CAMBRIDGE WATER WATER RESOURCES MANAGEMENT PLAN 2024

Strategic Environmental Assessment

Scoping Report

Report for: Cambridge Water

Ref. WRMP24 Environmental Assessment support

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1. INTRODUCTION

1.1 BACKGROUND AND PURPOSE OF REPORT

Like all water companies in England and Wales, Cambridge Water is required [1] to prepare, maintain and publish a Water Resource Management Plan (WRMP). A WRMP sets out the strategy for water resource and demand management to ensure supplies of safe, clean drinking water are maintained to customers throughout the relevant company's region in a way that is economically, socially, and environmentally sustainable. WRMPs are reviewed on a rolling five-year basis; Cambridge Water published their most recent WRMP (WRMP19) in December 2019. The next cycle of WRMPs (WRMP24) cover the period 2025 to 2050 and beyond. Cambridge Water is now reviewing and updating their draft WRMP24 for consultation in autumn 2022.

Cambridge Water forms part of the Water Resources East (WRE)[1] regional group and is one of five regional water resources groups in England and Wales working under the National Framework for Water Resources (the 'National Framework')[2]. Each regional group brings together the water companies operating in that region with key water users, stakeholders and environmental regulators including the Environment Agency. This enables greater co-ordination and alignment of water resources planning for WRMP and regional plan development. The other water companies that form WRE alongside Cambridge Water are Affinity Water, Anglian Water, Essex & Suffolk Water and Severn Trent Water.

In addition, Cambridge Water are merged with South Staffs Water. South Staffs Water are one of five water companies[3] that make up the Water Resource West (WRW) regional group. As such, there is also the requirement for the Cambridge Water WRMP to align with that of South Staffs Water and the WRW regional plan.

SEA is a statutory requirement under the Environmental Assessment of Plans and Programmes Regulations 2004 ('the SEA Regulations') requiring the assessment of effects of certain plans and programmes on the environment. The SEA Regulations apply to a wide range of public plans and programmes including WRMPs. SEA in relation to Cambridge Water's WRMP is explained further in Section 1.2 below.

This Scoping Report sets out the approach to the Strategic Environmental Assessment (SEA) of the Cambridge Water 2024 Water Resource Management Plan (WRMP). The WRMP will set out Cambridge Water's long-term strategy for maintaining reliable and resilient water supplies to its customers.

1.2 STRATEGIC ENVIRONMENTAL ASSESSMENT

SEA is a statutory requirement under the SEA Regulations[4]. SEA became a statutory requirement following the adoption of Directive 2001/42/EC (the SEA Directive). SEA assesses the effects of certain plans and programmes on the environment. This was transposed into legislation on 20 July 2004 as Statutory Instrument 2004 No.1633 - The Environmental Assessment of Plans and Programmes Regulations 2004. From December 31 2020, following the exit of the UK from the European Union, the SEA Directive no longer applies and the SEA Regulations are now the principal legal basis for the SEA.

The objective of SEA is:

> *" to provide a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans with a view to promoting sustainable development."*

As a water company Cambridge Water is required to determine whether the WRMP falls within the scope of the SEA Regulations and whether an SEA must be undertaken. The purposes of the SEA of the WRMP are to:

- identify the potentially significant environmental effects of the WRMP in terms of the water resources management options being considered by Cambridge Water;

[1] https://wre.org.uk/

[2] https://www.gov.uk/government/publications/meeting-our-future-water-needs-a-national-framework-for-water-resources

[3] Along with Severn Trent Water, United Utilities Water, Dŵr Cymru Welsh Water and Hafren Dyfrdwy

[4] The Environmental Assessment of Plans and Programmes Regulations 2004 (Statutory Instrument 2004 no. 1633) apply to any plan or programme which related solely or in part of England.

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

1.3 REQUIREMENTS FOR THE SEA OF CAMBRIDGE WATER'S WATER RESOURCE MANAGEMENT PLAN

The UK Government has produced generic SEA guidance[5] that sets out the stages of the SEA process. This, along with specific guidance for undertaking SEA and Habitats Regulations Assessment (HRA) of WRMPs[6], is being used to inform the SEA of Cambridge Water's WRMP. The 2021 Final Water Resources Planning Guideline[7] (WRPG) also provides guidance on the role of SEA within the water resources management planning process. This includes supplementary guidelines on Best Value Planning and Environment and Social Decision Making, which contains a number of requirements and recommendations for the scope of WRMP environmental assessment, in particular in relation to SEA, Biodiversity Net Gain (BNG) and Natural Capital Assessment (NCA).

As stated in the WRPG, water companies need to demonstrate that they have investigated whether a SEA is required. As responsible authorities under the SEA Regulations, water companies must themselves determine if its WRMP falls within the scope of the SEA Regulations.

UK Water Industry Research (UKWIR) have developed a number of methodologies which support the WRPG. This includes an updated guidance document for SEA, HRA, and the new guidance for Water Framework Directive (WFD) assessment and NCA for strategic water resource plans and drought plans[8]. The guidance has recently been updated for WRMP24 and regional plans to account for recent developments in regulatory guidance, new legislation and current best practice methods.

The UKWIR Guidance, from which Figure 1.1 is adapted, provides directions as to how the requirement for SEA should be determined for WRMPs. The boxes and arrows highlighted in green on Figure 1.1 describe the provisions and route through the flow chart applicable to Cambridge Water's WRMP and demonstrate that the WRMP falls within the scope of the SEA Regulations. Notably, it is likely that the WRMP will include schemes that will require Environmental Impact Assessment (EIA) (Box 3 Figure 1.1).

In October 2020, the group of water companies involved in developing Strategic Regional Water Resource Options (SROs) in the RAPID gateway process (known as the All Company Working Group - ACWG), published guidance[9] for environmental assessment methods for SROs which is aligned to the WRPG to increase the consistency of environmental assessment. This is supplemented with the ACWG Strategic Environmental Assessment: Core Objective Identification report (October 2020) which identifies appropriate SEA objectives following a review of water company approaches to SEA. The SEA approach objectives and indicator questions in this scoping report have been developed taking into account the ACWG SEA objectives.

Ricardo Energy and Environment has been commissioned by Cambridge Water to undertake the SEA of their WRMP24. The SEA will assess likely significant environmental effects of the WRMP and will develop ways in which any adverse effects identified can be avoided, minimised or mitigated.

1.4 SEA AND WATER RESOURCE MANAGEMENT PLANNING

In the context of water resource management planning, SEA can assist in the identification of the likely significant environmental effects (adverse and beneficial) of the options available to ensure long-term resilient

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

[6] UKWIR (2012) Strategic Environmental Assessment and Habitats Regulations Assessment - Guidance for Water Resources Management Plans and Drought Plans.

[7] Environment Agency and Natural Resources Wales (2021) Final Water Resources Planning Guideline.

[8] UKWIR (2021) Environmental Assessment Guidance for Water Resources Management Plans and Drought Plans. Report Ref 21/WR/02/15.

9 Mott MacDonald Limited (2020). All Companies Working Group WRMP environmental assessment guidance and applicability with SROs. Published October 2020

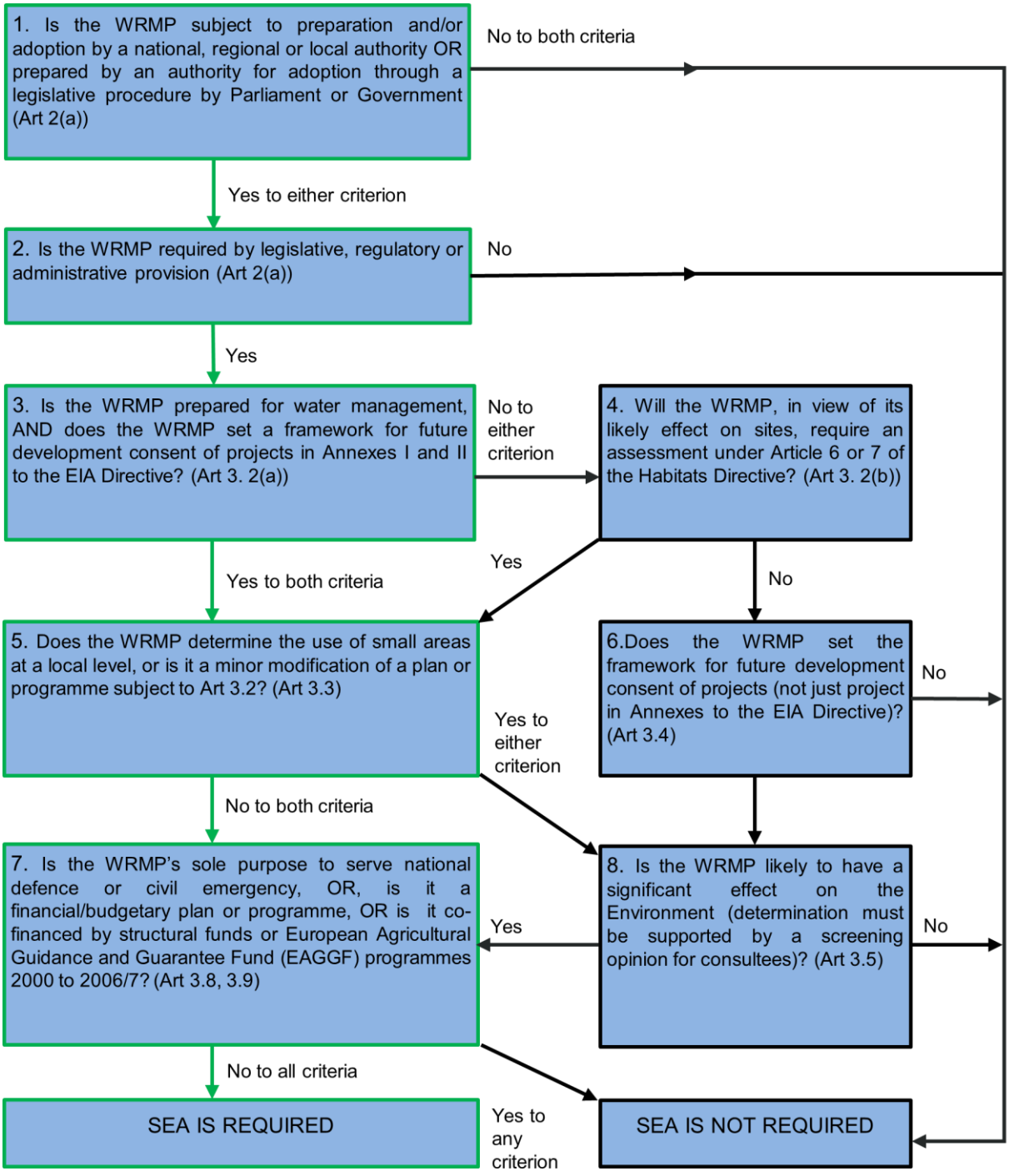
water supplies to Cambridge Water's customers. Knowledge of these effects can help to identify a preferred programme of options for a single Water Resource Zone (WRZ)[10] that makes up Cambridge Water's supply area to ensure a balance is maintained between available water supplies and demand for water.

The SEA informs the consideration of each option and the programme appraisal process, as well as development of the overall WRMP. The SEA can identify cumulative effects between different environmental and social aspects of a particular option, plan or programme, as well as between alternative options and programmes. SEA also helps identify potential cumulative effects of the WRMP with other plans, programmes and projects. Additionally, it facilitates consultation and complements consideration of Habitats Regulations[11] and WFD implications for the WRMP. The WRMP option appraisal will also integrate NCA and a description of the key linkages to the SEA process is included in this Scoping Report.

[10] UK Water Industry Research/Environment Agency define a WRZ as: 'The largest possible zone in which all resources, including external transfers, can be shared, and hence, the zone in which all customers will experience the same risk of supply failure from a resource shortfall.'

[11] The Conservation of Habitats and Species Regulations 2010 (as amended)

Figure 1.1 SEA Requirement of Cambridge Water's WRMP



1.5 SEA APPROACH

SEA incorporates the following generic stages:

- Stage A: Setting the context, identifying objectives, problems and opportunities, and establishing the baseline (scoping)
- Stage B: Developing and refining options and assessing effects (impact assessment)
- Stage C: Preparing the Environmental Report (recording results)
- Stage D: Consulting on the Draft Plan and the Environmental Report (seeking consensus)
- Stage E: Monitoring the significant effects of the plan or programme on the environment (verification)

Table 1.1 is an extract from the ODPM Practical Guide[12] (the 'SEA Practical Guide') that sets out the main stages of the SEA process and the purpose of each task within the process. This Scoping Report represents Stage A: Tasks A1-A4 of the SEA process. Specific guidance on the application of the SEA process to WRMPs is provided by UKWIR[13].

Table 1.1 SEA Stages and Tasks

SEA Stages and Tasks	Purpose
Stage A: Setting the context and objectives, establishing the baseline and deciding on the scope	
Task A1. Identifying other relevant plans, programmes and environmental protection objectives	To establish how the plan or programme is affected by outside factors to suggest ideas for how any constraints can be addressed, and to help identify SEA objectives.
Task A2. Collecting baseline information	To provide an evidence base for environmental problems, prediction of effects, and monitoring; to help in the development of SEA objectives.
Task A3. Identifying environmental problems	To help focus the SEA and streamline the subsequent stages, including baseline information analysis, setting of the SEA objectives, prediction of effects and monitoring.
Task A4. Developing SEA Objectives	To provide a means by which the environmental performance of the plan or programme and alternatives can be assessed.
Task A5. Consulting on the scope of the SEA	To ensure the SEA covers the likely significant environmental effects of the plan or programme.
Stage B: Developing and refining alternatives and assessing effects	
Task B1. Testing the plan or programme objectives against SEA objectives	To identify potential synergies or inconsistencies between the objectives of the plan or programme and the SEA objectives and help in developing alternatives.
Task B2. Developing strategic alternatives	To develop and refine strategic alternatives.
Task B3. Predicting the effects of the plan or programme, including alternatives	To predict the significant environmental effects of the plan or programme and its alternatives.
Task B4. Evaluating the effects of the plan or programme, including alternatives	To evaluate the predicted effects of the plan or programme and its alternatives and assist in the refinement of the plan or programme.
Task B5. Mitigating adverse effects	To ensure that adverse effects are identified, and potential mitigation measures are considered.
Task B6. Proposing measures to monitor the environmental effects of plan or programme implementation	To detail the means by which the environmental performance of the plan or programme can be assessed.
Stage C: Preparing the Environmental Report	
Task C1. Preparing the environmental report	To present the predicted environmental effects of the plan or programme, including alternatives, in a form

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

[13] UKWIR (2021) Environmental Assessment Guidance for Water Resources Management Plans and Drought Plans. Report Ref 21/WR/02/15.

SEA Stages and Tasks	Purpose
	suitable for public consultation and use by decision-makers.
Stage D: Consulting on the Draft Plan or programme and the Environmental Report	
Task D1. Consulting the public and consultation bodies on the draft plan or programme and the Environmental Report	To give the public and the consultation bodies an opportunity to express their opinions on the findings of the Environmental Report and to use it as a reference point in commenting on the plan or programme. To gather more information through the opinions and concerns of the public
Task D2. Assessing significant changes	To ensure that the environmental implications of any significant changes to the draft plan or programme at this stage are assessed and taken into account.
Task D3. Making decisions and providing information	To provide information on how the Environmental Report and consultees opinions were taken into account in deciding the final form of the plan or programme to be adopted.
Stage E: Monitoring the significant effects of the plan or programme on the environment	
Task E1. Developing aims and methods for monitoring	To track the environmental effects of the plan or programme to show whether they are as predicted; to help identify adverse effects.
Task E2. Responding to adverse effects	To prepare for appropriate responses where adverse effects are identified.

1.6 REGIONAL PLANNING

Water Resources East (WRE)[14] is one of five water resources groups working under the National Framework for Water Resources (the 'National Framework')[15]. WRE is designed to oversee water resources planning for the East of England. It is formed of the water providers Anglian Water, Essex and Suffolk Water, Cambridge Water, Severn Trent Water and Affinity Water with input also from the Environment Agency.

WRE has published a seven-part strategy[16] for the region which seeks to:

- Work with all water users in Eastern England to become as water efficient as they can be.
- Retain and store more water in the landscape of the region.
- Move water into and around the region, from areas of surplus to areas of deficit.
- Link land and water management more effectively, increasing resilience and restoring and enhancing natural systems.
- Understand where abstraction is having a detrimental impact on the environment, and develop options which restore and enhance it whilst ensuring sustainable economic development.
- Explore alternative sources of water, including desalinisation and water re-use.
- Contribute to low carbon strategies and plans to meet a net zero ambition.

The Regional Plan environmental assessment methodologies are being developed alongside those of the individual companies WRMPs. As South Staffs Water incorporates Cambridge Water, to ensure consistency across the approaches and allow integration of outcomes, the proposed methodology for Cambridge Water will closely follow that provided in the Water Resources West (WRW) and South Staffs Water Strategic

[14] https://wre.org.uk/

[15] https://www.gov.uk/government/publications/meeting-our-future-water-needs-a-national-framework-for-water-resources

[16] WRE (2022) Our Strategy https://wre.org.uk/about-us/#our-strategy

Environmental Assessment Scoping Report which has been previously agreed with the statutory consultees (Natural England, Environment Agency and Historic England). As the methodology used for the Cambridge Water WRMP and other WRE assessments follow ACWG methodology this will facilitate integration across assessments.

1.7 CONSULTATION

SEA regulations state that the statutory bodies to be consulted on the SEA (including the Scoping Report) in England are the Environment Agency, Natural England and Historic England. Cambridge Water has also made the Scoping Report available to stakeholders and the public for comment via its website.

There will be two key opportunities for SEA consultation: firstly at this Scoping Stage and secondly on publication of the Environmental Report that will accompany the draft WRMP24.

Consultees are invited to express their views on the scope of the SEA as set out in this Scoping Report. A consultation period of five weeks has been provided in line with SEA Regulation 12(6). The Scoping Report has been made available on Cambridge Water's website so that the statutory bodies and any members of the public may provide comments on it within the consultation timescale.

The Environmental Report will be produced according to the scope and approach agreed through consultation on the Scoping Report. The Environmental Report will document the assessed environmental effects of the alternative options and programmes considered for the WRMP. The statutory consultation bodies, as well as stakeholders and the public, will be invited to express their views on the Environmental Report and will have the opportunity to use it as a reference point in expressing their views on Cambridge Water's draft WRMP.

On adoption of the final WRMP, following approval by the Secretary of State, Cambridge Water will publish an SEA Statement setting out how the SEA and any views expressed by the consultation bodies or the public have influenced the WRMP. The SEA Statement will also set out the monitoring that will be required during implementation of the plan to assess any significant effects of the plan on the environment (Stage E of the SEA process).

1.7.1 Consultation on the Scoping Report

The consultation period for this Scoping Report will run from 22 April 2022 to 29 May 2022. Comments can be submitted by email to WRMP.consultationCAM@south-staffs-water.co.ukmailto:

Cambridge Water will review comments received and publish a report setting out its response to the comments and how the approach to the SEA has changed in response to the comments received.

1.8 STRUCTURE OF THE SCOPING REPORT

This Scoping Report documents the activities required under Stage A of the SEA process as described in Section 1.5. It has been prepared to facilitate consultation and agreement on the scope and approach of the SEA of Cambridge Water's WRMP. The Scoping Report is structured as follows:

- **Section 1** – Introduction (this section) – describes the requirement for, purpose and process of the SEA, and its context in relation to the WRMP.
- **Section 2** – Cambridge Water Supply System and Water Resources Management Planning; describes how Cambridge Water develops its plan to provide reliable and resilient water supplies to its customers over the long-term planning horizon.
- **Section 3** – Policy Context; identifies key messages and environmental protection and social objectives from other relevant plans and programmes.
- **Section 4** – Environmental Baseline Review; draws out the key environmental issues that Cambridge Water intends to consider in the SEA. Identifies the current and future baseline conditions within the area of potential influence of the WRMP.
- **Section 5** – Proposed SEA Objectives and Assessment Framework; develops the objectives to form the basis of the assessment, and introduces the assessment approach and framework to consider the environmental effects of the WRMP.
- **Section 6** – Integrating WRMP Associated Environmental Assessments; explains how the other environmental assessment associated with the WRMP will be integrated into the SEA.

- **Section 7** – Use of SEA in Options and Programme Appraisal; explains how the outputs of the SEA will be integrated into the development of the WRMP.
- **Section 8** – Next Steps; sets out the next stages and tasks in undertaking the SEA, and presents a proposed structure for the Environmental Report.

2. CAMBRIDGE WATER SUPPLY SYSTEM AND WATER RESOURCES MANAGEMENT PLANNING

2.1 INTRODUCTION

This section provides an overview of the water resources management planning process, the Cambridge Water supply system and Cambridge Water's WRMP. Section 2.2 and Figure 2.1 provide an overview of the Cambridge Water supply area.

Water Resources Management Planning is undertaken by all water companies in England in order to ensure reliable, resilient water supplies over the long-term planning horizon (at least 25 years). The process includes 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 seek to identify the preferred, 'best value' programme of demand management and water supply options to maintain a balance between reliable supply and demand in each WRZ and for their supply area as whole (the WRMP).

Water companies in England and Wales have a statutory requirement to prepare a WRMP every five years; the next WRMP must be submitted in draft to the Secretary of State by October 2022. The WRMP also informs the regulatory water company business planning 'Periodic Review' process through which the Water Services Regulation Authority (Ofwat) sets the price that water companies can charge its customers for water (and wastewater) services. The next Periodic Review will be in 2024 ('PR24').

Engagement with government, regulators, other licensed water suppliers and water companies, customers and a wide range of stakeholders is key to the WRMP process. Cambridge Water's WRMP consultation programme has already commenced and pre-consultation information is available to view on Cambridge Water's website at https://www.cambridge-water.co.uk/about-us/our-strategies-and-plans/our-water-resources-management-plan. Consultation will continue over the next two years as the WRMP continues to be developed. It is anticipated that the draft WRMP will be published for formal public consultation in November 2022, accompanied by the SEA Environmental Report.

Following comments on the draft WRMP and SEA Environmental Report, a Statement of Response will be prepared by Cambridge Water setting out how it intends to take account of the comments in finalising the WRMP for submission to the Secretary of State.

In developing its WRMP24, Cambridge Water will examine the supply/demand balance for a single WRZ and determine how any deficits between forecast demand and reliable water supplies should be addressed for the selected planning period.

The planning process will consider key issues which affect future water supply reliability and demand for water, such as:

- population and housing growth
- water consumption behaviour and how these may change in the future
- climate change implications for reliability of water supplies
- reductions to the availability of water supplies due to environmental impact of existing water source abstractions ('sustainability reductions')
- raw water quality deterioration due to land use and/or climate change

A wide range of alternative options will be considered by Cambridge Water to address any forecast supply shortfalls, including:

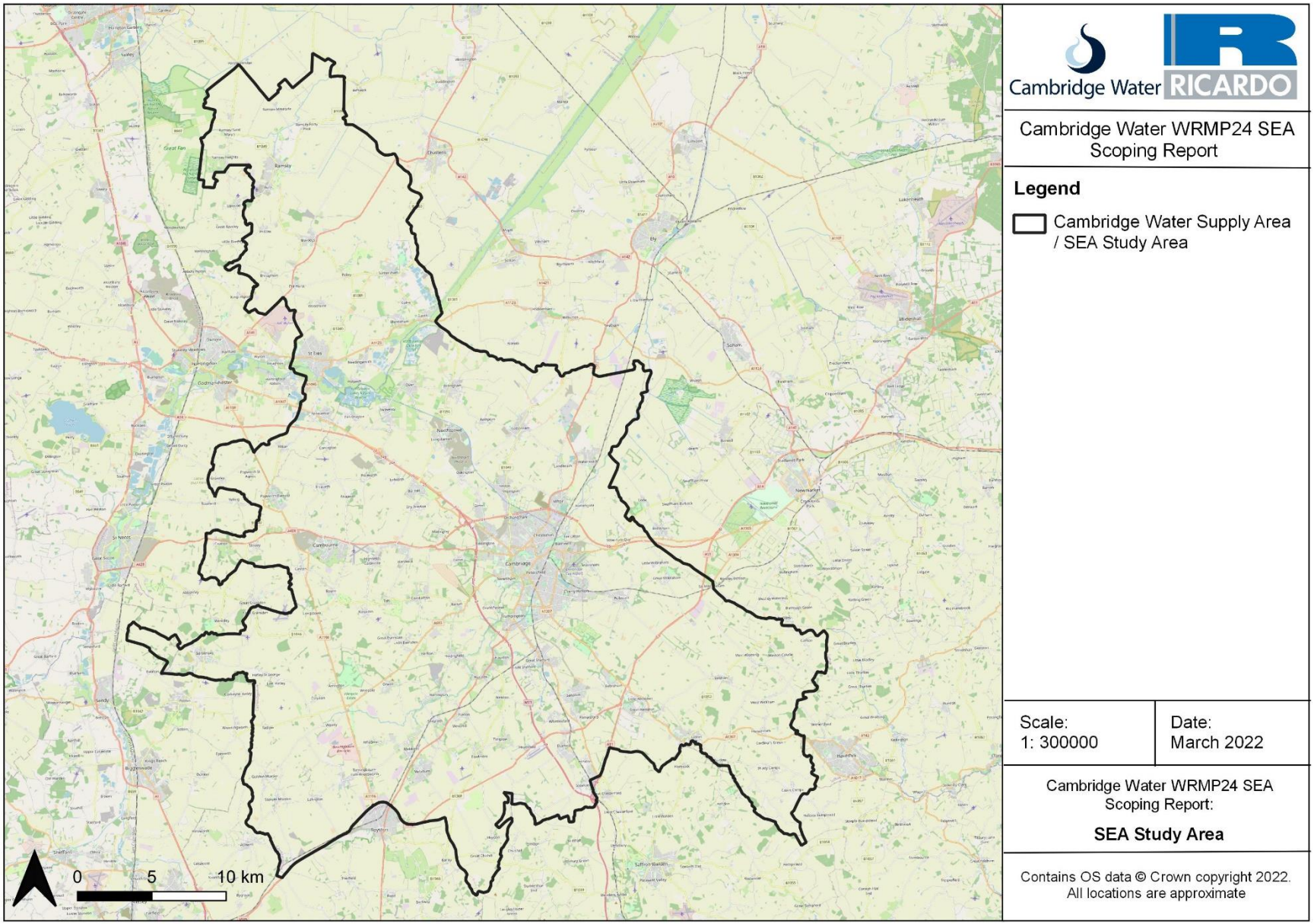
- promotion of water efficiency measures
- reducing water leakage from the water supply network or at customers' properties
- water transfers from other water companies or other owners of water sources
- water reuse
- changes to river or groundwater abstraction
- increased transfer of water within a single WRZ to improve connectivity around the whole system

- Investment in and transfers from a regional strategic resource option (SRO), most likely a winter storage reservoir.

Each of these options is assessed to understand the costs, the benefits to the supply-demand balance, the effect on carbon emissions and the environmental effects (through the SEA process and associated HRA, WFD NCA, Biodiversity Net Gain (BNG) and Invasive Non-Native Species (INNS) assessments). The options are subsequently compared through a comprehensive programme appraisal process to determine the 'best value' programme of measures to maintain a supply-demand balance over the planning period for the single WRZ. Decisions on the best value programme will take account of a range of factors, such as the implications for water bills, the resilience to future risks and uncertainties (such as climate change), deliverability considerations and the environmental and social effects of the programme (adverse and beneficial, as informed by the SEA).

Section 7 of this Scoping Report explains in more detail how the SEA will actively inform the WRMP process.

Figure 2.1 Cambridge Water SEA study area



2.2 CAMBRIDGE WATER'S SUPPLY SYSTEM AND WATER RESOURCES

Cambridge Water provides high quality water to approximately 351,000 customers over an area of 1,173 km^2 which includes Cambridge city and extends to Ramsey and St Ives in the north, Balsham in the East, Gamlingay in the West and Melbourn in the South. Water is supplied through 2,300 km of water mains fed by ground water abstraction from underground aquifers. In total, 97% of the water available for supply by Cambridge Water comes from boreholes drilled into the chalk strata to the south and east of Cambridge, and from a single wellfield in the Thetford area. The remaining 3% comes from a greensand source to the west of the area which can supply the more local area and surrounding villages. Water supplies are both pumped directly into supply following treatment or are distributed through a system of service reservoirs with sufficient capacity to manage short term peaks in demand.

Cambridge Water is beginning the process of developing its WRMP and it expects to publish and consult on the draft plan in November 2022. There are several future key challenges faced by Cambridge Water in providing reliable and secure water supplies to its customers. These include considerable projected housing growth and increasing population in some areas, the potential effects of climate change, and water availability challenges in the east of England due to the chalk stream issues.

As a result of these various pressures, actions are likely to be required by Cambridge Water to maintain sustainable and secure water supplies to customers. These actions could include measures to reduce the demand for water and/or develop additional water supply availability. A wide range of demand and supply measures will be considered initially, which will then be narrowed down to a smaller number of options for more detailed evaluation.

2.2.1 Area under consideration for the SEA

For water resource planning purposes, Cambridge Water's supply area is managed under one WRZ (Figure 2.1. For the SEA purposes, the assessment area (Figure 2.1) includes the Cambridge Water supply area and the wider surrounding area, where there are either existing or proposed sources of water for the company (such as the groundwater sources in the Thetford area).

Should options be included in the WRMP for water transfer from outside the Cambridge Water supply area then the Environmental Report will include discussion of relevant information pertaining to these options as appropriate.

2.2.2 Temporal scope of the SEA

The temporal scope of the WRMP must cover a minimum statutory planning period of 25 years. However, as the statutory process requires WRMPs to be produced every five years, the schemes and programmes for balancing supply and demand for water will be reviewed again and subject to SEA in 2028-29.

3. POLICY CONTEXT

3.1 INTRODUCTION

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)),

Identifying other relevant plans, programmes, and environmental protection objectives, is one of the first steps in undertaking SEA, forming part of Stage A of the SEA process. The review identifies how Cambridge Water's WRMP might be influenced by other plans, policies, programmes and other environmental protection objectives which Cambridge Water should consider in developing its WRMP. This information helps to identify and inform the objectives for the SEA process.

A review of relevant plans, policies and programmes is presented in Appendix A. A summary of key messages derived from the review is presented in Table 3.1. Relevant plans, policies and programmes have been identified from international, national, regional and local levels. Plans that have no likely interaction with the WRMP (i.e., where they are unlikely to influence the plan, or be influenced by it), were not included in the review.

Table 3.1 Key Policy Messages derived from the Review of Plans and Programmes

SEA Topic	Key Messages	Plans, Programmes and Strategies
Biodiversity, flora and fauna	Conservation and enhancement of the natural environment and of biodiversity, particularly internationally and nationally designated sites, whilst taking into account future climate change and ability to adapt. To achieve favourable condition for priority habitats and species. Avoidance of activities likely to cause irreversible damage to natural heritage. Support well-functioning ecosystems, respect environmental limits and capacities, and maintain/enhance coherent ecological networks, including provision for fish passage and connectivity for migratory/mobile species. Strengthen the connections between people and nature and realise the value of biodiversity. Ecosystem services from natural capital contributes to the economy and therefore should be protected and, where possible, enhanced. Avoidance of activities likely to cause the spread of Invasive Non-Native species (INNS). Incorporating Biodiversity Net Gain (BNG) into development projects.	**International:** European Commission, Birds Directive (2009/147/EC) European Commission, Fresh Water Fish Directive (2006/44/EC) European Commission, 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, The Water Framework Directive (2000/60/EC) European Commission, Habitats Directive (1992/43/EEC) European Commission, The EU Biodiversity Strategy to 2020 European Commission Blueprint to Safeguard Europe's Water Resources Ramsar Convention, The Convention on Wetlands of International Importance (1971) The Bonn Convention on the Conservation of Migratory Species of Wild Animals (1983) The Bern Convention on the Conservation of European Wildlife and Natural Habitats (1979) United Nations (1992) Convention on Biological Diversity (CBD) European Commission, SEA Directive (2001/42/EC) European Commission, (2020) The 8th Environmental Action Programme to 2030 **National:** HM Government (2018) A Green Future: Our 25 Year Plan to Improve the Environment – Priority Outcome 1 (PO1): Environment Conservation of Habitats and Species Regulations 2010 Conservation of Habitats and Species Regulations 2010 (as amended by the Conservation of Habitats and Species (Amendment) Regulations 2017) Ministry of Housing, Communities and Local Government (2019) National Policy Planning Framework Defra (2011) Water for Life - Water White Paper Defra (2011) The Natural Choice: Securing the value of nature. The Natural Environment White Paper Defra (2011) Biodiversity 2020: A Strategy for England's Wildlife and Ecosystem Services 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 (2020) Enabling a Natural Capital Approach (ENCA) Defra (2015) The Great Britain Invasive Non-native Species Strategy Defra (2008), England Biodiversity Strategy –climate change adaptation principles Environment Agency (undated) Hydroecology: Integration for modern regulation Environment Agency (undated) WFD River Basin Characterisation Project Environment Agency CAMS (various dates for relevant water catchments) Natural England's standing advice on protected species. Natural Environment and Rural Communities Act 2006 Salmon and Freshwater Fisheries Act 1975 The Countryside and Rights of Way (CRoW) Act 2000 Environmental Protection Act 1990 The Environmental Damage (Prevention and Remediation) (England) Regulations 2015 The Eels (England and Wales) Regulations 2009 (as amended) Wildlife and Countryside Act 1981 (as amended) HM Government (2021) Environment Act 2021 The Water Environment (Water Framework Directive) Regulations (England and Wales) 2017 **Regional/Local:** Cambridge City Council (2021) Biodiversity Strategy 2021-2030 Peterborough City Council (2018) Biodiversity Strategy Cambridge and Peterborough City Council's Local Priority Species List Environment Agency and Defra (2015) Humber River Basin District River Basin Management Plan Environment Agency and Defra (2015) Anglian River Basin District River Basin Management Plan Natural England (2014) Site Improvement Plans (SIPs) for Natura 2000 Sites Natural England National Character Area (NCA) Profiles The Wildlife Trust for Bedfordshire, Cambridgeshire, Northamptonshire & Peterborough (2006) Cambridge City Nature Conservation Strategy "Enhancing Biodiversity" South Cambridgeshire District Council (2009) Local Development Framework: Biodiversity Supplementary Planning Document Cambridgeshire Together (2007) Cambridgeshire Vision: Countywide Sustainable Community Strategy: 2007 – 2021 Cambridge City Council (2018) Cambridge Local Plan 2018 East Cambridgeshire District Council (2015) East Cambridgeshire Local Plan 2015 Cambridge City Council (2011) Cambridgeshire green infrastructure strategy

SEA Topic	Key Messages	Plans, Programmes and Strategies
		Cambridge City Council (2015) Environment Policy Statement
Soils, Land Use and Geology	Protect and enhance the quality and diversity of geology (including designated sites) and soils including geomorphology and geomorphological processes. Ensure that soils will be protected and managed to optimise the varied ecosystem service functions that soils perform for society (e.g. supporting agriculture and forestry, protecting cultural heritage, carbon sequestration, supporting biodiversity, as a platform for construction), in keeping with the principles of sustainable development. Promote catchment-wide approach to land management by relevant stakeholders, in order to benefit natural resources, reduce pollution and develop resilience to climate change. Promote mixed-use developments, and encourage multiple benefits from the use of land in urban and rural areas, recognising that some open land can perform many functions. 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.	**International:** Council of Europe (2003) European Soils Charter European Commission (2006) Thematic Strategy for Soil Protection European Commission, SEA Directive (2001/42/EC) European Commission, (2020) The 8th Environmental Action Programme to 2030 **National:** The Countryside and Rights of Way (CRoW) Act 2000 HM Government (2018) A Green Future: Our 25 Year Plan to Improve the Environment Defra (2009) Safeguarding our Soils – A Strategy for England Ministry of Housing, Communities and Local Government (2019) National Planning Policy Framework Defra (2004) Rural Strategy 2004 Environmental Protection Act (1990) Wildlife and Countryside Act 1981 (as amended) **Regional/local:** Natural England - National Character Area (NCA) profiles (various) Environment Agency and Defra (2015) Anglian River Basin District, River Basin Management Plan Cambridgeshire Together (2007) Cambridgeshire Vision: Countywide Sustainable Community Strategy: 2007 – 2021 Cambridge City Council (2018) Cambridge Local Plan East Cambridgeshire District Council (2015) East Cambridgeshire Local Plan 2015 Cambridge City Council (2011) Cambridgeshire green infrastructure strategy Cambridge City Council (2015) Environment Policy Statement
Water	Protection and enhancement of all water supplies and resources. Promoting the sustainable and efficient use of water, including a sustained reduction in water consumption, to meet society's needs and offer opportunities for green growth whilst protecting and enhancing the natural environment. Reduce flood risk to people, residential and non-residential properties, community facilities and key	**International:** European Commission Floods Directive (2007/60/EC) European Commission, The Water Framework Directive (2000/60/EC) European Commission Drinking Water Directive (1998/83/EC) (amended 2015) European Commission Environmental Liability Directive (2004/35/EC) European Commission, The Groundwater Directive (2006/118/EC) European Commission Revised Bathing Water Quality Directive (76/160/EEC)

SEA Topic	Key Messages	Plans, Programmes and Strategies
	transport links, as well as designated nature conservation sites and heritage assets and landscapes of value. Maintain and, where possible, improve water quality in both surface waters and groundwater. Improve the quality of the water environment and the ecology which it supports, and continue to provide high levels of drinking water quality. Ensure appropriate management of abstractions and protect flow and level variability across the full range of regimes from low to high conditions. Prevent deterioration of waterbody status and contribute to achievement of WFD Good Status. Develop a resilient and flexible water management approach to cope with changing climate, population and economic conditions. Balance the abstraction of water for supply with the other functions and services the water environment performs or provides. Steer new development to areas with the lowest probability of flooding and manage any residual flood risk, taking account of the impacts of climate change. Ensure a sustainable balance between the supply and demand for water. Support achievement of River Basin Management Plan objectives.	European Commission Urban Waste Water Treatment Directive (91/271/EEC) European Commission Nitrates Directive (91/676/EEC) European Commission, SEA Directive (2001/42/EC) European Commission, (2020) The 8th Environmental Action Programme to 2030 **National:** Ministry of Housing, Communities and Local Government (2019) National Planning Policy Framework Defra (2005) Making Space for Water HM Government (2013) The Bathing Water Regulations 2013 HM Government (2021) Environment Act 2021 HM Government (2016) The Groundwater (Water Framework Directive) (England) Direction 2016 HM Government (2018) A Green Future: Our 25 Year Plan to Improve the Environment Defra (2011) Water for Life - Water White Paper Defra (2011) The Natural Choice: Securing the value of nature. The Natural Environment White Paper Defra (2011) Future Water: The Government's water strategy for England Environment Agency (2020) Meeting our future water needs: a national framework for water resources Defra and Welsh Government (2014) River Basin Planning Guidance 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, OfWAT and Natural Resources Wales (2020) Water Resources Planning Guideline Draft for consultation – July 2020, and Technical Supplementary Guidance Environment Agency (2010) Water Resources Action Plan for England and Wales Environment Agency (2009) Water Resources Strategy for England and Wales Environment Agency (2013) Managing Water Abstraction Flood and Water Management Act (2010) The Water Act (2003) The Water Environment (Water Framework Directive) Regulations (England and Wales) 2017 UKTAG WFD Guidance Documents (various dates) Water Resources Act (1991) (as amended) Environmental Protection Act 1990 Canal & River Trust (2015) Living Waterways Transform Places & Enrich Lives: Our 10 Year Strategy Canal and River Trust (2015) Water Resources Strategy 2015 – 2020

SEA Topic	Key Messages	Plans, Programmes and Strategies
		Regional/Local: Environment Agency (2015) River Basin District River Basin Management Plans (Various) Environment Agency and Defra (2015) Anglian River Basin District, River Basin Management Plan Environment Agency CAMS (various dates for relevant catchments) Environment Agency Catchment Flood Management Plans (various) Environment Agency (2011) Water Resources Strategy – A Regional Action Plan for Thames Region. Water companies WRMPs 2019 (various) including Cambridge Water (2019) Final WRMP Water companies 2014 Business Plan submissions to Ofwat (various) Water companies Drought Plans (various) including Cambridge Water (2018) Final Drought Plan Cambridgeshire County Council (2021) Cambridgeshire Local Flood Risk Management Strategy 2021-2027 Cambridgeshire Flood Risk Management Partnership (2014) Cambridgeshire Surface Water Management Plan, and detailed sub-plans Cambridgeshire County Council (2016) Cambridgeshire Flood and Water Supplementary Planning Document Cambridgeshire Together (2007) Cambridgeshire Vision: Countywide Sustainable Community Strategy: 2007 – 2021 Cambridge City Council (2018) Cambridge Local Plan East Cambridgeshire District Council (2015) East Cambridgeshire Local Plan 2015 Cambridge City Council (2011) Cambridgeshire green infrastructure strategy Cambridge City Council (2015) Environment Policy Statement
Air Quality and Climatic Factors	Ensuring air quality is maintained or enhanced and that emissions of air pollutants are kept to a minimum. Minimising emissions of greenhouse gases that cause climate change and contribute to national net zero targets. Minimising the effects of climate change on natural resources, the population and the economy. Reduce the effects of air pollution on ecosystems. Sustain compliance with and contribute towards national objectives for pollutants, taking into account the presence of Air Quality Management	**International:** United Nations (1992) Framework Convention on Climate Change (UNFCCC) – as updated, including The Paris Agreement (2016), The Cancun Agreement (2011) and Kyoto Agreement (1997) European Commission (2008) Ambient Air Quality Directive (2008/50/EC) European Commission (2009) Promotion of the use of energy from renewable sources Directive (2009/28/EC) European Commission (2005) Thematic Strategy on Air Pollution European Commission, SEA Directive (2001/42/EC) **National:** Defra (2018) The National Adaptation Programme and the Third Strategy for Climate Adaptation Reporting 2018-2023 Ministry of Housing, Communities and Local Government (2019) National Planning Policy Framework HM Government (2021) Environment Act 2021

SEA Topic	Key Messages	Plans, Programmes and Strategies
	Areas and the cumulative impacts on air quality from individual sites in local areas. Minimise energy consumption, support the use of sustainable/renewable energy and improve resilience to climate change. Build in adaption to climate change to future planning and consider the level of urgency of associated risks of climate change impacts accordingly. Need for adaptive measures to respond to likely climate change impacts on water supply and demand.	HM Government (2018) A Green Future: Our 25 Year Plan to Improve the Environment Department for Business, Energy and Industrial Strategy (2020) Energy White Paper Department for Energy and Climate Change (2020) Energy White Paper: Powering our Net Zero Future Defra (2008), England Biodiversity Strategy –climate change adaptation principles Defra (2019) Clean Air Strategy 2019 The Climate Change Act 2008 (as amended) The Energy Act 2013 UKCIP (2018) UK Climate Projections UKCP18 (2018) HM Government (2020) Energy white paper: Powering our net zero future HM Government (2021) Net Zero Strategy: Build Back Greener **Regional/Local:** Defra (various dates) Climate Adaptation Reports for relevant water companies Cambridge City Council (2022) Climate Change and Environment Strategy Cambridge City Council, Huntingdonshire District Council, South Cambridgeshire District Council (2009) Air Quality Action Plan for the Cambridgeshire Growth Areas Cambridgeshire Together (2007) Cambridgeshire Vision: Countywide Sustainable Community Strategy: 2007 – 2021 Cambridge City Council (2018) Cambridge Local Plan East Cambridgeshire District Council (2015) East Cambridgeshire Local Plan 2015 Cambridge City Council (2011) Cambridgeshire green infrastructure strategy Cambridge City Council (2015) Environment Policy Statement
Population and Human Health	To ensure secure, safe, reliable, sustainable and affordable supplies of water (including good quality drinking water) are provided for all communities and all business sectors. To provide a clean, healthy environment that benefits both people and the economy. Water resources play an important role in supporting the health and recreational needs of local communities. Addressing deprivation and reducing inequality. Promoting improvements to health and well-being.	**International:** European Commission, Drinking Water Directive (1998/83/EC) (as amended) European Commission Blueprint to Safeguard Europe's Water Resources European Commission, (2020) The 8th Environmental Action Programme to 2030 The Environment Noise Directive (Directive 2002/49/EC) United Nations Economic Commission for Europe (1998) Aarhus Convention - Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters European Commission, SEA Directive (2001/42/EC) **National:** HM Treasury Infrastructure UK (2014) National Infrastructure Plan HM Government (2016) National Infrastructure Delivery Plan 2016-2021

SEA Topic	Key Messages	Plans, Programmes and Strategies
	Providing high quality services, community facilities and social infrastructure that is accessible to all. Achieving sustainable economic growth and promoting key sectors in the local economy, supported by universal access to essential utility and infrastructure services. Improving and expanding the tourism economy. Maximising job opportunities for all and enhancing the quality of employment opportunities. Minimising noise pollution.	The Countryside and Rights of Way (CRoW) Act 2000 Defra (2011) Water for Life - Water White Paper Defra (2019) Clean Air Strategy 2019 Defra (2011) The Natural Choice: securing the value of nature. The Natural Environment White Paper Defra (2005) Securing the Future; Delivering UK Sustainable Development Strategy Defra, Environment Agency, Natural England, Forestry Commission England (2016) Creating a great place for living Ministry of Housing, Communities and Local Government (2019) National Planning Policy Framework The Natural Environment and Rural Communities (NERC) Act (2006) HM Government (2018) A Green Future: Our 25 Year Plan to Improve the Environment **Regional/Local:** Local Planning Authorities (various) Water Cycle Studies for housing growth points Public Rights of Way Improvement Plans (ROWIPs) Cambridge City Council (2014) Anti-Poverty Strategy 2014-2017 Cambridgeshire Together (2007) Cambridgeshire Vision: Countywide Sustainable Community Strategy: 2007 – 2021 Cambridge City Council (2018) Cambridge Local Plan East Cambridgeshire District Council (2015) East Cambridgeshire Local Plan 2015 Cambridge City Council (2011) Cambridgeshire green infrastructure strategy Cambridge City Council (2015) Environment Policy Statement
Material Assets and Resource Use	Promote sustainable production and consumption whilst seeking to reduce the amount of waste generated by using materials, energy and water more efficiently. Minimising waste production, promoting reuse and recycling, and ensure waste management follows the 'waste hierarchy' to eliminate the waste sent to landfill. Promoting the use of sustainable/renewable energy and encourage energy efficiency and contribute to a resource efficient, green and competitive low carbon economy. Consider issues of water demand, water supply	**International:** United Nations (2002) Commitments arising from the World Summit on Sustainable Development, Johannesburg European Commission, (2020) The 8th Environmental Action Programme to 2030 European Commission (2008) Revised Waste Directive (2008/98/EC) European Commission (1999) Landfill of Waste Directive (1999/31/EC) European Commission (2002) Directive on the Energy Performance of Buildings (2002/91/EC) **National:** HM Government (2020) The Waste (Circular Economy) (Amendment) Regulations 2020 Defra (2011) Government Review of Waste Policy in England 2011 HM Government (2018) A Green Future: Our 25 Year Plan to Improve the Environment Defra (2011) Future Water: The Government's water strategy for England

SEA Topic	Key Messages	Plans, Programmes and Strategies
	and water quality in the natural environment and ensure a sustainable use of water resources. Government expects water companies to continue reducing overall demand for water. Maintain a resilient, reliable public water supply and ensure there is enough water for human uses, as well as providing an improved water environment.	Ministry of Housing, Communities and Local Government (2019) National Planning Policy Framework Environment Agency (2009) Water Resources Strategy for England and Wales Environment Agency (2010) Water Resources Action Plan for England and Wales HM Government (2021) Environment Act 2021 Environmental Protection Act 1990 HM Treasury Infrastructure UK (2014) National Infrastructure Plan HM Government (2016) National Infrastructure Delivery Plan 2016-2021 Environment Agency (2020) Meeting our future water needs: a national framework for water resources HM Government (2020) Energy white paper: Powering our net zero future HM Government (2021) Net Zero Strategy: Build Back Greener **Regional/Local:** Cambridge Water WRMP 2019 Cambridgeshire and Peterborough Minerals and Waste Local plan 2036 (2021) Cambridgeshire County Council (2012) RECAP Waste Management Design Guide Supplementary Planning Document Cambridgeshire Together (2007) Cambridgeshire Vision: Countywide Sustainable Community Strategy: 2007 – 2021 Cambridge City Council (2018) Cambridge Local Plan East Cambridgeshire District Council (2015) East Cambridgeshire Local Plan 2015 Cambridge City Council (2011) Cambridgeshire green infrastructure strategy Cambridge City Council (2015) Environment Policy Statement
Archaeology and Cultural Heritage	Conserve and enhance the historic environment, heritage assets and their settings. Protect, enhance and manage the character and appearance of historic and cultural assets and their settings including maintaining and strengthening local distinctiveness and sense of place. Built development in the vicinity of historic buildings and Scheduled Monuments could have implications for the setting and/or built fabric and cause damage to any archaeological deposits present on the site.	**International:** The Convention for the Protection of the Architectural Heritage of Europe (Granada Convention) The European Convention on the Protection of Archaeological Heritage (Valletta Convention) The World Heritage Convention (UNESCO) 1972 European Commission, SEA Directive (2001/42/EC) European Commission, (2020) The 8th Environmental Action Programme to 2030 ICOMOS (2011) Guidance on Heritage Impact Assessments for Cultural World Heritage Properties IUCN (2013) World Heritage Advice Note: Environmental Assessment UNESCO (2001) Convention on the Protection of Underwater Cultural Heritage **National:** Ministry of Housing, Communities and Local Government (2019) National Planning Policy Framework

SEA Topic	Key Messages	Plans, Programmes and Strategies
	Ensure active management of the Region's environmental and cultural assets. Ensure effects resulting from changes to water level (surface or sub-surface) on all historical and cultural assets are avoided. Consider effects on important wetland areas with potential for paleo-environmental deposits. Promote the conservation and enhancement of the historic environment, including the promotion of heritage and landscape as central to the culture of the region and conserve and enhance distinctive characteristics of landscape and settlements.	Department for Culture, Media and Sport (2001) The Historic Environment – A Force for the Future (2001) Historic England (2021) Heritage at Risk Historic England (2013) Strategic Environmental Assessment, Sustainability Appraisal and the Historic Environment Historic England (2015) The Setting of Heritage Assets, Historic Environment Good Practice Advice in Planning Planning (Listed Buildings and Conservation Areas) Act 1990 **Regional/Local:** Cambridgeshire County Council (n/a) Cambridgeshire Historic Environment Record (CHER) South Cambridgeshire District Council (2009) Listed Buildings: Works to or affecting the setting of Supplementary Planning Document Cambridgeshire Together (2007) Cambridgeshire Vision: Countywide Sustainable Community Strategy: 2007 – 2021 Cambridge City Council (2018) Cambridge Local Plan East Cambridgeshire District Council (2015) East Cambridgeshire Local Plan 2015 Cambridge City Council (2011) Cambridgeshire green infrastructure strategy Cambridge City Council (2015) Environment Policy Statement
Landscape	Protection and enhancement of landscape (including designated landscapes, landscape character, distinctiveness and the countryside). Take account of the different roles and character of different areas, promoting the vitality of main urban areas, protecting the Green Belts around them, recognising the intrinsic character and beauty of the countryside and supporting thriving rural communities within it. Enhance the value of the countryside by protecting the natural environment for this and future generations. Improve access to valued areas of landscape character in sustainable ways to enhance its enjoyment and value by visitors and stakeholders.	**International:** Council of Europe (2000) European Landscape Convention (Florence Convention) European Commission, SEA Directive (2001/42/EC) **National:** Ministry of Housing, Communities and Local Government (2019) National Planning Policy Framework HM Government (2018) A Green Future: Our 25 Year Plan to Improve the Environment Defra (2011) The Natural Choice: Securing the value of nature. The Natural Environment White Paper Defra (2010) Making Space for Nature: A Review of England's Wildlife Sites and Ecological Network The Countryside and Rights of Way (CRoW) Act (2000) Wildlife and Countryside Act 1981 (as amended) **Regional/Local:** Natural England - National Character Area (NCA) profiles Cambridge City Council (2003) Cambridge Landscape Character Assessment Cambridgeshire Together (2007) Cambridgeshire Vision: Countywide Sustainable Community Strategy: 2007 – 2021

SEA Topic	Key Messages	Plans, Programmes and Strategies
		Cambridge City Council (2018) Cambridge Local Plan East Cambridgeshire District Council (2015) East Cambridgeshire Local Plan 2015 Cambridge City Council (2011) Cambridgeshire green infrastructure strategy Cambridge City Council (2015) Environment Policy Statement

4. ENVIRONMENTAL BASELINE REVIEW

4.1 INTRODUCTION

An important part of the SEA process is to identify the current baseline conditions, and how they might change over time, in absence of the WRMP. With the knowledge of baseline conditions potential impacts of the WRMP and its schemes can be identified, monitored, and if necessary mitigated. It is important to note that the future baseline does not constitute a 'do nothing' option with respect to water resources planning as there will be elements of the current Cambridge Water WRMP (published in 2019) that would continue, even in absence of the new plan. These will continue to alter the baseline.

As previously mentioned in Section 2.2.2, the temporal period covered by the WRMP is lengthy, which introduces uncertainty in considering future baselines.

The analysis of baseline information is presented for the SEA assessment area (hereafter referred to as the 'assessment area') for the following topics:

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

Baseline data has been drawn from a range of sources, including a number of the plans, policies and programmes reviewed and summarised in Table 3.1 and Appendix A. The sections below also summarise the likely future baseline in the issues considered (where information is available). The key issues arising from the baseline review are summarised at the end of each sub-section.

4.1.1 Limitations of the data and assumptions made

The principal limitations surround the future social and environmental baseline where there are substantial differences in the availability and temporal resolution of robust projections across the various SEA topic areas: for example, whilst some water companies are planning up to 80 years ahead and climate change estimate extend to a similar horizon, regional population and housing projects only extend up to the 2040s. Forecasts of changes in the natural environment are shorter still, and subject to considerable uncertainty.

The area under consideration for this SEA covers different geographical and social regions, which makes establishing an all-encompassing baseline challenging. There are also challenges around extrapolating information from data collated at differing spatial resolutions. Relevant spatial data have been obtained for each of the SEA topics and presented as mapped information where possible to summarise the extensive datasets involved. In some instances, reporting cycles mean that the available information may have been superseded.

SEA is a high level assessment aimed at highlighting potential environmental concerns. The environmental data to be used in this assessment is based on that which is readily available from existing sources such as statutory organisations. No primary research or survey work has been carried out specifically to inform the SEA and therefore it is possible that at the individual option level, it is possible that additional environmental issues could influence a WRMP option. At a later stage during implementation of the WRMP options, some schemes, that have the potential to give rise to likely significant environmental effects and depending on their extent and nature, would be subject to further environmental appraisal including EIA where appropriate.

The baseline information presented within this report may not identify specific, localised issues that are reflective of the general trends of the region. For example, this may include locally important sites for recreation or nature conservation.

4.2 BIODIVERSITY, FAUNA AND FLORA

4.2.1 Baseline

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.

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 4.1 and Table 4.1), including:

- 1 Ramsar Sites
- 1 Special Protection Areas (SPA)
- 2 Special Areas of Conservation (SAC)
- 50 Sites of Special Scientific Interest (SSSI)
- 1 National Nature Reserves (NNR)
- 20 Local Nature Reserves (LNR)

Table 4.1 List of designated sites within the Cambridge Water SEA assessment area

Designation	Designated Site Names
Ramsar	Ouse Washes
SPA	Ouse Washes
SAC	Eversden and Wimpole Woods Ouse Washes
SSSI	Alder Carr Balsham Wood Barrington Pit Barrington Chalk Pit Berry Fen Buff Wood Caldecote Meadows Cam Washes Carlton Wood Cherry Hinton Pit Dernford Fen Elsworth Wood Eversden and Wimpole Woods Fleam Dyke Fowlmere Watercress Beds Fulbourn Fen Furze Hill Gamlingay Wood Gog Magog Golf Course Great Wilbraham Common Hardwick Wood Hatfield Forest Hayley Wood

Designation	Designated Site Names
	Hildersham Wood Histon Road Holland Hall (Melbourn) Railway Cutting Houghton Meadows Kingston Wood and Outliers L-moor, Shepreth Langley Wood Madingley Wood Orwell Clunch Pit Ouse Washes Over and Lawn Woods Overhall Grove Papworth Wood Potton Wood Roman Road Sawston Hall Meadows Stow-cum-Quy Fen Therfield Heath Thriplow Meadows Thriplow Peat Holes Traveller's Rest Pit Warboy's and Wistow Wood Warboys Claypit Waresley Wood Weaveley and Sand Woods Whittlesford - Thriplow Hummocky Fields Wilbraham Fens Woodwalton Fen
NNR	Woodwalton Fen
LNR	Barnwell Barnwell II Bramblefields Byron’s Pool Coldham’s Common East Pit Kingston Amenity Area Limekiln Close (and West Pit) Logan’s Meadow Mare Fen Melwood Nine Wells Paradise Sheep’s Green and Coe Fen Somersham St Denis Church

Designation	Designated Site Names
	The Beechwoods
	Therfield Heath
	Worts Meadow

A 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 take into account 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 through pipelines and pumping stations can also have adverse effects on designated sites of nature conservation importance.

There are a range of designated Natural Environment and Rural Communities (NERC) Act Section 41 habitats within the Cambridge Water supply area[17]. NERC habitats include coastal and floodplain grazing marsh, lowland meadows, lowland fens, deciduous woodland, traditional orchards and fens. NERC priority species include:

- Otter
- Water vole
- Atlantic salmon
- European eel
- Sea/Brown trout
- River lamprey
- White clawed crayfish
- Snakeshead Fritillary
- Loddon Lilly
- Creeping Marshwort
- Narrow-leaved water-dropwort
- River water-dropwort
- Fine-lined pea Mussel
- Freshwater Pea Mussel
- Depressed River Mussel
- Greater Water Parsnip
- Club-tailed Dragonfly
- Tassel Stonewort
- Desmoulins Whorl Snail
- Snipe
- Lapwing Natterer’s Bat
- Daubenton’s Bat
- Pipistrelle Bat

[17] Defra MAGIC Interactive map: Habitat Inventories (http://magic.defra.gov.uk/)

4.2.1.1 Ancient Woodlands

Ancient woodlands in England 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 9.7 km^2 of ancient woodland within the SEA area under consideration. Areas of ancient woodland are shown on Figure 4.2.

4.2.1.2 Chalk Streams

Chalk streams are rare and valuable habitat and out of only around 200 chalk streams in the world, 85% are found in England, reflecting the countries geology and temperate climate. The chalk streams emerge from chalk aquifers and are characterised by their very pure, mineral-rich water which stays at a relatively constant temperature year-round providing a suitable habitat to diverse aquatic plant species such as water-crowfoot and water star-wort which supports many invertebrate and fish species. The unique and diverse ecology of chalk streams makes them a globally rare and important habitat.

In Cambridge, Bin Brook, Cherry Hinton Brook, Coldham's Brook, Hobson's Brook and Vicar's Brook are all examples of chalk streams. The chalk aquifer they emerge from also acts as a crucial drinking water resource. In the Cambridge Water supply area, 100% of the water stems from the chalk aquifer which lies to the south and east of Cambridge. Businesses and farms in the region also rely on these water resources.

Cambridge Water, together with Cambridge City Council, commissioned the Wildlife Trust and Wild Trout Trust to assess the health of local chalk streams. The report[18] provides an overview of each river and the main issues affecting it and highlights key opportunities and potential projects. The Environment Agency's WFD classifications show that most chalk streams are not in good health. Current threats to chalk stream ecology include flow pressures, channel modifications and poor water quality.

4.2.1.3 Natural Character Areas

Natural England has defined a series of 160 National Character Areas (NCAs) as a means to conserve nature in England[19]. These are areas of countryside identified by the unique combination of physical attributes, wildlife, land use and culture. Key messages regarding habitat type are presented in Table 4.9 Landscape Character Areas: Landscape Characteristics and National Character Areas (NCAs) that cover the assessment area are shown in Figure 4.8 (under the Landscape topic).

4.2.1.4 Water Framework Directive – ecological status

The 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 be caused by 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 WFD River Basin Management Plans (RBMPs) relevant to the study area identify changes to the natural flow and level of water as one of the major issues affecting the ecology of rivers – these being related to abstraction and flow regulation measures.

The Anglian River Basin Management Plan[20] (RBMP) outlines significant water management issues which can have impacts on the aquatic habitats and species. 51% of water bodies in the River Basin District (RBD) are subject to physical modifications, 50% of watercourses experience pollution from wastewater, 47% from rural areas, 10% from towns, cities and transport, 10% are affected by changes to natural flow and INNS have negative effects on 6% of watercourses.

[18] https://www.cambridge.gov.uk/media/9067/greater-cambridge-chalk-streams-project-report.pdf

[19] 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

[20] Environment Agency (2015) Part 1: Anglian river basin district: River Basin Management Plan. December 2015

4.2.1.5 Invasive Non-Native Species

There are over 2,000 non-native species established (reproducing in the wild) in Britain, predominantly in the terrestrial environment[21]. Invasive species within the Cambridge Water WRMP assessment area include species such as pennywort, Himalayan balsam, signal crayfish and giant hogweed[22].

[21] https://jncc.gov.uk/our-work/ukbi-b6-invasive-species/

[22] Cambridge City Council (2020) Greater Cambridge Chalk Streams Project Report https://www.cambridge.gov.uk/media/9067/greater-cambridge-chalk-streams-project-report.pdf)

Figure 4.1 International and National Designated Sites in the Assessment Area

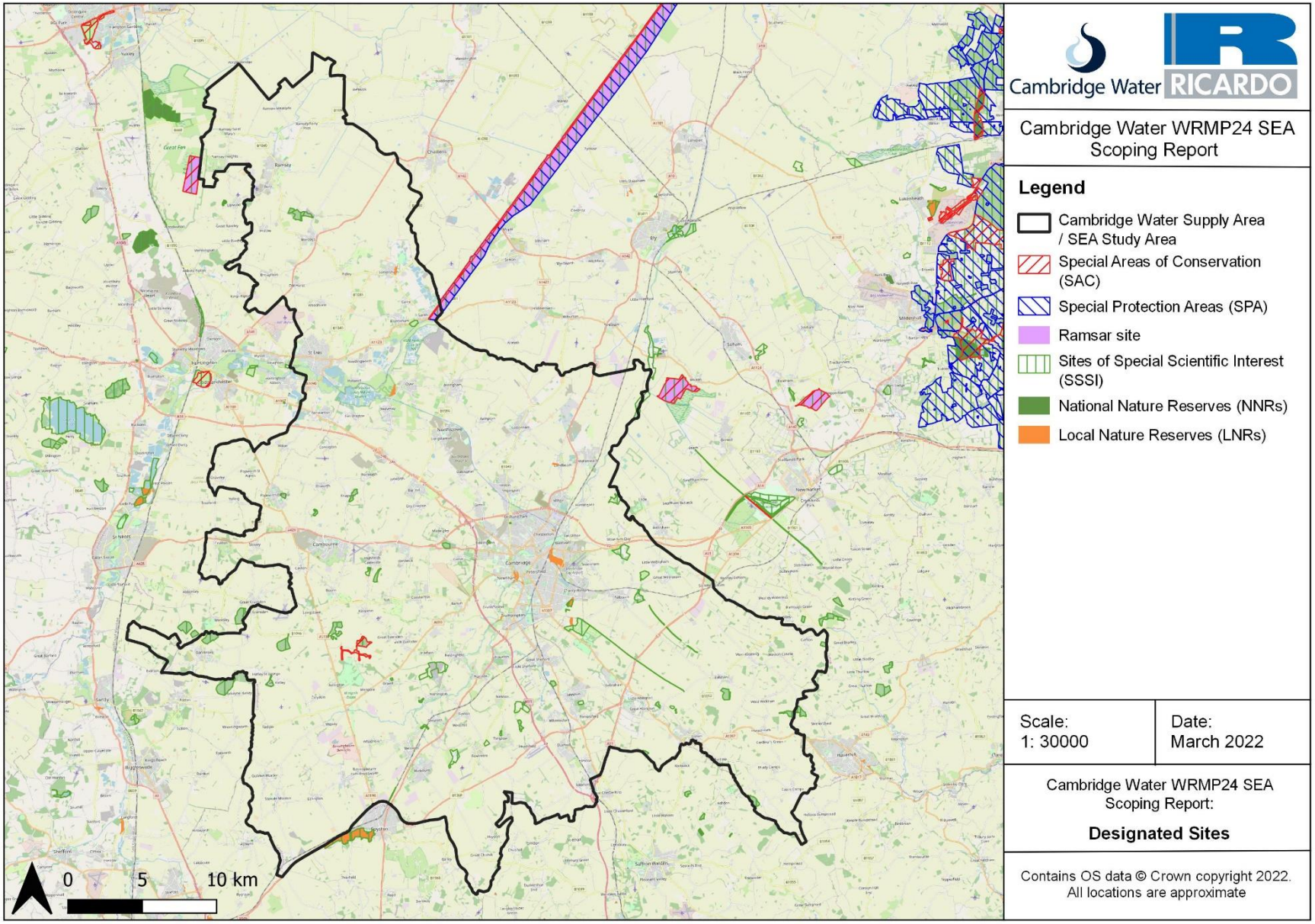
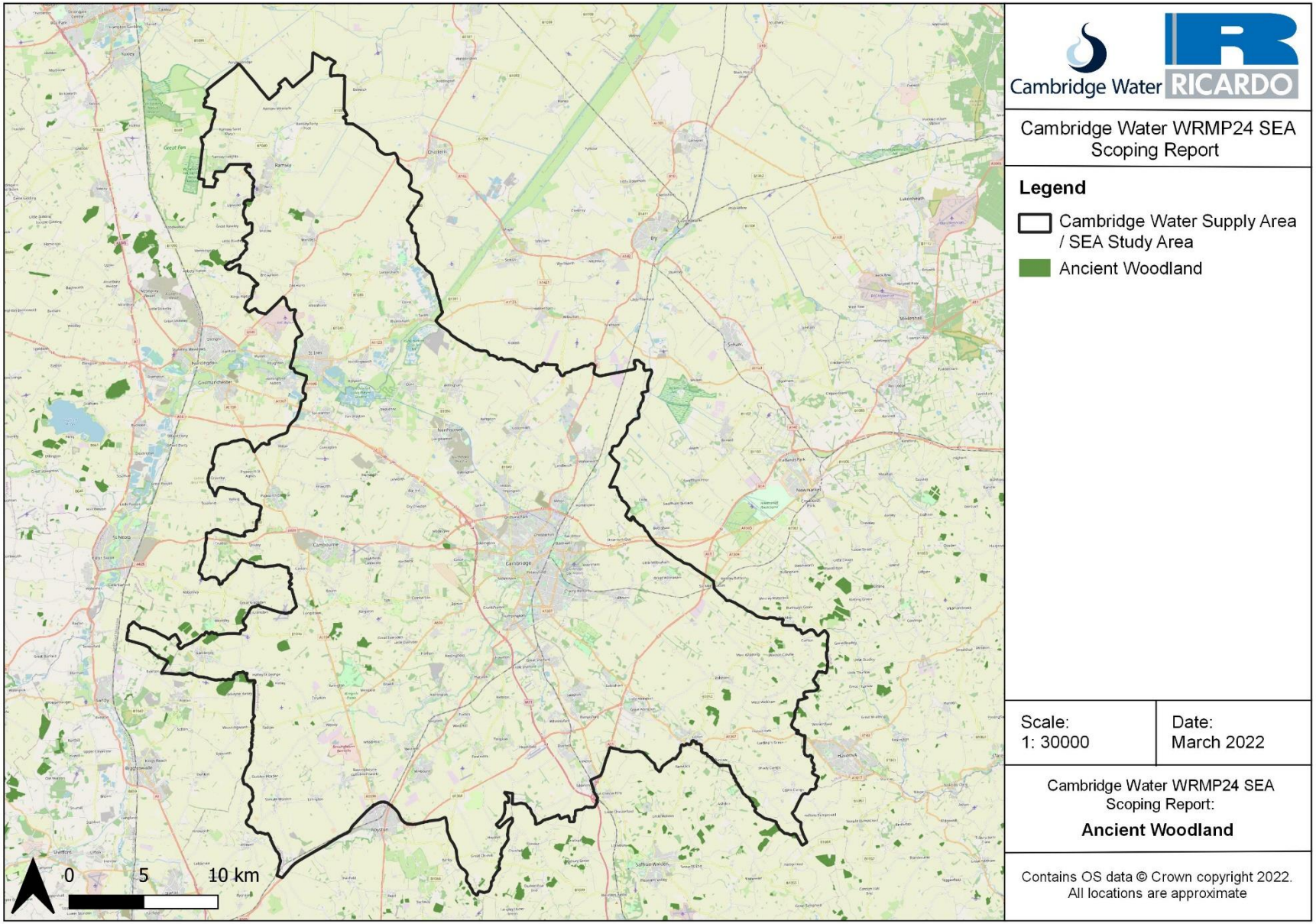


Figure 4.2 Ancient Woodland in the Assessment Area



4.2.2 Future Baseline

The Defra 25 Year Environment Plan[23] includes a commitment to restore 75% of 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 a 'Biodiversity Net Gain' approach to development, an approach introduced into national planning policy in 2019. The Environment Act[24] enacted in 2021 has now mandated the need for Biodiversity Net Gain assessment.

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. 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.

Natural Cambridgeshire Local Nature Partnership (LNP) is a cross-sector partnership working to restore the natural environment in the Cambridgeshire area through embedding the value of nature in decision making across spatial planning, public health and economic development. It is the designated Local Nature Partnership (LNP) for Cambridgeshire and Peterborough. LNPs are a key commitment from the 2011 Government White Paper, The Natural Choice: Securing the Value of Nature, which recognised the need for a more joined-up approach to reverse the loss of biodiversity and degradation of ecosystems. Natural Cambridgeshire LNP has a vision to double nature including land managed for nature in Cambridgeshire by 2050 by focussing on six strategic areas: living landscapes, local food and farming, better places to live, sustainable jobs, healthy communities and heritage, culture and leisure and with a number of direct delivery projects in development that support the doubling nature vision and strategic projects that underpin the delivery of that vision.

In 2017, Cambridge Water launched PEBBLE (Projects that Explore Biodiversity Benefits in the Local Environment) fund, a biodiversity improvement fund which provides grants for projects that look to improve, restore and or create habitat within the Cambridge Water supply area. Since its launch, the fund has helped over 28 projects, improving over 80 hectares over five years. This is one example of local environmental initiatives and growing community activities which will aid in strengthening people's connection with wildlife and nature and contribute to the overall improvement in the condition of these areas.

4.2.3 Key Issues

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 and rare and valuable habitat such as chalk streams.
- The need to avoid activities likely to cause irreversible 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).
- 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.

[23] UK Government (2018) 25 Year Environment Plan. https://www.gov.uk/government/publications/25-year-environment-plan

[24] UK Government (2021) Environment Act. https://www.legislation.gov.uk/ukpga/2021/30/part/1/enacted

4.3 SOILS, LAND USE AND GEOLOGY

4.3.1 Baseline

4.3.1.1 Geology

The Cambridge Water assessment area is geologically diverse and includes a number of major aquifers such as the Cam and Ely Ouse Chalk and North Essex Chalk. Geological sites may be sensitive to changes in water levels and quality, pollution and land use.

England has been divided into areas with similar landscape character, which are called National Character Areas (NCAs). 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. Relevant NCA boundaries are shown in Figure 4.8. A brief description of the key soil, geological and land use characteristics of each of the main character areas is provided in Table 4.2.

Table 4.2 Landscape Character Areas: Soil, Geology and Land Use Characteristics

Area (Shown in Figure 4.8)	Characteristics
The Fens	Jurassic clays are overlain by rich, fertile calcareous and silty soils over the coastal and central fens and by dark, friable fen peat further inland. The soils are important for agriculture, which is hugely significant for the rural economy in the Fens. There are over 4,000 farms in the Fens; enough wheat is grown here annually to produce a quarter of a million loaves of bread and one million tons of potatoes are grown here. In addition to traditional vegetables, exotics such as pak choi are now cultivated. Some 40 % of England's bulbs and flowers are also produced in the Fens.
South Suffolk and North Essex Clayland	The widespread moderately fertile, chalky clay soils give the vegetation a more or less calcareous character. Gravel and sand deposits under the clay are important geological features, often exposed during mineral extraction, which contribute to our understanding of ice-age environmental change. Fragments of chalk give many of the soils a calcareous character, which also influences the character of the semi-natural vegetation cover.
East Anglian Chalk	The underlying and solid geology is dominated by Upper Cretaceous Chalk, a narrow continuation of the chalk ridge that runs south-west–north-east across southern England, continuing in the Chilterns and along the eastern edge of The Wash. The chalk bedrock has given the NCA its nutrient-poor and shallow soils.
Bedfordshire and Cambridgeshire Claylands	Underlying geology of Jurassic and Cretaceous clays overlain by more recent Quaternary glacial deposits of chalky boulder clay (till) and sand and gravel river terrace deposits within the river valleys. Lime-rich, loamy and clayey soils with impeded drainage predominate, with better-drained soils in the river valleys.
Bedfordshire Greensand Ridge	Well-drained acidic sandy soils are capped in places with drift deposits of Boulder Clay. Sand and gravel deposits are present in the Ouzel valley, and there are deposits of peat in the Flit valley between Flitwick and Clophill. Much of the Ridge has acidic, free-draining soils which are less fertile than the surrounding Claylands and historically suitable for hunting estates of heath and mixed woodland. In the more fertile river valleys there is some pasture and market gardening. A variety of sand types occur here, including a pure 'silver sand' quarried especially around Heath and Reach, which is both important and famous for glass-making. Fuller's earth has been worked from large quarries at Woburn Sands and Clophill.

Geological Conservation Review (GCR) Sites is the register of known nationally and internationally important earth science (geological and geomorphological) sites in Great Britain[25]. The GCR underpins the designation of earth science features in SSSIs. There are 5 GCR sites in the Cambridge Water supply area.

4.3.1.2 Soils and Land Use

The Agricultural Land Classification (ALC) was developed by Defra to provide a means of assessing the agricultural land suitability. The 'best and most versatile land' is generally defined as agricultural land that is at Grade 1, 2 or 3a, with Grade 1 being the best.

shows that the majority of agricultural land in the assessment area is classified as Grade 2 ('Very Good'), with pockets of Grade 1 ('Excellent') soils to the north. 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. The majority of land in the assessment area is farmed and agricultural practices have a major influence on soil quality. Good soil structure is beneficial to water retention and crop yield.

Ministry of Housing, Communities and Local Government data states that for the East of England region and England, land that is not developed constitutes 92.1% and 91.5% respectively of total land area. The single largest land use in the East is agriculture, constituting 71.2% of total land (this is considered to be land that is not developed). Within developed land, the single largest use is Transport and Utilities, which constitutes 4.2% of total land use. Water equates to 1.6% of the total non-developed area of land within the East of England compared to 1.4% nationally[26].

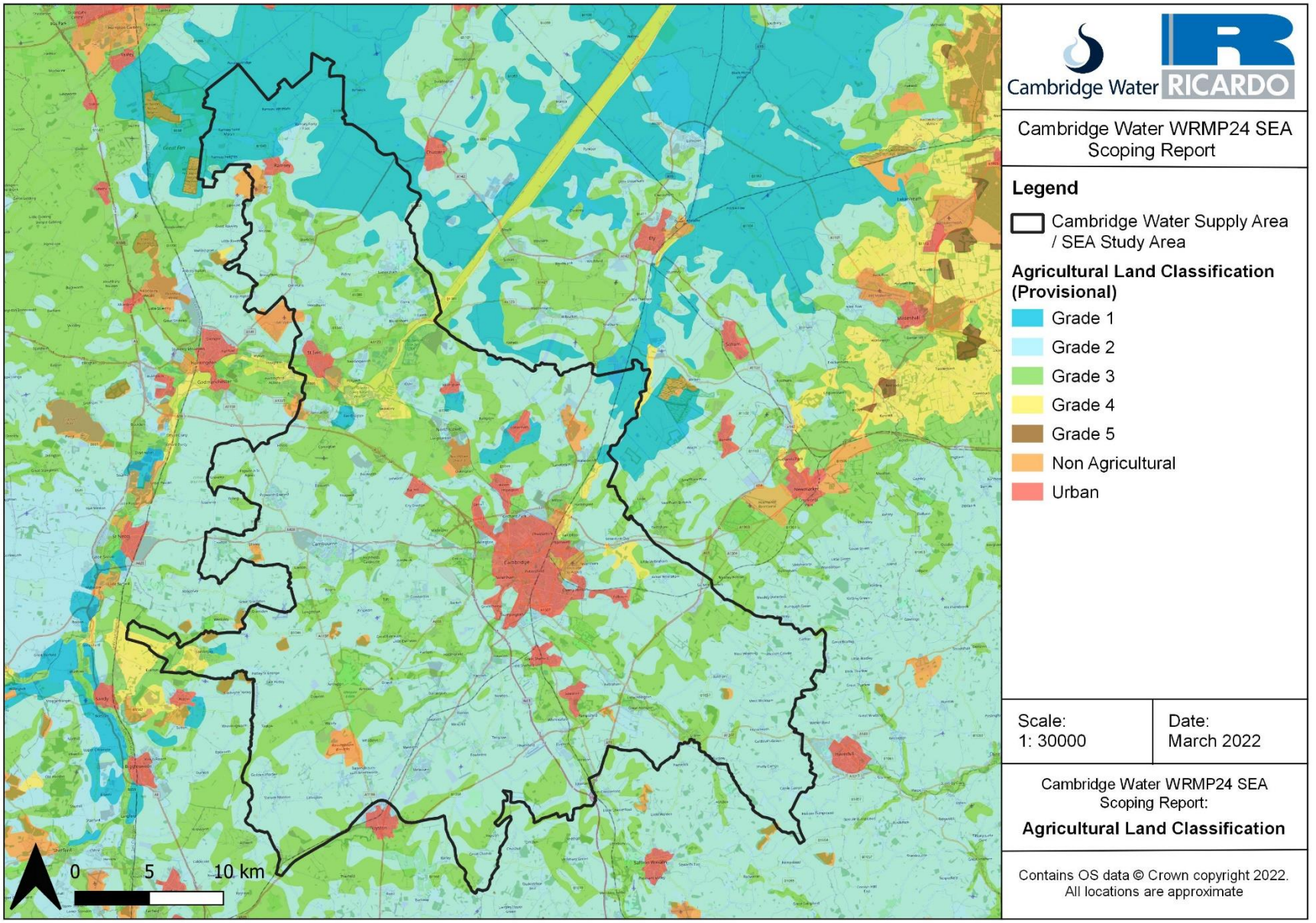
Contaminated land is defined as land where substances could cause significant harm to people or protected species; or significant pollution of surface waters or groundwaters. Some types of contaminated land can be designated as special sites for a variety of reasons, including land that seriously affects drinking water, surface waters (e.g. lakes and rivers) and important groundwater sites. A contaminated land register for the Cambridge area is provided on the Cambridgeshire City Council website; all listed sites are said to be fully remediated and suitable for use[27].

[25] Geological Conservation Review. http://jncc.defra.gov.uk/page-2947

[26] Live tables on land use - GOV.UK (www.gov.uk), Total land area by usage type, Land Use Statistics England 2018

[27] https://www.cambridge.gov.uk/contaminated-land

Figure 4.3 Agricultural Land Classification of assessment area



4.3.2 Future Baseline

The vision of Defra's Soils Strategy for England[28] 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.

One of the core planning principles of the NPPF[29] 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.

The 25 Year Environment Plan (2018) runs alongside the Industrial Strategy (2017) and outlines the government's approach to safeguarding the environment and sustainable management of the economy. It introduces reforms to incentivised land management following Brexit. The plan details the Environmental Land Management scheme (ELMs); the evolution of the Common Agricultural Policy (CAP) following exit from the EU. The ELMs includes three new schemes designed to support the rural economy and the government's commitment to net zero emissions by 2050. The first of these schemes, the Sustainable Farming Incentive, will pay farmers to manage their land in an environmentally sustainable way. The scheme designates standards based on a feature such as hedgerows or grassland, and contains a series of actions required to meet the criteria. The scheme is currently being piloted but is due to launch in 2022. The Local Nature Recovery Scheme is intended to encourage collaboration between farmers and will pay for actions that support nature recovery which meet local environmental priorities. The Local Nature Recovery Scheme is due to launch in 2024. Finally, the Landscape Recovery scheme support long-term projects to recover landscape and ecosystems. Examples of projects include the restoration of peatland and salt marshes, large-scale tree planting and the re-wilding of landscapes where appropriate. Again, this scheme is due to come online in 2024.

4.3.3 Key Issues

The key sustainability issues arising from the baseline assessment for soil, geology and land use 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.

4.4 WATER

4.4.1 Baseline

In the context of the Water Framework Directive (WFD), the water environment includes rivers, lakes, estuaries, groundwater and coastal waters out to one nautical mile. The aquatic environment has been characterised as part of the UK Government's reporting obligations to the EU under the WFD and this provides the most appropriate baseline reference.

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. Although the UK has left the European Union, European Law and policy has formed the basis for UK environmental laws and contributed to the direction of UK policy in these areas for many years up to 30 January 2020. As such, the WFD is considered to remain a useful contextual frame for this baseline review.

[28] Defra (2009) Safeguarding our soils – A Strategy for England

[29] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf

4.4.1.1 Surface Waters: Rivers and Canals

The assessment area falls within the Anglian River Basin District and is comprised of the following management catchments:

- Old Bedford and Middle Level
- Upper and Bedford Ouse
- Cam and Ely Ouse
- Combined Essex

The most significant watercourses being the River Ouse and River Cam. **Figure 4.4** shows the distribution of surface waters in the assessment area.

4.4.1.2 Surface Waters: Lakes and Reservoirs

Currently, Cambridge Water has no surface water reservoirs. There are a number of lakes, pits and surface water features in the area, although none are used for water resource abstraction by Cambridge Water.

4.4.1.3 Groundwater

The majority of groundwater that Cambridge Water abstracts is sourced from the Cam and Ely Ouse Chalk aquifer (Figure 4.4). The most recent Abstraction Licensing Strategy for the Cam and Ely Ouse catchment[30] suggests that no groundwater is available for new consumptive abstraction across all groundwater units. The main pressures on groundwaters are abstraction for drinking water supply and contamination with nitrates and pesticides. Unsustainable abstraction from groundwater can lower groundwater levels and affect dependent river flows or wetlands, or can induce the intrusion of poorer quality water from the sea or from deeper 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, and 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 Cycle 2 classifications for the Cam and Ely Ouse groundwater body is poor overall, with both chemical and quantitative status also poor. The main reasons for not achieving good status (RNAGs) are poor nutrient management resulting in high nitrate concentrations and groundwater abstraction levels exceeding the rate at which the aquifer can recharge.

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.

4.4.1.4 Catchment Abstraction Management System

Catchment Abstraction Management System (CAMS) set out how the Environment Agency will manage the water resources of a catchment and contribute to implementing the WFD. The CAMS process is used to translate the RBMPs and Water abstraction plan into the licensing policy. CAMS is a standard approach to assess the amount of water available for further abstraction licensing, taking into account the requirements for the environment.

Abstraction licensing strategies (ALS) are published as part of the CAMS process. They are produced for each management catchment. Table 4.3 summarises the resource availability at each assessment point within the management catchments that fall wholly, or partially, within the assessment area.

[30] https://www.gov.uk/government/publications/cam-and-ely-ouse-abstraction-licensing-strategy/cam-and-ely-ouse-abstraction-licensing-strategy#availability

Table 4.3 Resource availability in the WFD Management Catchments in the Cambridge Water supply area

		Resource Availability		GWMU only
		Q50	Q95	
Cam and Ely Ouse[31]	AP1 – Old West	Restricted	Not available	
	AP2 – River Granta and Chalk	Not available	Not available	
	AP3 – Upper River Granta and Chalk	Not available	Not available	
	AP4 – River Rhee and Chalk	Not available	Not available	
	AP5 – Bourn Brook	Restricted	Not available	
	AP6 – Lower River Cam and Chalk	Restricted	Not available	
	AP7 – River Snail and Chalk	Restricted	Not available	
	AP8 – River Kennett and Chalk	Restricted	Not available	
	AP9 – Upper River Lark and Chalk	Restricted	Not available	
	AP10 – Lower River Lark and Chalk	Restricted	Not available	
	AP11 – River Sapiston and Chalk	Restricted	Not available	
	AP12 – Upper Little Ouse and Chalk	Restricted	Not available	
	AP13 – River Thet and Chalk	Restricted	Not available	
	AP14 – Lower Little Ouse and Chalk	Restricted	Not available	
	AP15 – Upper River Wissey and Chalk	Restricted	Not available	
	AP16 – Lower River Wissey and Chalk	Restricted	Not available	
	AP17 – Denver Sluice	Restricted	Not available	
Upper Ouse and Bedford Ouse[32]	AP1 - Earith	Restricted	Not available	
	AP2 - Brampton	Restricted	Not available	
	AP3 - Offord	Restricted	Not available	
	AP4 - Kym	Restricted	Not available	

[31] https://www.gov.uk/government/publications/cam-and-ely-ouse-abstraction-licensing-strategy/cam-and-ely-ouse-abstraction-licensing-strategy

[32] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/636744/ALS_2017_Upper_Ouse_and_Bedford_Ouse.pdf

		Resource Availability		GWMU only
		Q50	Q95	
	AP5 - Roxton	Restricted	Not available	
	AP6 - Ivel	Restricted	Not available	
	AP7 – Flit and Campton	Restricted	Not available	
	AP8 - Hiz	Restricted	Not available	
	AP9 – Campton Brook	Restricted	Not available	
	AP10 - Flit	Restricted	Not available	
	AP11 - Bedford	Restricted	Not available	
	AP12 – Newport Pagnell	Restricted	Not available	
	AP13 – Broughton Brook	Not available	Not available	
	AP14 - Ouzel	Restricted	Not available	
	AP15 - Clipstone	Restricted	Not available	
	AP16 – Leighton Buzzard	Restricted	Not available	
	AP17 - Tove	Restricted	Not available	
	AP18 - Ouse	Restricted	Not available	
	AP19 - Buckingham	Restricted	Not available	
	AP20 - Twins	Restricted	Not available	
	Upper Bedford Ouse Woburn Sands			Not available
	Upper Bedford Ouse Oolite			Restricted
	Upper Bedford Ouse Chalk			Not available
Old Bedford and	Middle Level LDMU (Catchment 53)			Not available (Summer only)
	Counter Drain LDMU Supply (Catchment 52)			Not available (Summer only)

		Resource Availability		GWMU only
		Q50	Q95	
Middle Level[33]	Hundred Foot LDMU (Catchment 26)			Not available (Summer only)

4.4.1.5 Key Pressures

The SEA study area falls within the Anglian River Basin District (RBD), which covers an area of over 27,000km^2 where more than 50% of the land use is for agricultural and horticultural purposes. The key water management issues preventing waters within the RBD from reaching good status have been identified in the recent Draft River Basin Management Plans and for the Anglian RBD[34], these most significant issues were identified as; pollution from rural areas, physical modifications and pollution from wastewater. Some of the measures suggested that can address these issues include:

- Improving soil management to reduce the loss of soil, phosphate and nitrogen
- Improving use of pesticides to reduce pollution of the water environment
- Reducing the amount of water abstracted from sensitive locations by using water more efficiently (including greater use of on-farm storage for agriculture), taking water from difference locations and reducing demand for water
- A stronger catchment focus for water resources, working collaboratively with stakeholders to find innovative solutions that give greater access to sustainable water that promotes catchments resilient to climate change
- Improving sewerage systems and sewage treatment works to reduce the amount of pollution discharged to the water environment
- Installing fish passes around physical modifications (for example, locks on navigable rivers

4.4.1.6 Water Quality

Since 2000, the health of waterbodies has been classified using a status based approach according to quality elements defined within Annex V of the WFD.

Surface water status is awarded on a 5 point scale (High, Good, Moderate, Poor, Bad), and overall scores are split into scores for ecological status and chemical status. For a waterbody to be in overall 'good' status, both ecological and chemical status must be at least 'good' (i.e. the lowest score out of ecological and chemical status also constitutes the waterbody's overall score). Ecological status classification considers the condition of biological quality elements (e.g. aquatic invertebrates, plants and fish), hydromorphological quality elements (the morphology of the habitat available). Chemical status considers the general chemical and physico-chemical quality elements (concentrations of supporting physico-chemical elements; and concentrations of specific pollutants).

Table 4.4 summarises the key statistics for surface water quality, for the management catchments which cover Cambridge Water supply area.

[33] Environment Agency (2017) Old Bedford including Middle Level abstraction licensing strategy https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/636776/ALS_2017_Old_Bedford.pdf

[34] DEFRA (2021) Anglian River Basin District Draft River Basin Management Plan Consultation https://environment.data.gov.uk/catchment-planning/v/c3-draft-plan/RiverBasinDistrict/5

Table 4.4 Cycle 2 Surface Water Classifications data for WFD Management Catchments which fall under the assessment area

Ecological Status or Potential						
Management Catchment	Bad	Poor	Moderate	Good	High	Total
Old Bedford and Middle Level	0	0	6	0	0	6
Ouse Upper and Bedford	1	6	75	11	0	93
Cam and Ely Ouse	3	6	57	7	0	73
Essex Combined	0	14	52	4	0	70

Chemical Status or Potential		
Management Catchment	**Fail**	**Good**
Old Bedford and Middle Level	6 (100%)	0
Ouse Upper and Bedford	93 (100%)	0
Cam and Ely Ouse	73 (100%)	0
Essex Combined	70 (100%)	0

4.4.1.7 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. The Environment Agency's Flood Risk Maps available on its website show areas at risk of flooding, including people, economic activity and the environment[35].

An estimated 5.2 million properties are at risk from flooding in England with the Environment Agency estimating a total of 121,000 residential properties in areas at high-risk of flooding from rivers and the sea and 458,000 in medium-risk areas. Surface water flooding is also a substantial threat, with 239,000 residential properties at high-risk of flooding.

Across the country, the Government budgeted £2.3bn on 1,500 flood defence schemes between 2015 -2021. The Environment Agency's Flooding in England report[36] highlighted that regionally, the East of England has far fewer people at risk of flooding compared with areas such as London and Yorkshire.

[35] Flood Risk Maps for Rivers and Sea in England - December 2019 (arcgis.com)

[36] Environment Agency (2009) Flooding in England: A National Assessment of Flood Risk

The extreme floods of 2007 prompted the Pitt Review (2008) and the subsequent Flood and Water Management Act 2010. In 2008-2009, the Environment Agency spent approximately £427 million on building, improving and keeping flood defences such as managed river channels, walls and raised embankments, flood barriers and pumps in good condition, which reduced the risk of flooding to over 176,000 households across England.

Under the Flood Risk Regulations 2009, the Environment Agency must produce and publish flood risk management plans at the river basin district scale[37]. Since 2009, 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.

The Anglian River Basin District (RBD) covers 27,900km^2. It extends from Lincolnshire in the north to Essex in the south and from Northamptonshire in the west to the east coast of Norfolk, Suffolk, and Essex.

The RBD is particularly susceptible to large scale river flooding. There are a number of extensive rivers often with multiple tributaries. Very large fluvial events have occurred across the area, with some of these affecting multiple rivers at the same time. Surface water flooding is a problem in many towns and cities across the Anglian RBD including Cambridge[38]. Within the Anglian RBD there are:

• 16 Flood Risk Areas (FRAs) for significant risk of flooding from main rivers and the sea

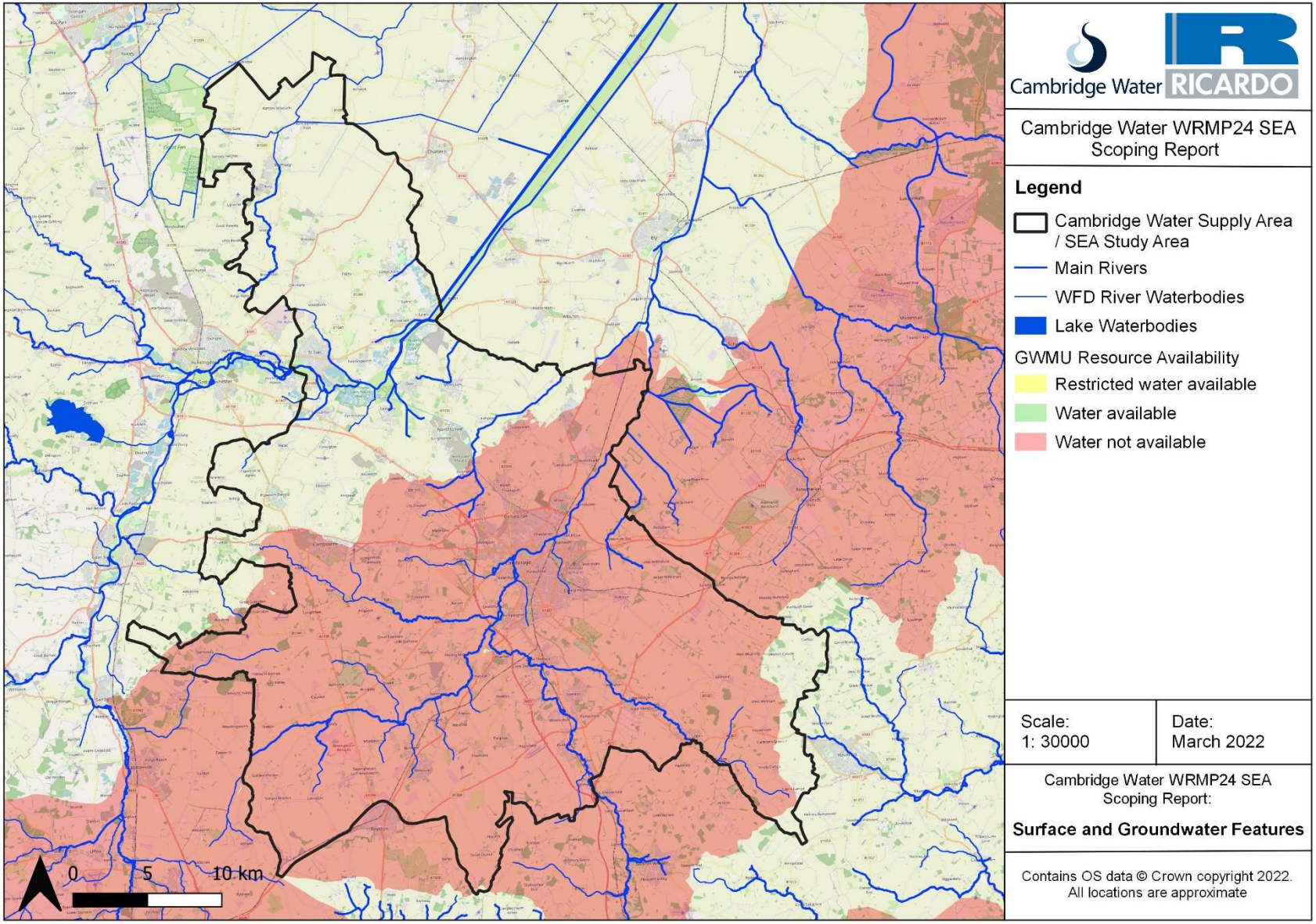
• 12 FRAs for significant risk of flooding from surface water

The plan discusses prevention, protection and forecasting/warning measures including further measures implemented since 2015 including installation of infrastructure, flood warning and information systems across the RBD.

[37] Environment Agency (2021) Anglian River Basin District Flood Risk Management Plan 2021-2027 Anglian River Basin District Draft Flood Risk Management Plan 2021 to 2027 (environment-agency.gov.uk)

[38] Environment Agency (2016) Anglian river basin district: River basin management plan Anglian_RBD_Part_1_river_basin_management_plan.pdf (publishing.service.gov.uk)

Figure 4.4 Map of WFD Surface Water and Groundwater Features



4.4.2 Future Baseline

A national framework for water resources[39] highlights that if no action is taken between 2025 and 2050, around 3,435 million extra litres of water per day will be needed to address future pressures across England. Five regional groups have been set up each tasked with pulling together a regional plan to build resilience to a range of uncertainties and future scenarios. These include water companies and other water users. Cambridge Water is a member of the east's regional group, Water Resources East (WRE), where there is significant pressure and little surplus water available. An estimated 570Ml/d will be needed to meet public water resource needs in the east, this is equivalent to all the supply options featured across the respective water company WRMPs across WRE. Consumptive water use outside of public water supply is greatest in the WRE region compared to the other four regional groups, with an estimated demand of 444 Ml/d with 64% of this is for agriculture (spray irrigation). The focus of WRE will be on reducing demand for water across all water users and increasing the amount of water available through exploration of new supply options.

Originally, the WFD set a target of aiming to achieve at least 'good status' in all water bodies by 2015. However, provided that certain conditions are satisfied, it was acknowledged that in some cases the achievement of good status may be delayed until 2027.

The NPPF states that inappropriate development in areas at risk of flooding (in Flood Zone 1, Flood Zone 2, Flood Zone 3a or Flood Zone 3b - the functional floodplain) should be avoided by directing development away from areas at highest risk. The NPPF requires that where development is necessary, it should be made safe for its lifetime without increasing flood risk elsewhere. 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 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 UK Climate Change Risk Assessment (CCRA3) 2021 Evidence Report[40] fulfils the requirement of the Climate Change Act 2008 for the government to lay before Parliament a five-yearly assessment of the risks for the UK of current and predicted impacts of climate change. The most recent findings of all CCRA assessments on the water environment include:

- Changing climatic conditions and extreme events, including temperature change, water scarcity, wildfire, flooding, wind, and altered hydrology (including water scarcity, flooding and saline intrusion)
- Increasing pressure on the UK's water resources due to changes in hydrological conditions and regulatory requirements to maintain good ecological status
- Increases in water demand for irrigation of crops
- A reduction in public water supplies due to increasing periods of water scarcity
- Lower summer river 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.

4.4.3 Key Issues

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.

[39] Environment Agency (2020) Meeting our future water needs: a national framework for water resources. March 2020
[40] HM Government (2022) UK Climate Change Risk Assessment 2022. January 2022

- The need to maintain 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.

4.5 AIR QUALITY AND CLIMATIC FACTORS

4.5.1 Baseline

The schemes in the WRMP may involve construction, operation of abstraction and treatment operations in new locations and changes to the operation of such processes in existing locations. Therefore, there is the potential for adverse effects on air quality and climate through emissions associated with construction (on site and transport) or through the operation of the schemes.

4.5.1.1 Local Air Quality

Options in the WRMP may require construction of new infrastructure or increased pumping of water. Therefore, there is the potential for adverse effects on local air quality through emissions associated with construction (on site and from transport) although generally only in the short term.

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. The majority of the AQMAs in the UK have been declared because of emissions from road transport. There are three AQMAs within the assessment area (as shown in Figure 4.5).

The most recent Clean Air Strategy contains a set of objectives focused on the reduction of traffic emission impacts[41]. In April 2015, the Supreme Court ruled that the UK Government must redraft the national nitrogen dioxide (NO_2) air quality action plan, as well as 16 regional action plans, including Greater London, with the aim of ensuring that these areas reach compliance with legal NO_2 limits as soon as possible. In response, the Government published an updated plan in 2017 along with individual zone plans for the 37 zones identified as having air quality issues with NO_2, including the Eastern region[42]. Air quality compliance data is further detailed in the Defra report: Air Pollution in the UK 2020.[43]

In recent years, several key air pollutants have shown major decreases in atmospheric concentrations across the UK, while others have remained constant[44]:

- Atmospheric concentrations of SO_2 have continued to decrease, in line with long-term trends across the UK. These reductions are a result of decreasing dependence on coal for energy and reductions in the sulphur content of fuels.
- Overall emissions of NO_x have decreased over the last 20 years, falling 57% between 2009 and 2019. Emissions from road transport also decreased by 31% between 2009 and 2019 as a result of tighter emissions standards for petrol and diesel cars. The monitored atmospheric concentrations did not show such a notable decrease, potentially due to continued high levels of NO_x emissions from older vehicles.
- Atmospheric concentrations of particulate matter ($PM_{2.5}$ and PM_{10}) decreases in emissions have been partially offset by increases in emissions from residential burning with $PM_{2.5}$ emissions increasing by 28% between 2009 and 2019.
- Carbon monoxide (CO) concentrations were reduced as a result of reductions in emissions from road transport, iron and steel production and the domestic sector.

[41] Defra (2019) Clean Air Strategy 2019. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/770715/cleanair-strategy-2019.pdf

[42] AQplans_UK0029.pdf (defra.gov.uk)

[43] Annual Report 2020 Issue 1 Online Viewer - Defra, UK

[44] DEFRA (2021) Emissions of air pollutants in the UK – Summary. Emissions of air pollutants in the UK - Summary - GOV.UK (www.gov.uk)

- Levels of ozone have remained relatively constant since the mid-1990s, with a possible increase observed within significant annual variation as a consequence of primary NO emission reductions. The distribution of ozone across the UK shows highest concentrations over upland and rural locations with annual average concentrations of >60µg m^{-3} over rural areas in the UK.
- Tentative observations show that increases in average ozone may be generally larger at rural (and urban) sites in the eastern part of the UK than in the western part, probably reflects both the greater influence in the east from changes in emissions in continental Europe and the greater reductions in NOx levels in eastern areas where populations (and therefore emissions) are greater than in the west[45].

4.5.1.2 Greenhouse Gases and Climate Change

Greenhouse gases including carbon dioxide (CO_2) emitted from human actions are a major contributor to climate change. The East of England emitted approximately 9.9% of the UK's greenhouse gas emissions in 2019[46]. The amount of CO_2 emitted in the East of England sub-region between 2015 and 2019 is shown in Table 4.5 and highlights that total emissions have reduced since 2015 by 13.2% to 27.7 $MtCO_2$ in 2019, principally because of declines in emissions from the industry and commercial, domestic and public sectors. Domestic and transport sectors remained the largest source of CO_2 emissions in the region.

Table 4.5 End User Estimates of Carbon Emissions, East of England 2015-2019[47]

End User	2015	2016	2017	2018	2019
Industry ($MtCO_2$)	5.5	4.8	4.8	4.9	4.5
Commercial ($MtCO_2$)	3.8	3.1	3.0	3.0	2.7
Public sector ($MtCO_2$)	1.4	1.3	1.0	1.0	0.9
Domestic ($MtCO_2$)	10.1	9.6	9.0	9.0	8.7
Transport ($MtCO_2$)	10.7	11.0	11.3	11.1	10.8
LULUCF[48] Net Emissions	0.3	0.3	0.3	0.3	0.3
Total	**31.6**	**29.9**	**29.1**	**29.0**	**27.7**
Per capita emissions (t)	*5.2*	*4.9*	*4.7*	*4.7*	*4.4*

Of the three local authority (LA) areas within SEA study area, every LA experienced a reduction in per capita emissions between 2014 and 2019[49]. Cambridge had the highest percentage decrease in emissions with 24.8%, followed by Huntingdonshire with 15.7% and South Cambridgeshire with 11.1%.

The predominant greenhouse gas of interest is carbon dioxide (CO_2). Cambridge Water's greenhouse gas emissions, reported as tonnes of CO_2 equivalent per Ml of treated water (CO2e/Ml), were 309 kgCO2e/Ml in 2020/2021[50] (figure also incorporates South Staffordshire Water).

The latest UK Climate Projections (UKCP18[51]) estimate that summers in the East of England will be hotter and drier and the winters warmer and wetter. Table 4.6 presents the key findings of the UKCP18 projections for the East of England and England. Overall, figures for the East of England are comparable with the rest of the country, however, the region is forecasted to be slightly wetter, drier and warmer than the average for England.

[45] Air Quality Expert Group (2021) Ozone in the UK – recent trends and future projections. 2112200932_Ozone_in_the_UK_Recent_Trends_and_Future_Projections.pdf (defra.gov.uk)

[46] BEIS (2021) UK Local authority carbon dioxide emissions estimates 2019.UK local authority carbon dioxide emissions estimates 2019 (publishing.service.gov.uk)

[47] BEIS (2021) UK Local authority and regional carbon dioxide emissions national statistics: 2005 to 2019. UK local authority and regional carbon dioxide emissions national statistics: 2005 to 2019 - GOV.UK (www.gov.uk)

[48] Land Use, Land-Use change and Forestry

[49] BEIS (2021) UK Local authority and regional carbon dioxide emissions national statistics: 2005 to 2019. UK local authority and regional carbon dioxide emissions national statistics: 2005 to 2019 - GOV.UK (www.gov.uk)

[50] http://www.discoverwater.co.uk/energy-emissions

[51] https://www.metoffice.gov.uk/research/approach/collaboration/ukcp/index

Table 4.6 Key findings of UKCP18 projections, using high emission scenario, median values (50th percentile)

Date Range	2010-29		2040-59		2080-99	
Variable	East of England	England	East of England	England	East of England	England
Mean annual temperature change (°C)	+0.8	+0.8	+1.8	+1.8	+4.1	+4.1
Mean summer precipitation (% change)	-6	-5	-19	-19	-37	-35
Mean summer temperature change (°C)	+1.1	+1.1	+2.3	+2.3	+5.3	+5.3
Mean winter precipitation (% change)	+5	+5	+9	+9	+22	+21
Mean winter temperature change (°C)	+0.7	+0.7	+1.7	+1.6	+3.6	+3.5

Future climate change is likely to influence processes within the hydrological cycle such as runoff and evapotranspiration. The potential impact of climate change on Cambridge Water's WRMP water supply and demand management schemes is summarised in Table 4.7**Error! Reference source not found.**.

Table 4.7 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.

4.5.1.3 Adaption to Climate Change

The UK Climate Change Risk Assessment (CCRA3) 2021 Evidence Report, which is required to conduct its assessment every five years,[52] draws together and interprets 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 CCRA3 have identified eight priority areas for Government and other organisations to address within the next five years:

- Risks to the viability and diversity of terrestrial and freshwater habitats and species from multiple hazards
- Risks to soil health from increased flooding and drought
- Risks to natural carbon stores and sequestration from multiple hazards leading to increased emissions
- Risks to crops, livestock and commercial trees from multiple hazards
- Risks to supply of food, goods and vital services due to climate-related collapse of supply chains and distribution networks
- Risks to people and the economy from climate-related failure of the power system
- Risks to human health, well-being and productivity from increased exposure to heat in homes and other buildings
- Multiple risks to the UK from climate change impacts overseas.

The UK Climate Change Act 2008 set legally binding targets for the UK to reduce greenhouse gas emissions by at least 80% by 2050, and CO_2 emissions by at least 26% by 2020, both set against a 1990 baseline. Under the requirements of the Act, the Government has set five year carbon budgets to set out a trajectory for emissions reductions 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 National Adaptation Programme (NAP) is currently in its second period [2018-2023] which sets out the actions that government and others will take to adapt to climate change challenges in England. The NAP addresses climate risks which could affect the natural environment, critical infrastructure, communities and businesses and consequently explains associated actions and future responses on risks such as flooding and coastal change, risks to health from high temperatures, and risk of public water supply shortages[53].

4.5.2 Future Baseline

Government and international targets will require significant cuts in greenhouse gas emissions by 2027. The UK met the first and second carbon budgets with headrooms of 36 and 384 $MtCO_2e$ respectively and is currently projected to meet the third carbon budget with a headroom of around 26 $MtCO_2e$ (until 2022)[54]. 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 NO_2[55] and PM_{10}[56] are flattening or even reversing at a number of locations, despite current policy measures.

Future climate change is projected (UKCP18) to cause a change in the seasonality of extremes through an extension of the convective season from summer to autumn, with increases in heavy rainfall intensity in the autumn. Although an overall summer drying trend is to be expected in the future, data from the Met Office's UK Climate Projections (UKCP18 [Local 2.2km] projections) suggest increases in heavy summer rainfall event

[52] Defra (2021) The UK Climate Change Risk Assessment 2021 Evidence Report. https://www.theccc.org.uk/wp-content/uploads/2021/07/Independent-Assessment-of-UK-Climate-Risk-Advice-to-Govt-for-CCRA3-CCC.pdf

[53] DEFRA (2018) The National Adaptation Programme and the Third Strategy for Climate Adaptation Reporting. national-adaptation-programme-2018.pdf (publishing.service.gov.uk)

[54] DECC (2020) Updated energy and emissions projections 2019. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/931323/updated-energy-and-emissions-projections-2019.pdf

[55] Nitrogen dioxide

[56] Particulates with a diameter of 10µm or less

intensity[57]. The UKCP18 also estimates that summers in central England are likely to be between 1.1°C to 5.8°C warmer,57% drier and 9% wetter[58].

Emissions of PM_{10} and $PM_{2.5}$ have been relatively stable since 2009. The Government's aim is to reduce emissions of $PM_{2.5}$ 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[59].

4.5.3 Key Issues

The key sustainability issues relevant to the WRMP and the SEA, arising from the analysis of the air quality and climate baseline are:

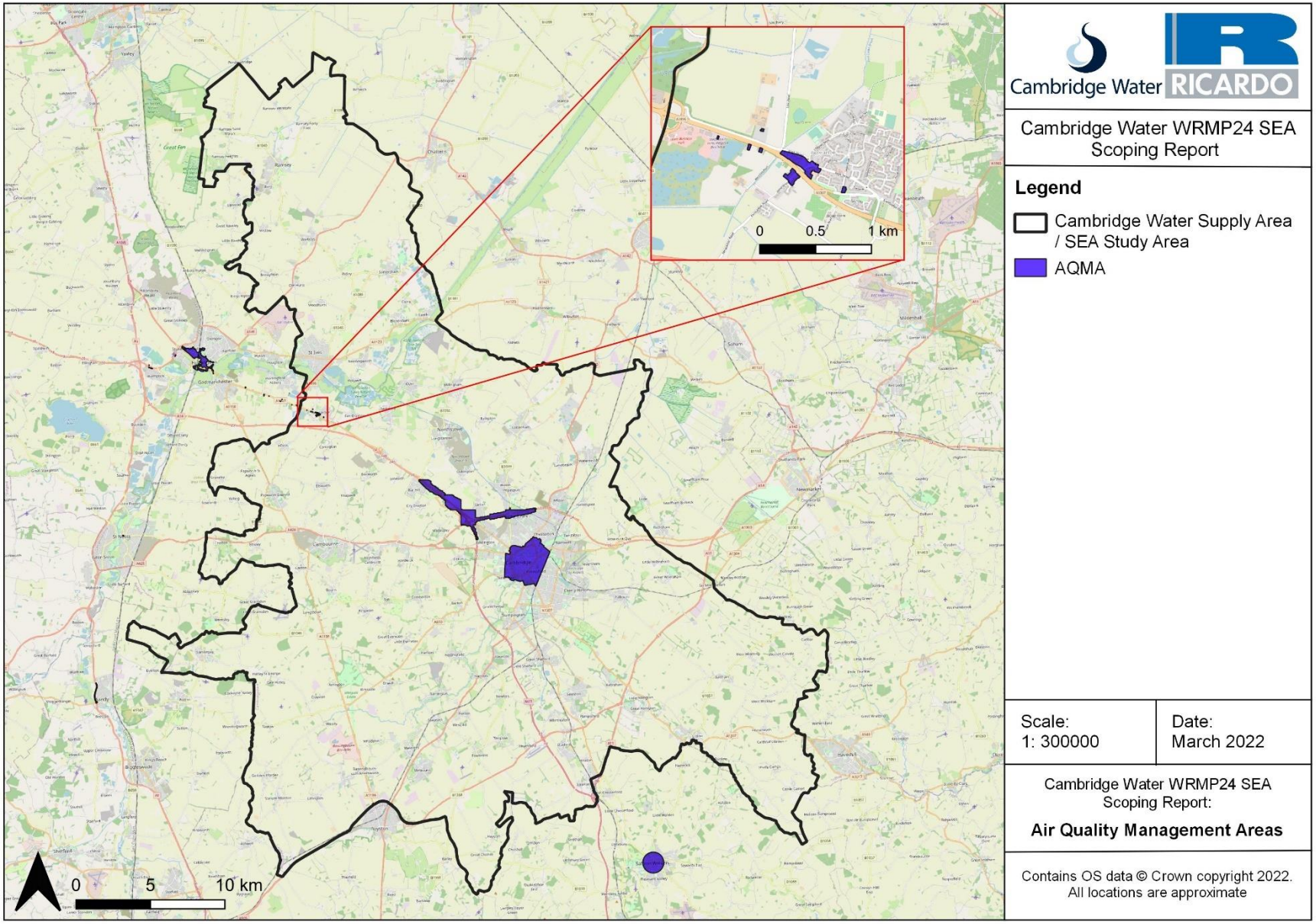
- The need to minimise emissions of pollutant gases and particulates and enhance air quality;
- The need to reduce greenhouse gas emissions arising from implementation of the WRMP;
- The need to take into account, and where possible adapt to, the potential effects of climate change;
- The need to increase environmental resilience to the effects of climate change.

[57] Met Office (2021) UK Climate Projections: Headline Findings

[58] 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-infographicheadline-findings-land.pdf

[59] Defra (2019), Clean Air Strategy 2019

Figure 4.5 Air Quality Management Areas



4.6 POPULATION AND HUMAN HEALTH

4.6.1 Baseline

4.6.1.1 Population

The assessment area is wholly within the East of England region, which is the second largest English region by area, behind only the South West; where large expanses of arable land are characteristic of the region. The east of England population is projected to increase by 15% by 2043, based on the 2020 estimated figure of 6.3 million. Cambridgeshire Research Group produces population and dwelling stock forecasts for Cambridgeshire and its districts. It is estimated that between 2021 and 2036, the population of Cambridgeshire will rise by 16%, from 685,770 to 794,200[60].

Population change is the function of natural change (difference between births and deaths) and net migration (the difference between the number of people moving into and out of an area). The balance of factors underlying population change varies by region. To provide context, the population in England as a whole is expected to increase by 9% by 2043. Table 4.8 shows the population and household statistics and projections for the regions that fall within, and surround, the assessment area.

Table 4.8 Population[61],[62] and Household[63] estimates and projections (millions)

Region	2020 estimates		2043 projections		% change 2020-2043	
	Population	No. Households	Population	No. Households	Population	No. Households
East Midlands	4.9	2.0	5.5	2.4	12	20
East of England	6.3	2.6	6.8	3.0	8	15
South East of England	9.2	3.8	9.9	4.3	8	13
England	56.6	23.5	61.7	27.0	9	15

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. However, the UK's exit from the European Union (EU) may possibly lead to greater uncertainty regarding future population and housing growth.

4.6.1.2 Human Health and Deprivation

The WRMP has the potential to influence quality of life, including human health, wellbeing, amenity and community, through actions to maintain essential water supplies for public use. There could be beneficial (such as actions to provide additional supply of water will help safeguard public health) or adverse impacts (such as noise and disruption from the construction of infrastructure).

In general, the health of the population in the assessment area is good. The East of England region experiences higher than average life expectancy at birth for both males (80.2 years compared with 79.4 for England) and females (83.8 years compared with 83.1 for England), for the period 2018 to 2020[64].

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[65]. The Index of Multiple Deprivation combines a number of indicators, chosen to cover a range of economic, social and housing issues, into a single deprivation score for each Lower Super Output Area 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

[60] Cambridgeshire Insight (2020) Cambridgeshire and Peterborough 2018-based district population forecasts
[61] ONS (2020) Mid-Year Population Estimates, UK, June 2020
[62] ONS (2020) Subnational population projections for England: 2018-based
[63] ONS (2020) 2018-based household projections for local authorities and higher administrative areas within England (principal projection)
[64] ONS (2021) Life expectancy for local areas of the UK: between 2001 to 2003 and 2018 to 2020.
[65] Defra (2006) Air Quality and Social Deprivation in the UK: an environmental inequalities analysis

from special initiatives or programmes and as a tool to determine eligibility for specific funding streams. shows the Index of Multiple Deprivation across the assessment area.

In contrast with the rest of the UK, Cambridge and other towns and villages in the assessment area do not contain areas with high levels of deprivation. 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 report.

4.6.1.3 Affordability of Water

An independent review of water affordability was undertaken by the Consumer Council for Water (CCW) in 2021[66]. This found that roughly 1.5 million households spend more than 5% of their income (after housing costs) on water bills, whilst 4.1 million spend more than 3%. As a result, a number of recommendations were made ranging from immediate, short-term (12 months), medium term (within three years and long term (within three to six years) actions, along with the who the responsibility lies with to make each one a reality.

It should be noted that Cambridge Water already has one of the lowest average household water and sewerage bills in England.

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. Cambridge Water's current strategy is to continue offering unmetered customers the option to swap to a water meter free of charge as well as metering all new household properties.

4.6.1.4 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).

Tourism contributes around 9% of the UK's GDP (approximately £127 billion a year) and accounts for 10% of the UK job market[67]. In 2019, over 9 million UK domestic overnight trips were made to the East of England, accounting for 10% of overnight trips in England and generating a total spend of £1.7 billion[68]. Cambridge is the largest city in the assessment area and, in 2019, over 8 million people visited the area, contributing over £850 million to the local economy[69]. The tourism industry was one of the hardest hit sectors by the COVID-19 pandemic.

Some of the areas that may be used for recreation within the assessment area are shown in **Figure 4.1.** These include National Nature Reserves (NNRs) and Local Nature Reserves (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 Cambridge Water supply area includes a number of water resources of recreation importance including canals, reservoirs and lakes (i.e. Moor lake, Drayton Lagoon, Far fen Lake, Trout Pool) for sailing or fishing and river reaches (i.e. River Greater Ouse, St. Ives Chub Stream) of particular importance with respect to navigation and angling – both coarse and salmonid).

Other, non-water based, recreational and cultural resources in the assessment area include a number of nature reserves presented in Section 4.2. Section 4.8 identifies the importance of the assessment area with respect to heritage assets, including 26 Registered Parks and Gardens and 128 Scheduled Monuments. Section 4.9 presents the Landscape baseline.

Public areas of open space, National Parks (see Landscape topic), country parks, Public Rights of Way, walking routes and cycle routes are also important with respect to recreation and tourism. The National Planning Policy Framework (NPPF) for England states planning policies should protect and enhance public rights of way and access[70]. All Local Authorities are required to prepare and publish Rights of Way

[66] CCW (2021) Independent Review of Water Affordability

[67] British Tourist Authority (2021) Visit Britain & Visit England Annual Report and Accounts – Year Ended 31 March 2021.

[68] Visit Britain (2020) England – All Trip Purposes 2019. england_all_trip_purposes_2019.pdf (visitbritain.org)

[69] Cambridge City Council (2019) East of England Tourism's Volume and Value Study

[70] MHCLG (2021) National Planning Policy Framework. https://www.gov.uk/government/publications/national-planning-policy-framework--2

Improvement Plans (ROWIPs). These plans explain how improvements made by local authorities to the public rights of way network will provide a better experience for a range of users, including pedestrians and cyclists.

The NPPF defines green infrastructure as 'a network of multi-functional green and blue spaces and other natural features, urban and rural, which is capable of delivering a wide range of environmental, economic, health and wellbeing benefits for nature, climate, local and wider communities and prosperity'. 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.

4.6.1.5 Economy and Employment

The Cambridge Water service area has a varied economy that is centred around the city of Cambridge. In 2017, a combined authority was established connecting Cambridgeshire with Peterborough, which lies to the north just outside of the Cambridge Water supply area.

Within the Cambridgeshire area (which contains the majority of the Cambridge Water customer population) 78.4% of the population between 16 and 64 are employed, compared to 74.5% in the United Kingdom. Of the 101,000 individuals who are not employed, 31,100 (30%) are full-time students[71]. The largest industries by workforce numbers in the East of England are Wholesale and Retail Trade (468,000 people) Human Health and Social Work (418,000 people) and Administrative and Support Services (325,000 people)[72].

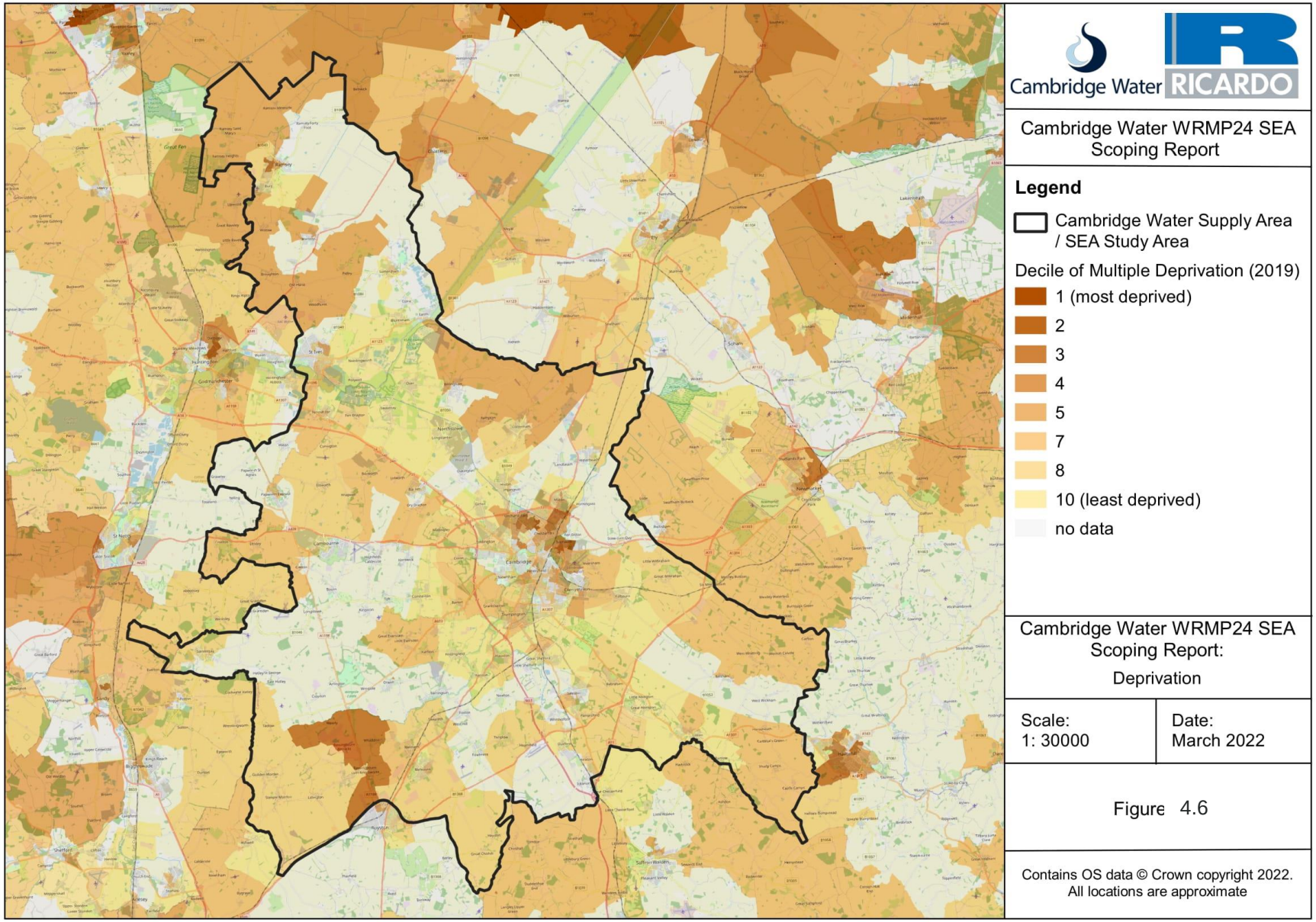
The East of England had a Gross Domestic Product (GDP) of £190 billion in 2019, or £30,622 per worker[73]. Cambridgeshire and Peterborough had a combined Gross Value Added (GVA) per head of £30,840.

[71] Cambridgeshire Insight (2022) https://cambridgeshireinsight.org.uk/

[72] ONS (2022) Regional labour market statistics: HI06 Headline indicators for the East of England.

[73] ONS (2021) Regional economic activity by gross domestic product, UK: 1998 to 2019

Figure 4.6 Map of Indices of Multiple Deprivation



4.6.2 Future Baseline

As shown in Table 4.8, the population in the East of England is expected to increase by 15% to 2043, with an increasing proportion of people at or above state pension age. Household projections show potential increases of approximately 15% across the region. However, the UK's exit from the EU may pose greater uncertainty in the short term regarding future population and housing growth.

Average yearly household water and sewerage bills are expected to rise by 1.7% in 2022, however the actual increase varies by geographic location. 1 million households are receiving help with their water bills, a figure which is expected to rise to at least 1.4 million by 2025. As a result of the 'Independent review of water affordability' commissioned by the UK and Welsh governments and published by CCW, more pressure has been put on water companies to provide support for customers struggling to pay.

Cambridge Water charges up to 25% less than the average amount charged for water across England and Wales. The company has special tariffs (Assure, Assure Assist and WaterSure) aimed at people on low incomes who are struggling to pay their water and wastewater bills. Cambridge Water also offer payment breaks to provide short-tern financial relief to their customers.

The NPPF highlights the importance of protecting and enhancing areas used for recreational, social and cultural purposes in future planning policies in order to promote healthy and safe communities. The Environment Plan further emphasises the need to consider an 'environmental net gain' principle in future development, building on the approaches used for biodiversity and expanding to include wider natural capital benefits such as recreation and improved water and air quality. One of the actions promoted in the plan is to produce stronger new standards for green infrastructure which will promote health and wellbeing and social interaction amongst communities.

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[74].

Key Issues

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, reflecting the importance of water and sewerage services for health and wellbeing.
- 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 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.
- Sites of nature conservation importance, heritage assets, water resources, important landscapes and public rights of way contribute to recreation and tourism opportunities and subsequently health and well-being and the economy.

4.7 MATERIAL ASSETS AND RESOURCE USE

4.7.1 Baseline

4.7.1.1 Water Use

Cambridge Water abstracts from groundwater sources and typically supply an average of 83 million litres of water per day (Ml/d) to its customers. Cambridge Water has a number of small cross-border metered supplies with Anglian Water and Affinity Water, both into and out of the company's area. These serve a small numbers of properties only, and are not the subject of formal agreement.

[74] UK Climate Change Risk Assessment 2022 (publishing.service.gov.uk).

Cambridge Water 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 Cambridge Water for 2018/19 was 13.2 Ml/d. 0.3 Ml/d lower than the proposed target of 13.5 Ml/d. Furthermore, a 4.1% reduction in leakage was reported for the period 2020/21 (based on a three-year rolling average). Water consumption per person, also referred to as per capita consumption (PCC), is slightly lower in the Cambridge Water supply area compared to other parts of the country, with an average use per person estimated at around 140 litres/day compared to a national average in England of around 145 litres/day[7576]. Cambridge Water propose to reduce average PCC to 137 litres/day by 2025.

The 2020/21 period experienced a 3% increase in household water use (per capita consumption) in the Cambridge Water region, attributed to the unprecedented impact of the COVID-19 pandemic which had significant impacts on household water use patterns. Ofwat, the regulator, has agreed to review the water use targets for water companies at its next review to enable companies to better understand the impacts of the pandemic on water efficiency.

4.7.1.2 Resource Use and Waste

Cambridge Water is a large user of energy due to the energy needed to treat and pump water. 98% of all Cambridge Water's electricity usage is used for pumping water and also contributes 90% to all the company's carbon emissions. The aim of the water industry sector is to achieve net zero carbon emissions by 2030[77].

Cambridge Water undertake a Pumping Efficiency Programme (PEP) which allows effective planning of maintenance and replacement of pumps, with newer and more efficient technology, balancing the costs of the replacement against electricity.

The East of England is a relatively high producer and consumer of energy. Total energy consumption in the region was 134.4 terawatt hours in 2017 (Total All Fuels), about 9.1% of the total UK figure. This represents a decrease of 12% energy consumption over a 10-year period, from the 2007 total of 152.9 terawatt hours[78].

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. In England, waste going to landfill has almost halved from 2010 to 2019 (20,298 thousand tonnes to 11,492 thousand tonnes) whilst recycling rates have increased from 41.2% to 45.5%[79]. The recycling rate in the Greater Cambridge area, which falls within the assessment area, was above that of England at 51% in 2019[80]. Waste generated by businesses, referred to commercial and industrial waste, increased by 16% between 2010 and 2019. 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.

Data on waste arisings are 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 its treatment facilities. Waste streams include commercial and industrial waste (statistics include waste arisings from the power and utilities sector, which includes water supply and sewage removal), and also hazardous wastes. Table 4. shows waste data according to economic activity in England in 2018 against 2014 data.

[75] Water UK; England and Wales, three year average (April 2018 – March 2021)

[76] https://discoverwater.co.uk/amount-we-use

[77] Water UK – Net Zero 2030 Routemap

[78] DEIS (2019) *Sub-national total final energy consumption in the United Kingdom* (2005-2017). https://www.gov.uk/government/statistical-data-sets/total-final-energy-consumption-at-regional-and-local-authority-level

[79] Defra (2021) UK Statistics on Waste. July 2021.

[80] Cambridge City Council, Climate Change Strategy 2021-2026.

Table 4.9 Waste Generation Split by Responsible Economic Activity in England

Sector	2014 ('000 tonnes)	Recycle Rate (%)	2018 ('000 tonnes)	Recycle Rate (%)
Commercial and Industrial	19,849	-	25,938	-
Construction	49,109	91.4	119,429	93.8
Household	22,355	44.8	22,033	44.8
Other (municipal waste)	13,714	-	886	-

4.7.2 Future Baseline

The Government's national aspiration is to reduce water usage to an average of 110 litres per person per day by 2050[81]. Water companies across England and Wales are currently working towards this assumption.[82]

The 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. Ofwat have set companies stretching leakage targets over the 2020-2025 period. Cambridge Water have an ambition to reduce leakage by 15%, through investment into the maintenance of pipes and associated assets as well as use of innovative methods such as satellite detection technology. According to the latest annual performance report, the company has met its leakage targets and are on track to deliver this target by 2025. Furthermore, water companies have committed to delivering a 50% reduction in leakage (based on 2017-18 levels) by 2050. This was a recommendation from the National Infrastructure Commission[83].

There is a potential for an increase in operational waste from the water sector as the regional population rises, more water is supplied to customers and standards of treatment are increased through regulatory requirements. For example, as well as wastage of water from leakage, types of operational waste from the water industry will include additional chemical use in water treatment works and waste from construction operations due to pipe network upgrades and extensions.

The Resources and Waste Strategy for England sets out the desire to extract the maximum value out of resources to achieve a more circular economy and forms a key part of the government's pledge to leave the environmental in a better condition than we inherited it. The government has set a target for at least 65% municipal waste to be recycled by 2035 and no more than 10% ending up in landfill.

The Government's National Infrastructure Strategy[84] (2020) outlines a legal commitment to decarbonise the economy by 2050, and strategies to rebuild the economy following the COVID-19 pandemic and plans to 'level-up' UK cities and regional powerhouses. The UK Government plans to accelerate the deployment of green technology through private sector investment in the retrofitting of existing stock, carbon capture and low-carbon hydrogen. Cambridge City Council is committed to decarbonising and aims to be net zero by 2030, subject to government, industry and regulators implementing the necessary changes to enable this.

Cambridge Water's Pumping Efficiency Programme (PEP) allows efficient planning of the maintenance and replacement of pumps, with newer, more efficient technology to balance the cost of the pump replacement against the cost of electricity. Cambridge Water are also installing solar panels at some of sites to reduce electricity taken from the electricity grid and further reduce emissions, and are committed to the industry net zero targets, including migration to EV within its fleet.

4.7.3 Key Issues

The key sustainability issues arising from the baseline assessment for Material Assets and Resource Use are:

[81] Defra (2021) The government's strategic priorities for Ofwat. Draft for consultation. July 2021

[82] Environment Agency (2020) Meeting our future water needs: a national framework for water resources. March 2020.

[83] National Infrastructure Commission (2018) Preparing for a drier future. England's water infrastructure needs. April 2018.

[84] 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 need to minimise the consumption of resources, including water and energy.
- The need to reduce the total amount of waste (from all sources) produced in the region, promote recycling and reduce the proportion of waste sent to landfill
- 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 continue to reduce leakage from the water supply system
- Promote the efficient use of water to help reduce future demand for water.
- The need to support regional and national commitments to decarbonisation.

4.8 CULTURAL HERITAGE

4.8.1 Baseline

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[85] 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.*'

Table 4. lists the designated heritage asset count, nationally and for the assessment area. Heritage assets are also shown on Figure 4.7.

Table 4.10 Designated Heritage Assets[86]

Asset	England	SEA Assessment Area
World Heritage Sites	20	None
Scheduled Monuments	19,923	128
Listed Buildings	379,126	4,092
Registered Historic Parks and Gardens	1,696	26
Registered Historic Battlefields	47	None
Protected Historic Wrecks	54	None

The National Character Areas (NCAs) described in Section 4.9 include consideration of historic and cultural influences on the landscape. The key historic and cultural characteristics of each NCA are included in Table 4. below. Relevant NCA boundaries are shown in Figure 4.8

Table 4.11 Landscape Character Areas: Historic and Cultural Characteristics

Area (Shown in Figure 4.8)	Characteristics
The Fens	The area is very rich in geodiversity and archaeology, with sediments containing evidence for past environmental and climate changes and with high potential for well-preserved waterlogged site remains at the fen edge, within some of the infilled palaeo-rivers and beneath the peat. The Great Fen project aims to maintain and restore these wetlands. The potential impact on this project is a consideration in the assessment.

[85] Ministry of Housing, Communities & Local Government (2021) National Planning Policy Framework

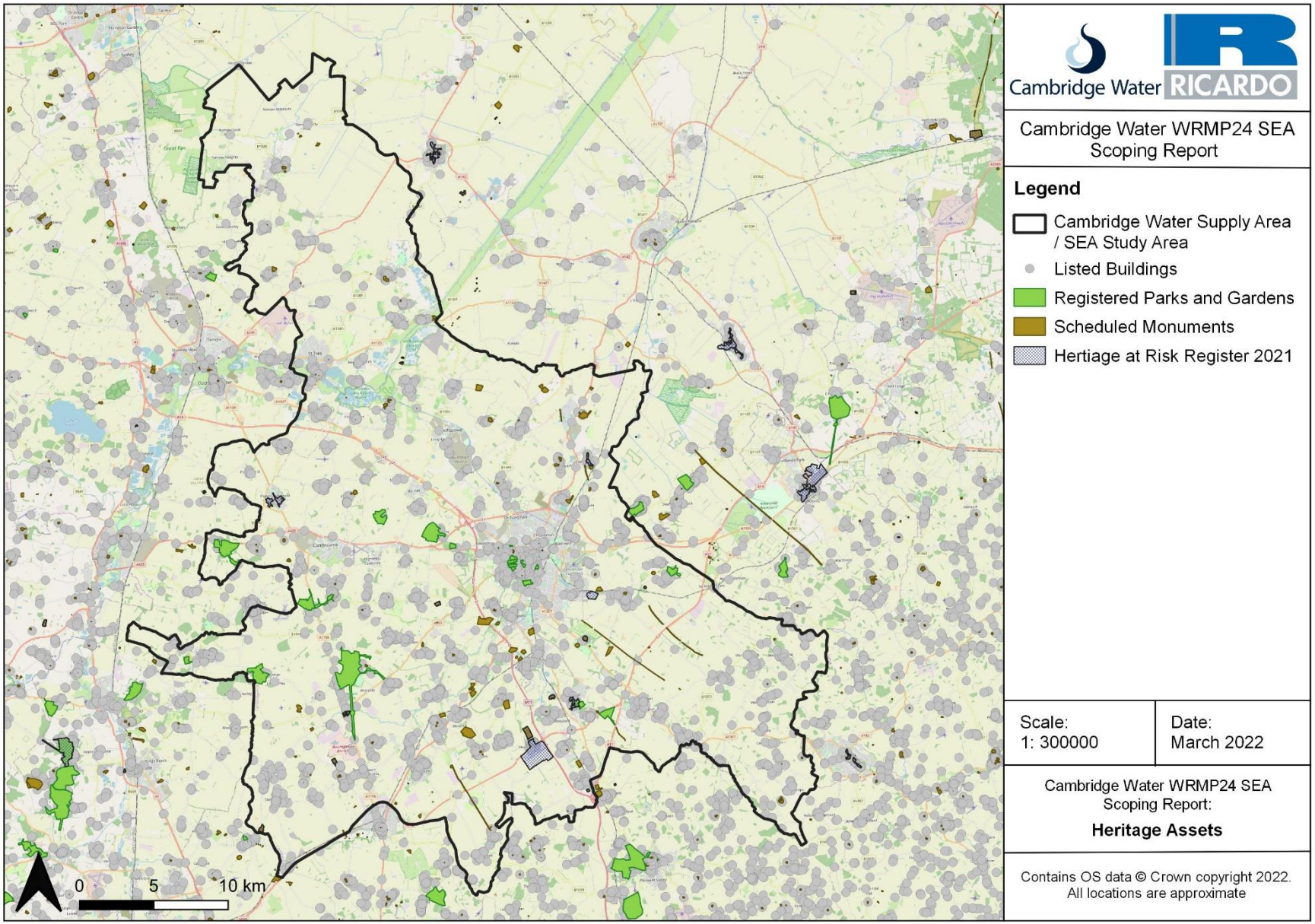
[86] Historic England: Heritage Counts 2021 (designated assets in study area were identified from GIS datasets available from Historic England at https://historicengland.org.uk/listing/the-list/data-downloads/)

Area (Shown in Figure 4.8)	Characteristics
South Suffolk and North Essex Clayland	Roman sites, medieval monasteries and castles and ancient woodlands contribute to a rich archaeology. Impressive churches, large barns, substantial country house estates and Second World War airfields dot the landscape, forming historical resources.
East Anglian Chalk	Archaeological features include Neolithic long barrows and bronze-age tumuli lining the route of the prehistoric Icknield Way; iron-age hill forts, including that at Wandlebury; impressive Roman burial monuments and cemeteries such as the Bartlow Hills; a distinctive communication network linking the rural Roman landscape to settlements and small towns, such as Great Chesterford; the four parallel Cambridgeshire dykes that cross the Chalk: the Anglo-Saxon linear earthworks of Devil's Dyke, Fleam Dyke, Heydon/Bran Ditch and Brent Ditch; ridge-and-furrow cultivation remains of the open field systems of the earlier medieval period; and large numbers of later moated enclosures, park lands created, sheepwalks, arterial routes and nucleated villages that emphasise the land use change of this period.
Bedfordshire and Cambridgeshire Claylands	Rich geological and archaeological history evident in fossils, medieval earthworks, deserted villages and Roman roads. A number of historic parklands, designed landscapes and country houses – including Stowe House and Park, Kimbolton Park, Croxton Park, Wimpole Hall and Wrest Park – combine with Bletchley Park, Second World War airfields, the Cardington Airship Hangars and brickfields to provide a strong sense of history and place.
Bedfordshire Greensand Ridge	Visible heritage of iron-age banks and ditches at Kings Wood and Glebe Meadows, Houghton Conquest Site of Special Scientific Interest (SSSI) and iron-age hill fort remains at Sandy. Remnant ridge and furrow at Hockliffe and Potsgrove. Historic parklands and estates associated with grand country houses such as Woburn.

Historic England has been collecting data on buildings at risk for more than a decade. The Heritage at Risk (HAR) Register systematically checks the condition of problem sites, initially focused on buildings at risk, but now adapted to serve other types of heritage asset. An Annual Register is published which identifies sites most at risk of being lost as a result of neglect, decay or inappropriate development. The HAR programme helps understanding of the overall state of historic sites in England identify those most at risk and most in need of safeguarding for the future. In 2021, there were 4,985 entries on the Register including 3.4% of all grade I and grade II listed buildings (excluding places of worship) along with 10% of all scheduled monuments in England. There are 28 historic sites on the 2021 HAR Register in the assessment area, the locations of these are illustrated on **Figure 4.7**. They include nine listed buildings, five conservation areas and 14 scheduled monuments.

Scheduled Monuments are at risk from water abstraction or dewatering. However, other assets including unknown 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). The waterlogged conditions that preserve these 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.

Figure 4.7 Heritage Assets



4.8.2 Future Baseline

The NPPF was introduced in 2012 and updated in 2019. It aimed to make the planning system less complex and more accessible, changing the emphasis on planning towards a presumption in favour of development. However, the NPPF states that *"Local Planning authorities should identify and assess the particular significance of any heritage asset that may be affected by a proposal […]. They should take this into account when considering the impact of a proposal on a heritage asset, to avoid or minimise any conflict between the heritage asset's conservation and any aspect of the proposal."*[87].

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. For example, global warming is likely to encourage fungal and plant growth and insect infestation which could impact historic building materials with temperate fluctuations also potentially increasing structural problems[88]. However, many more historic assets are potentially at risk from the direct impacts of future climate change[89].

4.8.3 Key Issues

The key issues arising from the baseline assessment for archaeology and cultural heritage are:

- 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.
- The need to protect water-dependent heritage sites during drought conditions.

4.9 LANDSCAPE

4.9.1 Baseline

4.9.1.1 Landscape character

Landscape character[90] can be defined as 'a distinct and recognisable pattern of elements, or characteristics, in the landscape that make 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 Areas of Outstanding Natural Beauty (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.

Implementation of WRMP options has the potential to influence landscape, for example through effects arising from construction of new infrastructure, raising of reservoir levels or the abstraction of water affecting existing water levels in rivers.

The assessment area is flat and predominantly arable, with the only major city being Cambridge. The area features three major country parks: Coton, Milton and Wandlebury. The visual landscape characteristics of the relevant Natural Character Areas (NCA) are shown in Figure 4.8 and are included in Table 4.9 below.

4.9.1.2 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'[91]. 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 no AONBs within, or partially within, the assessment area.

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[87] MHCLG (2021) National Planning Policy Framework. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf

[88] Historic England (2021) What Are the Effects of Climate Change on the Historic Environment? What Are the Effects of Climate Change on the Historic Environment? | Historic England

[89] English Heritage, now known as Historic England, (2010) Climate Change and the Historic Environment

[90] Natural England (2014) An approach to Landscape Character Assessment. landscape-character-assessment.pdf (publishing.service.gov.uk)

[91] http://www.landscapesforlife.org.uk/

4.9.1.3 Green Belt

The main characteristics of Green Belt are its openness and permanence. The main aim of Green Belt policy is to prevent urban sprawl by keeping land permanently open. The Green Belt therefore aims to check the unrestricted sprawl of large built-up areas; prevent neighbouring towns merging into one another; assist in safeguarding the countryside from encroachment; preserve the setting and special character of historic towns; and assist in urban regeneration while encouraging the recycling of derelict and other urban land.

A proportion of the Cambridge Water supply area is covered by the Cambridge Green Belt, which surrounds the city. The Cambridge Green Belt stretches from Great Eversden in the west to Newmarket in the east and from Fowlmere in the south to Cottenham in the North.

4.9.1.4 Tranquillity Areas

'Tranquillity' can be defined as the quality of calm that is experienced by people in places full of the sights and sounds of nature. The Campaign for Rural England (CPRE) developed tranquillity mapping for England to identify areas that are either disturbed or undisturbed by urban areas (towns and cities), traffic (road, rail and airports), power stations, pylons, power lines and open-cast mines[92]. Effects on tranquil areas will be considered when assessing the WMRP options.

Table 4.9 Landscape Character Areas: Landscape Characteristics

Area (Shown in Figure 4.8)	
The Fens	Expansive, flat, open, low-lying wetland landscape influenced by the Wash estuary, and offering extensive vistas to level horizons and huge skies throughout, provides a sense of rural remoteness and tranquillity. Open fields, bounded by a network of drains and the distinctive hierarchy of rivers (some embanked), have a strong influence on the geometric/rectilinear landscape pattern. The structures create local enclosure and a slightly raised landform, which is mirrored in the road network that largely follows the edges of the system of large fields. The drains and ditches are also an important ecological network important for invertebrates, fish including spined loach, and macrophytes.
Bedfordshire and Cambridgeshire Claylands	The River Great Ouse and its tributaries meander slowly across the landscape, and the River Nene and the Grand Union Canal are also features. Three aquifers underlie the National Character Area (NCA) and a large manmade reservoir, Grafham Water, supplies water within and outside the NCA. Brickfields of the Marston Vale and Peterborough area form distinctive post-industrial landscapes with man-made waterbodies and landfill sites. Restoration of sand and gravel workings has left a series of flooded and restored waterbodies within the river valleys.
East Anglian Chalk	The underlying geology is Upper Cretaceous Chalk, which is covered in a surface deposit of ice and river-deposited material laid down during the last ice age. This creates a visually simple and uninterrupted landscape of smooth, rolling chalkland hills with large regular fields enclosed by low hawthorn hedges, with few trees, straight roads and expansive views to the north. Certain high points have small beech copses or 'hanger', which are prominent and characteristic features in the open landscape. In the east there are pine belts.
South Suffolk and North Essex Clayland	The agricultural landscape is predominantly arable with a wooded appearance. There is some pasture on the valley floors. Field patterns are irregular despite rationalisation, with much ancient countryside surviving. Field margins support corn bunting, cornflower and brown hare. The area's open yet wooded character is sufficiently endowed with copses and small woods to have wooded horizons, which give a large, distantly wooded character to the landscape – an impression that is sometimes missing at close quarters due to the loss of hedges and hedgerow trees. Larger woods are typically confined to the north and south of the area. Within the valleys, the main impression is of the blocks of willows and poplars planted on the valley floor and sides.
Bedfordshire Greensand Ridge	The dominant and highly visible north-west-facing scarp slope with its mix of coniferous and deciduous woodland, pasture, arable and heathland overlooks

[92] CPRE tranquillity mapping for England: http://www.cpre.org.uk/what-we-do/countryside/tranquil-places

Area (Shown in Figure 4.8)	
	Milton Keynes and the Marston Vale; the ridge offers fine panoramic views out over the surrounding landscape, including reciprocal views of and from the Chilterns to the south. The undulating dip slope is a mix of arable land and estate parklands, villages and woodlands, giving the impression of a carefully tended landscape.

4.9.2 Future Baseline

The intrinsic planning policy in the updated 2019 NPPF is to enable and facilitate growth whilst aiming to protect the character of areas. The 2019 NPPF re-iterates that more 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 that they are in the public interest.

The NPPF states that planning policies and decisions should contribute to and enhance the natural and local environment by protecting and enhancing valued landscapes while 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.

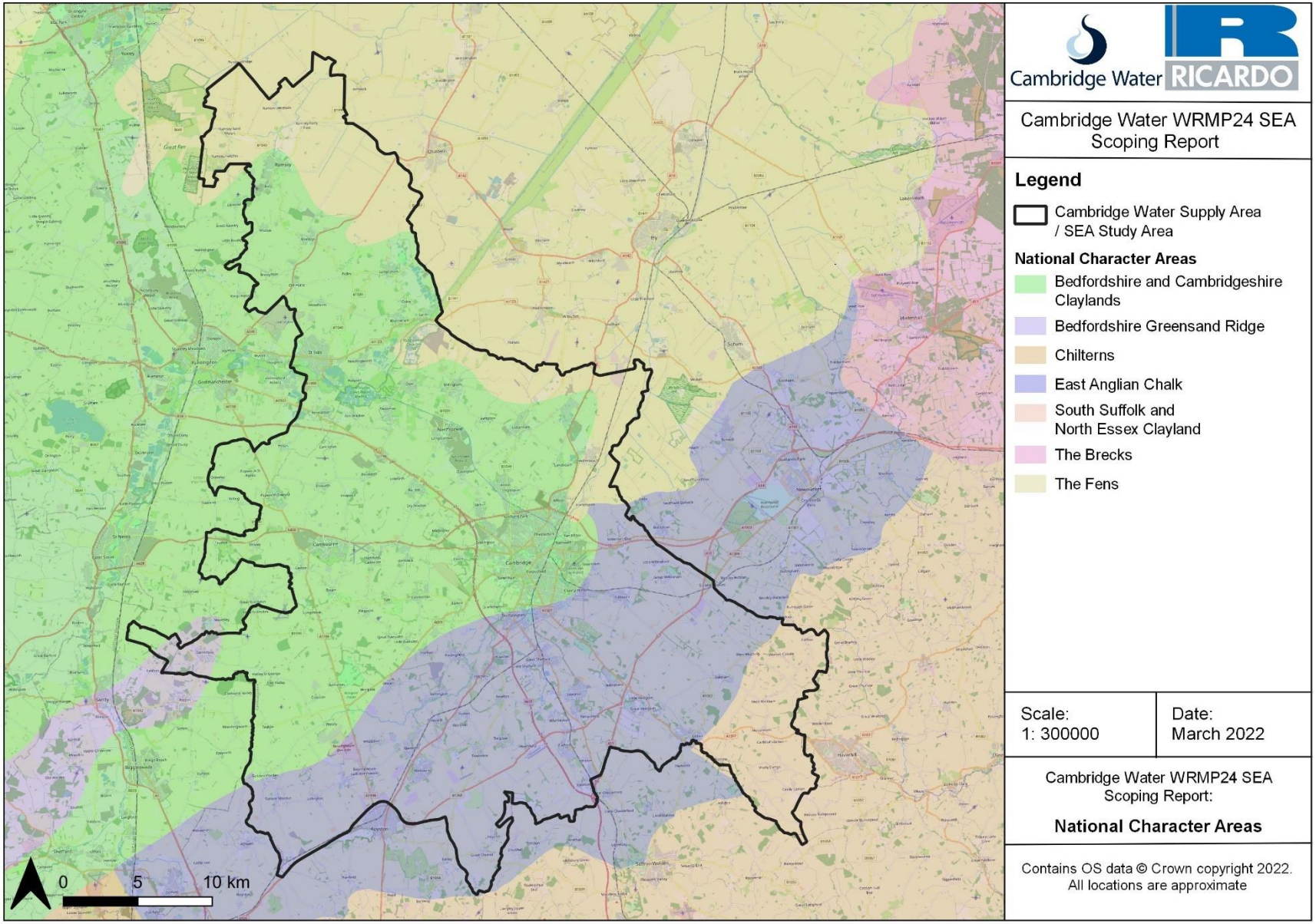
With the pressures for housing in parts of the assessment area, there are likely to be some threats to visual amenity more broadly beyond designated landscape areas (including within Green Belt). Climate change and land use change (such as due to agricultural reform associated with the UK's exit from the EU and Common Agricultural Policy) may also, in the longer term, lead to changes to landscape character.

4.9.3 Key Issues

The key sustainability issue arising from the baseline assessment for landscape is:

- The need to protect and improve the natural beauty of the region's National Parks and other landscapes of natural beauty.
- The need to protect and improve the character of landscapes and townscapes.

Figure 4.8 National Character Areas



4.10 INTER-RELATIONSHIPS BETWEEN SEA TOPICS

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. Secondary, cumulative and synergistic effects will be assessed as part of the SEA. Inter-relationships that result in changes to individual effects will be considered through the assessment of synergistic effects.

5. PROPOSED SEA OBJECTIVES AND PROPOSED ASSESSMENT FRAMEWORK

5.1 PROPOSED SEA OBJECTIVES

This section outlines the draft SEA objectives and proposed assessment framework that will be used to identify the environmental effects of the options identified in Cambridge Water’s WRMP.

Establishing appropriate SEA objectives and guide questions is central to assessing the effects of the Cambridge Water WRMP on the environment. Each of the water resource management options and preferred options will be 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 the Cambridge Water assessment area.

As South Staffs Water incorporates Cambridge Water and therefore to ensure consistency across the approaches and allow integration of outcomes, the proposed methodology for Cambridge Water will closely follow the WRW (and South Staffs Water) SEA.

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

- the approach used for the WRW and South Staffs WRMP24 including 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;
- the baseline information and key issues;

The draft assessment framework is presented in Table 5.1. Following scoping consultation responses, the assessment framework will be reviewed and revised.

Table 5.1 SEA Objectives and Draft Assessment Framework

Topic	Proposed Objective	Proposed 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, 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?
	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 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?
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 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)?
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?

Topic	Proposed Objective	Proposed Guide Questions
		• 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? • 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?

Topic	Proposed Objective	Proposed Guide Questions
		• 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?
	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	Proposed Objective	Proposed 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?

5.2 PROPOSED FRAMEWORK FOR ASSESSMENT

The effects of the draft Cambridge Water WRMP will be assessed in a staged process, complementary to the development of the plan, and reflecting the decision-making requirements, as follows:

- **Feasible option assessment**: an assessment of the final list of feasible options (expected to be around 20 options) against the 17 SEA assessment objectives detailed in Table 5.1.
- **Preferred programme assessment**: the cumulative effects of the preferred programme of options will be completed, to ensure that the effects of the draft WRMP have been identified, described and evaluated.
- **Alternative Plan assessments**: if alternative plans or plan pathways are identified for the draft Cambridge Water WRMP, the cumulative effects will be identified, described and evaluated for consideration along with the preferred plan. It is assumed that the alternative plans will comprise alternative selections of options that have already been assessed.

Both the construction and operational effects of each option will be 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.

A matrix similar to that shown in Table 5.2 will be used to capture the assessment of each water resource management options in a consistent manner; a key to the meaning of the symbols is presented in Table 5.3.

Table 5.2 Example Options Assessment Matrix

Option	Stage	1. Biodiversity	2. Geology and Soils	3. Water Quantity and Quality	Etc...
Option Name	Construction (negative)	-	-	0	
	Construction (positive)	0	0	+	
	Operation (negative)	-/?	0	0	
	Operation (positive)	+	?	+++	

Construction

A description of the likely significant effects of the option under consideration on the SEA objectives during construction has been included here.

Operation

A description of the likely significant effects of the option under consideration on the SEA objectives during operation has been included here.

Table 5.3 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	--
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.	?

5.2.1 Assessment of Secondary, Cumulative and Synergistic Effects

The SEA Regulations require that the cumulative effects of the Cambridge Water WRMP are assessed. In addition to the assessments of the preferred programme of option (at the WRZ level) and plan level assessments (and alternatives) described above, this would also include the cumulative effects of the Cambridge Water WRMP in-combination with other plans and programmes.

5.2.2 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.

As South Staffs Water incorporates Cambridge Water and therefore to ensure consistency across the approaches and allow integration of outcomes, it is suggested that the proposed methodology for Cambridge Water will closely follow the WRW (and South Staffs Water WRMP24) SEA. An example of thresholds is provided for biodiversity in Table 5. with the full suite of definitions presented in Appendix B.

In developing the definitions and thresholds of significant effects for South Staffordshire WRMP, information was drawn from:

- the approach used for the WRW and South Staffs Water WRMP24;
- the previous definitions and thresholds used in the SEA's of WRMP19;
- suggested definitions and thresholds for assessment scoring from the All Company Working Group (ACWG) for application to the SROs;
- an evaluation of the range of quantitative values (such as yield, capex, embodied carbon, operational carbon and material quantities) available for a selection of WRMP19 options for different option types (e.g., supply-side options such as reservoirs, transfers, boreholes, enhanced treatment).

Table 5.4 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.

6. INTEGRATING WRMP ASSOCIATED ENVIRONMENTAL ASSESSMENTS

Ricardo Energy and Environment has also been commissioned by Cambridge Water to undertake the other environmental assessments associated with the WRMP (NCA, HRA, WFD, and INNS). As identified by relevant guidance these assessments will be integrated with the SEA. A summary of each environmental assessment and their integration to the SEA are provided in the sections below. As mentioned previously, the methodology is intended to closely follow the SEA methodology of the South Staffordshire Water WRMP24.

6.1 NATURAL CAPITAL ACCOUNTING AND BIODIVERSITY NET GAIN

NCA and BNG assessments are required by regulators to provide a comprehensive understanding of the benefits and costs to the natural environment of plan proposals. The approach that will be applied to these assessments draws on the WRPG[93] and UKWIR[94] guidance. It also draws on the principles of the Natural Capital Register and Account Tool (EA, 2021)[95] and the approach outlined in Defra's Enabling a Natural Capital Approach (ENCA) (Defra, 2020)[96].

Although there is currently no legislative requirement for NCA, the WRPG states that water companies should use NCA in their decision-making which can be used to include an assessment of ecosystem resilience. The EA have published separate supplementary guidance on Environment and Society in Decision-making[9798], which provides more detail about the expectation for NCA, and how NCA 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 5) together with supporting water companies to promote plans that have the potential to deliver wider environmental and social benefits.

The BNG assessment will demonstrate that options and plans will look to maximise biodiversity gain and facilitate the incorporation of BNG into supply option design. This will underpin delivery of wider environmental net gain through provision of improved habitat quality and quantity.

The purpose of NCA assessment is to evaluate the benefits and disbenefits to society that arise from changes to natural capital assets. It can work alongside the SEA and BNG which is concerned with habitat improvement for the purposes of ecosystem resilience rather than for the associated benefits to society. Therefore NCA, SEA and BNG can be seen as complementary and the outputs of all three should be considered in decision-making.

Natural capital and BNG are incorporated within the SEA framework through the inclusion of a dedicated objective associated with the 'biodiversity, flora and fauna' topic.

6.2 HABITAT REGULATION ASSESSMENT

As a competent authority, Cambridge Water must ensure that its WRMP meets the requirements of the Habitats Regulations prior to implementation. If the WRMP (i.e. one or more schemes within it) may cause a likely significant effect on one or more European sites, either alone or in-combination with other schemes, plans or projects, the WRMP must be subject to Appropriate Assessment. In accordance with the Habitats Regulations, Cambridge Water is undertaking a Habitats Regulations Assessment (HRA) of its WRMP. The process has four potential stages as shown below: stages 3 and 4 are only invoked if an option were to be included in the preferred programme of the WRMP that may cause likely significant effects on a European site:

1. Screening stage, which identifies likely impacts, alone or in-combination with other projects or plans, and considers whether these impacts are likely to be significant. Screening will initially be carried out at the option

[93] Ofwat, NRW & EA (2021), Water Resources Planning Guideline – v9 for Publishing February 2021

[94] Andrews R, Ashmole R, Fredenham E, Mant JM, Pitcher C, Sanders J, Twigg W, Wade TI and Westbrook M (2021) Environmental Assessments for Water Resources Planning. UK Water Industry Research Ltd Report 21/WR/02/15.

[95] EA (2021) The Environment Agency Natural Capital Register and Account Tool, Version 1. Technical Report. Published January 2021.

[96] Defra (2020) Enabling a Natural Capital Approach Guidance, updated August 2021

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

[98] NRW (2020) WRPG 2024 supplementary guidance – Environment and Society in decision-making (Wales). Draft for consultation published September 2020.

level to assess whether any options will result in likely significant effects on a European site. Screening will also be carried out at the programme level and for the WRMP as a whole.

2. Appropriate Assessment stage, if screening identifies the potential for likely significant effects, an Appropriate Assessment of the impacts of an option, programme or the whole WRMP (alone and in combination with other plans and projects) will be required such that a conclusion can be made as to whether there will be impacts on site integrity, taking into account potential alternative solutions and mitigation measures.

3. Assessment of alternative solutions, where alternative solutions are identified, and consideration of their impacts are given in comparison to those in the WRMP.

4. Assessment where no alternatives exist and adverse impacts remain, which provides an assessment of imperative reasons of overriding public interest and compensatory measures required.

Subject to the findings of the HRA screening process, and the selection of options for the WRMP, Appropriate Assessment of the WRMP may need to be undertaken and mitigation or alternatives developed. The scope and approach for Appropriate Assessment, if required, will be determined in consultation with Natural England.

The findings from the HRA will inform the SEA at each stage of the assessment process, in particular the SEA 'biodiversity, flora and fauna' topic.

6.3 WATER FRAMEWORK DIRECTIVE ASSESSMENT

In line with the WRPG, water companies must also consider the impact of options, programmes and plans on relevant water bodies as defined under the WFD. In particular, companies must ensure that its proposed activities do not result in any deterioration between status classes of any water body (as assessed through a series of objective measures, including biological, chemical and morphological condition) or prevent the achievement of "Good Ecological Status".

The findings from the WFD will inform the SEA at each stage of the assessment process, in particular the 'water' and 'biodiversity, flora and fauna' topics.

6.4 INVASIVE NON-NATIVE SPECIES RISK ASSESSMENT

Section 5.14 of the WRPG[99] states that water companies must review whether current abstraction operations and future solutions will risk spreading INNS or create pathways which increase the risk of spreading INNS. The approach that will be undertaken in reviewing the INNS risk associated with the WRMP options will provide information that will support the SEA, option selection and inform the type and extent of mitigation measures that may be required. The INNS assessment is incorporated within the SEA framework through the inclusion of a dedicated objective associated with the 'biodiversity, flora and fauna' topic.

[99] Ofwat (2021). Water resources planning guideline Draft update November 2021

7. USE OF SEA IN WRMP OPTIONS AND PROGRAMME APPRAISAL

7.1 OPTION APPRAISAL

Option appraisal is an overarching term for the specification and assessment of options under consideration for the WRMP. It includes the process of refinement of the unconstrained options list to the constrained list considering a wide range of factors such as promotability to customers, yield, lead time, environmental effects, and technical feasibility. More detailed assessment is then carried out of the constrained list options against the SEA objectives, taking into account the range of assessments which are now sheltered under the SEA 'umbrella'. Once the constrained list options have been subjected to SEA, the assessment outcomes are used to support programme appraisal.

7.2 PROGRAMME APPRAISAL

The aim of the WRMP is to find the 'best value' programme of supply and/or demand options to restore and maintain a supply-demand balance. The selection process is facilitated through programme appraisal modelling tools, which are designed to produce an optimised programme taking account of specified metrics that include (but are not limited to) whole life cost, carbon, drought resilience and environmental considerations via the SEA, NCA and BNG assessment.

The WRMP will continue to follow a 'twin track' approach to addressing the supply-demand deficit, with demand management and leakage reduction measures continuing to be implemented to further reduce water consumption per person/per property within Cambridge Water's supply area.

8. NEXT STEPS

8.1 CONSULTATION ON THE SCOPING REPORT

This Scoping Report documents the proposed scope and approach for the SEA of Cambridge Water's WRMP and represents Stage A of the SEA. It is issued as a consultation document to seek agreement on the scope and approach. Following consultation, the scope and/or approach may be modified to take account of consultees' responses. Consultation responses, and any subsequent amendments made as a consequence of the responses, will be documented in an appendix to the Environmental Report.

Five weeks are being provided for consultees to provide comments on the scope of the SEA as described within this report, in line with SEA Regulation 12(6).

Following completion of the assessment, the draft SEA Environmental Report, HRA Screening Report (and Appropriate Assessment(s) if required) WFD Compliance Report and reports concerning NCA, BNG and INNS, will be issued alongside the draft WRMP for consultation to statutory consultees, stakeholders and the wider public in November 2022.

8.2 STAGE B: DEVELOPING AND REFINING ALTERNATIVES

Stage B of the SEA process comprises the SEA assessment and the development of reasonable alternative options. In determining the preferred programme, Cambridge Water will use the findings of the SEA and accompanying environmental assessments as an integral part of the best value planning approach and modelling. The option-level SEA results will inform the programme appraisal which will involve the use of an optimisation model to select the Best Value plan for customers and environment to address the deficit. Cambridge Water will then assess the preferred solution against the SEA (and other non-monetary factors) to provide an additional review stage of the impacts of individual options in the preferred plan and to determine if it is necessary to introduce mitigation measures or consider alternative solutions. Cambridge Water may also decide to constrain out some options during the programme appraisal stage if the impacts are highly adverse and cannot be mitigated. This may result in several iterations of running the model and Cambridge Water will assess each run against the SEA. If there is significant uncertainty in the baseline supply demand balance, Cambridge Water may need to identify solutions to alternative scenarios and assess these against the SEA.

8.3 STAGE C: PREPARATION OF THE ENVIRONMENTAL REPORT

8.3.1 Structure and Content

The findings of the SEA will be documented in an Environmental Report (this comprises Stage C of the SEA process). Assessments will be fully documented in the Environmental Report, to be published for consultation alongside the WRMP. The Environmental Report will also identify provisional monitoring and mitigation measures according to the significant effects identified.

The proposed structure of the report is derived from the requirements specified by the SEA Regulations[100] and set out in the Practical Guide[101] . A non-technical summary of the information will be provided under the headings listed in Schedule 2 of the SEA regulations.

The Environmental Report(s) will have the following purposes:

- to ensure that the likely significant environmental effects associated with the draft plan (whether WRMP or WRW Regional Plan) are identified, characterised and assessed;
- to propose measures to mitigate the adverse effects identified and, where appropriate, to enhance potential positive effects;
- to provide a framework for monitoring the potential effects arising from the implementation of the draft plan; and
- to provide sufficient information to those potentially affected to enable them to contribute effectively to the public consultation.

In accordance with the requirements of Schedule 2 of the SEA Regulations, the Environmental Report will indicatively consist of:

- a non-technical summary;
- a chapter providing an overview of the principal objectives and contents of the draft plan being assessed;
- a chapter providing the relevant contextual information including a review of the plans and programmes, the relevant baseline information and an outline of the evolution of the baseline with the plan;
- a chapter setting out the proposed approach to assessment including the relevant environmental protection objectives;
- a chapter outlining the likely significant environmental effects of the measures set out in the draft plan and any reasonable alternatives identified, including cumulative effects, mitigating measures, uncertainties and risks;
- a chapter presenting views on implementation and monitoring;
- and appendices containing the any further detailed contextual information and assessment matrices.

8.3.2 Stage D: Consulting on the Draft WRMP 2024 and the Environmental Report

Cambridge Water will formally invite the statutory consultation bodies, stakeholders and the public to comment on the draft WRMP and the SEA Environmental Report during the statutory public consultation period. This consultation comprises Stage D of the SEA. Comments made will be taken into account in determining the final WRMP, acknowledging that environmental considerations are not the only determining factors in formulating the WRMP.

Any significant changes made to the WRMP at that stage in the process, including changes based on consultation responses and the SEA, will be assessed to identify their likely significant effects. The findings of the assessment will then be taken into account in developing the final WRMP.

[100] SEA Regulations, Part 3, Regulations 2 and 3 and Schedule 2.
[101] Office of the Deputy Prime Minister (2005) A Practical Guide to the Strategic Environmental Assessment Directive.

8.3.3 SEA Statement

Once the revised WRMP is published and adopted, Cambridge Water will publish an SEA Post Adoption Statement, describing how the SEA and the responses to consultation have been taken into account during the preparation of the WRMP. This statement will describe how environmental considerations have been integrated into the WRMP, and explain any changes made or alternatives rejected. Information will also be provided on the environmental monitoring to be carried out during implementation of the WRMP to track the environmental effects of the WRMP and to trigger appropriate responses where effects are identified.

8.4 QUALITY ASSURANCE

The Practical Guide to SEA contains a Quality Assurance checklist to help ensure that the requirements of the SEA Directive are met. The checklist is reproduced in Appendix C, indicating where this Scoping Report meets the requirements, and which requirements will be addressed in the Environmental Report.

APPENDICES

Appendix A Review of Policy, Plans and Programmes

The findings of the review of policy, plans and programmes are set out in **Table A.1**. This table sets out the purpose and objectives of the policies, plans and programmes, their potential relationship with Cambridge Water's WRMP, and the potential implications for the objectives of the SEA.

Table A.1 Summary of the Policy, Plans and Programmes reviewed and their link to the Strategic Environmental Assessment

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
International	
Council of Europe (1979) *The Convention on the Conservation of European Wildlife and Natural Habitats (The Bern Convention)*	
International convention which aims to ensure conservation of wild flora and fauna species and their habitats. Special attention is given to endangered and vulnerable species, including endangered and vulnerable migratory species specified in appendices. Enforced in European legislation through the Habitats Directive (92/43/EEC) and Birds Directive (79/409/EEC).	The potential impacts of the WRMP options on internationally designated sites, species and important Bird habitats must be considered as part of the SEA.
Council of Europe (1985) *Convention for the Protection of the Architectural Heritage of Europe (Granada Convention)*	
To reinforce and promote policies for the conservation and enhancement of Europe's heritage.	The SEA should take into account the need to conserve heritage.
Council of Europe (1992) *Convention on the Protection of Archaeological Heritage (Valetta Convention)*	
This Convention sets out a revised body of new basic legal standards for Europe to the previous Granada Convention, to be met by national policies for the protection of archaeological assets as sources of scientific and documentary evidence. It makes the conservation and enhancement of the archaeological heritage one of the goals of urban and regional planning policies.	The SEA should take into account the need to conserve heritage.
Council of Europe (2000) *European Landscape Convention (Florence Convention)*	
The European Landscape Convention is an international convention focusing specifically on landscape. The UK Government signed the European Landscape Convention in 2006 and it became binding from March 2007.	The SEA should take landscape quality into account and include water quality in the assessment framework.
Council of Europe (2003) *European Soils Charter*	
Sets out common principles for protecting soils across the EU and will help.	The SEA should seek to ensure that the quality of the regions land, including soils, is protected or enhanced.
European Commission (1991) The Nitrates Directive (91/676/EEC)	

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
The Nitrates Directive is designed to reduce water pollution caused by nitrate from agriculture. The directive requires Defra and the Welsh Assembly Government to identify surface or groundwaters 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 nitrate from agriculture. The SEA assessment framework should include water quality.
European Commission (1991), *Urban Waste Water Treatment Directive (1991/271/EC)*	
The Directive's objective is to protect the environment from the adverse effects of urban waste water discharges and discharges from certain industrial sectors and concerns the collection, treatment and discharge of domestic waste water, mixture of waste water and waste water from certain industrial sectors.	The SEA should seek to maintain, protect and improve water quality across the region.
European Commission (1992) *Habitats Directive (1992/43/EC)*	
The aim of the Directive is to promote the maintenance of biodiversity by requiring Member States to take measures to maintain or restore natural habitats and wild species listed on the Annexes to the Directive at a favourable conservation status, introducing robust protection for those habitats and species of European importance.	The impacts of the WRMP options on internationally designated sites and species must be considered as part of the SEA.
European Commission (1998), *Drinking Water Directive (1998/83/EC)*	
The objective of the Drinking Water Directive is to protect the health of the consumers in the European Union and to make sure the water is clean and of good quality. To make sure drinking water everywhere in the EU is healthy, clean and tasty, the Drinking Water Directive sets standards for the most common substances (so-called parameters) that can be found in drinking water. A total of 48 microbiological and chemical parameters must be monitored and tested regularly.	The SEA should seek to ensure that objectives address water quality in the region, particularly drinking water quality.
European Commission (1999) *Landfill of Waste Directive (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 landfilling of waste, by introducing stringent technical requirements for waste and landfills.	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.
European Commission (2000), *The Water Framework Directive (2000/60/EC)*	

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
This Directive establishes a framework for the protection of inland surface waters, transitional waters, coastal water and groundwater. It also encourages the sustainable use of water resources. Key objectives are general protection of the aquatic ecology, specific protection of unique and valuable habitats, protection of drinking water resources, and protection of bathing water.	The SEA should seek to promote the protection and enhancement of all water resources.
European Commission (2001) *Directive on the assessment of the effects of certain plans and programmes on the environment (SEA Directive) 2001/42/EC*	
This Directive ensures that individual Parties integrate environmental assessment into their plans and programmes at the earliest stages, whereby an SEA becomes mandatory for plans / programmes which are: • Prepared for agriculture, forestry, fisheries, energy, industry transport, waster / water management, telecommunications, tourism, town & country planning or land use and which set the framework for future development consent of projects listed in the EIA Directive; Or • Have been determined to require an assessment under the Habitats Directive. For any plans / programmes not included in the above, the Member States must carry out a screening procedure to determine whether the plans / programmes are likely to have significant environmental effects.	This directive provides the regulatory basis for an SEA being carried out as part of the WRMP.
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 Cambridge Water 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).	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)*	

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
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 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) *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.	The SEA assessment framework should include soils.
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 seek to promote the protection of river and lake water quality in order to maintain and develop suitable environments that will sustain water fish populations.
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: • 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	The SEA should take account of the need to maintain or enhance the quality of habitats and biodiversity.
European Commission (2006) *Directive on the protection of groundwater against pollution and deterioration (2006/118/EC)*	
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.

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
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 management measures.
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 SEA should seek to ensure that flood risk in the region is not adversely affected by the implementation of the WRMP. The SEA assessment framework should include flood risk.
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; • Movements of waste should be reduced; • Ensure a high level of protection and effective control; • That proportion of the costs not covered by the proceeds of treating the waste must be defrayed in accordance with the 'polluter pays' principle.	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.
European Commission (2008) *Ambient Air Quality Directive (2008/50/EC)*	
The Directive sets legally binding limits for concentrations in outdoor air of major air pollutants that impact public health such as particulate matter (PM10 and PM2.5) and nitrogen dioxide (NO2). There are also indirect effects as these pollutants can combine in the atmosphere and contribute to greenhouse gases which can be transported great distances by weather systems.	The implementation of the WRMP may have some influence on air quality, either directly or indirectly, through construction or operational activities. The SEA should take account of the need to ensure that the region's air quality is maintained or enhanced, and that emissions of air pollutants are kept to a minimum. Seek to help meet regional air quality targets.
European Commission (2009), *Birds Directive (2009/147/EC)*	

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
The Directive provides a framework for the conservation and management of, and human interactions with, wild birds in Europe. It sets broad objectives for a wide range of activities, although the precise legal mechanisms for their achievement are at the discretion of each Member State (in the UK delivery is via several different statutes).	The SEA should seek to protect and conserve important bird habitats.
European Commission (2009), *Promotion of the use of energy from renewable sources Directive (2009/28/EC)*	
This promotes the use of energy from renewable sources.	The SEA should take account of the need to seek to promote the use of renewable energy.
European Commission (2012) A Blueprint to safeguard Europe's Water Resources	
This document outlines actions that concentrate on better implementation of current water legislation, integration of water policy objectives into other policies, and filling the gaps in particular with regard to water quantity and efficiency. This has a long-term aim to ensure sufficient availability of good quality water for sustainable and equitable use.	The implementation of the WRMP should seek to facilitate the ongoing reliable availability of good quality water.
European Commission (2020), *The EU Biodiversity Strategy for 2030*	
The strategy aims to halt the loss of biodiversity and ecosystem services in the EU and help stop global biodiversity loss by 2020. It reflects the commitments taken by the EU in 2010, within the international Convention on Biological Diversity.	The implementation of the WRMP may influence biodiversity in the Cambridge Water area and as such the SEA should take account of the need to maintain or enhance the quality of habitats and biodiversity.
European Commission (2020) The 8th Environment Action Programme to 2030	
Building on the European Green Deal, the programme has the following six priority objectives: • achieving the 2030 greenhouse gas emission reduction target and climate neutrality by 2050 • enhancing adaptive capacity, strengthening resilience and reducing vulnerability to climate change • advancing towards a regenerative growth model, decoupling economic growth from resource use and environmental degradation, and accelerating the transition to a circular economy • pursuing a zero-pollution ambition, including for air, water and soil and protecting the health and well-being of Europeans • protecting, preserving and restoring biodiversity, and enhancing natural capital (notably air, water, soil, and forest, freshwater, wetland and marine ecosystems) • reducing environmental and climate pressures related to production and consumption (particularly in the areas of energy, industrial development, buildings and infrastructure, mobility and the food system)	The implementation of the WRMP may impact the objectives set out in the Action Programme.

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
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 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	
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.
The Bonn Convention (or CMS) (1983) *The Convention on the Conservation of Migratory Species of Wild Animals*	
Aims to conserve terrestrial, marine and avian migratory species by protecting endangered, conserving or restoring the places where they live, mitigating obstacles to migration and controlling other factors that might endanger such species. Enforced in European legislation through the Habitats Directive (92/43/EEC) and Birds Directive (79/409/EEC).	The impacts of the WRMP options on important Bird habitats (i.e. Ramsar sites and SPA designated sites) must be considered as part of the SEA.
The Paris Agreement (2016), Cancun Agreement (2011) and Kyoto Agreement (1997)	
These agreements represent 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. It includes a shared vision to control the global rise in temperature.	The SEA should consider the need for water companies to seek to promote a reduction in greenhouse gas emissions in carrying out its service activities.
UNESCO (2017) *Ramsar Convention on Wetlands of International Importance*	
The Convention on Wetlands (Ramsar, Iran, 1971) (the "Ramsar Convention") is an intergovernmental treaty that embodies the commitments of its member countries to maintain the ecological character of their Wetlands of International Importance and to plan for the "wise use", or sustainable use, of all of the wetlands in their territories. Ramsar sites within Cambridge Water's SEA Assessment area include the Severn Estuary and the Somerset Levels.	The impacts of the WRMP options on important wetland habitats must be considered as part of the SEA.

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
UNESCO (1972) The World Heritage Convention – a global instrument for the protection of cultural and natural heritage.	
A global instrument for the protection of cultural and natural heritage. Signatories commit themselves to refraining from 'any deliberate measures which might damage, directly or indirectly, the cultural and natural heritage' of their World Heritage Sites. The city of Bath is the closest UNESCO designated site.	The WRMP and SEA should take account of the need to protect World Heritage Sites.
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 (CBD)*	
The main objectives are: • Conservation of biological diversity • Sustainable use of its components • Fair and equitable sharing of benefits arising from genetic resources	The commitment to conserving biological diversity must be considered in any WRMP options and the SEA should seek to promote the protection and enhancement of biodiversity.
United Nations Economic Commission for Europe (1998) *Aarhus Convention - Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters*	
The Aarhus Convention grants the public rights regarding access to information, public participation and access to justice, in governmental decision-making processes on matters concerning the local, national and transboundary environment. It focuses on interactions between the public and public authorities. The Aarhus Convention has been ratified by the European Community, which has begun applying Aarhus-type principles in its legislation, notably the Water Framework Directive (Directive 2000/60/EC).	The Convention is designed to improve the way ordinary people engage with government and decision-makers on environmental matters. It helps to ensure that environmental information is easy to get hold of and easy to understand. The SEA should seek to provide easily understood information to the public on the environmental implications of the WRMP and its constituent options.
United Nations (2002), Commitments arising from the World Summit on Sustainable Development, Johannesburg	
The World Summit on Sustainable Development proposed broad-scale principles which should underpin sustainable development and growth. It included objectives such as:	These commitments are the highest level definitions of sustainable development. The WRMP should be

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• Greater resource efficiency • Work on waste and producer responsibility • New technology development • Push on energy efficiency • Integrated water management plans needed Minimise significant adverse effects on human health and the environment from chemicals by 2020.	influenced strongly by all of these themes and should seek to take its aims into account. The SEA should seek to promote the achievement of the sustainable development objectives outlined in this plan.
National	
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 • 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.	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.
Canal and River Trust (2015) Water Resources Strategy 2015 – 2020	
The Strategy sets out the Canal and River Trust's overarching vision and work plan for the next five years 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 Cambridge Water area and individual water company supply areas. The SEA should consider the effects of the draft Drought Plan on the long-term supply of water to the canal network.
The Climate Change Act 2008 & The Climate Change Act 2008 (2050 Target Amendment) Order 26 June 2019	
This act sets carbon targets for 2050. Originally the target was for net carbon account for 2050 at least 80% lower than 1990 baseline, however, this was revised in 2019 to be at least 100% lower in line with the net zero ambition.	This target needs to be taken into account by the SEA. The new target from 2019 needs to be taken into account by the SEA objective for energy use and

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The 2019 amendment changed the UK carbon emissions reduction target from an 80% to a 100% reduction.	greenhouse gas emissions, and adaptation to climate change.
Conservation of Habitats and Species Regulations (as amended) 2017	
These regulations consolidate all the various amendments made to the Conservation (Natural Habitats) Regulations 1994 in England. The regulations provide for the designation and protection of 'European sites', the protection of 'European species', and the adaptation of planning and other controls for the protection of European Sites. They are the principal means by which the Habitats Directive is transposed in England as such its main objective is to promote the maintenance of biodiversity.	The WRMP must fully comply with the Regulations. The impacts of the WRMP options on biodiversity and protected species and sites must be considered as part of the SEA.
The Countryside and Rights of Way (CROW) Act, 2000	
The Act provides for increased public access to the countryside and strengthens protection for wildlife. The main provisions of the Act are as follows: • Extends the public's ability to enjoy the countryside whilst also providing safeguards for landowners and occupiers • Creates new statutory right of access to open country and registered common Land Use Consultants • Modernises Right of Way system • Gives greater protection to SSSIs • Provides better management arrangements for AONBs Strengthens wildlife enforcement legislation.	The SEA should include objectives that take into account public access, protection of SSSIs and the management of relevant landscape designations.
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 WRMP 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 (2004) The First Soil Action Plan for England	
This plan is a comprehensive statement on the state of the UK's soils and how Government and other partners were working together to improve them. It aims to ensure that England's soils will be protected and managed to optimise the varied functions that soils perform for society (e.g. supporting agriculture and	The SEA should seek to ensure that the quality of the region's land, including soils, is protected or enhanced.

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forestry, protecting cultural heritage, supporting biodiversity, as a platform for construction), in keeping with the principles of sustainable development.	
Defra (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.
Defra (2005) Making space for water: taking forward a new government strategy for flood and coastal erosion risk management in England	
The strategy outlines how to manage the risks from flooding and coastal erosion in the UK. The strategy aims 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.	The SEA should seek to ensure that flood risk in the region is not adversely affected by the implementation of the WRMP.
Defra (2007) The Air Quality Strategy for England, Scotland and Wales	
This strategy identifies air quality objectives and policy options to further improve air quality in the UK from into the long term. The options are intended to provide important benefits to quality of life and help protect the environment as well as the direct benefits to public health.	The implementation of the WRMP may have some influence on air quality, either directly or indirectly through construction or operation activities. The SEA should seek to ensure that the region's air quality is maintained or enhanced, and that emissions of air pollutants are kept to a minimum.
Defra (2007), Conserving Biodiversity in a Changing Climate: Guidance on Building Capacity to Adapt	
The guiding principles described in this document summarise current thinking on how to reduce the impacts of climate change on biodiversity and how to adapt existing plans and projects in the light of climate change. The guidance is intended to inform implementation of the UK Biodiversity Action Plan, taking account of climate change is relevant to the fulfilment of many international agreements and obligations affecting the UK.	The SEA must consider the impacts on biodiversity whilst also taking into account the potential for future climate change.
Defra (2008) England Biodiversity Strategy –climate change adaptation principles	
Government strategy presenting five principles that are fundamental to conserving biodiversity during climate change. The precautionary principle underlies all the principles.	The SEA must consider the impacts on biodiversity whilst also taking into account the potential for future climate change.
Defra (2009) Safeguarding our soils – A Strategy for England	

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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, enhance, restore and ensure their resilience, and improve our understanding of the threats to soil and best practice in responding to them. The Governments 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.	The SEA should seek to ensure that the quality of the regions soils and their management is protected or enhanced.
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 or enhance the quality of habitats and biodiversity.
Defra (2011) The Natural Choice: securing the value of nature, The Natural Environment White 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	The WRMP supports the provisioning service of freshwater through ensuring security of supply. The media campaigns that form part of the demand side WRMP options may contribute towards increasing the awareness of the population to the value the provisioning services of water. Other related 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 effects the related provisioning services in the least damaging way through informing the WRMP formulation and selection of WRMP options during times of Drought.
Defra (2011) Biodiversity 2020: A Strategy for England's Wildlife and Ecosystem Services	

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The objective for the next decade is: 'to halt overall biodiversity loss, support healthy well-functioning ecosystems and establish coherent ecological networks, with more and better places for nature for the benefit of wildlife and people.' Four action areas are: • A more integrated large-scale approach to conservation on land and at sea • Putting people at the heart of biodiversity policy • Reducing environmental pressures • Improving our knowledge.	The SEA must consider impacts on biodiversity. The implementation of the WRMP may influence biodiversity in the area and as such the SEA should seek to maintain or enhance the quality of habitats and biodiversity and take regards of priority species.
Defra (2011) Water for Life – Water White Paper	
This sets out market reform in the water sector.	The WRMP should take into account the contents of this paper.
Defra (2011) Government Review of Waste Policy in England 2011	
The review is guided by the "waste hierarchy", EU obligations and targets on waste management, carbon impacts, environmental objectives and the costs and benefits of different policy options. The Governments vision include a move beyond the current throwaway society to a "zero waste economy" in which material resources are re-used, recycled or recovered wherever possible, and only disposed of as the option of very last resort.	The WRMP may involve options that involve the generation of waste (e.g. either through construction requirements or operation of supply side options). The SEA should seek to enhance recycling and minimise the amount of waste going to landfill.
Defra (2011) Future Water: The Government's water strategy for England	
This strategy is the high level Government document which outlines how the Government wants the water sector to look by 2030, considering issues of water demand, water supply, water quality in the natural environment, surface water drainage, river and coastal flooding, greenhouse gas emissions and charging. It states that "by 2030 at the latest, we have: Improved the quality of our water environment and the ecology which it supports, and continued to provide high levels of drinking water quality from our taps Sustainably managed risks from flooding and coastal erosion, with greater understanding and more effective management of surface water Ensured a sustainable use of water resources, and implemented fair, affordable and cost-reflective charges.	The SEA should seek to ensure that the themes included in the strategy objectives are also reflected in the SEA objectives, particularly around water quality in the region, the quality of aquatic ecology, drinking water quality, resource use, energy use and greenhouse gas emissions, and adaptation to climate change.
Defra (2012) The UK Evidence Report	
Five themes are identified that form the priorities for adaptation in the UK.	The SEA should take into account the need for climate change adaptation.

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Defra (2012) National Policy Statement for Waste Water	
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 SEA should seek to ensure the WRMP considers any unforeseen NSIP proposals that come forward prior to adoption which may affect water resources in the Cambridge Water area.
Defra (2011) UK National Ecosystem Assessment 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 key questions for example: • Provisioning Services: Freshwater • 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 effects 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 (2015) The Great Britain Invasive Non-native Species Strategy	
The Strategy is intended to provide a strategic framework, updated from the 2008 framework, within which the actions of government departments, their related bodies and key stakeholders can be better co-	The implementation of the WRMP may influence biodiversity in the south east and as such the SEA

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ordinated. Its overall aim is to minimise the risks posed, and reduce the negative impacts caused, by invasive non-native species in Great Britain.	should seek to maintain or enhance the quality of habitats and biodiversity.
Defra (2019) Clean Air Strategy 2019	
The Clean Air Strategy provides a way in which the UK will tackle all sources of air pollution with the main aims of making UK air healthier to breathe, protecting nature and boosting the economy.	The WRMP should consider the impact it may have on air quality.
Defra (2020) Enabling a Natural Capital Approach (ENCA)	
ENCA resources are a mixture of data, guidance and tools that enable individuals/ organisations to understand natural capital and know how to take it into account. The aims of ENCA are to: • Build capacity among users to assess and value the natural environment by providing comprehensive information and resources • Reduce search costs for analysts and decision makers • Provide a platform to update tools and guidance as knowledge develops • Identify new evidence and areas for development The guidance is a comprehensive document providing information and resources for Natural Capital, covering the natural capital framework, economic valuation of the environment, how project or policy appraisal can incorporate natural capital, natural capital accounting principles and methods, benefits and challenges and applying natural capital at a local level.	The SEA will help to inform future development by Cambridge Water and therefore should consider the effect of the WRMP options on opportunities for natural capital.
Defra (2020) Water abstraction plan and supplementary documents: Water abstraction plan: Environment; Water abstraction plan: Catchment focus; and, Water abstraction plan: Abstraction licensing service	
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:	The WRMP should consider how they 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.

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• 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.	
Defra (2021) Waste Management Plan for England 2021	
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 options that involve the generation of waste (e.g. either through construction requirements or operation of supply side options). The SEA should seek to enhance recycling and minimise the amount of waste going to landfill.
Defra, Environment Agency, Natural England, Forestry Commission England (2016) Creating a great place for living	
Sets out a number of objectives linked to creating 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;	The SEA must take into account impacts of the WRMP 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).

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
• 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.	
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 of Energy and Climate Change (2011) Planning our electric future: a White Paper for secure, affordable and low carbon electricity	
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 Cambridge Water's 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.
Department of Energy and Climate Change (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 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. It highlights that the construction, operation and decommissioning of 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 SEA should consider the cumulative effects of the WRMP and any major energy proposals which may affect the availability of water in the Cambridge Water supply area.
Department for Culture, Media and Sport (2001) *The Historic Environment – A Force for the Future*	
This strategy outlines the Government's 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 implementation of the WRMP may have an influence on the heritage of the region, in particular if options affect surface water levels. The SEA should seek to ensure any adverse effects on heritage assets are minimised or avoided.

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Department for Culture, Media and Sport (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
Department for Culture, Media and Sport (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.
The Eels Regulations 2009	
Implement European Council Regulations 1100/2007 establishing measures for the recovery of the stock of European eel. The Regulations will help implement delivery Eel Management Plans. They address eel records and re-stocking, close season and reduction of fishing effort, passage of eels and entrainment. The key objective is to ensure that at least 40% of the potential production of silver eels returns to the sea to spawn. This will be achieved by reducing exploitation of all life-stages of the eel and restoration of their habitats.	The SEA should seek to maintain the quality of habitats and biodiversity and take regard of protected species identified. This should include migratory fish species and their migratory passage.
The Energy Act 2013	
This provides the legislative framework for delivering secure, affordable and low carbon energy. It includes provision for decarbonisation.	The implementation of the WRMP may have an influence upon the Cambridge Water area's 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.
The Environment Act 2021	

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
The Environment Act set up the EA to manage resources and protect the environment in England and Wales Priority areas are air quality, water, biodiversity and resource efficiency and waste reduction.	The SEA should seek to promote the protection and enhancement of all water resources without having negative effects on other aspects of the environment.
Environmental Protection Act 1990	
The Environmental Protection Act 1990 makes provision for the improved control of pollution to the air, water and land by regulating the management of waste and the control of emissions	The WRMP should take into consideration the impact it may have on air, water and land pollution
The Environmental Assessment of Plans and Programmes Regulations 2004 (the SEA Regulations)	
This represents the transposition of the Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (SEA Directive).	This regulation provides the UK regulatory basis for an SEA being carried out as part of the WRMP.
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. 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 an SSSI or on the conservation status of species and habitats protected by EU legislation outside SSSIs.	The SEA should seek to ensure that the guidance is considered when assessing the WRMP.
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 (2009), Water Resources Strategy for England and Wales	
Launched on 30 March 2009, covering the actions that the Environment Agency believes need to be taken to ensure that there is enough water for people and wildlife in the face of future pressures. These include: • climate change • population growth	The SEA should seek to ensure that strategy objectives are also reflected in the SEA objectives, particularly around water resource use and availability in the region.

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
• diffuse pollution • water for wildlife and wetlands	
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), Managing Water Abstraction	
This sets out how the EA manages water resources in England.	The SEA should consider the range of impacts that changes to abstractions could have on the environment, including water bodies, biodiversity, and water users.
Environment Agency (2017) Drought response: our framework for England	
This framework describes how drought affects England and how the EA works closely with the government, water companies and others to manage the effects of drought on people, business and the environment. Specifically, the framework sets out: • How drought affects different parts of England • Who is involved in managing drought and how they work together • How the agency and others take action to manage drought • How we monitor and measure the impacts of drought to advise senior management and government on the prospects and possible action How we report on drought and communicate with others	The supply of water resources in the region may be affected by future drought, therefore this framework is linked closely with the WRMP. The WRMP and SEA need to take account of the guidance provided by the Environment Agency.
Environment Agency (2020) National Flood and Coastal Erosion Risk Management Strategy for England	
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	The SEA should consider how the WRMP may affect flood and coastal risk across the region.

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
• 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	
Environment Agency (2020) Meeting our future water needs: a national framework for water resources	
The organisations responsible for England's water supplies have understood the long term needs of sectors that depend on a secure supply of water – public water supply, agriculture, power generation, industry and the environment. These needs will be met through the development of regional water resources plans. Agreed what the regional plans should deliver and how, so they drive a step-change in water resources planning. The national framework identifies strategic water needs for England and its regions across all sectors up to and beyond 2050. Sets out a strategic direction for the work being carried out by regional water resources groups by exploring the range of approaches available to meet the likely pressures	The WRMP should consider the water resource framework and what it states should be included in a plan.
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 (undated) Restoring Sustainable Abstraction Programme	
EA 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. EA investigates where over-abstraction has occurred and work with local people to restore sustainable supplies.	The WRMP will need to consider the implications of changes to abstraction strategies. The SEA should include a guide question relating to water resources.
Environment Agency (various dates) Abstraction Licensing Strategies	
Sets out how much water is available for abstraction within each key river catchment, taking into account the needs of the environment and existing abstractors.	The WRMP should consider relevant catchment strategies and any environmental protection measures of relevance to the WRMP options.
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 and SEA should ensure relevant ecological considerations are integral to water resource evaluation

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
	and management decisions across the range of temporal and spatial scales.
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, OfWAT and Natural Resources Wales (2020) Water Resources Planning Guideline Draft for consultation – July 2020, and Technical Supplementary Guidance	
The draft 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.	These guidelines, once adopted, will replace the previous guidelines and will be used by water companies to develop their WRMP, the WRMPs should therefore be developed in line with the guideline. An appreciation of the processes used to develop the WRMP will benefit the SEA. The SEA should seek to ensure that water supplies and resources are maintained or enhanced in line with the Water Resources Planning Guidelines.
Flood and Water Management Act (2010) as amended	
The Flood and Water Management Act 2010 aims to provide better, more comprehensive management of flood risk for people, homes and businesses. It aims improve efficiency in the water industry, improve the affordability of water bills for certain groups and individuals, and help ensure continuity of water supplies to the consumer.	The SEA should seek to ensure that flood risk in the region is not adversely affected by the implementation of the WRMP and that water supplies across the region are maintained.
Historic England (2013) Strategic Environmental Assessment, Sustainability Appraisal and the Historic Environment	
Guidance for addressing the historic environment in Strategic Environmental Assessment or river bas. 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 palaeo-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.

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
Historic England (2015) Historic Environment Good Practice Advice in Planning Note 3	
This provides guidance on managing change within settings of heritage assets. This includes archaeological remains, historic buildings, sites, areas and landscapes.	The SEA should take into account effects on settings of heritage assets.
Historic England (2016) 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.
Historic England (2021) Heritage at Risk	
Heritage at risk is a national programme 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. Regional Heritage at Risk Registers were most recently published in 2019.	The SEA should seek to protect and enhance and landscape.
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 draft Drought plan 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 draft Drought Plan on climate change and associated effects on the historic environment
HM Government (2016) National Infrastructure Delivery Plan 2016-2021	
This plan updates and replaces the previous National Infrastructure Plan and takes a targeted approach to infrastructure investment and delivery across different sectors over five years. These are all critical to support economic growth through the expansion of private sector businesses across all regions and industries, to enable competitiveness and to improve the quality of life of everyone in the UK. The plan recognises the pressure on future water and waste services from population growth and climate change.	The WRMP could result in the production of additional waste. The SEA should seek to reduce the production of waste and ensure it is treated in line with the widely adopted ‘waste hierarchy’ and not sent to landfill. The WRMP can contribute to the providing resilient water services.
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.	The WRMP may influence the environmental benefits and pressures identified in the Environment Plan, such as:

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
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	• 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 WRMP 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 (2020) Energy White Paper: Powering our Net Zero Future	
The white paper outlines a series of policies and commitments made by the government as part of the transition to net zero carbon emissions. The strategies are threefold: Prioritisation of renewable sources energy generation and invest in low-carbon technologies Supporting a green recovery from COVID-19 through investment in green industries Creating a fair deal for consumers through facilitating competition, enhanced regulation and strategies to improve the energy performance of homes.	The implementation of the WRMP may have an influence upon the Cambridge Water area's 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.
HM Government (2021) Net Zero Strategy: Build Back Greener	
This strategy sets out policies and proposals for decarbonising all sectors of the UK economy to meet our net zero target by 2050. It builds on the approach of the Ten Point Plan to keep us on track for UK carbon budgets, our 2030 Nationally Determined Contribution, and net zero by 2050. It includes: • our decarbonisation pathways to net zero by 2050, including illustrative scenarios	The WRMP may include options which have an impact on carbon emissions. The SEA should seek to take the Net Zero Strategy into account and include an objective on carbon emissions.

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
• policies and proposals to reduce emissions for each sector • cross-cutting action to support the transition The Net Zero Strategy was submitted to the United Nations Framework Convention on Climate Change (UNFCCC) as the UK's second Long-Term Low Greenhouse Gas Emission Development Strategy under the Paris Agreement.	
HM Treasury Infrastructure UK (2014) National Infrastructure Plan	
The Plan focusses on economic infrastructure: the networks and systems in energy, transport, digital communication, flood protection, water and waste management. These are all critical to support economic growth through the expansion of private sector businesses across all regions and industries, to enable competitiveness and to improve the quality of life of everyone in the UK. The objectives for the water sector are 'to secure a fair deal for customers while enabling water companies to continue to attract low-cost investment needed to provide the high quality, resilient water services customers want.'	The SEA objectives should take into account the objectives for the water sector presented in this plan.
Ministry of Housing, Communities and Local Government (2019) National Planning Policy Framework	
The NPPF sets out the Government's planning policies for England. The revision to the NPPF published in February 2019 broadly continues the guidance set out in the 2012 NPPF, with more emphases on housing, design, efficient use of land and continued reference to an objective of achieving net gains. It constitutes guidance for local planning 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. However, the 'presumption in favour of sustainable development' is not applicable where any adverse impacts would significantly outweigh the benefits, when assessed against all policies in the NPPF or where specific policies indicate development should be restricted. This includes proposed developments that affect European designated sites, Green Belt or AONB land. It presents guidance under broad themes which include: Promoting healthy and safe communities; Meeting the challenge of climate change, flooding and coastal change; Conserving and enhancing the natural environment; and Conserving and enhancing the historic environment.	Any permanent construction activities in the WRMP should take account of the key components of the NPPF to ensure sustainable development and seek to promote biodiversity net gain.
Natural England (2011) UK Geodiversity Action Plan	
The UKGAP sets out of framework for geodiversity action across the UK. It provides a shared context and direction for the protection and enhancement of geodiversity through a common aim, themes, objectives and targets which link national, regional and local activities. The UKGAP consists of six broad themes: 1. Furthering our understanding of geodiversity 2. Influencing planning policy, legislation and development design 3. Gathering and maintaining information on our geodiversity	The WRMP should have regard to the aims and objectives of the UKGAP. The SEA framework should consider effects of options on geodiversity and outline enhancement and mitigation opportunities where these are identified.

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
4. Conserving and managing our geodiversity 5. Inspiring people to value and care for our geodiversity 6. Sustaining resources for our geodiversity	
Natural Environment and Rural Communities Act (2006)	
This Act makes provision about bodies concerned with the natural environment and rural communities in connection with wildlife, sites of special scientific interest, National Parks and the Broads. The Natural Environment and Rural Communities Act is designed to help achieve a rich and diverse natural environment and thriving rural communities.	The SEA should seek to maintain or enhance the quality of habitats and biodiversity. The impacts of the WRMP on any designated features, as highlighted in the Natural Environment and Rural Communities Act, should be addressed.
Planning (Listed Buildings and Conservation Areas) Act 1990	
This Act addresses listed buildings including the prevention of deterioration and damage and preservation and enhancement of conservation areas.	The WRMP and SEA should take account of the need to protect listed buildings and conservation areas.
Salmon and Freshwater Fisheries Act, 1975	
The Act lays down the present basic legal framework within which salmon and freshwater fisheries in England are regulated. Proposals have been made to extend the legislation to apply to more fish species e.g. coarse fish, eel and lamprey species. These proposals are currently under review. The Act covers legislation on fishing methods and related offences, obstructions to fish passage, salmon and freshwater fisheries administration and law enforcement. Proposed extensions to the legislation (under review) include the provision of fish passes and screening of water abstraction and discharge points for coarse fish, eel and lamprey species.	The Act Provides statutory requirements for maintaining fish passage. The SEA will cover fish passage as an element of at least one sustainability objective. The SEA should seek to address any potential issues or effects on existing measures to address fish passage.
Salmon and Freshwater Fisheries Act, 1975	
The Act lays down the present basic legal framework within which salmon and freshwater fisheries in England are regulated. Proposals have been made to extend the legislation to apply to more fish species e.g. coarse fish, eel and lamprey species. These proposals are currently under review. The Act covers legislation on fishing methods and related offences, obstructions to fish passage, salmon and freshwater fisheries administration and law enforcement. Proposed extensions to the legislation (under review) include the provision of fish passes and screening of water abstraction and discharge points for coarse fish, eel and lamprey species.	The Act Provides statutory requirements for maintaining fish passage. The SEA will cover fish passage as an element of at least one sustainability objective. The SEA should seek to address any potential issues or effects on existing measures to address fish passage.

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
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 their formulation, taking account of climate change in its supply and demand 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
The Water Act (2003) (as amended)	
The Water Act 2003 is in three Parts, relating to water resources, regulation of the water industry and other provisions. The four broad aims of the Act are: • The sustainable use of water resources • Strengthening the voice of consumers • A measured increase in competition • The promotion of water conservation.	The implementation of the WRMP may have an effect through its role in maintaining supplies of water. The SEA should seek to promote sustainable use of water resources.
The Water Environment (Water Framework Directive) Regulations (England and Wales) 2017	
These Regulations implement the Water Framework Directive and set out a range of statutory actions to secure and maintain Good Ecological Status or Potential for all water bodies designated under WFD.	The WRMP should seek to maintain, protect and improve ecological status across the region and prevent any deterioration of WFD status. The SEA will be informed by the parallel WFD compliance assessment of the WRMP.
Water Industry Act 1991 was amended by the commencement of Section 36 of the Flood and Water Management Act 2010	
This makes provision for general duties of water undertakers including those associated with water resources management plans and sets out supply duties.	The WRMP must take into account this legislation.
Water Resources Act, 1991 (Amendment) Regulations 2009 SI3104	
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.

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
Water Resource Management Plan Regulations 2007	
These regulations prescribe how water undertakers in England and Wales are to prepare and publish water resources management plans in accordance with Section 37 of the Water Industry Act. This prescribes the method of publication of a draft water resources management plan, and how water undertakers are to deal with representations received in relation to a draft water resources management plan.	This is the UK regulatory basis against which all water undertakers must be compliant in the production of their individual WRMPs.
Wildlife and Countryside Act (as amended) (1981)	
The Act is the principle mechanism for providing legislative protection of wildlife in Great Britain. Species listed in Schedule 5 of the Act are protected from disturbance, injury, intentional destruction or sale. Other provisions outlaw certain methods of taking or killing listed species. This Act is brought up to date regularly to ensure the most endangered animals are on the schedule. The Act also improved protection for the most important wildlife habitats.	Some aspects of the WRMP may have effects on habitats and species. The SEA should seek to maintain or enhance the quality of habitats and biodiversity and take regard of protected species and habitats.
Regional	
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 neighbouring Drought Plans relevant to the Cambridge Water WRMP are: • Anglian Water • Affinity Water	The WRMP should take account of emerging neighbouring plans where appropriate.
Water Company (various) Water Resource Management Plans	
Water companies in England and Wales, are required to prepare, maintain and publish a WRMP under the Water Industry Act 1991, updated by the provisions in section 37A-D of the Water Act 2003 and the Water Act 2014. The plan must set out how a water company intends to maintain the balance between supply and demand for water over a minimum of a 25 year period. This is complemented by a water company drought plan, which sets out the short-term operational steps a company will take as a drought progresses. Those neighbouring WRMPs relevant to the Cambridge Water WRMP are. • Anglian Water • Affinity Water	The WRMP should take account of emerging neighbouring plans where appropriate.
Sub-regional / Local	

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
Environment Agency (various) River Basin Management Plans	
River Basin Management Plans (RBMPs) set out how the water environment will be managed and provide 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 Cambridge Water area is covered by the Anglian River Basin Management area.	The WRMP should reflect the broad objectives of these plans. The SEA objectives should reflect the need to manage water resources on a catchment basis in a sustainable manner
Local Planning Authority (various) Land Use Plans	
The Cambridge Water area covers a number of planning authorities. These have been identified as; • Cambridge • South Cambridgeshire • Huntingdonshire	Measures identified in the WRMP should be consistent with the Land Use Plans of those local authorities that will be affected by the plans.
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 protects PRoW.
Environment Agency (various) Abstraction Licensing Strategies (CAMS process)	

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
The CAMS process is used to assess how much water is available for abstraction, and where. Therefore, highlighting where water abstraction licences can be granted. 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 Cambridge Water area the following CAMS/ALS are in place: • Cam and Ely Ouse • Old Bedford including Middle Level • Upper Ouse and Bedford Ouse	The WRMP should take the CAMS into account. The SEA assessment should consider the effects of options on the availability and sustainability of water supply.
Cambridge City Council (2021) Biodiversity Strategy 2021-2030	
The council wants all City Council services to consider their net impact on biodiversity within their operations. This new strategy attempts to embed biodiversity principles and considerations across all Council service areas and the communities they serve. The strategy is also a way in which the council can monitor its progress against the strategy baseline to ensure the delivery of BNG commitments and Natural Cambridgeshire's 'Doubling Nature' Ambitions.	The impact of WRMP options on biodiversity resilience should be considered. The WRMP should take into account
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 impact of WRMP options on biodiversity and climate change resilience should be considered.
Local Planning Authorities (various) Water Cycle Studies that have been undertaken for housing growth points	
A water cycle study identifies tensions between growth proposals and environmental requirements on a local scale, and identifies potential solutions to addressing them. The water cycle studies within Cambridge Water area: • bring together all partners and stakeholders existing knowledge, understanding and skills • bring together all water and planning evidence under a single framework • understand the environmental and physical constraints to development • work alongside green infrastructure planning to identify opportunities for more sustainable planning • identifying water cycle planning policies and a water cycle strategy to help all partners plan for a sustainable future water environment.	The WRMP has the potential to impact on water resources, water supply and wastewater treatment, so should take account of development proposed within the area.
Cambridgeshire and Peterborough Minerals and Waste Local plan 2036 (2021)	

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
Over the plan period to 2036 Cambridgeshire and Peterborough will ensure a steady, adequate but sustainable supply of minerals to meet current and projected future need. There will be an increased commitment to the use of secondary and recycled aggregate over land won material, with restoration and aftercare placed at the forefront of planning decisions. As existing communities grow and new communities are formed, a network of waste management facilities will provide for the sustainable management of all wastes to the achievement of net self-sufficiency. A balance will be struck between meeting present and future needs, and maintaining and enhancing the social, environmental and economic vibrancy of the plan area.	Mineral extraction has the potential to impact water resources and their pathways, and locations at which waste is stored water resources are likely to be more susceptible to contamination. The WRMP should take this plan into consideration when considering resource options.
Cambridgeshire County Council Surface Water Management Plan (2014)	
The overall objectives of the SWMP are summarised as follows: • Engage with partners and stakeholders; • Map historical flood incident data; • Map surface water influenced flooding locations; • Identify areas at risk of surface water flooding, referred to throughout as ‘wetspots’; • Assess, compare and prioritise wetspots for detailed assessment; • Identify measures, assess options and confirm preferred options for the prioritised wetspots; and • Make recommendations for next steps.	The WRMP has the potential to impact surface water resources so should take into account the objectives set out in the SWMP.
Cambridgeshire County Council’s Climate Change and Environment Strategy 2022	
The council recognises that it needs to help towards tacking the climate and environmental crisis. The Cambridgeshire Net Zero by 2045 emissions Strategy describes how the council will deliver on its commitments and respond to the climate impact challenges it will need to face. 9 Priority Areas of the strategy: • Communication and engagement • New economic models • Low carbon buildings • Low carbon transport • Waste and Pollution • Green spaces • Peatland	The strategy identifies Water Management as a priority area. The WRMP needs to take into account the proposed actions stated in the strategy.

Objective Identified in the Policy, Plan or Programme	Influence on the WRMP and the SEA Objectives
• Water management • Resilience of our services	
Cambridgeshire County Council (2021) Cambridgeshire Flood Risk Management Strategy 2021-2027	
Cambridgeshire county council recognises the importance of working with its communities and risk management authorities to create a safer and more resilient Cambridgeshire. The strategy identifies how the county council and other organisations will help local communities become more resilient to flooding and how flood risk will be managed between 2021 and 2027.	The WRMP has the potential to impact water resources resulting in changes to flood risk, the WRMP needs to take the local flood management strategy into consideration.

Appendix B 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.

		?	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.
		?	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 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?	+++	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.
		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.

	• Will it avoid adverse effects on other land uses (such as forestry)?	--	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.
		-	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.
		?	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?	+++	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.

	• Wil it promote the use of sustainable drainage systems? • Will it promote opportunities for collaborative working with other risk management authorities?	-	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.
		0	Neutral	The option would not result in any effects on Air Quality and AQMAs.
		-	Minor Negative	The option would result in a decrease of the air quality
		--	Moderate Negative	The option would result in a decrease of the air quality within one or more AQMAs
		---	Major/Significant Negative	The option would result in a major decrease in the air quality within one or more AQMAs
		?	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?	+++	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.

	• 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?	++	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.
		---	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 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? • Will it avoid negative effects on built assets/ existing infrastructure including transport?	+++	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).
		+	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.
13. 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	+++	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

	healthy lifestyles including mental well-being?	+	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.
		---	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? • 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?	**+++**	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.
		+	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.

		-	Minor Negative	The option would require new infrastructure. 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 option would have limited opportunities for the re-use or recycling of waste materials.
		---	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.
		?	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
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 C Quality Assurance Checklist

The Practical Guide suggests a Quality Assurance checklist to help ensure that the requirements of the SEA Directive are met. The checklist is reproduced in **Table C1**, indicating where this Scoping Report meets the requirements, and which requirements will be addressed in the Environmental Report.

Table C1 Quality Assurance Checklist

Checklist Items	Comments
Objectives and Context	
The plan's or programme's purpose and objectives are made clear	The purpose of the WRMP is set out in Section 1.1 of this Scoping Report.
Environmental issues and constraints, including international and EC environmental protection objectives, are considered in developing objectives and targets	Objectives of other plans and programmes are set out in Section 3 and Appendix A.
SEA objectives, where used, are clearly set out and linked to indicators where appropriate	Draft objectives are set out in Section 5 of this Scoping Report.
Links with other plans, programmes and policies are identified and explained	Links are identified in in Section 3 and Appendix A.
Conflicts that exist between SEA objectives, between SEA and plan objectives and between SEA objectives and other plan objectives are identified and described	Any such compatibility conflicts would be identified as part of the cumulative assessment completed during the assessment of options and would be presented in the Environment Report.
Scoping	
Consultation Bodies are consulted in appropriate ways and at appropriate times on the content and scope of the Environmental Report	This Scoping Report is part of the consultation process required to meet the requirements of the SEA Directive and will be circulated to consultees. Further Consultation will be undertaken on the Environmental Report and Draft WRMP. The Consultation Process is described in Section 8.
The assessment focusses on specific issues	The proposed scope of the assessment reflects the geographic extent of Cambridge Water's supply area and provides a comprehensive approach to assessment of potentially.
Technical, procedural and other difficulties encountered are discussed; assumptions and uncertainties are made explicit	Data limitations and assumptions are discussed in Section 4.1.1 of this Scoping Report.
Reasons are given for eliminating issues from further consideration	The proposed objectives provide a comprehensive basis for assessment and at this stage, no issues have been eliminated.
Alternatives	
Realistic alternatives are considered for key issues, and the reasons for choosing them are documented	The appraisal framework, which will be revised following consultation, will be used to assess options, programmes and the plan. This will be set out in the Environmental Report.
Alternatives include 'do minimum' and / or 'business as usual' scenarios wherever relevant	Assessment of alternatives will be considered in the Environmental Report.

Checklist Items	Comments
The environmental effects (both adverse and beneficial) of each alternative are identified and compared	Assessment of alternatives will be considered in the Environmental Report.
Inconsistencies between the alternatives and other relevant plans, programmes and policies are identified and explained	Assessment of alternatives will be considered in the Environmental Report.
Reasons are given for the selection or elimination of alternatives	Assessment of alternatives will be considered in the Environmental Report.
Baseline Information	
Relevant aspects of the current state of the environment and their likely evolution without the plan or programme are described	The current state of the environment and predicted future baseline is set out in Section 4 of this Scoping Report for each SEA topic.
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 Cambridge Water's water supply area, and bordering regions where appropriate, are described in Sections 1.1, 2.2 and Section 4.
Difficulties such as deficiencies in information or methods are explained	Difficulties and limitations are set out in Section 4.1.1 of this Scoping Report.
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	Potential environmental effects will be set out in the Environmental Report.
Both positive and negative effects are considered, and the duration of effects (short, medium or long-term) is addressed	The nature and duration of potential effects will be set out in the Environmental Report, using an appraisal framework based on the one in Section 5 of this Scoping Report.
Likely secondary, cumulative and synergistic effects are identified where practicable	Potential secondary, cumulative and synergistic effects will be set out in the Environmental Report as described in Section 5..
Inter-relationships between effects are considered where practicable	Potential inter-relationship effects will be set out in the Environmental Report.
The prediction and evaluation of effects makes use of relevant accepted standards, regulations and thresholds	Relevant standards will be used where appropriate in undertaking the assessment in the Environmental Report.
Methods used to evaluate the effects are described	The Environmental Report will include information on the methods used for evaluation of potential effects.
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 will be incorporated into the assessment undertaken in preparing the Environmental Report.
Issues are to be taken into account in project delivery	Such mitigating measures, if required, will be highlighted against the options in the plan.
The Environmental Report	
Is clear and concise in its layout and presentation	The Environmental Report will be clear and concise.

Checklist Items	Comments
Uses simple, clear language and avoids or explains technical terms	The Environmental Report will use simple, clear language, and explain technical terms, as appropriate.
Uses maps and other illustrations where appropriate	The Environmental Report will use maps and illustration where appropriate.
Explains the methodology used	The SEA methodology will be described in the Environmental Report.
Explains who was consulted and what methods of consultation were used	The consultation strategy, including organisations and dates of consultation will be included in the Environmental Report.
Identifies sources of information, including expert judgement and matters of opinion	Sources of information will be detailed in the Environmental Report.
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	The Environmental Report will include a non-technical summary.
Consultation	
The SEA is consulted on as an integral part of the plan-making process.	This Scoping Report is a part of the consultation process required to meet the requirements of the SEA Directive and will be circulated to consultees. Further consultation will be undertaken on the Environmental Report and draft WRMP. The Consultation process is described in Section 8.
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	This Scoping Report is a part of the consultation process required to meet the requirements of the SEA Directive and will be circulated to consultees. Further consultation will be undertaken on the Environmental Report and draft WRMP. The Consultation process is described in Section 8.
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	Responses from consultation on the draft Environmental Report will be incorporated in the development of the final Environmental Report. After finalisation of the WRMP, a statement will be published describing how the SEA and the responses to consultation have been taken into account during the preparation of the WRMP.
An explanation is given of how they have been taken into account	Responses from consultation on the draft Environmental Report will be incorporated in the development of the final Environmental Report. After finalisation of the WRMP, a statement will be published describing how the SEA and the responses to consultation have been taken into account during the preparation of the WRMP.
Reasons are given for choosing the plan or programme as adopted, in the light of other reasonable alternatives considered	This will be set out following consultation on the draft WRMP and Environmental Report.
Monitoring measures	

Checklist Items	Comments
Measures proposed for monitoring are clear, practicable and linked to the indicators and objectives used in the SEA	The Environmental Report will include a section addressing proposals for monitoring.
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 will be made in the Environmental Report, with monitoring taking place following implementation of the WRMP, further to consultation with regulatory authorities including the Environment Agency and Natural England.
Monitoring enables unforeseen adverse effects to be identified at an early stage. (These effects may include prediction which prove to be incorrect)	The suggestions for monitoring will be made in the Environmental Report, with monitoring taking place following implementation of the WRMP, further to consultation with regulatory authorities including the Environment Agency and Natural England.
Proposals are made for action in response to significant adverse effects	Mitigation measures for adverse effects will be addressed in the Environmental Report.

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