrial and aquatic INNS, the risk is considered as minor assuming best practice biosecurity measures will be adopted during construction.

Objective 4: Moderate negative effect - A vast majority of the option is within Grade 3 Agricultural land, some areas are within Grade 2. There are 2 historic landfill sites within 1km, with the closest being 370m from the pipeline. There are also 3 permitted waste sites within 1km of the option, the closest permitted waste site is located 210m away. Therefore there is a potential risk for contamination.

Objective 5: Neutral effect - The option intersects Bourne Brook, the Trent and Mersey Canal, the River Trent, Pyford Brook and Ashby Stitch. No construction activities associated with this component would have a discernible effect on river flows or groundwater levels. There could be a short term change in sediment dynamics associated with the construction activities near water, however, this is expected to be minimal and is unlikely to result in a change in channel morphology.

Objective 6: Minor negative effect - Construction activities near watercourses may have a minor effect on water quality which result in short-term or intermittent effects on receptors. The component would not lead to a change in WFD classification.

Objective 7: Moderate negative effect - Approximately 50% of the option is located within Flood Zones 2 and 3. Construction of the option could potentially cause or exacerbate flooding in the catchment.

Objective 8: Moderate negative uncertain effect - The pipeline encroaches upon the A38, Wall Island to Alrewas AQMA, and there are 3 further AQMAs within 10km. Impacts on AQMAs resulting from construction are considered likely. There will be an increase in vehicle movement associated with construction activities and will likely cause short-term deterioration in local air quality. The number of vehicle movements is unknown, thus the extent of impact is uncertain.

Objective 9: Major negative effect - Construction would involve the use of materials with embodied carbon as well as carbon emissions related to construction traffic. The total CAPEX value is £117,841,901.

Objective 10: Neutral effect - It is not anticipated that the construction of this option would have any effect on climate resilience.

Objective 11: Major positive effect - due to potential for construction employment taking into account a total CAPEX value of £117,841,901.

Objective 11: Minor negative effect - The option crosses a railway line and roads. The option is also near built up areas. Therefore the option is anticipated to cause minor disruption to built assets and infrastructure.

Objective 12: Moderate negative effect - Construction works are likely to impact on opportunities/facilities for recreation and tourism. There are 11 greenspace areas within 1km of the option, the closest site is a golf course located 150m from the pipeline. The option crosses National Cycle route 54. There are no national trials within 10km of the option. There are 4 Country Parks within 10km; Cannock Chase is the closest country park located 6.5km from the option.

Objective 13: Major negative effect - Construction works could have a major negative effect (e.g. noise disturbance, vibration, dust deposition and air quality impacts) on residential receptors in nearby Alrewas and Fradley Village as well as King's Bromley which is located in close proximity to the location of the reservoir and WTW works. The option is also within 1km of a noise action area.

Objective 14: Neutral effect - The construction phase of this option is not anticipated to have any effect on the sustainable and efficient use of resilient water resources.

Objective 15: Major negative effect - The option requires new infrastructure and will result in the use of new materials. New infrastructure includes a pipeline, abstraction point, a bankside storage reservoir and Water Treatment Works. Effects are expected to be major due to the options total CAPEX of £117,841,901.

Objective 16: Major negative effect - As there are 92 Listed Buildings within 1km of the option, 3 of which are adjacent to the option and which have the potential to be adversely affected by the construction both in terms of their structure and their setting. There is a Scheduled Monument within 1km (700m away). There is a Registered Park within 5km of the option (Cathedral Close and Linear Park is 3.7km away). There are no World Heritage Sites within 10km of the option.

Objective 17: Moderate negative effect - Cannock Chase AONB is located 3.8km from the option. There are no National Parks within 10km of the option. The pipeline encroaches upon the Birmingham Greenbelt. Impacts on landscape designations are likely. The option requires the construction of a number of assets including a storage reservoir, pipeline and WTW, construction works will be visually intrusive to the semi-rural landscape in the short term.

Operation

Objective 1: Moderate negative effect - Operation activities will require abstraction of 40Ml/d on the River Trent which may have impact on hydrology and hydromorphology of the SACs connected to the River Trent. Therefore, the option may have an impact on habitats and species associated with River Mease SAC and Humber Estuary SAC/SPA/Ramsar. Due to the distance and the location upstream of Cannock Chase SAC, no Likely Significant Effects (LSEs) are anticipated. Without further understanding of the impact to water level, flow, velocity and hydromorphology, LSE cannot be ruled out and therefore further assessment would be required for River Mease SAC and Humber Estuary SAC/SPA/Ramsar. The operation of this options could result in effects on non-designated aquatic habitats or species. Flows in the River Trent would be reduced however a suitable hands-off flow condition will be required to ensure no significant impacts on biodiversity. As a result, there could be up to minor degradation of non-designated aquatic habitat as a result of any changes to flow, geomorphology or water quality associated with this component. Any operational impacts are unlikely to alter geomorphological forms and processes which underpin physical habitat for aquatic ecosystems.

Objective 2: Moderate positive effect - It is assumed that operational biodiversity net gain would be greater than the net loss in construction; however, without quantification, it's magnitude is uncertain. In consequence, an equivalent positive score to the negative score in construction is provided.

Objective 3: Minor negative effect - The scheme creates a new pathway for the distribution of INNS between the River Trent and a new waterbody which could in turn provide secondary distribution pathways for introducing new INNS into the River Trent during releases into the river. The risk is considered minor given the nature of the River Trent at the source and the assumption that the storage reservoir will not be utilised for recreational activities.

Objective 4: Minor negative effect - The built structures and storage reservoir will permanently alter existing land use at the option's location. However, it is not anticipated that there would be any further operational effects on soils, land use or geodiversity.

Objective 5: Minor negative effect - Operational activities associated with this component may have a minor discernible effect on river flows or groundwater levels, however, hands-off flow conditions would be required to prevent this from being a significant impact. This flow change is insufficient to impact sediment dynamics and will not result in a change to channel morphology.

Objective 6: Minor negative effect - The reduction in flows associated with this component may reduce the rivers buffering capacity against point source pollutants, however, this would not be sufficient to cause WFD deterioration.

Objective 7: Moderate positive effect - As the new bankside storage reservoir has the potential to help alleviate or mitigate flooding in the catchment and the option is located partly within flood zone 3.

Objective 8: Minor negative uncertain effect - It is not anticipated that there would be any significant impact on traffic congestion during the operational period such that the option is expected to have a neutral effect on local air quality, however, as the number of vehicle movements required during the operation of the option is currently unknown, the effect against this objective has been scored as a minor negative uncertain effect.

Objective 9: Major negative effect - Throughout the options operational lifespan of 80 years it is expected that 8,183 tonnes of carbon will be emitted.

Objective 10: Moderate positive effect - Operation of the option will provide 40Ml/d of water resource, supporting community resilience to climate change wherein drought may otherwise have been a risk.

Objective 11: Major positive effect - Operation of this option will provide an additional 40Ml/d that can support economic activity.

Objective 12: Neutral effect - Operation of the option is not expected to have a negative impact on tourism and recreation.

Objective 13: Major positive effect - Operation of this option will provide an additional 40Ml/d that can support human health and wellbeing.

Objective 14: Moderate positive effect - The option is not a leakage reduction or water efficiency option and would have no impact on water efficiency. However, the option would increase the resilience of water resources within the South Staffordshire Water supply area by providing an additional 40Ml/d deployable output.

Objective 15: Moderate negative uncertain effect - Operation of the option will require additional energy (888kWh/Ml) and may require the use of additional chemicals to treat raw water, however, the effects in this regard are currently uncertain.

Objective 16: Neutral effect - Operation of this option is not expected to have any impact on cultural heritage sites.

Objective 17: Moderate negative effect - Effects on the Birmingham Greenbelt during operation are unlikely as the works within the greenbelt are only associated with the pipeline. However, the built structures and storage reservoir have the potential to permanently alter the existing landscape.

Option Assessment Information	
WRW Option ID	[if needed.]
Option ID	6.1.3
Option Name	70 Ml/d capacity treatment works on the Trent, with 6 month bankside storage
Water company	South Staffordshire Water
Option Description	This option seeks to make use of the available water in the River Trent by installing a new 70 Ml/d capacity treatment works adjacent to the River Trent between Alrewas and Burton. Due to the likely summer season HoF restrictions to abstraction a new bankside storage reservoir will be required. Water quality on the River Trent is poor so treatment needs are expected to result in high cost for the option for both capital investment and the operational cost requirements. The proposed option is to install a new river abstraction on the River Trent which discharges into a new bankside storage reservoir (14,090 Ml, equating to 183 days at 70 Ml/d and 10% of 'dead' storage). The storage reservoir (282ha) is to be sized to provide 6 months storage to enable continued treatment works output when the River Trent is subject to HoF. This is to be separated into two reservoir units. Bankside storage 1 would comprise of: a new river intake (200kW) and pumping into bankside storage 1, a new pipeline (0.1km, 1,200mm) between river intake and bankside storage 1, a new inlet to bankside storage 1, a new outlet from bankside storage and associated pumping (200kW), and a new pipeline (1.7km, 1,200mm) between bankside storage and WTW. Bankside storage 2 would comprise of: a new river intake (200kW) and pumping into bankside storage 2, a new pipeline (0.1km, 1200mm) between river intake and bankside storage 2, a new inlet to bankside storage 2, a new outlet from bankside storage and associated pumping (200kW) and a new pipeline (0.8km, 1,200mm) between bankside storage and WTW. There may be opportunity to use former gravel workings in the area, both for land and for first stage settlement of river water. However, it should be noted that abstractions from gravel aquifers or former quarry lakes will not be exempt from HoF restrictions, so a new dedicated storage reservoir will be required. A new water treatment works (10ha) with design capacity of 70 Ml/d will be constructed. The exact works will need to be designed in accordance with water quality data which requires further investigation and study. A notional treatment plant comprising clarifiers, filters, GAC plant, Manganese contactor and chlorine disinfection has been included for the purpose of this option assessment. New pipelines will be required between the new treatment works and the existing SST distribution grid. It is proposed that two connections are installed. The first to the network supplying Burton on Trent (25Ml/d, 0.5km, 750mm and a 220kW pump (440kW pumping station)) thereby reducing demand on Seedy Mill WTW, the second to Seedy Mill WTW for distribution into the rest of the SST grid (45 Ml/d, 11.8km, 900mm and new 300kW pump (600kW pumping station)). Further investigation is required to establish suitable sites for the proposed storage and treatment works. For the purpose of this option assessment a notional location near to Walton on Trent has been suggested. Land acquisition will be required for this option for both the treatment works and bankside storage. Linear land compensation is also required for the installation of the new pipelines. New links into the power supply grid will be required at the abstraction point and at the new treatment works. The average deployable output (DO) is anticipated to be 60 Ml/d (70 Ml/d peak). An overall delivery period of 10 years.
Yield	70Mld
WRZ	South Staffordshire Water WRZ

Option	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape
Option 6.1.3	Construction (negative)	---/?	--	-	---	0	-	--	--/?	---	0	--	---	---	0	---	---	--
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	+++	0	0	0	0	0	0
	Operation (negative)	--	0	-	--	-	-	0	-/?	---	0	0	0	0	0	---/?	0	--
	Operation (positive)	0	++	0	0	0	0	++	0	0	+++	+++	0	+++	+++	0	0	0

Construction

Objective 1: Major negative uncertain effect - The pipeline intersects a parcel of ancient woodland, there are 5 more areas of ancient woodland within 500m of the option (with one adjacent). There are no Ramsar or SPA sites within 10km of the option. The River Mease SAC and SSSI is 2.6km from the option, there is one further SAC and 8 further SSSIs within 10km. There are no NNRs within 10km. There are 8 LNRs within 10km of the option, with the closest site being 570m from storage reservoir 1. The River Mease SAC is located approximately 3.1km upstream of the option. There is uncertainty as to the distribution of mobile species of the River Mease SAC (spined loach in particular) within the River Trent, and therefore whether impacts (sedimentation, pollution incidents) could occur during construction. A Stage 2 Appropriate Assessment will be required to consider the mitigation measures necessary to avoid an adverse effect to the River Mease SAC. The Humber Estuary is considered sufficiently distant at construction impacts will not result in an adverse effect, with the Supplementary Advice on Conservation Objectives (SACO) stating that the River Trent does not support sea or river lamprey (Cromwell Weir impassable). Pipeline construction activities and construction activities near water may result in minor loss or degradation of non-designated aquatic habitat associated with short-term changes in river flows, geomorphology or water quality. There could be a short term change in sediment dynamics associated with any construction activities near water, however, this is unlikely to alter geomorphological forms and processes which underpin physical habitat for aquatic ecosystems.

Objective 2: Moderate negative effect - Construction of new pipelines and other infrastructure will cause a temporary, moderate, negative impact.

Objective 3: Minor negative effect - Although extensive construction activities are required which result in increased distribution of terrestrial and aquatic INNS, the risk is considered as minor assuming best practice biosecurity measures will be adopted during construction.

Objective 4: Major negative effect - Approximately 80% of the option is within Grade 3 Agricultural land, with small parts of the option located on Grade 2 land and is likely to lead to loss of best and most versatile land. As storage reservoir 1 is located on a historic landfill site, there is potential for contamination impacts. There are a further 4 historic landfill sites either adjacent or within 500m to the pipeline and reservoirs. There are 3 permitted waste sites within 1km of the option, with the closest being 400m away.

Objective 5: Neutral effect - The option intersects a number of watercourses including the Trent and Mersey Canal, River Trent, Pyford Brook, Curborough Brook and Ashby Sitch. No construction activities associated with this component would have a discernible effect on river flows or groundwater levels. There could be a short term change in sediment dynamics associated with the construction activities near water, however, this is expected to be minimal and is unlikely to result in a change in channel morphology.

Objective 6: Minor negative effect - Construction activities near watercourses may have a minor effect on water quality which result in short-term or intermittent effects on receptors. The component would not lead to a change in WFD classification.

Objective 7: Moderate negative effect - Approximately 50% of the option is within flood zones 2 and 3. Construction of the option could potentially cause or exacerbate flooding in the catchment.

Objective 8: Moderate negative uncertain effect - due to the scheme not being within an AQMA although is near to built up areas and therefore potential effects. The A38, Wall Island to Alrewas is located 1.1km from the option. Burton upon Trent AQMAs 1 and 2 are located within 5km and there are a further 3 AQMAs within 10km. Impacts on AQMAs resulting from construction are considered likely. There will be an increase in vehicle movement associated with construction activities and will likely cause short-term deterioration in local air quality. The number of vehicle movements is unknown, thus the extent of impact is uncertain.

Objective 9: Major negative effect - Construction would involve the use of materials with embodied carbon as well as carbon emissions related to construction traffic. The total CAPEX value is £191,946,744.

Objective 10: Neutral effect - It is not anticipated that the construction of this option would have any effect on climate resilience.

Objective 11: Major positive effect - Due to potential for construction employment taking into account a total CAPEX value of £191,946,744.

Objective 11: Moderate negative effect - As the option crosses roads and is close to built up areas and existing buildings. Therefore, the option is anticipated to cause moderate disruption to built assets and infrastructure.

Objective 12: Major negative effect - The option pipeline intersects a play space area, there are a further 11 greenspace areas within 500m of the option location. The option crosses National Cycle route 54. There are no national trails within 10km of the option. Branston Water Park is located 550m from storage reservoir 1 and there are 3 further Country Parks within 10km of the option.

Objective 13: Major negative effect - Construction of the option may have an effect on health during the construction period due to the options location. Construction works may have a major negative effect (e.g. noise disturbance, vibration, dust deposition and air quality impacts) on residential receptors in nearby Alrewas, Branston, Walton-on-Trent and Barton-under-Needwood. The option is also within 1km of a noise action area.

Objective 14: Neutral effect - The construction phase of this option is not anticipated to have any effect on the sustainable and efficient use of resilient water resources.

Objective 15: Major negative effect - The option requires new infrastructure and will result in the use of new materials. New infrastructure includes a pipeline, abstraction point, two bankside storage reservoirs and Water Treatment Works. Effects are expected to be major due to the options total CAPEX of £191,946,744.

Objective 16: Major negative effect - There are no World Heritage Sites within 10km of the option. The pipeline crosses 2 Scheduled Monuments, and there are 5 further scheduled monuments within 500m of the option. There are 34 listed buildings within 500m of the option. There are also 3 registered parks and gardens within 10km of the option, with the closest being Cathedral Close and Linear Park 3.7km away.

Objective 17: Moderate negative effect - Cannock Chase AONB is located 3.8km from the option. There are no National Parks within 10km of the option. The pipeline encroaches upon the Birmingham Greenbelt and the Burton-upon-Trent and Swadlincote Greenbelt is within 5km of the option. The option requires the construction of a number of assets including storage reservoirs, pipeline and WTW and construction works are expected to be visually intrusive to the semi-rural landscape in the short term.

Operation

Objective 1: Moderate negative effect - Operational activities will require abstraction of 70Ml/d on the River Trent which may have impact on hydrology and hydromorphology of functionally linked habitat used by the mobile species of the River Mease SAC. Although hydrologically linked to the Humber Estuary SAC, qualifying features not known to be present on the River Trent. The SACO states the following:

- Sea lamprey: Distribution of sea lamprey in the River Trent is unknown however it is thought that distribution of the species is severely limited by Cromwell weir, which is considered as impassable.
- River lamprey: Distribution of river lamprey in the River Trent is severely limited by Cromwell weir, which is considered as impassable to river lamprey.

The reduction in flow is not considered to adversely affect the Humber Estuary SAC estuaries feature (SACO target for freshwater input) alone (based on WFD impact assessment). The operation of this options could result in effects on non-designated aquatic habitats or species. Flows in the River Trent would be reduced however a suitable hands-off flow condition will be required to ensure no significant impacts on biodiversity. As a result, there could be up to minor degradation of non-designated aquatic habitat as a result of any changes to flow, geomorphology or water quality associated with this component. Any operational impacts are unlikely to alter geomorphological forms and processes which underpin physical habitat for aquatic ecosystems.

Objective 2: Moderate positive effect - It is assumed that operational biodiversity net gain would be greater than the net loss in construction; however, without quantification, it's magnitude is uncertain. In consequence, an equivalent positive score to the negative score in construction is provided.

Objective 3: Minor negative effect - The scheme creates a new raw water transfer pathway for the distribution of INNS between the River Trent and two new waterbodies which could in turn provide secondary distribution pathways for introducing new INNS into the River Trent during releases into the river. The risk is considered minor given the distance of the proposed pipeline and the nature of the River Trent at the source and the assumption that the storage reservoir will not be utilised for recreational activities.

Objective 4: Moderate negative effect - The option will lead to the permanent loss of best and most versatile agricultural land.

Objective 5: Minor negative effect - Operational activities associated with this component may have a minor discernible effect on river flows or groundwater levels, however, hands-off flow conditions would be required to prevent this from being a significant impact. This flow change is insufficient to impact sediment dynamics and will not result in a change to channel morphology.

Objective 6: Minor negative effect - The reduction in flows associated with this component may reduce the rivers buffering capacity against point source pollutants, however, this would not be sufficient to cause WFD deterioration.

Objective 7: Moderate positive effect - As the new bankside storage reservoir has the potential to help alleviate or mitigate flooding in the catchment and the option is located partly within flood zone 3.

Objective 8: Minor negative uncertain effect - It is not anticipated that there would be any significant impact on traffic congestion during the operational period such that the option is expected to have a neutral effect on local air quality, however, as the number of vehicle movements required during the operation of the option is currently unknown, the effect against this objective has been scored as a minor negative uncertain effect.

Objective 9: Major negative effect - Throughout the option's operational lifespan of 80 years it is expected that 12,328 tonnes of carbon will be emitted.

Objective 10: Major positive effect - Operation of the option will provide 70Ml/d of water resource, supporting community resilience to climate change wherein drought may otherwise have been a risk.

Objective 11: Major positive effect - Operation of this option will provide an additional 70Ml/d that can support economic activity.

Objective 12: Neutral effect - Operation of the option is not expected to have a negative impact on tourism and recreation.

Objective 13: Major positive effect - Operation of this option will provide an additional 70Ml/d that can support human health and wellbeing.

Objective 14: Major positive effect - The option is not a leakage reduction or water efficiency option and would have no impact on water efficiency. However, the option would increase the resilience of water resources within the South Staffordshire Water supply area by providing an additional 70Ml/d deployable output.

Objective 15: Major negative uncertain effect - Operation of the option will require additional energy (764kWh/Ml) and may require the use of additional chemicals to treat raw water however, the effects in this regard are currently uncertain.

Objective 16: Neutral effect - Operation of this option is not expected to have any impact on cultural heritage sites.

Objective 17: Moderate negative effect - Impacts on the Birmingham greenbelt during operation are unlikely as the greenbelt as the works within the greenbelt are only associated with the pipeline. However, the built structures and storage reservoir have the potential to permanently alter the existing landscape.

Option Assessment Information	
WRW Option ID	[If needed.]
Option ID	7.1.2.1
Option Name	Third Party Option: Canal & River Trust: Birmingham Blithfield surplus
Water company	South Staffordshire Water
Option Description	This option seeks to make surplus water in the Birmingham Canal Network (BCN) available for water supply purposes. Surplus in the BCN can be supported by the CRT's Bradley borehole and Chasewater Reservoir. The CRT have suggested using the canal network to transfer the water from source to locations more suitable for South Staffordshire Water (SST). This option proposes transferring the water to the Trent and Mersey canal where it can be abstracted by SST and used to supplement flows into Blithfield Reservoir. This could potentially be a more attractive alternative to taking water from the River Trent, particularly when the River Trent is subject to Hands-off Flow (HoF) restrictions. However, the dry year yield has been discounted owing to assumption of a 1 in 20-year restrictions by CRT. The option requires upgrades to the canal network to facilitate the transfer to the Trent and Mersey Canal. This broadly requires the provision of an upgraded pumping station (4 kW pump (88 kW pumping station)), lock bypasses, appropriate control equipment and a new abstraction point. Permanent land take would be required for the canal intake. There will be two inlet arrangements at the canal and at the reservoir. SST would also need to provide a new pipeline (6.2km, 450mm) from the abstraction point to Blithfield Reservoir. Once within Blithfield Reservoir the canal water would be blended with other inflows and treated at Seedy Mill WTW before onward distribution into water supply. The CRT have indicated that a transfer of up to 15 Ml/d is available. An overall delivery period of 10 years.
Yield	15Ml/d
WRZ	South Staffordshire Water WRZ

Option	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape
Option 7.1.2.1	Construction (negative)	---/?	--	-	--	0	-	--	-	--/?	0	-	-	-	0	--	--	--
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	++	0	0	0	0	0	0
	Operation (negative)	--	0	---	-	0	-	0	-/?	--	0	0	0	0	0	-/?	0	-/?
	Operation (positive)	0	++	0	0	0	0	0	0	0	+	++	0	++	+	0	0	0

Construction

Objective 1: Major negative uncertain effect - The Midland Meres & Mosses Ramsar and SAC is located 3.5km from the option. There are 2 further SACs within 5km of the option. There are no SPAs within 10km. The option is partially within the Blithfield Reservoir SSSI, there is one further SSSI within 1km of the option. There is one NNR and 2 LNRs within 5km of the option. There are 2 areas of ancient woodland within 1km of the option, with the closest being Tithebarn Covert 100m from the pipeline. Due to the distance between the option and Cannock Chase SAC, West Midlands Mosses SAC, Midland Meres & Mosses Phase 1 Ramsar and the lack of hydrological connectivity, no Likely Significant Effects (LSE) are anticipated from construction of this option. Pastures Salt Marsh SAC is hydrologically connected to the River Trent, however is upstream of the new pipeline which would cross the River Trent. Therefore no LSEs are anticipated. The River Mease SAC is located approximately 20km downstream of the option. There is uncertainty as to the distribution of mobile species of the River Mease SAC (spined loach in particular) within the River Trent, and therefore whether impacts (sedimentation, pollution incidents) could occur during construction. It is assumed that a trenchless technique would be used for the river crossing, however a Stage 2 Appropriate Assessment will be required to consider the mitigation measures necessary to avoid an adverse effect to the River Mease SAC. The Humber Estuary is considered sufficiently distant as construction impacts will not result in an adverse effect, with the Supplementary Advice on Conservation Objectives (SACO) stating that the River Trent does not support sea or river lamprey (Cromwell Weir impassable). Pipeline construction activities and construction activities near water may result in minor loss or degradation of non-designated aquatic habitat associated with short-term changes in river flows, geomorphology or water quality. There could be a short term change in sediment dynamics associated with any construction activities near water, however, this is unlikely to alter geomorphological forms and processes which underpin physical habitat for aquatic ecosystems.

Objective 2: Moderate negative effect - The construction of the pipeline will have a temporary effect. This is expected to have a moderate impact.

Objective 3: Minor negative effect - Although extensive construction activities are required which result in increased distribution of terrestrial and aquatic INNS, the risk is considered as minor assuming best practice biosecurity measures will be adopted during construction.

Objective 4: Moderate negative effect - 80% of the option is within Grade 3 Agricultural land, with some of the option within Grade 2. There are 6 historic landfill sites within 1km of the option, with the closest site being 35m away so there is potential for contamination. There is one permitted waste site within 5km of the option.

Objective 5: Neutral effect - The option intersects the River Trent, the Trent and Mersey Canal and Moreton Brook. No construction activities associated with this component would have a discernible effect on river flows or groundwater levels.
There could be a short term change in sediment dynamics associated with the construction activities near water, however, this is expected to be minimal and is unlikely to result in a change in channel morphology.

Objective 6: Minor negative effect - The scheme is within 1km of a source protection zone. Construction activities near watercourses may have a minor effect on water quality which result in short-term or intermittent effects on receptors. The component would not lead to a change in WFD classification.

Objective 7: Moderate negative effect - Approximately 10% of the option is within Flood Zones 2 and 3. Construction of the option is unlikely to cause or exacerbate flooding in the catchment.

Objective 8: Minor negative effect - Woodbank AQMA is located 9.4km away. Impacts on AQMA are unlikely to occur during construction of the option. However, there will be an increase in vehicle movements associated with construction activities which may cause some short-term deterioration in local air quality. The number of vehicle movements is unknown therefore the impact is uncertain. Impacts on residential receptors are likely as the pipeline partly runs through a residential area.

Objective 9: Moderate negative uncertain effect - Due to the scale of construction and CAPEX construction value provided, £17,117,815, it is expected that this option will have a moderate effect on greenhouse gas emissions. The construction would involve the use of materials with embodied carbon as well as carbon emissions related to construction traffic, however the associated volumes are unknown at this stage therefore the impact is uncertain.

Objective 10: Neutral effect - Construction of this option is not expected to have an effect on climate resilience.

Objective 11: Moderate positive effect - Due to the potential for employment during construction based on the total CAPEX value of £17,117,815.

Objective 11: Minor negative effect - Due to potential for disruption to businesses (such as recreational at the reservoir and canal) and transport infrastructure (railway and roads).

Objective 12: Minor negative effect - There are 6 greenspace areas within 1km of the option, with the closest being St John the Baptist Roman Catholic Church 120m away. There are two Country Parks within 10km of the option; Cannock Chase is 1.9km away and Brindley Heath 6.9km away. There is potential for impacts on recreation for the canal and reservoir.

Objective 13: Minor negative effect - Construction of the option is not expected to have a significant impact on health during the construction period due to the rural location of the option. Construction works are likely to have a minor negative effect (e.g. noise disturbance, vibration, dust deposition and air quality impacts) on residential receptors in adjacent Great Haywood and nearby Little Haywood.

Objective 14: Neutral effect - The construction phase of this option is not anticipated to have any effect on the sustainable and efficient use of resilient water resources.

Objective 15: Moderate negative effect - The option requires new infrastructure and will result in the use of new materials. Elements include upgrades to the existing pumping station, a new abstraction point and new pipeline. Effects are expected to be moderate due to the options total CAPEX of £17,117,815.

Objective 16: Moderate negative effect - There are no World Heritage Sites within 10km of the option. There are 2 Scheduled Monuments within 500m of the option, Great Haywood canal bridge is adjacent to the option. There are 49 Listed Buildings within 1km of the option with the closest listed building directly adjacent to the pipeline. Shugborugh park is located 270m away and there are two further parks and gardens within 10km of the option. The Battle of Hopton Health battlefield is located 4.2km from the option. Impacts on heritage assets are considered likely during construction.

Objective 17: Moderate negative effect - There are no National Parks within 10km of the option. Cannock Chase AONB is adjacent to the western-most part of the option, therefore there is potential for effects on designated landscape. The Birmingham Greenbelt is located 2.7km from the option. The option requires the construction of a pipeline and earthworks to upgrade the canal network, construction works are likely to be visually intrusive to the semi-rural landscape in the short term.

Operation

Objective 1: Moderate negative effect - Operational activities may result in the introduction of non-native species to the River Trent through water transfer. This could have an adverse effect on mobile species of the River Mease SAC which could be using functionally linked habitat within the River Trent. A Stage 2 Appropriate Assessment will be required to ensure suitable mitigation measures for INNS can be achieved to avoid an adverse effect. Due to the lack of hydrological connectivity between the abstraction point located on the Birmingham Canal Network and Pasture fields Salt Marsh SAC and West Midlands Mosses SAC, no LSE during operation are anticipated on these two SACs. There is no pathway for impact on the Cannock Chase SAC or Midland Meres and Mosses Ramsar. The redistribution of water in the network is considered unlikely to result in an adverse effect on the Humber Estuary SAC, SPA and Ramsar. It is not expected that the operation of this component would lead to discernible impacts on any non-designated aquatic habitats or species. There may be a change in level regime in Blithfield Reservoir as a result of the new inlet however the ecology within the reservoir is accustomed to a variable level regime. Any operational impacts are unlikely to alter geomorphological forms and processes which underpin physical habitat for aquatic ecosystems.

Objective 2: Moderate positive effect - It is assumed that operational biodiversity net gain would be greater than the net loss in construction; however, without quantification, it's magnitude is uncertain. In consequence, an equivalent positive score to the negative score in construction is provided.

Objective 3: Major negative effect - The use of a canal as a transfer mechanism in this scenario poses a high risk, although there is an existing canal, the use of a canal for the transfer of raw water will provide a primary and secondary pathway for transfer of INNS. Additionally abstraction and transfer to Blithfield reservoir represents a new distribution pathway from a canal with significant boating traffic and numerous secondary pathways for the distribution of INNS. Mitigation is limited to standard best practice biosecurity measures (such as signs, wash down facilities for recreational users, .etc), which likely to be only be effective in reducing secondary pathway risks.

Objective 4: Minor negative effect - As permanent land take will be required for the canal intake. It is not anticipated that there would be any operational effects on soils or geodiversity.

Objective 5: Neutral effect - Operational activities associated with this component would not lead to a reduction in river or groundwater flows. This flow increase into Blithfield Reservoir associated with this component is likely to be insufficient to impact sediment dynamics and will not result in a change to channel morphology.

Objective 6: Minor negative effect - The transport of canal water into the reservoir may impact water quality in the reservoir, however, this would not be sufficient to cause WFD deterioration.

Objective 7: Neutral effect - The operation of this option is not expected to cause or exacerbate the risk of flooding in the vicinity of the scheme or elsewhere.

Objective 8: Minor negative uncertain effect - It is not anticipated that there would be any significant impact on traffic congestion during the operational period such that the option is expected to have a neutral effect on local air quality, however, as the number of vehicle movements required during the operation of the option is currently unknown, the effect against this objective has been scored as a minor negative uncertain effect.

Objective 9: Moderate negative effect - Throughout the options operational lifespan of 80 years it is expected that 439 tonnes of carbon will be emitted.

Objective 10: Minor positive effect - Operation of the option will provide 15Ml/d of water resource, supporting community resilience to climate change wherein drought may otherwise have been a risk.

Objective 11: Moderate positive effect - Operation of this option will provide an additional 15Ml/d that can support economic activity.

Objective 12: Neutral effect - Operation of the option is not expected to have a negative impact on tourism and recreation.

Objective 13: Moderate positive effect - Operation of this option will provide an additional 15Ml/d that can support human health and wellbeing.

Objective 14: Minor positive effect - The option is not a leakage reduction or water efficiency option and would have no impact on water efficiency. However, the option would increase the resilience of water resources within the South Staffordshire Water supply area by providing an additional 15Ml/d deployable output.

Objective 15: Minor negative uncertain effect - Operation of the option will require additional energy (226kWh/Ml) and may require the use of additional chemicals to treat raw water, however the effects in this regard are currently uncertain.

Objective 16: Neutral effect - Operation of this option is not expected to have an impact on cultural heritage sites.

Objective 17: Minor negative uncertain effect - There is potential for effects on the adjacent Cannock Chase AONB from built assets around the canal intake. Impacts on landscape designations are considered uncertain due to lack of scheme information regarding the scale of the canal intake asset.

Option Assessment Information	
WRW Option ID	[if needed.]
Option ID	7.1.5
Option Name	Third Party Option: Canal & Rivers Trust: Chasewater options, including augmentation
Water company	South Staffordshire Water
Option Description	Canal and Rivers Trust (CRT) to provide surplus from Chasewater Reservoir to SSW. Surplus would be fed from the reservoir to the Wryley & Essington Canal which would then in turn discharge to Cranes Brook. This would free up additional water in the catchment for SSW. The reservoir outflow is released via an automated structure from the Wryley & Essington Canal to the Crane Brook. Detailed hydrological modelling has not been undertaken to determine the surplus, but it is likely to be in the region of 2- 5 Ml/d. The main items included in the work are envisaged to be: • 1.0km of new 450mm dia pipeline between the Chasewater outlet and Crane Brook. To be conveyed by gravity. • Two inlet arrangements (canal and a discharge to the brook. • Drill new borehole at Pipehill, with new borehole pumps, new headworks and new building. • 0.9m of new 450mm dia main to connect new borehole to the existing Pipehill treatment plant. • New 14kW pump (28kW pumping station at new borehole. • Existing treatment at Pipehill WTW. • Existing distribution network from Pipehill BH WTW. • Compensation for linear pipeline scheme • Land for SSW access around Crane Brook site (priced as 1 ha at £20k/ha) • Land for new BH site
Yield	2-5Ml/d
WRZ	South Staffordshire Water WRZ

Option	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape
Option 7.1.5	Construction (negative)	---	--	-	---	0	-	--	--/?	--/?	0	-	--	--	0	--	-	--
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	++	0	0	0	0	0	0
	Operation (negative)	-	0	---	-	--	0	0	0	--	0	0	0	0	0	-/?	0	0
	Operation (positive)	0	++	0	0	0	+	0	0	0	+	+	0	+	0	0	0	0

Construction

Objective 1: Major negative effect - The pipeline is partly within an SSSI, and there are a further 4 SSSIs within 5km. There are two SACs within 10km of the option, with the closest 2.2km away. There are no Ramsar sites or SPAs within 10km of the option. The proposed additional infrastructure at Pipe Hill Treatment Works and at the pipeline would result in the loss of a small area of low priority habitat. The new pipeline would require construction works in an area of land designated in the National Forest Inventory. No Likely Significant Impacts (LSEs) identified due to the distance between the option and the Cannock Chase SAC, the lack of hydrological connectivity and the lack of terrestrial connectivity (major road infrastructures create physical barriers), Cannock Extension Canal is a terminal branch of the Wryley & Essington Canal, however given the numerous locks and direction of flow, it is considered unlikely that construction related impacts (e.g. sedimentation and pollution incidents) would give rise to an adverse effect. Pipeline construction activities and construction activities near water may result in minor loss or degradation of non-designated aquatic habitat associated with short-term changes in river flows, geomorphology or water quality. There could be a short term change in sediment dynamics associated with any construction activities near water, however, this is unlikely to alter geomorphological forms and processes which underpin physical habitat for aquatic ecosystems.

Objective 2: Moderate negative effect - The construction of the pipeline is expected to have a moderate impact.

Objective 3: Minor negative effect - Although extensive construction activities are required which result in increased distribution of terrestrial and aquatic INNS, the risk is considered as minor assuming best practice biosecurity measures will be adopted during construction.

Objective 4: Major negative effect - The vast majority of the option is within Grade 3 Agricultural land which is considered best and most versatile land. The option pipeline crosses two historic landfill sites, and there are a further 7 historic landfill sites within 1km. There is potential for contamination risk. There are 7 permitted waste sites within 5km of the option.
Objective 5: Neutral effect - The option crosses Crane Brook and is directly adjacent to the Wyrley and Essington Canal. No construction activities associated with this component would have a discernible effect on river flows or groundwater levels. There could be a short term change in sediment dynamics associated with the construction activities near water, however, this is expected to be minimal and is unlikely to result in a change in channel morphology.
Objective 6: Minor negative effect - The scheme is predominantly within a source protection zone. Construction activities near watercourses may have a minor effect on water quality which result in short-term or intermittent effects on receptors.
The component would not lead to a change in WFD classification.
Objective 7: Moderate negative effect - Some of the option is within Flood Zones 2 and 3. Construction of the option is unlikely to cause or exacerbate flooding in the catchment.

Objective 8: Moderate negative uncertain effect - The Walsall AQMA is within 500m of the option. There are a further 3 AQMAs within 5km of the option. There is potential for impacts on AQMAs during construction of the option. There will also be an increase in vehicle movements associated with construction activities which may cause short-term deterioration in local air quality. The number of vehicle movements is unknown therefore the impact is uncertain.
Objective 9: Moderate negative uncertain effect - Due to the scale of construction and a total CAPEX value of £5,132,765, it is expected that this option will have a moderate effect on greenhouse gas emissions. The construction would involve the use of materials with embodied carbon as well as carbon emissions related to construction traffic, however the associated volumes are unknown at this stage therefore the impact is uncertain.
Objective 10: Neutral effect - Construction of this option is not expected to have an effect on climate resilience.

Objective 11: Moderate positive effect - There is the potential for employment during construction. The total CAPEX value for the option is £5,132,765.
Objective 11: Minor negative effect - due to the scheme crossing a number of roads. Therefore the option is anticipated to cause minor disruption to infrastructure.
Objective 12: Moderate negative effect - Some of the option is located within greenspace areas including a cemetery and Chasewater Country Park. There are a further 6 Greenspace areas within 1km of the option. It is likely that there will be disruption to recreation activities during construction such as National cycle route 5 which is intersected by the option pipeline and recreation on the canal itself. There are no national trails within 10km of the option.
Objective 13: Moderate negative effect - The construction phase would be 5 years long which is considered to be a long-term, temporary negative effect. The scheme is also within 1km of a Noise Action Planning Important area. Construction works are likely to have a negative effect (e.g. noise disturbance, vibration, dust deposition and air quality impacts) on residential receptors in nearby Chase Town and Brownhills West.
Objective 14: Neutral effect - The construction phase of this option is not anticipated to have any effect on the sustainable and efficient use of resilient water resources.

Objective 15: Moderate negative effect - The option requires new infrastructure and will result in the use of new materials. Elements include a new borehole site, new pumping station and new pipeline. Effects are expected to be moderate due to the options total CAPEX of £5,132,765.

Objective 16: Minor negative effect - There are no World Heritage Sites within 10km of the option. There are 3 Scheduled Monuments within 5km of the option, with the closest being 4.1km away. There is 1 Listed Building within 1km of the option. There are 4 Registered Parks and Gardens within 10km of the option, with the closest being 2.1km away.
Objective 17: Moderate negative effect - The scheme is entirely within the Birmingham Greenbelt. There are no National Parks within 10km of the option. Cannock Chase AONB is located 3.1km from the option. The option requires the construction of a pipeline, construction works are likely to be visually intrusive to the semi-rural landscape in the short term.

Operation

Objective 1: Minor negative effect - No LSEs identified due to the lack of hydrological connectivity between the option and the Cannock Chase SAC. Surplus water release within Wryley & Essington Canal may have an impact upon the hydrology of the canal however this is not considered significant due to the existing water level management required to allow water transport. Therefore, no LSE are anticipated from operational activities on Cannock Chase SAC and Cannock Extension Canal SAC. The increase in flows associated with this component may result in minor negative effects on non-designated aquatic habitats or species. As a result, there may be minor degradation of non-designated aquatic habitat as a result of any changes to flow, geomorphology or water quality associated with this component. Any operational impacts are unlikely to alter geomorphological forms and processes which underpin physical habitat.

Objective 2: Moderate positive effect - It is assumed that operational biodiversity net gain would be greater than the net loss in construction; however, without quantification, its magnitude is uncertain. In consequence, an equivalent positive score to the negative score in construction is provided.

Objective 3: Major negative effect - The use of a canal as a transfer mechanism in this scenario poses a high risk, although there is an existing canal, the use of a canal for the transfer of raw water will provide a primary and secondary pathway for transfer of INNS. Additionally the discharge of raw water to Craner Brook represents a new INNS distribution pathway from a canal with significant boating traffic and numerous secondary pathways for the distribution of INNS. Mitigation is limited to standard best practice biosecurity measures (such as signs, wash down facilities for recreational users, .etc), which are likely to only be effective in reducing secondary pathway risks.
Objective 4: Minor negative effect - The option will lead to permanent land take of best and most versatile Grade 3 agricultural land.

Objective 5: Moderate negative effect - Operational activities associated with this component may have a moderate discernible effect on groundwater levels with additional water being abstracted from a GWMU (groundwater management unit) where there is no water available for abstraction.

Objective 6: Minor positive effect - There may be minor positive impacts on the water quality in the Crane Brook as the increased flow may dilute any point source water quality pressures.

Objective 7: Neutral effect - The operation of this option is not expected to cause or exacerbate the risk of flooding in the vicinity of the scheme or elsewhere.

Objective 8: Neutral effect - Operation of this option is not expected to have a noticeable impact on air quality.

Objective 9: Moderate negative effect - Throughout the options operational lifespan of 80 years it is expected that 389 tonnes of carbon will be emitted.

Objective 10: Minor positive effect - Operation of the option will provide approximately 2-5Ml/d of water resource, supporting community resilience to climate change where drought may otherwise have been a risk.

Objective 11: Minor positive effect - Operation of this option will provide 2-5Ml/d that can support economic activity.

Objective 12: Neutral effect - Operation of this option is not expected to have any effects on tourism and recreation.

Objective 13: Minor positive effect - Operation of this option will provide 2-5Ml/d that can support human health and wellbeing.

Objective 14: Neutral effect - The option is not a leakage reduction or water efficiency option and would have no impact on water efficiency. Whilst the option will increase the resilience of water resources in the South Staffordshire Water Supply Area by providing an additional 2-5Ml/d, this is considered to have a neutral effect.
Objective 15: Minor negative uncertain effect - Operation of the option will require additional energy (565kWh/Ml) and may require the use of additional chemicals to treat raw water, however, effects in this regard are currently uncertain.

Objective 16: Neutral effect - Operation of this option is not expected to have an impact on cultural heritage sites.

Objective 17: Neutral effect - The operation of this option is not expected to have a significant impact on landscape designations.

Option Assessment Information	
WRW Option ID	[If needed.]
Option ID	7.5.1.1
Option Name	UU Vyrnwy reservoir raw water release 15 Ml/d to River Severn transfer to Hampton Loade via River Severn to support SST
Water company	South Staffordshire Water
Option Description	This option assumes that UU release raw water release into the River Severn, making it available for abstraction downstream by SST. Water can then be abstracted for treatment at Hampton Loade WTW. For costing purposes, it is assumed there are no capital works associated with this item, as existing intake sites will be used to abstract the water. Any works / asset improvements required by UU will be considered by UU and form part of the commercial agreement between the two companies. Only OPEX costs are associated with this option. An estimate of payments to UU has been derived for inclusion in the option modelling but this will need to form part of negotiations and resulting commercial agreements. The assessment is based on the assumption that the water supplied by United Utilities is abstracted sustainably and all precautions have been taken in order to supply water of similar or better quality than that found in River Severn, as well as mitigating against the risk of spreading invasive nonnative species. Downstream, it is assumed that SST existing River Severn intake will be used to abstract water for treatment at Hampton Loade WTW (and potentially for storage in Chelmarsh Reservoir). Consideration needs to be given to the capacity of Hampton Loade WTW to treat the additional water that is abstracted. Option 7.5.1 is therefore linked to all options involving the existing or a rebuilt Hampton Loade WTW. Therefore, this option needs to take account of available treatment capacity and licensed volumes. An overall delivery period of 5 years (no CAPEX).
Yield	15Ml/d
WRZ	South Staffordshire Water WRZ

Option	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape
Option 7.5.1.1	Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Operation (negative)	--/?	0	-	0	0	0	-	0	-	0	0	0	0	0	-	0	0
	Operation (positive)	0	0	0	0	0	+	0	0	0	+	++	0	++	+	0	0	0

Construction

Objective 1: Neutral effect - There is an SSSI 2.2km from Hampton Loade WTW, there is one further SSSI within 5km. There are 2 NNRs and 3 LNRs within 10km of Hampton Loade WTW. There are no capital works associated with this component. Any construction work required to move the water from the Vyrnwy reservoir into the River Severn is assumed to be United Utilities responsibility. The option does not required construction works therefore no Likely significant effects (LSEs) are anticipated.

Objective 2: Neutral effect - No capital works are planned.

Objective 3: Neutral effect - As it is assumed that no capital works are required for the implementation of this scheme the risk of distribution of INNS is negligible.

Objective 4: Neutral effect - There are no capital works associated with this component. Any construction work to transfer the water is assumed to be United Utilities responsibility.

Objective 5: Neutral effect - There are no construction activities associated with this component.

Objective 6: Neutral effect - There are no construction activities associated with this component.

Objective 7: Neutral effect - There are no capital works associated with this component. Any flood risk during construction work to transfer the water is assumed to be United Utilities responsibility.

Objective 8: Neutral effect - There are no AQMA within 5km. Any construction work to transfer the water is assumed to be United Utilities responsibility.

Objective 9: Neutral effect - It is not anticipated that the construction phase of the option would result in any impact upon greenhouse gas emissions. Any construction work to transfer the water is assumed to be United Utilities responsibility.

Objective 10: Neutral effect - It is not anticipated that the construction phase of the option would result in any impact upon climate change resilience. Any construction work to transfer the water is assumed to be United Utilities responsibility.

Objective 11: Neutral effect - There are no capital works associated with this component. Any economic impact of construction work is assumed to be United Utilities responsibility.

Objective 12: Neutral effect - There are no capital works associated with this component. Any impact on tourism or recreation from construction work is assumed to be United Utilities responsibility.

Objective 13: Neutral effect - There are no capital works associated with this component. Any impact on human health from construction work is assumed to be United Utilities responsibility.

Objective 14: Neutral effect - There are no capital works associated with this component. Any construction work affecting water resource use is assumed to be United Utilities responsibility.

Objective 15: Neutral effect - There are no capital works associated with this component. Any waste from construction work to transfer the water is assumed to be United Utilities responsibility.

Objective 16: Neutral effect - There are no capital works associated with this component. Any effects on heritage designations during construction work to transfer the water is assumed to be United Utilities responsibility.

Objective 17: Neutral effect - There are no capital works associated with this component. Any effects on landscape from construction work to transfer the water is assumed to be United Utilities responsibility.

Operation

Objective 1: Moderate negative uncertain effect - Operational activities will include the release of raw water to the River Vyrnwy, a tributary of the River Severn, from UU (Vyrnwy Reservoir) which has the potential to result in the introduction of non-native species, change in flows, water level and geomorphology processes. However, water to be released would be available for abstraction downstream by South Staffs Water, at Hampton Loade WTW. There are uncertainties with regards to impacts of water transfer between UU and River Severn. This may have negative impact upon the migratory qualifying features of the Severn Estuary SAC, including sea lamprey and twaite shad and supporting habitats, introduction of non-native species, and the hydrology of the estuary. The use of the River Vyrnwy, and volume of water to be released into the watercourse, needs to be considered with regards impacts to supporting habitats for the freshwater life stages of the migratory fish of the Severn Estuary SAC and Ramsar. Changes in flow and water quality in the River Severn will also need to be considered alone and in-combination with other abstractions. LSEs identified and therefore a Stage 2 Appropriate Assessment will be required if this option is progressed. The increase in flows associated with this component may result in minor negative effects on non-designated aquatic habitats or species. As a result, there may be minor degradation of non-designated aquatic habitat as a result of any changes to flow, geomorphology or water quality associated with this component. Any operational impacts are unlikely to alter geomorphological forms and processes which underpin physical habitat.

Objective 2: Neutral effect - It is assumed that operational biodiversity net gain would be greater than the net loss in construction; however, without quantification, its magnitude is uncertain. In consequence, an equivalent positive score to the negative score in construction is provided.

Objective 3: Minor negative effect - The River Severn and River Vyrnwy are already in connection through compensation releases and River Severn Regulation releases. The additional volume could result in a slight increase in propagules being transported downstream. Risk will be negligible once raw water is treated at the WTWs.

Objective 4: Neutral effect - Operation of this option is not expected to have any impact on soils.

Objective 5: Neutral effect - Operational activities associated with this component would not lead to a reduction in river or groundwater flows. This flow increase associated with this component is likely to be insufficient to impact sediment dynamics and will not result in a change to channel morphology.

Objective 6: Minor positive effect - There may be minor positive impacts on the water quality in the River Vyrnwy/River Severn as the increased flow may dilute any point source water quality pressures.

Objective 7: Minor negative effect - The increased volume of water released into the River Severn may increase the risk of flooding.

Objective 8: Neutral effect - Operation of this option is not expected to have any impact on air quality.

Objective 9: Minor negative effect - Operation of this option is expected to have a minor negative effect on GHG emissions. Any carbon emissions resulting from the water transfer are considered the responsibility of UU.

Objective 10: Minor positive effect - Operation of the option will provide 15Ml/d of water resource, supporting community resilience to climate change wherein drought may otherwise have been a risk.

Objective 11: Moderate positive effect - Operation of the option will provide 15Ml/d of water resource, available for economic use.

Objective 12: Neutral effect - Operation of this option is not expected to have any impact on tourism and recreation.

Objective 13: Moderate positive effect - Operation of the option will provide 15Ml/d of water resource, supporting community health and wellbeing.

Objective 14: Minor positive effect - The option is not a leakage reduction or water efficiency option and would have no impact on water efficiency. By providing 15Ml/d, the option is considered to have a minor positive effect on increasing the resilience of water resources within the South Staffordshire Water supply area.

Objective 15: Minor negative effect - Operation of the option will require additional energy to transfer the water from the River Vyrnwy and this is considered UU's responsibility. The option will require the use of additional chemicals to treat the raw water at Hampton Loade WTW.

Objective 16: Neutral effect - The operation of this option is not expected to have any impact on cultural heritage.

Objective 17: Neutral effect - Operation of this option is not expected to have any impact on landscape designations.

Option Assessment Information	
WRW Option ID	[If needed.]
Option ID	7.5.1.2
Option Name	UU Vyrnwy reservoir raw water release 30 Ml/d to River Severn transfer to Hampton Loade via River Severn to support SST
Water company	South Staffordshire Water
Option Description	This option assumes that UU release raw water release into the River Severn, making it available for abstraction downstream by SST. Water can then be abstracted for treatment at Hampton Loade WTW. For costing purposes, it is assumed there are no capital works associated with this item, as existing intake sites will be used to abstract the water. Any works / asset improvements required by UU will be considered by UU and form part of the commercial agreement between the two companies. Only OPEX costs are associated with this option. An estimate of payments to UU has been derived for inclusion in the option modelling but this will need to form part of negotiations and resulting commercial agreements. The assessment is based on the assumption that the water supplied by United Utilities is abstracted sustainably and all precautions have been taken in order to supply water of similar or better quality than that found in River Severn, as well as mitigating against the risk of spreading invasive nonnative species. Downstream, it is assumed that SST existing River Severn intake will be used to abstract water for treatment at Hampton Loade WTW (and potentially for storage in Chelmarsh Reservoir). Consideration needs to be given to the capacity of Hampton Loade WTW to treat the additional water that is abstracted. Option 7.5.1 is therefore linked to all options involving the existing or a rebuilt Hampton Loade WTW. Therefore, this option needs to take account of available treatment capacity and licensed volumes. An overall delivery period of 5 years (no CAPEX).
Yield	30Ml/d
WRZ	South Staffordshire Water WRZ

Option	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape
Option 7.5.1.2	Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Operation (negative)	--/?	0	-	0	0	0	-	0	-	0	0	0	0	0	-	0	0
	Operation (positive)	0	0	0	0	0	+	0	0	0	++	+++	0	+++	++	0	0	0

Construction

Objective 1: Neutral effect - There is a SSSI 2.2km from Hampton Loade WTW and one further SSSI within 5km. There are also 2 NNRs and 3 LNRs within 10km of Hampton Loade WTW. There are no capital works associated with this component. Any construction work required to move the water from the Vyrnwy reservoir into the River Severn is assumed to be United Utilities responsibility. As the option does not required any new construction works therefore no Likely significant effects (LSEs) anticipated. South Staffordshire Water will need to undertake work at the site to increase the capacity of Hampton Loade WTW to treat the additional water, and works are expected to occur within the existing WTW site therefore, no significant effects are expected.

Objective 2: Neutral effect - No capital works are planned.

Objective 3: Neutral effect - As it is assumed that no capital works are required for the implementation of this scheme the risk of distribution of INNS is negligible.

Objective 4: Neutral effect - There are no capital works associated with this component. Any construction work to transfer the water is assumed to be United Utilities responsibility.

Objective 5: Neutral effect - There are no construction activities associated with this component.

Objective 6: Neutral effect - There are no construction activities associated with this component.

Objective 7: Neutral effect - There are no capital works associated with this component. Any flood risk during construction work to transfer the water is assumed to be United Utilities responsibility.

Objective 8: Neutral effect - There are no AQMA within 5km. Any construction work to transfer the water is assumed to be United Utilities responsibility.

Objective 9: Neutral effect - It is not anticipated that the construction phase of the option would result in any impact upon greenhouse gas emissions. Any construction work to transfer the water is assumed to be United Utilities responsibility.

Objective 10: Neutral effect - It is not anticipated that the construction phase of the option would result in any impact upon climate change resilience. Any construction work to transfer the water is assumed to be United Utilities responsibility.

Objective 11: Neutral effect - There are no capital works associated with this component. Any economic impact of construction work is assumed to be United Utilities responsibility.

Objective 12: Neutral effect - There are no capital works associated with this component. Any impact on tourism or recreation from construction work is assumed to be United Utilities responsibility.

Objective 13: Neutral effect - There are no capital works associated with this component. Any impact on human health from construction work is assumed to be United Utilities responsibility.

Objective 14: Neutral effect - There are no capital works associated with this component. Any construction work affecting water resource use is assumed to be United Utilities responsibility.

Objective 15: Neutral effect - There are no capital works associated with this component. Any waste from construction work to transfer the water is assumed to be United Utilities responsibility.

Objective 16: Neutral effect - There are no capital works associated with this component. Any effects on heritage designations during construction work to transfer the water is assumed to be United Utilities responsibility.

Objective 17: Neutral effect - There are no capital works associated with this component. Any effects on landscape from construction work to transfer the water is assumed to be United Utilities responsibility.

Operation

Objective 1: Moderate negative uncertain effect - Operational activities will include the release of raw water to the River Vyrnwy, a tributary of the River Severn, from UU (Vyrnwy Reservoir) which has the potential to result in the introduction of non-native species, change in flows, water level and geomorphology processes. However, water to be released would be available for abstraction downstream by SST, at Hampton Loade WTW. There are uncertainties with regards to impacts of water transfer between UU and River Severn. This may have negative impact upon the migratory qualifying features of the Severn Estuary SAC, including sea lamprey and twaite shad and supporting habitats, introduction of non-native species, and the hydrology of the estuary. The use of the River Vyrnwy, and volume of water to be released into the watercourse, needs to be considered with regards impacts to supporting habitats for the freshwater life stages of the migratory fish of the Severn Estuary SAC and Ramsar. Changes in flow and water quality in the River Severn will also need to be considered alone and in-combination with other abstractions. Likely Significant Effects (LSEs) identified and therefore a Stage 2 Appropriate Assessment will be required if this option is progressed. The increase in flows associated with this component may result in minor negative effects on non-designated aquatic habitats or species. As a result, there may be minor degradation of non-designated aquatic habitat as a result of any changes to flow, geomorphology or water quality associated with this component. Any operational impacts are unlikely to alter geomorphological forms and processes which underpin physical habitat.

Objective 2: Neutral effect - It is assumed that operational biodiversity net gain would be greater than the net loss in construction; however, without quantification, its magnitude is uncertain. In consequence, an equivalent positive score to the negative score in construction is provided.

Objective 3: Minor negative effect - The River Severn and River Vyrnwy is already in connection through compensation releases and River Severn Regulation releases. The additional volume could result in a slight increase in propagules being transported downstream. Risk will be negligible once raw water is treated at the WTWs.

Objective 4: Neutral effect - Operation of this option is not expected to have any impact on soils.

Objective 5: Neutral effect - Operational activities associated with this component would not lead to a reduction in river or groundwater flows. This flow increase associated with this component is likely to be insufficient to impact sediment dynamics and will not result in a change to channel morphology.

Objective 6: Minor positive effect - There may be minor positive impacts on the water quality in the River Vyrnwy/River Severn as the increased flow may dilute any point source water quality pressures.

Objective 7: Minor negative effect - The increased volume of water released into the River Severn may increase the risk of flooding.

Objective 8: Neutral effect - Operation of this option is not expected to have any impact on air quality.

Objective 9: Minor negative effect - Operation of this option is expected to have a minor negative effect on GHG emissions. Any carbon emissions resulting from the water transfer is considered the responsibility of UU.

Objective 10: Moderate positive effect - Operation of the option will provide 30Ml/d of water resource, supporting community resilience to climate change wherein drought may otherwise have been a risk.

Objective 11: Major positive effect - Operation of the option will provide 30Ml/d of water resource, available for economic use.

Objective 12: Neutral effect - Operation of this option is not expected to have any impact on tourism and recreation.

Objective 13: Major positive effect - Operation of the option will provide 30Ml/d of water resource, supporting community health and wellbeing.

Objective 14: Moderate positive effect - The option is not a leakage reduction or water efficiency option and would have no impact on water efficiency. By providing 30Ml/d, the option is considered to have a moderate positive effect on increasing the resilience of water resources within the South Staffordshire Water supply area.

Objective 15: Minor negative effect - Operation of the option will require additional energy to transfer the water from the River Vyrnwy and this is considered UU's responsibility. The option will require the use of additional chemicals to treat the raw water at Hampton Loade WTW.

Objective 16: Neutral effect - The operation of this option is not expected to have any impact on cultural heritage.

Objective 17: Neutral effect - Operation of this option is not expected to have any impact on landscape designations.

Option Assessment Information	
WRW Option ID	[If needed.]
Option ID	7.5.1.3
Option Name	45 Ml/d raw water transfer to Hampton Loade via River Severn
Water company	South Staffordshire Water
Option Description	This option assumes that UU release raw water release into the River Severn, making it available for abstraction downstream by SST. Water can then be abstracted for treatment at Hampton Loade WTW. For costing purposes, it is assumed there are no capital works associated with this item, as existing intake sites will be used to abstract the water. Any works / asset improvements required by UU will be considered by UU and form part of the commercial agreement between the two companies. Only OPEX costs are associated with this option. An estimate of payments to UU has been derived for inclusion in the option modelling but this will need to form part of negotiations and resulting commercial agreements. The assessment is based on the assumption that the water supplied by United Utilities is abstracted sustainably and all precautions have been taken in order to supply water of similar or better quality than that found in River Severn, as well as mitigating against the risk of spreading invasive nonnative species. Downstream, it is assumed that SST existing River Severn intake will be used to abstract water for treatment at Hampton Loade WTW (and potentially for storage in Chelmarsh Reservoir). Consideration needs to be given to the capacity of Hampton Loade WTW to treat the additional water that is abstracted. Option 7.5.1 is therefore linked to all options involving the existing or a rebuilt Hampton Loade WTW. Therefore, this option needs to take account of available treatment capacity and licensed volumes. An overall delivery period of 5 years (no CAPEX).
Yield	45Ml/d
WRZ	South Staffordshire Water WRZ

Option	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape
Option 7.5.1.3	Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Operation (negative)	--/?	0	-	0	0	0	-	0	-	0	0	0	0	0	-	0	0
	Operation (positive)	0	0	0	0	0	+	0	0	0	++	+++	0	+++	++	0	0	0

Construction

Objective 1: Neutral effect - There is an SSSI 2.2km from Hampton Loade WTW and one further SSSI within 5km. There are 2 NNRs and 3 LNRs within 10km of Hampton Loade WTW. There are no capital works associated with this component. Any construction work required to move the water from the Vyrnwy reservoir into the River Severn is assumed to be United Utilities responsibility. The option does not required any new construction works, therefore, no Likely significant effects (LSEs) are anticipated. South Staffordshire Water will need to undertake work at the site to increase the capacity of Hampton Loade WTW to treat the additional water, and works are expected to occur within the existing WTW site therefore, no significant effects are expected.

Objective 2: Neutral effect - No capital works are planned.

Objective 3: Neutral effect - As it is assumed that no capital works are required for the implementation of this scheme the risk of distribution of INNS is negligible.

Objective 4: Neutral effect - There are no capital works associated with this component. Any construction work to transfer the water is assumed to be United Utilities responsibility.

Objective 5: Neutral effect - There are no construction activities associated with this component.

Objective 6: Neutral effect - There are no construction activities associated with this component.

Objective 7: Neutral effect - There are no capital works associated with this component. Any flood risk during construction work to transfer the water is assumed to be United Utilities responsibility.

Objective 8: Neutral effect - There are no AQMA within 5km. Any construction work to transfer the water is assumed to be United Utilities responsibility.

Objective 9: Neutral effect - It is not anticipated that the construction phase of the option would result in any impact upon greenhouse gas emissions. Any construction work to transfer the water is assumed to be United Utilities responsibility.

Objective 10: Neutral effect - It is not anticipated that the construction phase of the option would result in any impact upon climate change resilience. Any construction work to transfer the water is assumed to be United Utilities responsibility.

Objective 11: Neutral effect - There are no capital works associated with this component. Any economic impact of construction work is assumed to be United Utilities responsibility.

Objective 12: Neutral effect - There are no capital works associated with this component. Any impact on tourism or recreation from construction work is assumed to be United Utilities responsibility.

Objective 13: Neutral effect - There are no capital works associated with this component. Any impact on human health from construction work is assumed to be United Utilities responsibility.

Objective 14: Neutral effect - There are no capital works associated with this component. Any construction work affecting water resource use is assumed to be United Utilities responsibility.

Objective 15: Neutral effect - There are no capital works associated with this component. Any waste from construction work to transfer the water is assumed to be United Utilities responsibility.

Objective 16: Neutral effect - There are no capital works associated with this component. Any effects on heritage designations during construction work to transfer the water is assumed to be United Utilities responsibility.

Objective 17: Neutral effect - There are no capital works associated with this component. Any effects on landscape from construction work to transfer the water is assumed to be United Utilities responsibility.

Operation

Objective 1: Moderate negative uncertain effect - Operational activities will include the release of raw water to the River Vyrnwy, a tributary of the River Severn, from UU (Vyrnwy Reservoir) which has the potential to result in the introduction of non-native species, change in flows, water level and geomorphology processes. However, water to be released would be available for abstraction downstream by SST, at Hampton Loade WTW. There are uncertainties with regards to impacts of water transfer between UU and River Severn. This may have negative impact upon the migratory qualifying features of the Severn Estuary SAC, including sea lamprey and twaite shad and supporting habitats, introduction of non-native species, and the hydrology of the estuary. The use of the River Vyrnwy, and volume of water to be released into the watercourse, needs to be considered with regards impacts to supporting habitats for the freshwater life stages of the migratory fish of the Severn Estuary SAC and Ramsar. Changes in flow and water quality in the River Severn will also need to be considered alone and in-combination with other abstractions. LSEs identified and therefore a Stage 2 Appropriate Assessment will be required if this option is progressed. The increase in flows associated with this component may result in minor negative effects on non-designated aquatic habitats or species. As a result, there may be minor degradation of non-designated aquatic habitat as a result of any changes to flow, geomorphology or water quality associated with this component. Any operational impacts are unlikely to alter geomorphological forms and processes which underpin physical habitat.

Objective 2: Neutral effect - It is assumed that operational biodiversity net gain would be greater than the net loss in construction; however, without quantification, its magnitude is uncertain. In consequence, an equivalent positive score to the negative score in construction is provided.

Objective 3: Minor negative effect - The River Severn and River Vyrnwy is already in connection through compensation releases and River Severn Regulation releases. The additional volume could result in a slight increase in propagules being transported downstream. Risk will be negligible once raw water is treated at the WTWs.

Objective 4: Neutral effect - Operation of this option is not expected to have any impact on soils.

Objective 5: Neutral effect - Operational activities associated with this component would not lead to a reduction in river or groundwater flows. This flow increase associated with this component is likely to be insufficient to impact sediment dynamics and will not result in a change to channel morphology.

Objective 6: Minor positive effect - There may be minor positive impacts on the water quality in the River Vyrnwy/River Severn as the increased flow may dilute any point source water quality pressures.

Objective 7: Minor negative effect - The increased volume of water released into the River Severn may increase the risk of flooding.

Objective 8: Neutral effect - Operation of this option is not expected to have any impact on air quality.

Objective 9: Minor negative effect - Operation of this option is expected to have a minor negative effect on GHG emissions. Any carbon emissions resulting from the water transfer is considered the responsibility of UU.

Objective 10: Moderate positive effect - Operation of the option will provide 45Ml/d of water resource, supporting community resilience to climate change wherein drought may otherwise have been a risk.

Objective 11: Major positive effect - Operation of the option will provide 45Ml/d of water resource, available for economic use.

Objective 12: Neutral effect - Operation of this option is not expected to have any impact on tourism and recreation.

Objective 13: Major positive effect - Operation of the option will provide 45Ml/d of water resource, supporting community health and wellbeing.

Objective 14: Moderate positive effect - The option is not a leakage reduction or water efficiency option and would have no impact on water efficiency. By providing 45Ml/d, the option is considered to have a moderate positive effect on increasing the resilience of water resources within the South Staffordshire Water supply area.

Objective 15: Minor negative effect - Operation of the option will require additional energy to transfer the water from the River Vyrnwy and this is considered UU's responsibility. The option will require the use of additional chemicals to treat the raw water at Hampton Loade WTW.

Objective 16: Neutral effect - The operation of this option is not expected to have any impact on cultural heritage.

Objective 17: Neutral effect - Operation of this option is not expected to have any impact on landscape designations.

Option Assessment Information	
WRW Option ID	[If needed.]
Option ID	7.5.1.4
Option Name	UU Vyrnwy reservoir raw water release 75 Ml/d to River Severn transfer to Hampton Loade via River Severn to support SST
Water company	South Staffordshire Water
Option Description	This option assumes that UU release raw water release into the River Severn, making it available for abstraction downstream by SST. Water can then be abstracted for treatment at Hampton Loade WTW. For costing purposes, it is assumed there are no capital works associated with this item, as existing intake sites will be used to abstract the water. Any works / asset improvements required by UU will be considered by UU and form part of the commercial agreement between the two companies. Only OPEX costs are associated with this option. An estimate of payments to UU has been derived for inclusion in the option modelling but this will need to form part of negotiations and resulting commercial agreements. The assessment is based on the assumption that the water supplied by United Utilities is abstracted sustainably and all precautions have been taken in order to supply water of similar or better quality than that found in River Severn, as well as mitigating against the risk of spreading invasive nonnative species. Downstream, it is assumed that SST existing River Severn intake will be used to abstract water for treatment at Hampton Loade WTW (and potentially for storage in Chelmarsh Reservoir). Consideration needs to be given to the capacity of Hampton Loade WTW to treat the additional water that is abstracted. Option 7.5.1 is therefore linked to all options involving the existing or a rebuilt Hampton Loade WTW. Therefore, this option needs to take account of available treatment capacity and licensed volumes.
Yield	75Ml/d
WRZ	South Staffordshire Water WRZ

Option	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape
Option 7.5.1.4	Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Operation (negative)	---/?	0	-	0	0	0	-	0	-	0	0	0	0	0	-	0	0
	Operation (positive)	0	0	0	0	0	+	0	0	0	+++	+++	0	+++	+++	0	0	0

Construction

Objective 1: Neutral effect - There is an SSSI 2.2km from Hampton Loade WTW and one further SSSI within 5km. There are 2 NNRs and 3 LNRs within 10km of Hampton Loade WTW. There are no capital works associated with this component. Any construction work required to move the water from the Vyrnwy reservoir into the River Severn is assumed to be United Utilities responsibility. The option does not required any new construction works, therefore, no Likely significant effects (LSEs) are anticipated. South Staffordshire Water will need to undertake work at the site to increase the capacity of Hampton Loade WTW to treat the additional water, and works are expected to occur within the existing WTW site therefore, no significant effects are expected.

Objective 2: Neutral effect - No capital works are planned.

Objective 3: Neutral effect - As it is assumed that no capital works are required for the implementation of this scheme the risk of distribution of INNS is negligible.

Objective 4: Neutral effect - There are no capital works associated with this component. Any construction work to transfer the water is assumed to be United Utilities responsibility.

Objective 5: Neutral effect - There are no construction activities associated with this component.

Objective 6: Neutral effect - There are no construction activities associated with this component.

Objective 7: Neutral effect - There are no capital works associated with this component. Any flood risk during construction work to transfer the water is assumed to be United Utilities responsibility.

Objective 8: Neutral effect - There are no AQMA within 5km. Any construction work to transfer the water is assumed to be United Utilities responsibility.

Objective 9: Neutral effect - It is not anticipated that the construction phase of the option would result in any impact upon greenhouse gas emissions. Any construction work to transfer the water is assumed to be United Utilities responsibility.

Objective 10: Neutral effect - It is not anticipated that the construction phase of the option would result in any impact upon climate change resilience. Any construction work to transfer the water is assumed to be United Utilities responsibility.

Objective 11: Neutral effect - There are no capital works associated with this component. Any economic impact of construction work is assumed to be United Utilities responsibility.

Objective 12: Neutral effect - There are no capital works associated with this component. Any impact on tourism or recreation from construction work is assumed to be United Utilities responsibility.

Objective 13: Neutral effect - There are no capital works associated with this component. Any impact on human health from construction work is assumed to be United Utilities responsibility.

Objective 14: Neutral effect - There are no capital works associated with this component. Any construction work affecting water resource use is assumed to be United Utilities responsibility.

Objective 15: Neutral effect - There are no capital works associated with this component. Any waste from construction work to transfer the water is assumed to be United Utilities responsibility.

Objective 16: Neutral effect - There are no capital works associated with this component. Any effects on heritage designations during construction work to transfer the water is assumed to be United Utilities responsibility.

Objective 17: Neutral effect - There are no capital works associated with this component. Any effects on landscape from construction work to transfer the water is assumed to be United Utilities responsibility.

Operation

Objective 1: Major negative uncertain effect - Operational activities will include the release of raw water to the River Vyrnwy, a tributary of the River Severn, from UU (Vyrnwy Reservoir) which has the potential to result in the introduction of non-native species, change in flows, water level and geomorphology processes. However, water to be released would be available for abstraction downstream by SST, at Hampton Loade WTW. There are uncertainties with regards to impacts of water transfer between UU and River Severn. This may have negative impact upon the migratory qualifying features of the Severn Estuary SAC, including sea lamprey and twaite shad and supporting habitats, introduction of non-native species, and the hydrology of the estuary. The use of the River Vyrnwy, and volume of water to be released into the watercourse, needs to be considered with regards impacts to supporting habitats for the freshwater life stages of the migratory fish of the Severn Estuary SAC and Ramsar. Changes in flow and water quality in the River Severn will also need to be considered alone and in-combination with other abstractions. LSEs identified and therefore a Stage 2 Appropriate Assessment will be required if this option is progressed. There is a significant risk of an adverse effect with the volume of water. The increase in flows associated with this component may result in minor negative effects on non-designated aquatic habitats or species. As a result, there may be minor degradation of non-designated aquatic habitat as a result of any changes to flow, geomorphology or water quality associated with this component. Any operational impacts are unlikely to alter geomorphological forms and processes which underpin physical habitat.

Objective 2: Neutral effect - It is assumed that operational biodiversity net gain would be greater than the net loss in construction; however, without quantification, its magnitude is uncertain. In consequence, an equivalent positive score to the negative score in construction is provided.

Objective 3: Minor negative effect - The River Severn and River Vyrnwy is already in connection through compensation releases and River Severn Regulation releases. The additional volume could result in a slight increase in propagules being transported downstream. Risk will be negligible once raw water is treated at the WTWs.

Objective 4: Neutral effect - Operation of this option is not expected to have any impact on soils.

Objective 5: Neutral effect - Operational activities associated with this component would not lead to a reduction in river or groundwater flows. This flow increase associated with this component is likely to be insufficient to impact sediment dynamics and will not result in a change to channel morphology.

Objective 6: Minor positive effect - There may be minor positive impacts on the water quality in the River Vyrnwy/River Severn as the increased flow may dilute any point source water quality pressures.

Objective 7: Minor negative effect - The increased volume of water released into the River Severn may increase the risk of flooding.

Objective 8: Neutral effect - Operation of this option is not expected to have any impact on air quality.

Objective 9: Minor negative effect - Operation of this option is expected to have a minor negative effect on GHG emissions. Any carbon emissions resulting from the water transfer is considered the responsibility of UU.

Objective 10: Major positive effect - Operation of the option will provide 75Ml/d of water resource, supporting community resilience to climate change wherein drought may otherwise have been a risk.

Objective 11: Major positive effect - Operation of the option will provide 75Ml/d of water resource, available for economic use.

Objective 12: Neutral effect - Operation of this option is not expected to have any impact on tourism and recreation.

Objective 13: Major positive effect - Operation of the option will provide 75Ml/d of water resource, supporting community health and wellbeing.

Objective 14: Major positive effect - The option is not a leakage reduction or water efficiency option and would have no impact on water efficiency. By providing 75Ml/d, the option is considered to have a major positive effect on increasing the resilience of water resources within the South Staffordshire Water supply area.

Objective 15: Minor negative effect - Operation of the option will require additional energy to transfer the water from the River Vyrnwy and this is considered UU's responsibility. The option will require the use of additional chemicals to treat the raw water at Hampton Loade WTW.

Objective 16: Neutral effect - The operation of this option is not expected to have any impact on cultural heritage.

Objective 17: Neutral effect - Operation of this option is not expected to have any impact on landscape designations.

Option Assessment Information	
WRW Option ID	[if needed.]
Option ID	8.1.1
Option Name	Third party potable import in Burton-upon-Trent
Water company	South Staffordshire Water
Option Description	Option to link in to Company X existing treatment plant infrastructure (depending on available capacity) to receive potable water directly via a pipeline into SSW existing supply network. The concept is to utilise third-party boreholes and a new potable import in the Burton-upon-Trent area. Raw water will be pumped from Company X's sources to either Chilcote WTW or Seedy Mill WTW for treatment before feeding into the SSW network. Potential potable water available from existing Company X''s licensed borehole infrastructure is 50m3/hr (1200m3/d). Historically, low volumes did not make this cost beneficial. SSW would either supply Company X with water at no charge or pay Company X for potable water received at same cost as mains water.
Yield	3Ml/d (TBC)
WRZ	South Staffordshire Water WRZ

Option	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape
Option 8.1.1	Construction (negative)	--	--	-	--	0	-	--	--/?	--/?	-	0	--	--	0	--	--	--
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	++	0	0	0	+	0	0
	Operation (negative)	0	0	0	0	0	0	0	0	--	0	0	0	0	0	-/?	0	0
	Operation (positive)	0	++	0	0	0	0	0	0	0	+/?	+/?	0	+/?	0	0	0	0

Construction

Objective 1: Moderate negative effect - Within 1km of the option there are 2 LNRs and one ancient woodland area, within 5km there are 1 SAC and 2 SSSI's and within 10km of the option there are a further 5 SSSIs and 4 LNRs. Construction works would be required to build new assets including a new pipeline which would require crossing the River Mease SAC, as well as tributaries including Seal Brook and Pessall Brook, the River Trent, and several unnamed watercourses. Likely Significant Effects (LSEs) have been identified for River Mease SAC due to the proximity of the proposed pipeline, and the potential for direct impacts to qualifying habitats and species. There is also the potential for LSE on functionally linked habitat (hydrologically connected watercourses and direct loss of terrestrial habitats suitable for otter). Pipeline construction activities and construction activities near water may result in minor loss or degradation of non-designated aquatic habitat associated with short-term changes in river flows, geomorphology or water quality. There could be a short term change in sediment dynamics associated with any construction activities near water, however, this is unlikely to alter geomorphological forms and processes which underpin physical habitat for aquatic ecosystems.

Objective 2: Moderate negative effect - Moderate temporary impacts are predicted through pipeline construction.

Objective 3: Minor negative effect - Although extensive construction activities are required which result in increased distribution of terrestrial and aquatic INNS, the risk is considered as minor assuming best practice biosecurity measures will be adopted during construction.

Objective 4: Moderate negative effect - A large proportion of the new pipeline is located on Grade 3 agricultural land, covering small areas of Grade 2 land. The Import is located in an urban and non agricultural area. There are 7 permitted landfill sites within 5km of the option. The pipeline crosses one historic landfill site; with a further 11 sites within 1km.

Objective 5: Neutral effect - The option crosses the River Trent and the Trent & Mersey Canal. Water resource availability at the option location is at least 95%. No construction activities associated with this component would have a discernible effect on river flows or groundwater levels. There could be a short term change in sediment dynamics associated with the construction activities near water, however, this is expected to be minimal and is unlikely to result in a change in channel morphology.

Objective 6: Minor negative effect - Construction activities near watercourses may have a minor effect on water quality which result in short-term or intermittent effects on receptors. The component would not lead to a change in WFD classification.

Objective 7: Moderate negative effect - A vast majority of the option is within Flood Zones 2 and 3. Construction of the option could potentially cause or exacerbate flooding in the catchment.

Objective 8: Moderate negative uncertain effect - Both Burton-upon-Trent AQMAs (No.1 & No.2) are within 500m of the option. Within 5km of the option is Lichfield (No.2) AQMA. Impacts on AQMA are possible during construction of the option. There will be an increase in vehicle movement associated with construction activities and will likely cause short-term deterioration in local air quality. The number of vehicle movements is unknown, thus the extent of impact is uncertain.

Objective 9: Moderate negative uncertain effect - Due to the scale of constructing a new pipeline and the total CAPEX value provided, £6,141,740, it is expected that this option will have a moderate effect on GHG emissions. Construction would involve the use of materials with embodied carbon as well as carbon emissions related to construction traffic. The associated GHG volumes are unknown at this stage, thus the impact remains uncertain.

Objective 10: Minor negative effect - Construction of the option within Flood Zone 3 has the potential to increase vulnerability to flooding.

Objective 11: Moderate positive effect - Due to the potential for employment during construction based on the total Capex value of £6,141,740.

Objective 12: Moderate negative effect - The option intersects a golf course and several playing fields. There are a number of greenspace areas within 500m of the option also, including a sports complex, Cemetery and Allotments. The option is within 1km of Branston Water Park (Country Park). National Cycle Routes 54 and 63 are intersected by the option pipeline. Construction of this option is expected to have a temporary moderate negative effect on tourism and recreation.

Objective 13: Moderate negative effect - Parts of the option are within the Burton-upon-Trent AQMA. Construction of this option is expected to have a moderate negative impact on human health and well being.

Objective 14: Neutral effect - Construction of this option is not expected to have any impact on water resilience.

Objective 15: Minor positive effect - Construction of the option is expected to make use of existing treatment plant infrastructure.

Objective 15: Moderate negative effect - New materials will be required to construct the new pipeline. Effects are expected to be moderate due to the options total CAPEX value of £6,141,740.

Objective 16: Moderate negative effect - The pipeline intersects 2 Scheduled Monuments, there are a further 7 within 500m of the option. A large number of Listed Buildings are within 500m of the option. There is 1 Park and Garden within 500m of the option. There is a moderate possibility that construction of the option could impact heritage assets.

Objective 17: Moderate negative effect - There is Green Belt within 5km of the option. There are no landscape designated features within 10km of the option. The option requires the construction of a new pipeline, and works would be visually intrusive to the landscape.

Operation

Objective 1: Neutral effect - The operation of the option utilises an existing abstraction, with no proposed changes to the licence. On the basis that the licence is still valid following the Environment Agency's Review of Consents process (c.2005) no LSEs have been identified. This option is not expected to have any impacts on any non-designated aquatic habitats or species. This is a bulk transport of water from Company X to SSW so it is assumed that Company X has the water already available to facilitate this supply.

Objective 2: Moderate positive effect - It is assumed that operational biodiversity net gain would be greater than the net loss in construction; however, without quantification, its magnitude is uncertain. In consequence, an equivalent positive score to the negative score in construction is provided.

Objective 3: Neutral effect - No negative effects are expected as the scheme involves the transfer of potable water within a closed system.

Objective 4: Neutral effect - It is not anticipated that there would be any operational effects on soil, land use or geodiversity.

Objective 5: Neutral effect - This option is not expected to have any impacts on the quantity of groundwater or surface water. This is a bulk transport of water from Company X to SSW so it is assumed that Company X has the water already available to facilitate this supply.

Objective 6: Neutral effect - This option is not expected to have any impacts on water quality. This is a bulk transport of water from Company X to SSW so it is assumed that Company X has the water already available to facilitate this supply.

Objective 7: Neutral effect - The option is not expected to cause or exacerbate flooding in the catchment.

Objective 8: Neutral effect - Operation of the option is not expected to impact local air quality.

Objective 9: Moderate negative effect - Operation of this option will have an impact on greenhouse gas emissions as energy will be required to pump and abstract the water. Throughout the options operational lifespan of 80 years it is expected that 174 tonnes of carbon will be emitted.

Objective 10: Minor positive uncertain effect - Operation of the option will provide 3Ml/d (TBC) of water resources, supporting community resilience to climate change wherein drought may otherwise have been a risk. Yield is still to be confirmed so remains uncertain.

Objective 11: Minor positive uncertain effect - Operation of this option will provide 3Ml/d (TBC) that can support economic activity. Yield is still to be confirmed so remains uncertain.

Objective 12: Neutral effect - Operation of the option is not expected to have a negative impact on tourism and recreation.

Objective 13: Minor positive uncertain effect - Operation of this option will provide up to 3Ml/d (TBC) that can support human health and wellbeing. Yield is still to be confirmed so remains uncertain.

Objective 14: Neutral effect - The option is not a leakage reduction or water efficiency option and would have no impact on water efficiency. Whilst the option would increase the resilience of water resources within the SSW supply area by providing an additional 3Ml/d (TBC) deployable output, this is considered to be a neutral effect based on the assessment thresholds.

Objective 15: Minor negative uncertain effect - Operation of the option will require additional energy (174kWh/Ml) and may require the use of additional chemicals to treat raw water, however, effects in this regard are currently uncertain.

Objective 16: Neutral effect - Operation of this option is not expected to have any impact on cultural heritage sites.

Objective 17: Neutral effect - The option will not permanently alter the existing landscape, having a neutral effect during operation.

Option Assessment Information	
WRW Option ID	[if needed.]
Option ID	8.1.5
Option Name	New Burton-upon-Trent GW source with licence trade
Water company	South Staffordshire Water
Option Description	The option would utilise third-party (Company X) abstraction licence(s) allowing for a new groundwater source in the Burton-upon-Trent area. The option will include purchasing land to drill a new borehole and a new pipeline to transfer raw water to existing Chilcote WTW to be treated.
Yield	2.5Ml/d (TBC)
WRZ	South Staffordshire Water WRZ

Option	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape
Option 8.1.5	Construction (negative)	---	-	-	--	0	-	-	--/?	--/?	-	0	--	--	0	--	--	--
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	++	0	0	0	0	0	0
	Operation (negative)	--	0	0	0	-	-	0	0	--	0	0	0	0	0	-/?	0	0
	Operation (positive)	0	+	0	0	0	0	0	0	0	+/?	+/?	0	+/?	0	0	0	0

Construction

Objective 1: Major negative effect - The new pipeline intersects 1 SAC/SSSI. Within 1km of the option there are 3 ancient woodland areas (1 within 500m) and 3 LNRs and within 10km of the option there are 11 SSSIs, 1 NNR and 7 LNRs. Construction works would be required to build new assets including a new pipeline which would require crossing the River Mease SAC, as well as a tributaries including Hooborough Brook and the River Trent. LSEs have been identified for River Mease SAC due to the proximity of the proposed pipeline, and the potential for direct impacts to qualifying habitats and species. There is also the potential for LSE on functionally liked habitat (hydrologically connected watercourses and direct loss of terrestrial habitats suitable for otter). The Humber Estuary is considered sufficiently distant at construction impacts will not result in an adverse effect, with the Supplementary Advice on Conservation Objectives (SACO) stating that the River Trent does not support sea or river lamprey (Cromwell Weir impassable). Pipeline construction activities and construction activities near water may result in minor loss or degradation of non-designated aquatic habitat associated with short-term changes in river flows, geomorphology or water quality. There could be a short term change in sediment dynamics associated with any construction activities near water, however, this is unlikely to alter geomorphological forms and processes which underpin physical habitat for aquatic ecosystems.

Objective 2: Minor negative effect - Pipeline construction will create a temporary, minor, negative impact.

Objective 3: Minor negative effect - Although extensive construction activities are required which result in increased distribution of terrestrial and aquatic INNS, the risk is considered as minor assuming best practice biosecurity measures will be adopted during construction.

Objective 4: Moderate negative effect - A large proportion of the pipeline route is on Grade 2 or 3 agricultural land. The borehole is located in an urban area. There are 8 permitted landfill sites within 5km of the option. The pipeline crosses one historic landfill site.

Objective 5: Neutral effect - The options pipeline crosses both the River Trent and River Mease. Water resource availability at the option location is at least 95%. No construction activities associated with this component would have a discernible effect on river flows or groundwater levels. There could be a short term change in sediment dynamics associated with the construction activities near water, however, this is expected to be minimal and is unlikely to result in a change in channel morphology.

Objective 6: Minor negative effect - Construction activities near watercourses may have a minor effect on water quality which result in short-term or intermittent effects on receptors. The component would not lead to a change in WFD classification.

Objective 7: Minor negative effect - Parts of the of the option are within Flood Zones 2 and 3. Construction of the option could potentially cause or exacerbate flooding in the catchment.

Objective 8: Moderate negative uncertain effect - Both Burton-upon-Trent AQMAs (No.1 & No.2) are within 1km of the option. Impacts on AQMA are possible during construction of the option. There will be an increase in vehicle movement associated with construction activities and will likely cause short-term deterioration in local air quality. The number of vehicle movements is unknown, thus the extent of impact is uncertain.

Objective 9: Moderate negative uncertain effect - Due to the scale of constructing a new pipeline and the total CAPEX value provided, £18,204,470, it is expected that this option will have a moderate effect on GHG emissions. Construction would involve the use of materials with embodied carbon as well as carbon emissions related to construction traffic. The associated GHG volumes are unknown at this stage, thus the impact remains uncertain.

Objective 10: Minor negative effect - Construction of the option within Flood Zone 3 has the potential to increase vulnerability to flooding.

Objective 11: Moderate positive effect - Due to the potential for employment during construction based on the total Capex value of £18,204,470.

Objective 12: Moderate negative effect - The borehole location is within a greenspace area (sports faculties), there are a number of green space areas within 500m of the pipeline including playing fields, a bowling green and allotments. The option is within 5km of 3 Country Parks. National Cycle Route 54 runs parallel to the option pipeline and is within 500m of the borehole site. National Cycle Route 63 is also within 500m of the pipeline. Construction of this option is expected to have a temporary moderate negative effect on tourism and recreation.

Objective 13: Moderate negative effect - Construction of the option could potentially cause temporary impacts on local air quality. The Burton-upon-Trent AQMA is within 500m of the option. Construction of the option is expected to have a moderate impact on human health and well being.

Objective 14: Neutral effect - Construction of this option is not expected to have any impact on water resilience.

Objective 15: Moderate negative effect - Construction of the option will make use of some existing treatment plant infrastructure. New materials will be required to construct the new borehole and pipeline and with a total CAPEX value of £18,204,470 it is likely that the option will have a moderate negative effect on waste and resource use.

Objective 16: Moderate negative effect - The pipeline intersects a Scheduled Monument, there are a further 3 within 1km of the option. There are 13 Listed Buildings within 500m of the option. There are 2 Parks and Gardens within 5km of the option. There is a moderate possibility that construction of the option could impact heritage assets.

Objective 17: Moderate negative effect - The pipeline intersects Green Belt for approximately 2km. There are no further landscape designated features within 10km of the option. The option requires the construction of a new borehole and pipeline, works would be visually intrusive to the landscape.

Operation

Objective 1: Moderate negative effect - Operation impacts will include increased abstraction at the proposed new borehole location. The proposed new boreholes are located on the same low productivity aquifer, sandstone, as the River Mease SAC. The underlying sandstone is permeable and therefore a reduction in groundwater may influence the flow levels in the watercourses nearby which includes the River Trent, which is potentially functionally linked habitat for the River Mease SAC. Further assessment and consideration of operational flow impacts are therefore required through a Stage 2 Appropriate Assessment. Although hydrologically linked to the Humber Estuary SAC, qualifying features not known to be present on the River Trent. The SACO states the following:

- Sea lamprey: Distribution of sea lamprey in the River Trent is unknown however it is thought that distribution of the species is severely limited by Cromwell weir, which is considered as impassable.
- River lamprey: Distribution of river lamprey in the River Trent is severely limited by Cromwell weir, which is considered as impassable to river lamprey.

The reduction in localised flow is not considered to adversely affect the Humber Estuary SAC estuaries feature (SACO target for freshwater input) alone. The operation of this option could result in effects on non-designated aquatic habitats or species. Flows in the River Trent would be reduced however the flow change is only expected to be small. As a result, there could be up to minor degradation of non-designated aquatic habitat as a result of any changes to flow, geomorphology or water quality associated with this component. Any operational impacts are unlikely to alter geomorphological forms and processes which underpin physical habitat for aquatic ecosystems.

Objective 2: Minor positive effect - It is assumed that operational biodiversity net gain would be greater than the net loss in construction; however, without quantification, its magnitude is uncertain. In consequence, an equivalent positive score to the negative score in construction is provided.

Objective 3: Neutral effect - No negative effects are expected as the scheme involves the abstraction and transfer of groundwater water within a closed system.

Objective 4: Neutral effect - It is not anticipated that there would be any operational effects on soil, land use or geodiversity.

Objective 5: Minor negative effect - Operational activities associated with this component may have a minor discernible effect on river flows and groundwater levels with there being an increase groundwater abstraction potentially reducing flows in the River Trent. This flow change is insufficient to impact sediment dynamics and will not result in a change to channel morphology.

Objective 6: Minor negative effect - The reduction in flows associated with this component may reduce the rivers buffering capacity against point source pollutants, however, this would not be sufficient to cause WFD deterioration.

Objective 7: Neutral effect - It is anticipated that the option would neither cause or exacerbate flooding in the area.

Objective 8: Neutral effect - Operation of the option is not expected to impact local air quality.

Objective 9: Moderate negative effect - Operation of this option will have an impact on greenhouse gas emissions as energy will be required to pump and abstract the water. Throughout the options operational lifespan of 80 years it is expected that 330 tonnes of carbon will be emitted.

Objective 10: Minor positive uncertain effect - Operation of the option will provide 2.5Ml/d (TBC) of water resources, supporting community resilience to climate change wherein drought may otherwise have been a risk. Yield is still to be confirmed so remains uncertain.

Objective 11: Minor positive uncertain effect - Operation of this option will provide 2.5Ml/d (TBC) that can support economic activity. Yield is still to be confirmed so remains uncertain.

Objective 12: Neutral effect - Operation of the option is not expected to have a negative impact on tourism and recreation.

Objective 13: Minor positive uncertain effect - Operation of this option will provide up to 2.5Ml/d (TBC) that can support human health and wellbeing. Yield is still to be confirmed so remains uncertain.

Objective 14: Neutral effect - The option is not a leakage reduction or water efficiency option and would have no impact on water efficiency. Whilst the option would increase the resilience of water resources within the SSW supply area by providing an additional 2.5Ml/d (TBC) deployable output, this is considered to be a neutral effect based on the thresholds.

Objective 15: Minor negative uncertain effect - Operation of the option will require additional energy (565kWh/Ml) and may require the use of additional chemicals to treat raw water.

Objective 16: Neutral effect - Operation of this option is not expected to have any impact on cultural heritage sites.

Objective 17: Neutral effect - The option will not permanently alter the existing landscape, having a neutral effect during operation.

Option Assessment Information	
WRW Option ID	[If needed.]
Option ID	8.3.1 [Disclaimer: The assessment only covers the reservoir site as the location of the pipeline and WTWs have not yet been decided]
Option Name	Burton-upon-Trent raw water reservoir
Water company	South Staffordshire Water
Option Description	There is a long history of brewing in the Burton-upon-Trent area. Water for the brewing process was drawn from groundwater abstraction and today there are still a number of abstraction licences held by brewing companies. One such company is Company X.Discussions have been held between South Staffs Water and Company X, to explore opportunities for licence trading and/or purchasing boreholes. The following option concepts have been proposed. 1.Link into Company X's existing treatment plant infrastructure (depending on available capacity) to receive potable water directly into the SSW network. SSW would either supply Company X with water at no charge or pay Company X for this potable supply at the same cost as mains water. 2.Improve Company X's existing treatment plant to increase capacity and install pipework to feed into the SSW network. 3.Pump raw water from the Company X's sources to either Chilcote WTW or Seedy Mill WTW for treatment before feeding into the SSW network. 4.Install a SSW treatment plant to treat raw water from the Company X sources and connect into the SSW network. Two additional options relating to Company X have also been proposed: 5.Treat Company X's effluent and reuse as a resource for supply. 6.Utilise the River Trent floodplain, where several disused boreholes are located, to create a storage reservoir
Yield	up to 7Ml/d (TBC)
WRZ	South Staffordshire Water WRZ

Option	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape
Option 8.3.1	Construction (negative)	--	0	-	-	0	-	-	--/?	---	-	0	--	--	0	--	-	--
	Construction (positive)	0	0	0	+/?	0	0	0	0	0	0	+++	0	0	0	0	0	0
	Operation (negative)	-	0	--	0	-	-	0	0	--	0	0	0	0	0	-/?	0	--
	Operation (positive)	0	0	0	0	0	0	++	0	0	+/?	++/?	+/?	++/?	+/?	0	0	0

Construction

Objective 1: Moderate negative effect - Within 1km of reservoir site A there is 1 LNR and one area of ancient woodland. Within 10km of the site there is 1 SAC, 5 SSSIs and 4 LNRs. Construction works would be required to build a new reservoir, and pipelines. The reservoir is located on potentially functionally linked habitat for otter associated with the River Mease SAC. The pipeline route may cross the River Mease SAC and LSE have therefore been identified for this SAC due to the potential proximity of the pipeline route, and the potential for direct and indirect impacts to qualifying habitats and species. There is also the potential for Likely Significant Effects (LSE) on functionally liked habitat (hydrologically connected watercourses and direct loss of habitats suitable for qualifying species). The Humber Estuary is considered sufficiently distant that construction impacts will not result in an adverse effect, with the Supplementary Advice on Conservation Objectives (SACO) stating that the River Trent does not support sea or river lamprey (Cromwell Weir impassable). Pipeline construction activities and construction activities near water may result in minor loss or degradation of non-designated aquatic habitat associated with short-term changes in river flows, geomorphology or water quality. There could be a short term change in sediment dynamics associated with any construction activities near water, however, this is unlikely to alter geomorphological forms and processes which underpin physical habitat for aquatic ecosystems.

Objective 2: Neutral effect - Construction of the reservoir is expected to cause neutral impacts.

Objective 3: Minor negative effect - Although extensive construction activities are required which result in increased distribution of terrestrial and aquatic INNS, the risk is considered as minor assuming best practice biosecurity measures will be adopted during construction.

Objective 4: Minor negative effect - The option site is located within non agricultural land. There are 31 historic landfill sites and 5 permitted landfill sites within 5km of the reservoir option. Objective 4: Minor positive uncertain effect - Potential to be minor positive effects if the option is on existing developed land.

Objective 5: Neutral effect - The option is adjacent to the River Trent. Water resource availability is at least 95% at the option location. No construction activities associated with this component would have a discernible effect on river flows or groundwater levels. There could be a short term change in sediment dynamics associated with the construction activities near water, however, this is expected to be minimal and is unlikely to result in a change in channel morphology.

Objective 6: Minor negative effect - Construction activities near watercourses may have a minor effect on water quality which result in short-term or intermittent effects on receptors. The component would not lead to a change in WFD classification.

Objective 7: Minor negative effect - The option is wholly within Flood Zones 2 and 3. Construction of the option could potentially cause or exacerbate flooding in the catchment.

Objective 8: Moderate negative uncertain effect - The Burton-upon-Trent AQMA (No.2) is within 1km of the option. There are a further two AQMAs within 10km of the option (Burton-upon-Trent (No.1) and Lichfield (No.2)). Impacts on AQMA are possible during construction of the option. There will be an increase in vehicle movement associated with construction activities and will likely cause short-term deterioration in local air quality. The number of vehicle movements is unknown, thus the extent of impact is uncertain.

Objective 9: Major negative effect - Due to the scale of constructing a new reservoir and the CAPEX value provided, £37,328,967 it is expected that this option will have a major effect on GHG emissions. Construction would involve the use of materials with embodied carbon as well as carbon emissions related to construction traffic.

Objective 10: Minor negative effect - The construction of a new reservoir within Flood Zone 3 has the potential to increase vulnerability to flooding.

Objective 11: Major positive effect - Due to the potential for employment during construction based on the Capex value of £37,328,967.

Objective 12: Moderate negative effect - There are several greenspace areas within 1km of the option including a golf course, religious grounds and playing fields. The option is within 5km of Branston Water Park (Country Park). National Cycle Network route 63 is within 1km of the option. Construction of this option is expected to have a temporary moderate negative effect on tourism and recreation.

Objective 13: Moderate negative effect - The Burton-upon-Trent built up area is within 500m of the option location and therefore construction of this option is expected to have a moderate impact on human health and well being. Construction works are likely to have a negative effect (e.g. noise disturbance, vibration, dust deposition and air quality impacts) on local residential receptors.

Objective 14: Neutral effect - Construction of this option is not expected to have any impact on water resilience.

Objective 15: Moderate negative effect - Construction of the option will not make use any existing infrastructure and will require the use of new materials. Construction of this option is likely to have a moderate negative effect on waste and resource use with a total CAPEX value of £37,328,967.

Objective 16: Minor negative effect - There is one Scheduled Monument within 1km of the option, there are a further 5 within 5km. There are 9 Listed Buildings within 500m of the option. Stapenhill Cemetery Park and Garden is within 1km of the option. There is a minor possibility that construction of the option could impact heritage assets.

Objective 17: Moderate negative effect - There is Green Belt just over 1km east of the option. There are no landscape designated features within 10km of the option. The option requires the construction of a new reservoir. Therefore the construction works would be visually intrusive to the local landscape.

Operation

Objective 1: Minor negative effect - Operation of the option will look to utilise 'spare third-party licences', with no new boreholes proposed which could be within proximity of the River Mease SAC, or be located within the same aquifer. On the basis that the licence is still valid following the Environment Agency's Review of Consents process (c.2005) no LSEs have been identified alone. Although hydrologically linked to the Humber Estuary SAC, qualifying features not known to be present on the River Trent. The SACO states the following:
- Sea lamprey: Distribution of sea lamprey in the River Trent is unknown however it is thought that distribution of the species is severely limited by Cromwell weir, which is considered as impassable.
- River lamprey: Distribution of river lamprey in the River Trent is severely limited by Cromwell weir, which is considered as impassable for river lamprey.

The reduction in localised flow is not considered to adversely affect the Humber Estuary SAC estuaries feature (SACO target for freshwater input) alone. The operation of this option could result in effects on non-designated aquatic habitats or species. Flows in the River Trent would be reduced however the flow change is only expected to be small. As a result, there could be up to minor degradation of non-designated aquatic habitat as a result of any changes to flow, geomorphology or water quality associated with this component. Any operational impacts are unlikely to alter geomorphological forms and processes which underpin physical habitat for aquatic ecosystems.

Objective 2: Neutral effect - It is assumed that operational biodiversity net gain would be greater than the net loss in construction; however, without quantification, its magnitude is uncertain. In consequence, an equivalent positive score to the negative score in construction is provided.

Objective 3: Moderate negative effect - The construction of a new reservoir fed by raw water abstraction will establish new habitat and transfer pathway for INNS. Additionally the reservoir will provide new secondary pathways for the distribution of INNS. Although not terminating at a open channel or reservoir the transfer of raw water from the proposed reservoir to Seedy Mill WTW also represents a risk of INNS transfer over a significant distance and between operational catchments. Risk will be reduced if a local treatment works could be constructed in the Burton-Upon-Trent area. Best practice biosecurity measures (such as signs, wash down facilities for recreational users, etc) may also reduce secondary transfer risks at the proposed reservoir.

Objective 4: Neutral effect - It is not anticipated that there would be any operational effects on soil, land use or geodiversity.

Objective 5: Minor negative effect - Operational activities associated with this component may have a minor discernible effect on river flows and groundwater levels with there being an increase in groundwater abstraction potentially reducing flows in the River Trent. There may also be additional surface water abstraction from the River Trent. This flow change is insufficient to impact sediment dynamics and will not result in a change to channel morphology.

Objective 6: Minor negative effect - The reduction in flows associated with this component may reduce the rivers buffering capacity against point source pollutants, however, this would not be sufficient to cause WFD deterioration.

Objective 7: Moderate positive effect - The new reservoir option will be located within Flood Zone 3 so has potential to help alleviate or mitigate flooding in the catchment.

Objective 8: Neutral effect - Operation of the reservoir is not expected to impact local air quality.

Objective 9: Moderate negative effect - Operation of this option will have an impact on greenhouse gas emissions as energy will be required to pump and abstract the water. Throughout the options operational lifespan of 80 years it is expected that 254 tonnes of carbon will be emitted.

Objective 10: Minor positive uncertain effect - Operation of the option will provide up to 7Ml/d (TBC) of water resource, supporting community resilience to climate change wherein drought may otherwise have been a risk. Yield is still to be confirmed so remains uncertain.

Objective 11: Moderate positive uncertain effect - Operation of this option will provide up to 7Ml/d that can support economic activity. Yield is still to be confirmed so remains uncertain.

Objective 12: Minor positive uncertain effect - Operation of the new reservoir has the potential to have a positive impact on tourism and recreation.

Objective 13: Moderate positive uncertain effect - Operation of this option will provide up to 7Ml/d (TBC) that can support human health and wellbeing. Yield is still to be confirmed so remains uncertain.

Objective 14: Minor positive uncertain effect - The option is not a leakage reduction or water efficiency option and would have no impact on water efficiency. However, the option would increase the resilience of water resources within the SSW supply area by providing an additional 7Ml/d (TBC) deployable output. Yield is still to be confirmed so remains uncertain.

Objective 15: Minor negative uncertain effect - Operation of the option will require additional energy (220kWh/Ml) and may require the use of additional chemicals to treat raw water but effects in this regard remain uncertain.

Objective 16: Neutral effect - Operation of this option is not expected to have any impact on cultural heritage sites.

Objective 17: Moderate negative effect - This option will result in permanently altering the existing landscape at the option location, having a moderate effect on the local landscape.

WRW Option ID	
Option ID	N/A
Option Name	Leakage Bundle 3
Water company	South Staffordshire Water
Option Description	Leakage bundle involves: **Active Leakage Control (option 073d)**; Better **trunk mains monitoring (option 057)** and **Enhanced customers supply pipeline (option 183)**. Active Leakage Control will increase leakage find **and fix** budget leading to improved monitoring and analysis of leakage data as well as improving leak detection through acoustic loggers. Better trunk mains monitoring focuses on implementing better technology to monitor water quality in the trunk mains in order to help maintain high standards for drinking water as well as help the identification of any issues. Enhanced customers supply pipeline involves enhanced monitoring of customers supply pipeline to provide better control of leakage control measures and enhance resilience of the supply system. Implementation of this bundle of measures is estimated to provide a saving of 12.0 Ml/d.
Yield	12 Ml/d (18.25 Ml/d by 2050)
WRZ	**Company**

Option	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape
Option Name	Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Operation (negative)	?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Operation (positive)	0	0	0	0	++	0	0	0	+	+	0	0	0	+	0	0	0

Construction

Objective 1: Neutral effect - The construction stage of this option would involve installation of more and better monitoring equipment, acoustic loggers, and analysis. This type of activity is not anticipated to impact on biodiversity.

Objective 2: Neutral effect - The construction of this option is not anticipated to impact on sustainable natural resources.

Objective 3: Neutral effect - The construction of this option is not anticipated to impact on INNS.

Objective 4: Neutral effect - The construction of this option is not anticipated to impact on soils, geodiversity and land use.

Objective 5: Neutral effect - The construction of this option is not anticipated to impact on water quantity.

Objective 6: Neutral effect - The construction of this option is not anticipated to impact on water quality.

Objective 7: Neutral effect - The construction of this option is not anticipated to impact on flood risk.

Objective 8: Neutral effect - **No quantified number** of vehicle movements with to deliver acoustic and other **non-specified** leak monitoring devices to the point of installation. **No information regarding green status of future fleet**.

Objective 9: Neutral effect - The construction of the option would only include embodied carbon from material production of the new devices (loggers etc). **No carbon data is available**, but similar options for other WRW companies with yields ~30Mld determined to be minor negative. This bundle of options may have <50% of those yields and impact. This construction is assumed to have only a small effect on overall greenhouse gas emission levels.

Objective 10: Neutral effect - The construction of this option is not anticipated to impact on climate resilience.

Objective 11: Neutral effect - The construction of this option is not anticipated to impact on the local employment opportunities, the local or regional economy, or on recreational activities. This scale of works expected to be within SSW existing capacity.

Objective 12: Neutral effect - The construction of this option is not anticipated to impact on tourism and recreation.

Objective 13: Neutral effect - The construction of this option is not anticipated to impact on human health and well-being.

Objective 14: Neutral effect - The construction of this option is not anticipated to impact on water resource use.

Objective 15: Neutral effect - The construction of this option would require **small-moderate** quantities of additional materials. No estimate is provided but the devices would maximise use of existing mains supply infrastructure. Similar options for other WRW companies with yields ~30Mld determined to be minor negative. This bundle of options may have <50% of those yields and impact.

Objective16: Neutral effect - The construction of this option is not anticipated to impact on cultural heritage. Installations will be distributed across the zone network - any potential disruption to cultural heritage close by will be very temporary, and small scale.

Objective 17: Neutral effect - The construction of this option is not anticipated to impact on landscape.

Operation

Objective 1: Neutral effect uncertain - The operation of this option involves the 'fix' aspect of find and fix. This would include trunk mains and customer supply pipes as discovered. Trunk main repairs may involve some excavation. Impact on biodiversity is unknown until locations and repair methods are identified.

Objective 2: Neutral effect - The operation of this option is not anticipated to impact on sustainable natural resources.

Objective 3: Neutral effect - The operation of this option is not anticipated to impact on INNS.

Objective 4: Neutral effect - The operation of this option is not anticipated to impact on soils, geodiversity and land use.

Objective 5: Moderate positive effect - The operation of this option would result in a moderate reduction in the demand for water (**12 Ml/d** WAFU benefit) and does not require abstraction to achieve yield.

Objective 6: Neutral effect - The operation of this option is not anticipated to impact on water quality.

Objective 7: Neutral effect - The operation of this option is not anticipated to impact on flood risk.

Objective 8: Neutral effect - The operation of this option is not anticipated to impact on air quality.

Objective 9: Minor positive effect - This option is anticipated to reduce operational carbon emissions by reducing lost Water put Into Supply (WIS), i.e. reduced pumping and treatment waste. Carbon quantities not disclosed but similar options for other WRW companies with yields ~30Mld determined to be moderate positive. This bundle of options may have <50% of those yields and impact. (**assuming that >10t CO2 threshold saved**)

Objective 10: Minor positive effect - The operation of this option could save 12Mld creating small scale resilience to climate change.

Objective 11: Neutral effect - The operation of this option would not significantly affect jobs, economic prospects, or recreational activities. Find and fix activities anticipated to be within existing SSW capacity. Option description does not specifically target major mains renewals.

Objective 12: Neutral effect - The operation of this option is not anticipated to impact on tourism and recreation.

Objective 13: Neutral effect - The operation of this option would not result in any additional effects on human health and existing recreational facilities and/or tourism. Customers would be unaware of the improved resilience in the system.

Objective 14: Minor positive effect - This option would result in a minor reduction in leakage from the supply network of approx. **12Ml/d.**

Objective 15: Neutral effect - The operation of this option is not anticipated to impact on waste and resource use. Waste associated with reduced leakage are considered within Objs 5, 9, and 14, and the construction stage for Obj 15.

Objective16: Neutral effect - The operation of this option is not anticipated to impact on cultural heritage.

Objective 17: Neutral effect - The operation of this option is not anticipated to impact on landscape.

Option Assessment Information	
WRW Option ID	
Option ID	N/A
Option Name	Water Efficiency Bundle
Water company	South Staffordshire Water
Option Description	Water efficiency measures could involve the following: Compulsory **metering (AMR)**; Variable infrastructure **charge**; **Partnership** with retailers for more efficient white goods; **Dual flush toilets** social housing; Household WEFF programme partnering approach home visit; and Non HH water efficiency programme - company led site visit with installation. The Compulsory metering programme (either standard meter, automated meter reading and automated metering infrastructure) will be rolled out across five years in South Staffs supply area. The Household WEFF programme partnering approach **home visit** will involve a home visit by plumber to **install water efficient devices such as low flow showerheads, tap inserts, cistern displacement devices, and dual flush retrofits** where appropriate. The Non HH water efficiency programme - company led site visit with installation will undertake an analysis of business and water use would be undertaken, then depending on business type and volume of water used per annum, a range of options could be promoted.
Yield	33.25Ml/d by 2050
WRZ	**Company**

Option	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape
Option Name	Construction (negative)	0	0	0	0	0	0	0	?	-/?	0	0	0	0	0	-/?	0	0
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Operation (negative)	0	0	0	0	0	0	0	0	?	0	0	0	0	0	0	0	0
	Operation (positive)	0	0	0	0	++	0	0	0	0	+	0	0	+	+	0	0	0

Construction

Objective 1: Neutral effect - The construction of this option is not anticipated to impact on biodiversity.

Objective 2: Neutral effect - The construction of this option is not anticipated to impact on sustainable natural resources.

Objective 3: Neutral effect - The construction of this option is not anticipated to impact on INNS.

Objective 4: Neutral effect - The construction of this option is not anticipated to impact on soils, geodiversity and land use.

Objective 5: Neutral effect - The construction of this option is not anticipated to impact on water quantity.

Objective 6: Neutral effect - The construction of this option is not anticipated to impact on water quality.

Objective 7: Neutral effect - The construction of this option is not anticipated to impact on flood risk.

Objective 8: Neutral effect uncertain - **No quantified number** of vehicle movements with to deliver home and site visits/installations. **No information regarding green status of future fleet**.

Objective 9: Minor negative effect uncertain - The construction of the option would include embodied carbon from material production of water meters and water efficiency devices (**total carbon not disclosed**). In addition, the option would require an **unspecified** number of vehicle movements to carry out the home/site visits and installations.

Objective 10: Neutral effect - The construction of this option is not anticipated to impact on climate resilience.

Objective 11: Neutral effect - The construction of this option would be involve the installation activities. This would have little impact on jobs/local economic development as is expected to be within existing SSW and partner capacity. Very little if any disruption to regional logistics/economy anticipated.

Objective 12: Neutral effect - The construction of this option is not anticipated to impact on tourism and recreation.

Objective 13: Neutral effect - The construction of this option is not anticipated to impact on human health and well-being. There may be some very minor disturbance during the installation stages.

Objective 14: Neutral effect - The construction of this option is not anticipated to impact on water resource use.

Objective 15: Minor negative effect uncertain - The construction of this option would require **minor** quantities of additional materials (**although no quantities are stated**) to maximise use of existing mains supply infrastructure. Minor rather than neutral assuming uptake of white goods. *This may be reviewed when product specific quantities are calculated.*

Objective16: Neutral effect - The construction of this option is not anticipated to impact on cultural heritage.

Objective 17: Neutral effect - The construction of this option is not anticipated to impact on landscape.

Operation

Objective 1: Neutral effect - The operation of this option is not anticipated to impact on biodiversity.

Objective 2: Neutral effect - The operation of this option is not anticipated to impact on sustainable natural resources.

Objective 3: Neutral effect - The operation of this option is not anticipated to impact on INNS.

Objective 4: Neutral effect - The operation of this option is not anticipated to impact on soils, geodiversity and land use.

Objective 5: Moderate positive effect - The operation of this option would result in a moderate reduction in the demand for water (**9.78** Ml/d WAFU benefit) and does not require abstraction to achieve yield.

Objective 6: Neutral effect - The operation of this option is not anticipated to impact on water quality.

Objective 7: Neutral effect - The operation of this option is not anticipated to impact on flood risk.

Objective 8: Neutral effect - The operation of this option is not anticipated to impact on air quality.

Objective 9: Neutral effect uncertain - This option is anticipated to reduce operational carbon emissions by **an unspecified quantity** through reduced demand, i.e. reduced greenhouse gas emissions associated with reduced electricity production.

Objective 10: Minor positive effect - The operation of this option could save **9.78** Mld creating small scale resilience to climate change.

Objective 11: Neutral effect - The operation of this option would not affect jobs, economic prospects, or recreational activities.

Objective 12: Neutral effect - The operation of this option is not anticipated to impact on tourism and recreation.

Objective 13: Minor positive effect - The operation of this option could result in positive impacts on human health and well-being through access to improved water using products, fixtures, and fittings. It is not expected to impact existing recreational facilities and/or tourism.

Objective 14: Minor positive effect - This option would result in a minor reduction in demand from the supply network of approx. **9.78 Ml/d.**

Objective 15: Neutral effect - The operation of this option is not anticipated to impact on waste and resource use.

Objective16: Neutral effect - The operation of this option is not anticipated to impact on cultural heritage.

Objective 17: Neutral effect - The operation of this option is not anticipated to impact on landscape.

Option Assessment Information	
WRW Option ID	
Option ID	N/A
Option Name	Enhanced Free Optants
Water company	South Staffordshire Water
Option Description	This option promotes installation of an additional 500 free meter optants (standard or automated reading) yearly for 10 years and then a declining number for a further 5 years. This will also influence reducing supply pipe leakage at properties with leakage, and where meters are installed externally. SSW will target an additional 2,600 free meter optants in addition to those included in the baseline forecast each year giving a total of approximately 8,000 optants a year in the early part of the demand forecast. As a result of this, meter penetration will reach 73% by 2039/40 and 77% by 2044/45
Yield	12.01Ml/d by 2037
WfI2	**Company**

Option	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape
Option Name	Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Operation (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Operation (positive)	0	0	0	0	+	0	0	0	0	+	0	0	0	0	0	0	0

Construction

Objective 1: Neutral effect - The construction of this option is not anticipated to impact on biodiversity. This option has little to no construction activity except the installation of meters.

Objective 2: Neutral effect - The construction of this option is not anticipated to impact on sustainable natural resources.

Objective 3: Neutral effect - The construction of this option is not anticipated to impact on INNS.

Objective 4: Neutral effect - The construction of this option is not anticipated to impact on soils, geodiversity and land use.

Objective 5: Neutral effect - The construction of this option is not anticipated to impact on water quantity.

Objective 6: Neutral effect - The construction of this option is not anticipated to impact on water quality.

Objective 7: Neutral effect - The construction of this option is not anticipated to impact on flood risk.

Objective 8: Neutral effect - No vehicle movements or associated carbon figures provided. One per installation is 2,600 per annum. **No information regarding green status of future fleet.**

Objective 9: Neutral effect - The total embedded carbon of 26,000 additional water meters (over 10 years) has not been provided. However, this scale is likely to be <10 tonnes.

Objective 10: Neutral effect - The construction of this option is not anticipated to impact on climate resilience.

Objective 11: Neutral effect - The construction of this option is not anticipated to impact on the local employment opportunities, the local or regional economy, or on recreational activities. This scale of works expected to be within SSW existing capacity.

Objective 12: Neutral effect - The construction of this option is not anticipated to impact on tourism and recreation.

Objective 13: Neutral effect - The construction of this option is not anticipated to impact on human health and well-being.

Objective 14: Neutral effect - The construction of this option is not anticipated to impact on water resource use.

Objective 15: Neutral effect - The construction of this option would require materials for additional 26,000 water meters to maximise use of existing mains supply infrastructure. This is within the Neutral threshold.

Objective16: Neutral effect - The construction of this option is not anticipated to impact on cultural heritage.

Objective 17: Neutral effect - The construction of this option is not anticipated to impact on landscape

Operation

Objective 1: Neutral effect - The operation of this option is not anticipated to impact on biodiversity.

Objective 2: Neutral effect - The operation of this option is not anticipated to impact on sustainable natural resources.

Objective 3: Neutral effect - The operation of this option is not anticipated to impact on INNS.

Objective 4: Neutral effect - The operation of this option is not anticipated to impact on soils, geodiversity and land use.

Objective 5: Minor positive effect - The operation of this option would result in a minor reduction in the demand for water (**3.4 Ml/d** WAFU benefit) and does not require abstraction to achieve yield.

Objective 6: Neutral effect - The operation of this option is not anticipated to impact on water quality.

Objective 7: Neutral effect - The operation of this option is not anticipated to impact on flood risk.

Objective 8: Neutral effect - The operation of this option is not anticipated to impact on air quality. (Smart meters would negate the need for operational travel to read meters).

Objective 9: Neutral effect - This option is anticipated to reduce operational carbon emissions through reduced demand, i.e. reduced greenhouse gas emissions associated with reduced electricity production. **The carbon savings have not been provided.** At this scale it is likely to be within <10t CO_2 saved.

Objective 10: Minor positive effect - The operation of this option could save **3.4** Mld creating small scale resilience to climate change.

Objective 11: Neutral effect - The operation of this option would not affect jobs, economic prospects, or recreational activities.

Objective 12: Neutral effect - The operation of this option is not anticipated to impact on tourism and recreation.

Objective 13: Neutral effect - The operation of this option would not result in any effects on human health and existing recreational facilities and/or tourism.

Objective 14: Neutral effect - This option would result in a minor reduction in demand from the supply network of approx. **3.4 Ml/d.** Below the 5Mld threshold for minor positive.

Objective 15: Neutral effect - The operation of this option is not anticipated to impact on waste and resource use.

Objective16: Neutral effect - The operation of this option is not anticipated to impact on cultural heritage.

Objective 17: Neutral effect - The operation of this option is not anticipated to impact on landscape.

APPENDIX G: PREFERRED PLAN OPTIONS ASSESSMENT MATRICES

WRW Option ID	
Option ID	N/A
Option Name	Leakage Bundle 3
Water company	South Staffordshire Water
Option Description	Leakage bundle involves: **Active Leakage Control (option 073d)**; Better **trunk mains monitoring (option 057)** and **Enhanced customers supply pipeline (option 183)**. Active Leakage Control will increase leakage find **and fix** budget leading to improved monitoring and analysis of leakage data as well as improving leak detection through acoustic loggers. Better trunk mains monitoring focuses on implementing better technology to monitor water quality in the trunk mains in order to help maintain high standards for drinking water as well as help the identification of any issues. Enhanced customers supply pipeline involves enhanced monitoring of customers supply pipeline to provide better control of leakage control measures and enhance resilience of the supply system. Implementation of this bundle of measures is estimated to provide a saving of 12.0 Ml/d.
Yield	12 Ml/d (18.25 Ml/d by 2050)
WRZ	**Company**

Option	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape
Option Name	Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Operation (negative)	?	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Operation (positive)	0	0	0	0	++	0	0	0	+	+	0	0	0	+	0	0	0

Construction

Objective 1: Neutral effect - The construction stage of this option would involve installation of more and better monitoring equipment, acoustic loggers, and analysis. This type of activity is not anticipated to impact on biodiversity.

Objective 2: Neutral effect - The construction of this option is not anticipated to impact on sustainable natural resources.

Objective 3: Neutral effect - The construction of this option is not anticipated to impact on INNS.

Objective 4: Neutral effect - The construction of this option is not anticipated to impact on soils, geodiversity and land use.

Objective 5: Neutral effect - The construction of this option is not anticipated to impact on water quantity.

Objective 6: Neutral effect - The construction of this option is not anticipated to impact on water quality.

Objective 7: Neutral effect - The construction of this option is not anticipated to impact on flood risk.

Objective 8: Neutral effect - **No quantified number** of vehicle movements with to deliver acoustic and other **non-specified** leak monitoring devices to the point of installation. **No information regarding green status of future fleet**.

Objective 9: Neutral effect - The construction of the option would only include embodied carbon from material production of the new devices (loggers etc). **No carbon data is available**, but similar options for other WRW companies with yields ~30Mld determined to be minor negative. This bundle of options may have <50% of those yields and impact. This construction is assumed to have only a small effect on overall greenhouse gas emission levels.

Objective 10: Neutral effect - The construction of this option is not anticipated to impact on climate resilience.

Objective 11: Neutral effect - The construction of this option is not anticipated to impact on the local employment opportunities, the local or regional economy, or on recreational activities. This scale of works expected to be within SSW existing capacity.

Objective 12: Neutral effect - The construction of this option is not anticipated to impact on tourism and recreation.

Objective 13: Neutral effect - The construction of this option is not anticipated to impact on human health and well-being.

Objective 14: Neutral effect - The construction of this option is not anticipated to impact on water resource use.

Objective 15: Neutral effect - The construction of this option would require **small-moderate** quantities of additional materials. No estimate is provided but the devices would maximise use of existing mains supply infrastructure. Similar options for other WRW companies with yields ~30Mld determined to be minor negative. This bundle of options may have <50% of those yields and impact.

Objective16: Neutral effect - The construction of this option is not anticipated to impact on cultural heritage. Installations will be distributed across the zone network - any potential disruption to cultural heritage close by will be very temporary, and small scale.

Objective 17: Neutral effect - The construction of this option is not anticipated to impact on landscape.

Operation

Objective 1: Neutral effect uncertain - The operation of this option involves the 'fix' aspect of find and fix. This would include trunk mains and customer supply pipes as discovered. Trunk main repairs may involve some excavation. Impact on biodiversity is unknown until locations and repair methods are identified.

Objective 2: Neutral effect - The operation of this option is not anticipated to impact on sustainable natural resources.

Objective 3: Neutral effect - The operation of this option is not anticipated to impact on INNS.

Objective 4: Neutral effect - The operation of this option is not anticipated to impact on soils, geodiversity and land use.

Objective 5: Moderate positive effect - The operation of this option would result in a moderate reduction in the demand for water (**12 Ml/d** WAFU benefit) and does not require abstraction to achieve yield.

Objective 6: Neutral effect - The operation of this option is not anticipated to impact on water quality.

Objective 7: Neutral effect - The operation of this option is not anticipated to impact on flood risk.

Objective 8: Neutral effect - The operation of this option is not anticipated to impact on air quality.

Objective 9: Minor positive effect - This option is anticipated to reduce operational carbon emissions by reducing lost Water put Into Supply (WIS), i.e. reduced pumping and treatment waste. Carbon quantities not disclosed but similar options for other WRW companies with yields ~30Mld determined to be moderate positive. This bundle of options may have <50% of those yields and impact. (**assuming that >10t CO2 threshold saved**)

Objective 10: Minor positive effect - The operation of this option could save 12Mld creating small scale resilience to climate change.

Objective 11: Neutral effect - The operation of this option would not significantly affect jobs, economic prospects, or recreational activities. Find and fix activities anticipated to be within existing SSW capacity. Option description does not specifically target major mains renewals.

Objective 12: Neutral effect - The operation of this option is not anticipated to impact on tourism and recreation.

Objective 13: Neutral effect - The operation of this option would not result in any additional effects on human health and existing recreational facilities and/or tourism. Customers would be unaware of the improved resilience in the system.

Objective 14: Minor positive effect - This option would result in a minor reduction in leakage from the supply network of approx. **12Ml/d.**

Objective 15: Neutral effect - The operation of this option is not anticipated to impact on waste and resource use. Waste associated with reduced leakage are considered within Objs 5, 9, and 14, and the construction stage for Obj 15.

Objective16: Neutral effect - The operation of this option is not anticipated to impact on cultural heritage.

Objective 17: Neutral effect - The operation of this option is not anticipated to impact on landscape.

Option Assessment Information	
WRW Option ID	
Option ID	N/A
Option Name	Water Efficiency Bundle
Water company	South Staffordshire Water
Option Description	Water efficiency measures could involve the following: Compulsory **metering (AMR)**; Variable infrastructure **charge**; **Partnership** with retailers for more efficient white goods; **Dual flush toilets** social housing; Household WEFF programme partnering approach home visit; and Non HH water efficiency programme - company led site visit with installation. The Compulsory metering programme (either standard meter, automated meter reading and automated metering infrastructure) will be rolled out across five years in South Staffs supply area. The Household WEFF programme partnering approach **home visit** will involve a home visit by plumber to **install water efficient devices such as low flow showerheads, tap inserts, cistern displacement devices, and dual flush retrofits** where appropriate. The Non HH water efficiency programme - company led site visit with installation will undertake an analysis of business and water use would be undertaken, then depending on business type and volume of water used per annum, a range of options could be promoted.
Yield	33.25Ml/d by 2050
WRZ	**Company**

Option	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well-being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape
Option Name	Construction (negative)	0	0	0	0	0	0	0	?	-/?	0	0	0	0	0	-/?	0	0
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Operation (negative)	0	0	0	0	0	0	0	0	?	0	0	0	0	0	0	0	0
	Operation (positive)	0	0	0	0	++	0	0	0	0	+	0	0	+	+	0	0	0

Construction

Objective 1: Neutral effect - The construction of this option is not anticipated to impact on biodiversity.

Objective 2: Neutral effect - The construction of this option is not anticipated to impact on sustainable natural resources.

Objective 3: Neutral effect - The construction of this option is not anticipated to impact on INNS.

Objective 4: Neutral effect - The construction of this option is not anticipated to impact on soils, geodiversity and land use.

Objective 5: Neutral effect - The construction of this option is not anticipated to impact on water quantity.

Objective 6: Neutral effect - The construction of this option is not anticipated to impact on water quality.

Objective 7: Neutral effect - The construction of this option is not anticipated to impact on flood risk.

Objective 8: Neutral effect uncertain - **No quantified number** of vehicle movements with to deliver home and site visits/installations. **No information regarding green status of future fleet**.

Objective 9: Minor negative effect uncertain - The construction of the option would include embodied carbon from material production of water meters and water efficiency devices (**total carbon not disclosed**). In addition, the option would require an **unspecified** number of vehicle movements to carry out the home/site visits and installations.

Objective 10: Neutral effect - The construction of this option is not anticipated to impact on climate resilience.

Objective 11: Neutral effect - The construction of this option would be involve the installation activities. This would have little impact on jobs/local economic development as is expected to be within existing SSW and partner capacity. Very little if any disruption to regional logistics/economy anticipated.

Objective 12: Neutral effect - The construction of this option is not anticipated to impact on tourism and recreation.

Objective 13: Neutral effect - The construction of this option is not anticipated to impact on human health and well-being. There may be some very minor disturbance during the installation stages.

Objective 14: Neutral effect - The construction of this option is not anticipated to impact on water resource use.

Objective 15: Minor negative effect uncertain - The construction of this option would require **minor** quantities of additional materials (**although no quantities are stated**) to maximise use of existing mains supply infrastructure. Minor rather than neutral assuming uptake of white goods. *This may be reviewed when product specific quantities are calculated.*

Objective16: Neutral effect - The construction of this option is not anticipated to impact on cultural heritage.

Objective 17: Neutral effect - The construction of this option is not anticipated to impact on landscape.

Operation

Objective 1: Neutral effect - The operation of this option is not anticipated to impact on biodiversity.

Objective 2: Neutral effect - The operation of this option is not anticipated to impact on sustainable natural resources.

Objective 3: Neutral effect - The operation of this option is not anticipated to impact on INNS.

Objective 4: Neutral effect - The operation of this option is not anticipated to impact on soils, geodiversity and land use.

Objective 5: Moderate positive effect - The operation of this option would result in a moderate reduction in the demand for water (**9.78** Ml/d WAFU benefit) and does not require abstraction to achieve yield.

Objective 6: Neutral effect - The operation of this option is not anticipated to impact on water quality.

Objective 7: Neutral effect - The operation of this option is not anticipated to impact on flood risk.

Objective 8: Neutral effect - The operation of this option is not anticipated to impact on air quality.

Objective 9: Neutral effect uncertain - This option is anticipated to reduce operational carbon emissions by **an unspecified quantity** through reduced demand, i.e. reduced greenhouse gas emissions associated with reduced electricity production.

Objective 10: Minor positive effect - The operation of this option could save **9.78** Mld creating small scale resilience to climate change.

Objective 11: Neutral effect - The operation of this option would not affect jobs, economic prospects, or recreational activities.

Objective 12: Neutral effect - The operation of this option is not anticipated to impact on tourism and recreation.

Objective 13: Minor positive effect - The operation of this option could result in positive impacts on human health and well-being through access to improved water using products, fixtures, and fittings. It is not expected to impact existing recreational facilities and/or tourism.

Objective 14: Minor positive effect - This option would result in a minor reduction in demand from the supply network of approx. **9.78 Ml/d.**

Objective 15: Neutral effect - The operation of this option is not anticipated to impact on waste and resource use.

Objective16: Neutral effect - The operation of this option is not anticipated to impact on cultural heritage.

Objective 17: Neutral effect - The operation of this option is not anticipated to impact on landscape.

Option Assessment Information	
WRW Option ID	
Option ID	N/A
Option Name	Enhanced Free Optants
Water company	South Staffordshire Water
Option Description	This option promotes installation of an additional 500 free meter optants (standard or automated reading) yearly for 10 years and then a declining number for a further 5 years. This will also influence reducing supply pipe leakage at properties with leakage, and where meters are installed externally. SSW will target an additional 2,600 free meter optants in addition to those included in the baseline forecast each year giving a total of approximately 8,000 optants a year in the early part of the demand forecast. As a result of this, meter penetration will reach 73% by 2039/40 and 77% by 2044/45
Yield	12.01Ml/d by 2037
WfI2	**Company**

Option	Stage	1. Biodiversity	2. Sustainable Natural Resources	3. INNS	4. Soils, Geodiversity and Land Use	5. Water Quantity	6. Water Quality	7. Flood Risk	8. Air Quality	9. Greenhouse Gas Emissions	10. Climate Resilience	11. Economy	12. Tourism and Recreation	13. Human Health and Well being	14. Water Resource Use	15. Waste and Resource Use	16. Cultural Heritage	17. Landscape
Option Name	Construction (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Construction (positive)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Operation (negative)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Operation (positive)	0	0	0	0	+	0	0	0	0	+	0	0	0	0	0	0	0

Construction

Objective 1: Neutral effect - The construction of this option is not anticipated to impact on biodiversity. This option has little to no construction activity except the installation of meters.

Objective 2: Neutral effect - The construction of this option is not anticipated to impact on sustainable natural resources.

Objective 3: Neutral effect - The construction of this option is not anticipated to impact on INNS.

Objective 4: Neutral effect - The construction of this option is not anticipated to impact on soils, geodiversity and land use.

Objective 5: Neutral effect - The construction of this option is not anticipated to impact on water quantity.

Objective 6: Neutral effect - The construction of this option is not anticipated to impact on water quality.

Objective 7: Neutral effect - The construction of this option is not anticipated to impact on flood risk.

Objective 8: Neutral effect - No vehicle movements or associated carbon figures provided. One per installation is 2,600 per annum. **No information regarding green status of future fleet.**

Objective 9: Neutral effect - The total embedded carbon of 26,000 additional water meters (over 10 years) has not been provided. However, this scale is likely to be <10 tonnes.

Objective 10: Neutral effect - The construction of this option is not anticipated to impact on climate resilience.

Objective 11: Neutral effect - The construction of this option is not anticipated to impact on the local employment opportunities, the local or regional economy, or on recreational activities. This scale of works expected to be within SSW existing capacity.

Objective 12: Neutral effect - The construction of this option is not anticipated to impact on tourism and recreation.

Objective 13: Neutral effect - The construction of this option is not anticipated to impact on human health and well-being.

Objective 14: Neutral effect - The construction of this option is not anticipated to impact on water resource use.

Objective 15: Neutral effect - The construction of this option would require materials for additional 26,000 water meters to maximise use of existing mains supply infrastructure. This is within the Neutral threshold.

Objective16: Neutral effect - The construction of this option is not anticipated to impact on cultural heritage.

Objective 17: Neutral effect - The construction of this option is not anticipated to impact on landscape

Operation

Objective 1: Neutral effect - The operation of this option is not anticipated to impact on biodiversity.

Objective 2: Neutral effect - The operation of this option is not anticipated to impact on sustainable natural resources.

Objective 3: Neutral effect - The operation of this option is not anticipated to impact on INNS.

Objective 4: Neutral effect - The operation of this option is not anticipated to impact on soils, geodiversity and land use.

Objective 5: Minor positive effect - The operation of this option would result in a minor reduction in the demand for water (**3.4 Ml/d** WAFU benefit) and does not require abstraction to achieve yield.

Objective 6: Neutral effect - The operation of this option is not anticipated to impact on water quality.

Objective 7: Neutral effect - The operation of this option is not anticipated to impact on flood risk.

Objective 8: Neutral effect - The operation of this option is not anticipated to impact on air quality. (Smart meters would negate the need for operational travel to read meters).

Objective 9: Neutral effect - This option is anticipated to reduce operational carbon emissions through reduced demand, i.e. reduced greenhouse gas emissions associated with reduced electricity production. **The carbon savings have not been provided.** At this scale it is likely to be within <10t CO_2 saved.

Objective 10: Minor positive effect - The operation of this option could save **3.4** Mld creating small scale resilience to climate change.

Objective 11: Neutral effect - The operation of this option would not affect jobs, economic prospects, or recreational activities.

Objective 12: Neutral effect - The operation of this option is not anticipated to impact on tourism and recreation.

Objective 13: Neutral effect - The operation of this option would not result in any effects on human health and existing recreational facilities and/or tourism.

Objective 14: Neutral effect - This option would result in a minor reduction in demand from the supply network of approx. **3.4 Ml/d.** Below the 5Mld threshold for minor positive.

Objective 15: Neutral effect - The operation of this option is not anticipated to impact on waste and resource use.

Objective16: Neutral effect - The operation of this option is not anticipated to impact on cultural heritage.

Objective 17: Neutral effect - The operation of this option is not anticipated to impact on landscape.

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