Drainage and Wastewater Management Plan

Strategic Environmental Assessment Scoping Report

Appendices

August 2021

from Southern Water

Contents

A. SEA Process Tasks

SEA Stage	SEA Task	Task Purpose
Stage A Setting the context and objectives, establishing the baseline and deciding on the scope	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 to identify SEA objectives
	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
	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
	A4: Developing SEA objectives	To provide a means by which the environmental performance of the plan or programme and alternatives can be assessed
	A5: Consulting on the scope of SEA	To ensure that the SEA covers the likely significant environmental effects of the plan or programme. This is a statutory five-week consultation period
Stage B Developing and refining alternatives and assessing effects	B1: Testing the plan or programme objectives against the 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
	B2: Developing strategic alternatives	To develop and refine strategic alternatives
	B3: Predicting the effects of the draft plan or programme, including alternatives	To predict the significant environmental effects of the plan or programme and alternatives
	B4: Evaluating the effects of the draft 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
	B5: Considering ways of mitigating adverse effects	To ensure that adverse effects are identified and potential mitigation measures are considered
	B6: Proposing measures to monitor the environmental effects of plan or programme implementation	To details the means by which the environmental performance for the plan or programme can be assessed
Stage C Preparing the Environmental Report	C1: Preparing the Environmental Report	To present the predicted environmental effects of the plan or programme, including alternatives, in a form suitable for public consultation and use by decision-makers
Stage D Consulting on the draft plan or programme and the Environmental Report	D1: Consulting on the draft plan or programme and 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. There is no set time period for consultation. The SEA Directive states that the Consultation Bodies and the public '*shall be given an early and effective opportunity within appropriate time frames to express*

		their opinion on the draft plan or programme and the accompanying environmental report before the adoption of the plan or programme or its submission to the legislative procedure'. The Environmental Report will be consulted upon alongside the draft Plan. To gather more information through the opinions and concerns of the public
	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
	D3: Decision making 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 implementation of the plans or programme	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
	E2: Responding to adverse effects	To prepare for appropriate responses where adverse effects are identified

Source: Adapted from 'A Practical Guide to the Strategic Environmental Assessment Directive' (ODPM, September 2005)

B. Review of Relevant Policies, Plans and Programmes

Policy, Plan or Programme	Topic	Key Objectives, Guidance and References
International		
Bern Convention on the Conservation of European Wildlife and Natural Habitats (1979)	Biodiversity	The aims are to conserve wild flora and fauna and their natural habitats and to promote European cooperation. Particular importance is placed on the need to protect endangered natural habitats and endangered vulnerable species, including migratory species.
Bonn Convention on the Conservation of Migratory Species of Wild Animals (1983)	Biodiversity	The Convention aims to conserve terrestrial, aquatic and avian migratory species throughout their range.
Convention on Biological Diversity (1992)	Biodiversity	The Biodiversity Convention has three main aims which are to conserve biological diversity; to ensure the sustainable use of the components of biological diversity; and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources.
Ramsar Convention - The Convention on Wetlands of International Importance (1971)	Biodiversity	Provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. The aim is 'the conservation and wise use of all wetlands through local and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world'. The Convention uses a broad definition of the types of wetlands covered, including lakes and rivers, swamps and marshes, wet grasslands and peatlands, oases, estuaries, deltas and tidal flats, near-shore marine areas, mangroves and coral reefs, and human-made sites such as fishponds, rice paddies, reservoirs, and salt pans.
United Nations (1992) Convention on Biological Diversity (CBD)	Biodiversity	The main objectives are: Conservation of biological diversity; Sustainable use of its components; and Fair and equitable sharing of benefits arising from genetic resources
UN Framework Convention on Climate Change (1992)	Climatic Factors	The stated objective is to achieve stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. The parties should protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities.
Kyoto Protocol to the UN Framework Convention on Climate Change (1997)	Climatic Factors	The Kyoto Protocol was adopted in 1997 and ratified in 2005. It commits its parties to limit climate change by setting internationally binding targets for emission reductions. Covering the six main green-house gases (GHGs) , it required the UK to reduce emissions by 12.5% in the first commitment period (2008-2012). This was successfully achieved, and a second commitment period has been agreed whereby European Union (EU) countries will aim to achieve a joint 20% reduction compared to 1990 levels.
Commitments arising from the World Summit on Sustainable Development, Johannesburg (2002)	Climatic Factors	Adopted at the World Summit on Sustainable Development in 2002 and built upon earlier declarations made at previous conferences and summits. It commits nations to take a collective responsibility to build a human, equitable and caring global society cognisant of the need for human dignity for all. The Declaration also reinforces the three pillars of sustainable development: environmental, economic and social development at the local, national, regional and global level.
Paris Agreement (2015)	Climatic Factors	The Paris Agreement came out of the COP21 and aims to limit global temperature rises to 1.5ºC to 2ºC above pre-industrial levels. It brings together 196 parties from across the world into a common cause and requires all parties to put forward nationally determined contributions to strengthen efforts in the years ahead. It also aims to strengthen the ability of countries to deal with the impacts of climate change.

Charter for the Protection and Management of Archaeological Heritage (1990)	Historic Environment	The charter lays down principles relating to the different aspects of archaeological heritage management. These include the responsibilities of public authorities and legislators, principles relating to the professional performance of the processes of inventorisation, survey, excavation, documentation, research, maintenance, conservation, preservation, reconstruction, information, presentation, public access and use of the heritage, and the qualification of professionals involved in the protection of the archaeological heritage. The Charter states that policies for the protection of archaeological heritage should constitute an integral component of policies relating to land use, development, and planning as well as of cultural, environmental and educational policies.
The World Heritage Convention (1972)	Historic Environment	The Convention defines the kind of natural or cultural sites which can be considered for inscription on the World Heritage List. It also sets out the duties of states in identifying potential sites and their role in preserving them.
Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (Aarhus Convention) (1998)	Population and Human Health	The Aarhus Convention was created to give empowerment to citizens and civil society organisations in relation to environmental matters and is founded on the principles of participative democracy. It provides for access to environmental information; public participation in environmental decision making; and access to justice.
European		
Ambient Air Quality Directive (2008/50/EC)	Air	It establishes ambitious, cost-effective targets for improving human health and environmental quality up to 2020. The EU objective on air quality is 'to achieve levels of air quality that do not result in unacceptable impacts on, and risks to, human health and the environment'.
Thematic Strategy on Air Pollution (2005)	Air	The Strategy recognises the impact of air pollution on human health and the environment. It establishes interim objectives for air pollution in the EU and proposes appropriate measures for achieving them.
Establishing measures for the recovery of the stock of European eel 2007 (1100/2007)	Biodiversity	Advice from the International Council for the Exploration of the Sea (ICES) in 2006 indicated that the stock of the European eel (*Anguilla anguilla*) is outside safe biological limits across European waters. The population has declined significantly, reducing to 5% of the original 1980s stock levels. In response to this advice, the European Union adopted Council Regulation (EC) No 1100/2007, which requires Member States to undertake a series of measures aimed at the recovery of eel stock. The goal is to achieve 40% escapement of adult eels, relative to that in absence of anthropogenic factors, to sea to spawn. The EU Regulation was transposed into UK law under The Eels (England and Wales) Regulations 2009. Eleven Eel Management Plans have been prepared, one for each River Basin identified in England and Wales. The plans outline the current situation and how we intend to achieve the targets required by the European Regulation. Such measures include a reduction in fishing pressure, improving access and habitat quality, and reducing the impacts of entrainment. The measures that will require the installation of passes at obstructions and screens at abstraction and discharge points that prevent the migration of eels.
Our life insurance, our natural capital: an EU biodiversity strategy to 2020 (2011)	Biodiversity	Strategy to halt the loss of biodiversity and ecosystem services in the EU by 2020. There are six main targets and 20 actions to help Europe reach its goal. The six targets cover: • Full implementation of EU nature legislation to protect biodiversity; • Better protection for ecosystems, and more use of green infrastructure; • More sustainable agriculture and forestry; • Better management of fish stocks;

		• Tighter controls on invasive alien species; and • A bigger EU contribution to averting global biodiversity loss. The strategy is in line with two commitments made by EU leaders in March 2010. The first is the 2020 headline target: 'Halting the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, and restoring them in so far as feasible, while stepping up the EU contribution to averting global biodiversity loss'; the second is the 2050 vision: 'By 2050, European Union biodiversity and the ecosystem services it provides – its natural capital – are protected, valued and appropriately restored for biodiversity's intrinsic value and for their essential contribution to human wellbeing and economic prosperity, and so that catastrophic changes caused by the loss of biodiversity are avoided'.
Fresh Water Fish Directive (2006/44/EC)	Biodiversity	The Directive concerns the quality of fresh waters and shall apply to those waters designated by the Member States as needing protection or improvement in order to support fish life. This directive shall not apply to waters in natural or artificial fishponds used for intensive fish-farming.
Directive on the Conservation of Wild Birds (79/409/EEC) (as amended)	Biodiversity	Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (this is the codified version of Directive 79/409/EEC as amended). This Directive ensures far-reaching protection for all of Europe's wild birds, identifying 194 species and sub-species among them as particularly threatened and in need of special conservation measures. There are a number of components to this scheme: • Member States are required to designate SPAs for 194 particularly threatened species and all migratory bird species. SPAs are scientifically identified areas critical for the survival of the targeted species, such as wetlands. They are part of the Natura 2000 ecological network set up under the Habitats Directive 92/43/EEC; • A second component bans activities that directly threaten birds, such as the deliberate killing or capture of birds, the destruction of their nests and taking of their eggs, and associated activities such as trading in live or dead birds (with a few exceptions); and A third component establishes rules that limit the number of bird species that can be hunted (82 species and subspecies) and the periods during which they can be hunted. It also defines hunting methods which are permitted (e.g. non-selective hunting is banned).
European Commission (2009), Birds Directive (2009/147/EC)	Biodiversity	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).
Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna (92/43/EEC)	Biodiversity	The main aim of the Habitats Directive is to promote the maintenance of biodiversity, taking account of economic, social, cultural and regional requirements. While the Directive makes a contribution to the general objective of sustainable development; it ensures the conservation of a wide range of rare, threatened or endemic species, including around 450 animals and 500 plants. Some 200 rare and characteristic habitat types are also targeted for conservation in their own right. The Directive provides for a ban on the downgrading of breeding and resting places for certain strictly protected animal species. Exceptions to the strict protection rules can be granted under very specific conditions. The Habitats Directive also establishes the EU wide Natura 2000 ecological network of protected areas. For these areas it provides a high level of

		safeguards against potentially damaging developments. Together with the Birds Directive, the Habitats Directive forms the backbone of EU nature protection legislation.
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)	Biodiversity	The Directive sets out rules on animal health concerning aquaculture animals and related products which apply to the marketing, importation and transit of such products. It also establishes measures aimed at the prevention and control of diseases in aquaculture animals as well as making further provisions regarding the authorisation to aquaculture production businesses and processing establishments.
Limiting Global Climate Change to 2 degrees Celsius - The way ahead for 2020 and beyond (2007)	Climatic Factors	This a set of binding legislation to ensure the EU meets its climate and energy targets for the year 2020. The targets are: • 20% reduction in GHGs • 20% of EU energy from renewables • 20% improvement in energy efficiency
A Clean Planet for all: A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy (2018)	Climatic Factors	The long-term strategy sets out Europe's commitment to lead in global climate action and to present a vision that can lead to achieving net-zero greenhouse gas emissions by 2050 through a socially-fair transition in a cost-efficient manner. It looks into the portfolio of options available for Member States, business and citizens, as well as into how these can contribute to the modernisation of our economy and improve the quality of life of Europeans, protect the environment, and provide for jobs and growth.
Promotion of the use of energy and renewable sources Directive (2009/28/EC)	Climatic Factors	The Directive sets ambitious targets that the EU will reach a 20% share of energy from renewable sources by 2020 and a 10% share of renewable energy specifically in the transport sector. It also sets out to improve the legal framework for promoting renewable energy.
Energy Act 2013	Climatic Factors	The Act makes provides a framework for delivering secure, affordable and low carbon energy. It includes provisions for decarbonisation and the duties in relation to it.
Mainstreaming sustainable development into EU policies: 2009 Review of the European Union Strategy for Sustainable Development	Cross-cutting	The Renewed EU Sustainable Development Strategy (2006) deals in an integrated way with economic, environmental and social issues and lists the following seven key challenges: 1. Climate change and clean energy; 2. Sustainable transport; 3. Sustainable consumption and production; 4. Conservation and management of natural resources; 5. Public health; 6. Social inclusion, demography and migration; and 7. Global poverty
European Commission (2013) The 7th Environmental Action Programme (EAP) to 2020 Living well, within the limits	Cross-cutting	The EAP aims to guide environment policy until 2020 with three key objectives: 1. To protect, conserve and enhance the Union's natural capital; 2. To turn the Union into a resource-efficient, green and competitive low-carbon economy;

of our planet' (1386/2013/EU)		3. To safeguard The Union's citizens from environmental-related pressures and risks to health and wellbeing
European Commission Environmental Liability Directive (2004/35/EC)	Cross-cutting	The Directives relates to the prevention and remedying of environmental damage (ELD) and establishes a framework based on the polluter pays principle to prevent and remedy environmental damage. The Directive defines "environmental damage" as damage to protected species and natural habitats, damage to water and damage to soil.
Directive on the assessment of the effects of certain plans and programmes on the environment (2001/42/EC)	Cross-cutting	The Directive, known as the SEA Directive, sets out the requirement for the assessment of certain plans and programmes on the environment. An SEA is mandatory for plans/programmes which are prepared for agriculture, forestry, fisheries, energy, industry, transport, waste/ 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. SEA is also required where plans/programmes have been determined to require an assessment under the Habitats Directive.
The Convention for the Protection of the Architectural Heritage of Europe (Granada Convention) (1985)	Historic Environment	The Convention sets out to reinforce and promote policies for the conservation and enhancement of Europe's heritage. It also affirms the need for European solidarity with regard to heritage conservation and is designed to foster practical co-operation among the Parties. It establishes the principles of "European co-ordination of conservation policies" including consultations regarding the thrust of the policies to be implemented.
The European Convention on the Protection of Archaeological Heritage (Valletta Convention) (1992)	Historic Environment	The Convention aims to protect the archaeological heritage as a source of the European collective memory and as an instrument for historical and scientific study.
The European Landscape Convention (2006)	Landscape	The Convention is also known as the Florence Convention and it aims to promotes the protection, management and planning of European landscapes and organises European co-operation on landscape issues.
The Environmental Noise Directive (2002/49/EC)	Population and Human Health	The Directive is the EU's main instrument to identify noise pollution levels and covers the following three key action areas: the determination of exposure to environmental noise; ensuring that information on environmental noise and its effects is made available to the public; and preventing and reducing environmental noise where necessary and preserving environmental noise quality where it is good. It applies to noise to which humans are exposed, particularly in built-up areas, in public parks or other quiet areas in an agglomeration, in quiet areas in open country, near schools, hospitals and other noise-sensitive buildings and areas. It does not apply to noise that is caused by the exposed person himself, noise from domestic activities, noise created by neighbours, noise at workplaces or noise inside means of transport or due to military activities in military areas.
European Soils Charter (2003)	Soil	The Charter sets out to protect soil as a complex natural resource which is fundamental to life. It recognises that: • Soil is a precious asset; • Soil is a limited resource which is easily destroyed; • Land has a wide variety of uses and a proper planning policy is needed by Governments for urban development and civil engineering projects; • Farmers and foresters must preserve the soils quality;

		• Soil must be protected from erosion and pollution; and Further research and collaboration is required to ensure the wise use and conservation of soil.
Thematic Strategy for Soil Protection (2006)	Soil	The Strategy aims to protect soil and promote its sustainable use. It is based on the following guiding principles: • Preventing further soil degradation and preserving its functions • Restoring degraded soils to a level of functionality consistent at least with current and intended use, thus also considering the cost implications of the restoration of soil
The Nitrates Directive (91/676/EEC)	Water	The Nitrates Directive aims to protect water quality across Europe by preventing nitrates from agricultural sources polluting ground and surface waters and by promoting the use of good farming practices. This Directive forms integral part of the Water Framework Directive and is one of the key instruments in the protection of waters against agricultural pressures.
The Water Framework Directive (WFD) (2000/60/EC)	Water	The WFD has the following key aims: • Expanding the scope of water protection to all waters, surface waters and groundwater; • Achieving 'good status' for all waters by a set deadline; • Water management based on river basins; • 'Combined approach' of emission limit values and quality standards; • Getting the prices right; • Getting the citizen involved more closely; and • Streamlining legislation. There are a number of objectives in respect of which the quality of water is protected. The key ones at European level are general protection of the aquatic ecology, specific protection of unique and valuable habitats, protection of drinking water resources, and protection of bathing water. Member States must aim to reach good chemical and ecological status in inland and coastal waters by 2015.
European Commission, Floods Directive (2007/60/EC)	Water	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.
Urban Wastewater Treatment Directive (91/271/EEC)	Water	The objective of this Directive is to protect the environment from the adverse effects of urban wastewater discharges and discharges from certain industrial sectors. The Directive concerns the collection, treatment and discharge of such wastewater.
Drinking Water Directive (1998/83/EC)	Water	The Drinking Water Directive sets out the following objectives: • Sets quality standards for drinking water quality at the tap (microbiological, chemical and organoleptic parameters) and the general obligation that drinking water must be wholesome and clean; • Obliges Member States to regular monitoring of drinking water quality and to provide to consumers adequate and up-to-date information on their drinking water quality; and Member States may exempt water supplies serving less than 50 persons or providing less than 10 m3 of drinking water per day as an average and water in food-processing undertakings where the quality of water cannot affect the wholesomeness of the foodstuff in its finished form.

Directive on Bathing Water (76/160/EEC); and Directive 2006/7/EC repealing Directive 76/160/EEC (from 2014)	Water	The overall objective of the Directive remains the protection of public health whilst bathing, but the revised Directive also offers an opportunity to improve management practices at bathing waters and to standardise the information provided to bathers across Europe and aims to set more stringent water quality standards and also puts a stronger emphasis on beach management and public information.
Groundwater Directive (2006/118/EC)	Water	This directive establishes a regime which sets underground water quality standards and introduces measures to prevent or limit inputs of pollutants into groundwater. The directive establishes quality criteria that takes account local characteristics and allows for further improvements to be made based on monitoring data and new scientific knowledge. The directive thus represents a proportionate and scientifically sound response to the requirements of the WFD as it relates to assessments on chemical status of groundwater and the identification and reversal of significant and sustained upward trends in pollutant concentrations. Member States will have to establish the standards at the most appropriate level and take into account local or regional conditions. The groundwater directive complements the WFD. It requires: • Groundwater quality standards to be established by the end of 2008; • Pollution trend studies to be carried out by using existing data and data which is mandatory by the WFD (referred to as 'baseline level' data obtained in 2007-2008); • Pollution trends to be reversed so that environmental objectives are achieved by 2015 by using the measures set out in the WFD; • Measures to prevent or limit inputs of pollutants into groundwater to be operational so that WFD environmental objectives can be achieved by 2015; • Reviews of technical provisions of the directive to be carried out in 2013 and every six years thereafter; and Compliance with good chemical status criteria (based on EU standards of nitrates and pesticides and on threshold values established by Member States).
Marine Strategy Framework Directive (2008/56/EEC)	Water	The aim of the Marine Strategy Framework Directive is to protect more effectively the marine environment across Europe. It aims to achieve Good Environmental Status of the EU's marine waters by 2020 and to protect the resource base upon which marine-related economic and social activities depend. The Directive enshrines in a legislative framework the ecosystem approach to the management of human activities having an impact on the marine environment, integrating the concepts of environmental protection and sustainable use.
Directive on the Assessment and Management of Flood Risks (2007/60/EC)	Water	Its aim is to reduce and manage the risks that floods pose to human health, the environment, cultural heritage and economic activity. The Directive requires Member States to first carry out a preliminary assessment by 2011 to identify the river basins and associated coastal areas at risk of flooding. For such zones they would then need to draw up flood risk maps by 2013 and establish flood risk management plans focused on prevention, protection and preparedness by 2015. The Directive applies to inland waters as well as all coastal waters across the whole territory of the EU.
Blueprint to Safeguard Europe's Water Resources (2012)	Water	The Blueprint outlines actions in relation to improved implementation of current water legislation and the integration of water policy objectives into other policies, and also aims to fill the gaps in regard to water quantity and efficiency. The objective is to ensure that a sufficient quantity of good quality water is available for people's needs, the economy and the environment throughout the EU. It is closely linked to EU's 2020

		Strategy and the 2011 Resource Efficiency Roadmap, however the analysis spans up to 2050 and is therefore expected to drive EU water policy over the long term.
European Commission (2013) The 7th Environmental Action Programme (EAP) to 2020 Living well, within the limits of our planet' (1386/2013/EU)	Biodiversity	The EAP aims to guide environment policy until 2020 with three key objectives: The commitment to conserving biological diversity must be considered in any drought plan options and the SEA should seek to Draft Drought Plan 2022 Annex 9: SEA Environmental Report Appendices 28 Objectives identified in the Policy, Plan or Programme Influences on the Drought Plan and the SEA objectives International To protect, conserve and enhance the Union's natural capital; To turn the Union into a resource-efficient, green and competitive low-carbon economy; To safeguard The Union's citizens from environmental-related pressures and risks to health and wellbeing
National		
The Eels (England & Wales) Regulations 2009 (as amended)	Biodiversity	Transposed from the European Directive (1100/2007) into UK law, the Regulations aim to establish measures for the recovery of the stock of European eel. The Regulations will help implement delivery Eel Management Plans.
Salmon and Freshwater Fisheries Act 1975	Biodiversity	The Act sets out the legal framework in which salmon and freshwater fisheries are regulated. It covers regulation on fishing methods and related offences, obstructions to fish passage, salmon and freshwater fisheries administration and law enforcement.
UK Post-2010 Biodiversity Framework, JNCC and Defra (2012)	Biodiversity	The purpose of the Framework is to set a broad enabling structure for action across the UK between now and 2020: • To set out a shared vision and priorities for UK-scale activities, in a framework jointly owned by the four countries, and to which their own strategies will contribute; • To identify priority work at a UK level which will be needed to help deliver the Aichi targets and the EU Biodiversity Strategy; • To facilitate the aggregation and collation of information on activity and outcomes across all countries of the UK, where the four countries agree this will bring benefits compared to individual country work; and • To streamline governance arrangements for UK-scale activity.
Making Space for Nature - A review of England's Wildlife Sites and Ecological Network (2010)	Biodiversity	The report aims to answer the following questions: Do England's wildlife sites comprise a coherent and resilient ecological network? If not, what needs to be done? The report concludes that the approaches required to achieve a coherent and resilient ecological network are varied, and 24 wide-ranging recommendations are presented. Five themes unite them: • We need to continue the recent progress in improving the management and condition of wildlife sites, particularly our SSSIs. We also make recommendations for how these should be designated and managed in ways that enhance their resilience to climate change; • We need to properly plan ecological networks, including restoration areas. Restoration needs to take place throughout England. However, in some areas, both the scale of what can be delivered to enhance the network, and the ensuing There are a large number of surviving patches of important wildlife habitat scattered across England outside of SSSIs, for example in Local Wildlife Sites. We need to take steps to improve the protection and management of these remaining wildlife habitats. 'Protection' will usually be best achieved through incentive-based mechanisms, but at times may require designation;

		• We need to become better at deriving multiple benefits from the ways we use and interact with our environment. There are many things that society has to do that may seem to have rather little to do with nature conservation, but could have, or even should have if we embrace more radical thinking; flood management by creating wetlands is an obvious example. We need to exploit these 'win-win' opportunities to the full. Being better at valuing a wider range of ecosystem services would help this process; We will not achieve a step-change in nature conservation in England without society accepting it to be necessary, desirable, and achievable. This will require strong leadership from government and significant improvements in collaboration between local authorities, local communities, statutory agencies, the voluntary and private sectors, farmers, landowners and other land-managers and individual citizens.
Biodiversity 2020: A strategy for England's wildlife and ecosystem services, Defra (2011)	Biodiversity	The Strategy builds on the Natural Environment White Paper and sets out how the UK is implementing the international and EU commitments. The mission for this strategy is as follows: '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'.
The Conservation of Habitats and Species Regulations (2010) (as amended)	Biodiversity	The Conservation of Habitats and Species Regulations 2010 apply in the terrestrial environment and in territorial waters out to 12 nautical miles. The EU Habitats and Wild Birds Directives are transposed in UK offshore waters by separate regulations. The new regulations do not make any substantive changes to existing policies and procedures other than the establishment of the Marine Management Organisation. The Marine Management Organisation takes on certain licensing functions from Natural England to ensure consistency with the approach in the Marine and Coastal Access Act 2009. The objective of the Habitats Directive is to protect biodiversity through the conservation of natural habitats and species of wild fauna and flora. The Directive lays down rules for the protection, management and exploitation of such habitats and species.
The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations (2019)	Biodiversity	This instrument provides changes to those parts of the 2017 conservation of habitats and species regulations which would no longer work when the UK leaves the EU.
Delivering a healthy natural environment. Ecosystem approach action plan, Defra (2010)	Biodiversity	Known as the "Ecosystems Approach Action Plan" (EAAP)), it was first published in 2007 and was then updated in 2010. It sets out the concept and framework of ecosystem services, and describes how this could be translated into "an ecosystems approach" to policy and decision making that could be applied at all levels of Government.
The Invasive Alien Species (Enforcement and Permitting) Order 2019	Biodiversity	The Order brings into force the EU Invasive Alien Species Regulation (1143/2014) on the prevention and management of invasive alien plant and animal species in England and Wales, including the relevant licenses, permits and rules for keeping invasive alien species.
EU Regulation 1143/2014 of the European Parliament and of the Council of 22 October 2014 on the prevention and management of the introduction and spread of invasive alien species	Biodiversity	This regulation seeks to address the problem of invasive alien species in a comprehensive way to enable the protection of native biodiversity and ecosystem services whilst minimising and mitigating the impacts on human health and the economy that such species can have. There are three types of interventions – prevention, early detection and rapid eradication and management.

The Great Britain Invasive Non-Native Species Strategy, Defra (2015)	Biodiversity	The Strategy builds on the first which was published in 2008 and sets out a series of aims and objectives to underpin action until 2020. It aims to address the issues of INNS in the UK to protect biodiversity, quality of life and economic interests.
A narrative for conserving freshwater and wetland habitats in England, Natural England (2016)	Biodiversity	Provides a narrative as to why the natural ecosystem system function is important for freshwater and wetland wildlife and recognises the ecosystem service benefits. It aims to provide a strategic framework for decision making for conserving these important habitats.
Conservation 21 - Natural England's Conservation Strategy for the 21st Century, Natural England (2016)	Biodiversity	The Strategy sets out how Natural England aim to contribute to the ambition set out the in Defra's strategy to 2020 and how they can work together with others to deliver this shared ambition. The Strategy is based on the following three principles: • Creating resilient landscapes and seas • Putting people at the heart of the environment • Growing natural capital
State of Natural Capital Annual Report 2020, Natural Capital Committee (2020)	Biodiversity	The Nature Capital Committee's seventh annual report on the state of natural capital. The report recognises the importance that nature-based interventions will have on achieving net zero by 2050 targets. The report makes recommendations for the Government to take forward and outlines key points for inclusion within the Environment Bill.
Standing Advice on Protected Species, Natural England (2016)	Biodiversity	Provides guidance on reviewing planning applications which might have an affected on protected species.
Defra (2002) Working with the grain of nature: a biodiversity strategy for England	Biodiversity	The Strategy seeks to embed biodiversity considerations into public policy and sets out a programme for the next five years to make the changes necessary to conserve and enhance biodiversity. The strategy sets out a number of indicators for biodiversity which are to be monitored by Defra, including the condition of Sites of Special Scientific Interest, populations of wild birds and progress with implementing biodiversity action plans (BAPs).
Climate Change Act 2008	Climatic Factors	The Act sets out a legal framework to commit the Government to tackling climate change and climate change adaptation is also covered in the Act as it provides a legal framework for adaptation policy. The Act sets out a target of net zero by 2050 based on 1990 levels.
UK Climate Change Risk Assessment, Defra (2017)	Climatic Factors	Identifies the key climate change risks and opportunities for the UK which are as follows: • Flooding and coastal change risks to communities, businesses and infrastructure; • Risks to health, well-being and productivity from high temperatures; • Risks of shortages in the public water supply for agriculture, energy generation and industry; • Risks to natural capital including terrestrial, coastal, marine and freshwater ecosystems, soils and biodiversity; • Risks to domestic and international food production and trade; and • New and emerging pests and diseases and invasive non-native species affecting people, plants and animals.
The National Adaptation Programme and the Third Strategy for Climate	Climatic Factors	This is the second National Adaptation Programme (NAP) and sets out the Government's response to the second Climate Change Risk Assessment (CCRA). It also outlines the actions that will be taken to address

Adaptation Reporting, Defra (2018)		the climate change issues identified in the CCRA across the following key sectors: Natural environment; Infrastructure; People and the built environment; Business and industry; and Local government.
DCLG (2019) National Planning Policy Framework	Cross-cutting	Presumption in favour of sustainable development. Core planning principles include taking account of the development needs of an area; contribute to conserving and enhancing the environment; re-use of previously developed land; conserve heritage assets; deliver sufficient community facilities to meet local needs. Delivering sustainable development includes: Building a strong competitive economy; Supporting a prosperous rural economy; Promoting sustainable transport; Requiring good design; Promoting healthy communities; Protecting green belt land; Meeting the challenge of climate change, flooding and coastal change; Conserving and enhancing the natural environment; Conserving and enhancing the historic environment; and Facilitating the sustainable use of minerals.
National Planning Policy Framework (NPPF) (2019)	Cross-cutting	The updated NPPF sets out government's planning policies for England and how these are expected to be applied. Achieving sustainable development is at the heart of the NPPF whereby it has three overarching objectives in the social, economic and environmental spheres.
A Green Future: Our 25 Year Plan to Improve the Environment, UK Government (2018)	Cross-cutting	The 25 Year Plan sets out the Governments actions for improving the health of the natural environment. It includes six actions in order achieve clean air, plentiful and clean water, thriving plants and wildlife, reduced harm from environmental hazards, sustainable resource use and enhanced beauty, heritage and engagement with the natural environment: • Using and managing land sustainably • Recovering nature and enhancing the beauty of landscapes • Connecting people with the environment to improve health and wellbeing • Increasing resource efficiency, reducing pollution and waste • Securing clean, productive and biologically diverse seas and oceans • Protecting and improving the global environment
The draft Environment Bill 2020	Cross-cutting	The Bill was first introduced to parliament in October 2019 and then reintroduced in January 2020. The Bill is currently under review by a Public Bill Committee. The Environment Bill will support the 25 Year Environment Plan and brings about urgent and meaningful action to combat the environmental issues that the UK is facing. It sets out a requirement for biodiversity net gain which includes at least a 10% improvement in biodiversity value for new development. It also includes details on: • Creating a new governance framework for the environment • A new direction for resources and waste management • Improving air quality • Securing our water services • Enhancing our green spaces • Updating laws on chemicals (REACH)
Securing the Future – Delivering the UK Sustainable Development Strategy (2005)	Cross-cutting	The Strategy for sustainable development aims to '…enable all people throughout the world to satisfy their basic needs and enjoy a better quality of life without compromising the quality of life of future generations.' Guiding principles: • Living within environmental limits • Ensuring a strong, healthy, and just society

		• Achieving a sustainable economy • Promoting good governance • Using sound science responsibly • UK priorities for immediate action: • Sustainable consumption and production • Climate change and energy • Natural resource protection and environmental enhancement • Sustainable communities
The Natural Choice: Securing the Value of Nature, Defra (2011)	Cross-cutting	The White Paper outlines the Government's vision for the natural environment for the next 50 years.
Marine and Coastal Access Act (2009)	Cross-cutting	The Act sets out to protect marine functions, activities and wildlife. It commits the UK to ambitions actions and sets out the provisions for Marine Conservation Zones (MCZs), a Marine Planning system, reform of inshore fishers, amongst others.
The Wildlife and Countryside Act 1981 (as amended)	Cross-cutting	The Wildlife and Countryside Act is the main Act which protects animals, plans and habitats in the UK. It implements the Bern Convention and the Birds Directive and contains details of European and national designated sites, protection for designated species.
Environment Protection Act 1990	Cross-cutting	The Act aims to set out provisions for the control of pollution to the environment (air, water and land) by regulating the management of waste and emissions. It places a duty of care on any business or person who produces waste to do so carefully and in line with requirements.
Countryside and Rights of Way (CROW) Act	Cross-cutting	The Act was introduced in 2000 with the intention to give greater freedom for people to explore open countryside and contains provisions to introduce a new statutory right of access for open-air recreation to mountain, moor, heath, down and registered common land. It also includes a power to extend the right to coastal land by order and enables landowners voluntarily to dedicate irrevocably any land to public access.
The Natural Environment and Communities Act 2006 (NERC Act)	Cross-cutting	The Natural Environment and Rural Communities Act is designed to help achieve a rich and diverse natural environment and thriving rural communities through modernised and simplified arrangements for delivering Government policy. It is about conserving and enhancing places and nature and helping people to enjoy them – taking a wider view, pursuing environmental management which encompasses access and recreation, and aiming where possible to achieve economic and social outcomes alongside conservation goals.
Creating a better place: Our ambition to 2020, Environment Agency (2018)	Cross-cutting	This aims to protect and improve natural resources in the UK and sits alongside Defra's 25 Year Environment Plan. It sets out the Environment Agency's vision, principles and purpose until 2020 as well as how they aim to deliver against the 25 Year Environment Plan.
UK National Ecosystem Assessment Follow-on (2014)	Cross-cutting	The 2011 UK National Ecosystem Assessment (UK NEA) which identified that the natural world and its ecosystems are important to our well-being and economic prosperity, however they are consistently undervalued. This follow on provides new information and tools to help decision makers integrate the value of ecosystems into decision making.
National Infrastructure Delivery Plan 2016–2021, Infrastructure and Projects Authority (HM Government) (2016)	Cross-cutting	Sets out the Government's plans for economic infrastructure over the next 5 years to support delivery of housing and social infrastructure. The Plan recognises that water services are likely to come under increasing pressure because of population growth and a changing climate. The Plan sets out the following key objectives for water:

		• Start of construction on the Thames Tideway Tunnel • Reductions in average bills of about 5% in real terms • Further expenditure from 2020 with the start of Asset Management Period 7
Fixing the foundations: Creating a more prosperous nation, HM Government (2015)	Cross-cutting	The reports sets out the importance of productivity and the Government's vision to delivering a UK economy which is the richest of all major economies by 2030. It includes two pillars for raising productivity: • Encouraging long term investment in economic capital, including infrastructure, skills and knowledge • Promoting a dynamic economy that encourages innovation and helps resources flow to their most productive use
Environment Act 1995	Cross-cutting	The Act set out provisions for the creation of a number of government agencies including the Environment Agency and the Scottish Environment Protection Agency (SEPA). It also set out new standards for environmental protection.
The Environmental Damage (Prevention and Remediation) (England) Regulations 2015	Cross-cutting	The Regulations seek to ensure action is taken put any environmental damage right and are based on the 'polluter pays principle'. It transposes the European Commission Environmental Liability Directive into UK law. The Regulations require action in response to the most significant cases, covering specific types of: damage to species and habitats; damage to water; or risks to human health from contamination of land.
Environmental Assessment of Plans and Programmes Regulations 2004	Cross-cutting	The regulations transpose the SEA Directive into UK law which requires an assessment of the effects of certain plans and programmes on the environment. Article 3 (2b) states that SEA is required for plans and programmes which are prepared for water management, set the framework for development consents, and/or are likely to have a significant environmental effect.
Creating a great place for living: together we are building a green and healthy future (2018)	Cross-cutting	The Defra group sets out make air purer, water cleaner, land greener and food more sustainable, and their mission is to restore and enhance the environment for the next generation, and to leave the environment in a better state. There are 10 goals which underpin this mission and include: • Sustainable farming and food • Pure air, clean rivers and a resilient water supply • Healthy seas and oceans • Beautiful landscapes, flourishing wildlife and native species • Thriving rural economies and communities • Efficient resource use and reduced waste • Protecting animals and plants from health risks • Resilient communities and economies • Great places for living for people and animals • Green global Britain
National Flood and Coastal Erosion Risk Management Strategy for England, Environment Agency (2020)	Water	The Strategy sets out the long-term delivery objectives the nation should take over the next 10 to 30 years as well as shorter term, practical measures risk management authorities should take working with partners and communities. It includes the following long term vision: 'a nation ready for, and resilient to, flooding and coastal change – today, tomorrow and to the year 2100', and includes the following three long-term ambitions: • Climate resilient places

		• Today's growth and infrastructure resilient in tomorrow's climate • A nation ready to respond and adapt to flooding and coastal change
The Flood and Coastal Erosion Risk Management Policy Statement, Defra (2020)	Water	The Policy Statement sets out the long-term goal of the Government to create a nation which is resilient to future flood and coastal erosion, and therefore protects people, the environment and the economy. The National Flood and Coastal Erosion Strategy has helped to inform this policy statement. It identifies five key areas for action which include: • Upgrading and expanding our national flood defences and infrastructure • Managing the flow of water more effectively • Harnessing the power of nature to reduce flood and coastal erosion risk and • achieve multiple benefits • Better preparing our communities • Enabling more resilient places through a catchment-based approach
Flood risk assessments: climate change allowances, Environment Agency (2016)	Cross-cutting	The guidance sets out how climate change should be accounted for when local authorities prepare strategic flood risk assessment as well as when developers and their agents when they prepare flood risk assessments for planning applications, and development consent orders for nationally significant infrastructure projects. The guidance provides allowances for anticipated change of the following and are aligned to each river basin in some cases: peak river flow; peak rainfall intensity; sea level rise; and offshore wind speed and extreme wave height.
Climate change approaches in water resources planning – Overview of new methods, Environment Agency (2013)	Cross-cutting	The report explores different ways in which the possible impacts of climate change could be incorporated into Water Resource Management Plans (WRMPs) in England and Wales. A number of improvements are suggested, but not limited to: • Undertaking vulnerability assessments to evaluate Water Resource Zones (WRZs) vulnerability to current and future climate and using the outcomes to determine the level of modelling required to assess future impacts of climate change • Alternative methods to scaling the impacts of climate change from the base year to the 2030s and beyond • Headroom assessment should clearly distinguish between climate and non-climate risks and report outputs for specific reference levels of headroom
Defra (2008) England Biodiversity Strategy – climate change adaptation principles	Cross-cutting	Government strategy presenting five principles that are fundamental to conserving biodiversity during climate change. The precautionary principle underlies all the principles.
The Natural Environment and Rural Communities Act (NERC), 2006	Cross-cutting	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.
Defra (2015) The government's response to the Natural Capital	Cross-cutting	This provides a number of recommendations such as: Agreement for the development of a 25 year plan for a healthy natural economy. This includes helping organisations understand the economic, social and cultural value the impact their actions have on it and how to use the knowledge for better decisions; identify

Committee's third State of Natural Capital report		most important and threatened environmental assets; protection of designated areas; address outstanding monitoring and data issues to enable better decisions about strategic investments in natural capital. Assigning institutional responsibility for monitoring the state of natural capital. Organisations that manage land and water assets should create a register of natural capital for which they are responsible.
Natural Environment and Rural Communities Act 2006	Cross-cutting	An Act to make provision about bodies concerned with the natural environment and rural communities; to make provision in connection with wildlife, sites of special scientific interest, National Parks and the Broads; to amend the law relating to rights of way; to make provision as to the Inland Waterways Amenity Advisory Council; to provide for flexible administrative arrangements in connection with functions relating to the environment and rural affairs and certain other functions; and for connected purposes.
Environment Agency (2013) Evidence Climate change approaches in water resources planning – overview of new methods	Cross-cutting	The aim of this project was to explore potential changes in how climate change impacts are incorporated into the water resources planning process in England and Wales.
Planning (Listed Buildings and Conservation Areas) Act 1990	Historic Environment	An Act of Parliament that altered the laws on granting of planning permission for building works, notably including those of the listed building system in England and Wales
The Ancient Monuments and Archaeological Areas Act 1979	Historic Environment	This Act is concerned with the provisioning, investigation, recording and the preservation and protection of archaeological sites and ancient monuments.
Climate Change and the Historic Environment, English Heritage (2008)	Historic Environment	The statement recognises the climate change impacts the UK is facing and how this poses a risk to the historic environment.
Strategic Environmental Assessment, Sustainability Appraisal and the Historic Environment, Historic Environment (2016)	Historic Environment	Provides guidance on SEA in relation to the historic environment.
The Setting of Heritage Assets, Historic Environment Good Practice Advice in Planning 3, Historic Environment (2017)	Historic Environment	Sets out guidance on managing change within the settings of heritage assets, including archaeological remains and historic buildings, sites, areas, and landscapes, against the backdrop of the NPPF. It gives general advice on understanding setting, and how it may contribute to the significance of heritage assets and allow that significance to be appreciated, as well as advice on how views contribute to setting.
Ancient Woodland and Veteran Trees: Protecting them from development, Forestry Commission and Natural England (2014)	Landscape	Sets out guiding principles for considerations when developments affect ancient woodlands or veteran trees. Ancient woodland is defined as an irreplaceable habitat which is important for wildlife, soils, recreational value and cultural, historical and landscape value. Ancient tree is one which attributes include the following: great age, size, condition, biodiversity, cultural heritage and value. The guidance also states that all ancient trees are veteran trees but not all veteran trees are ancient. A veteran tree may not be very old, but it has decay features, such as branch death and hollowing which contribute to its biodiversity, cultural and heritage value. When making decisions the following should be considered:

		• conserving and enhancing biodiversity • reducing the level of impact of the proposed development on ancient woodland and ancient and veteran trees
Our Waste, Our Resources: A Strategy for England, HM Government (2018)	Material Assets	The Strategy recognises that natural capital is one of our most valuable assets and sets out how the Government plans to preserve the stock of material resources by minimising waste, promoting resource efficiency and moving towards a circular economy. They also set out how they aim to minimise damage to the natural environment and is aligned to the Government's 25 Year Environment Plan. This is our blueprint for eliminating avoidable plastic waste over the lifetime of the 25 Year Plan, doubling resource productivity, and eliminating avoidable waste of all kinds by 2050.
Safeguarding our Soils - A strategy for England, Defra (2009)	Soil	The Strategy recognises that soil is fundamental resource and sets out a 2030 vision for the sustainable management of soil where degradation threats are tackled successfully. It aims to improve the quality of England's soils and safeguard their ability to provide essential services for future generations.
Water Resources Act 1991	Water	The Act sets out the functions of National Rivers Authority (now the Environment Agency) and introduced water quality classifications and objectives for the first time.
Water Industry Act 1991	Water	The Act sets out the main powers and duties of the water and sewerage companies, thus replacing those set out in the Water Act 1989, and defined the powers of the Director General of Water Services (now the Water Services Regulation Authority (Ofwat)).
Water Act 2003 (as amended)	Water	The Act amends the Water Resources Act and Regulations 1991 and the Water Industry Act 1991. The Act has the following four broad aims: • the sustainable use of water resources; • strengthening the voice of consumers; • a measured increase in competition; and • the promotion of water conservation.
Preparing for a drier future: England's water infrastructure needs, National Infrastructure Commission (2018)	Water	Sets out the National Infrastructure Commission's advice on how to address England's water supply challenges and deliver the appropriate level of resilience for the long term. It recognises that water shortages is a risk in England and that climate change alongside an increasing population A (especially in the drier south and east) and the need to protect the environment will result in further challenges.
Draft National Policy Statement for Water Resources Infrastructure, Defra (2018)	Water	The draft National Policy Statement for Water Resources Infrastructure (NPS) sets out the need and government's policies for the development of nationally significant infrastructure projects relevant to water resources in England. It is aligned with the goal of clean and plentiful water as set out in the UK Government's 25 Year Environment Plan and recognises that a twin track approach is required to secure resilient water supplies.
Water for Life White Paper, Defra (2011)	Water	This White Paper sets out a vision for future water management in which the water sector is resilient; water companies are more efficient and customer focused; and water is valued as the precious and finite resource it is. It explains that everyone has a part to play in the realisation of this vision. It sets out the principles and timetable for an overhaul of the abstraction regime, which governs how and when water can be taken from the environment for use by business, agriculture and the public; and explains how improved interconnections between water catchments will allow water to be moved more easily around the country to areas of need. It details Government policy on charging for water and providing help to those who struggle to afford their bills.

The Water Environment (Water Framework Directive) (England and Wales) Regulations 2003 (as amended)	Water	The Regulations transpose the EC WFD in UK law. They will help implement the WFD requirement in England and Wales. They aim to protect and enhance the quality of: • Surface freshwater (including lakes, streams and rivers); • Groundwaters; • Groundwater dependant ecosystems; • Estuaries; and • Coastal waters out to one mile from low-water.
Protect groundwater and prevent groundwater pollution, Environment Agency (2017)	Water	It aims to avoid negative impacts on groundwater sources including impacts of pollution by providing guidance on discharging or abstracting from groundwater sources.
Groundwater protection technical guidance, Environment Agency (2017)	Water	It aims to avoid negative effects on the quality and quantity of groundwater resources by providing guidance on the inputs of substances and pollutants to groundwater, discernibility of hazardous substances and when geological formations can be determined permanently unsuitable for other purposes.
The Environment Agency's approach to groundwater protection, Environment Agency (2018)	Water	These position statements describe the Environment Agency's approach to managing and protecting groundwater. They update Groundwater protection: principles and practice (GP3).
The Groundwater (England and Wales) Regulations 2009	Water	The Regulations transpose the EU Groundwater Directive (2006/118/EC) into UK law. The Regulations set out to protect groundwater from being polluted by hazardous substances.
Directive 2006/118EC of the European Parliament and of the council of 12 December 2006 on the protection of groundwater against pollution and deterioration	Water	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.
Flood and Water Management Act 2010	Water	The Act seeks to address the threat of flooding and water scarcity. The Act takes forward a number of recommendations from the Pitt Review into the 2007 floods and places new responsibilities on the Environment Agency, local authorities and others to manage the risk of flooding. Climate projections suggest extreme weather will happen more frequently in the future and this Act is central to reducing the flood risk associated with extreme weather.
The Water Resources Management Plan Regulations 2007	Water	The regulations set out the statutory duty for water companies to prepare and publish a WRMP.
Water Resources Planning Framework (2015-2065), Water UK (2016)	Water	The project aims to develop a high-level strategy and framework for the long-term management and planning of water resources in England and Wales. It identifies the challenges facing water resources including climate change, resilience to droughts and demand growth and presents options to mitigate the issues.
Water Supply (Water Quality) Regulations 2016 (as amended)	Water	The regulations consolidate legislation concerning the quality of water supplies for human consumption in England. They also apply in Wales where the water undertaker or licensee is primarily based in England.

National Policy Statement for Wastewater (2012)	Water	National Policy Statement (NPS) sets out Government policy for the provision of major wastewater infrastructure. It aims to make existing policy and practice clear and transparent in relation to nationally significant wastewater infrastructure.
Drought response: our framework for England, Environment Agency (2017)	Water	The document outlines the national framework for how drought is managed by the Environment Agency, the government and water companies to reduce the effects on the people, business and the environment. It sets out how drought affects different areas of England, who is involved in management drought and how those stakeholders, and how drought is manged, monitored and reported on.
Future Water: the Government's water strategy for England, Defra (2008)	Water	The Strategy sets Defra's vision for the water sector up to 2030 and outlines the steps they will implement to achieve that vision. Their vision is where rivers, canals, lakes and seas have improved for people and wildlife, with benefits for angling, boating and other recreational activities, and with continued provisions for excellent quality drinking water. It is structured around water supply and demand, water quality in the natural environment, surface water drainage, river and coastal flooding, greenhouse gas, water charging, the regulatory framework and innovation.
Water Resources Planning Guideline, Environment Agency (2016)	Water	This document provides guidance on the requirements and process for water resource planning through WRMPs to ensure resilient and sustainable water supplies. It is currently being updated and is out for public consultation until October 2020.
The Urban Waste Water Treatment (England and Wales) Regulations 1994	Water	The Regulations transpose the EU Urban Waste Water Treatment Directive (91/271/EEC) and sets out to regulate the disposal of sewage.
The Nitrate Pollution Prevention Regulations 2015	Water	The Regulations transpose EU Nitrates Directive (91/676/EEC) into UK law and aim to reduce the pollution in the water environment from nitrates.
Managing Water Abstraction, Environment Agency (2016)	Water	Sets out how the Environment Agency manage water resources in England and outlines the technical, legal and policy requirements behind the abstraction licensing strategies.
Marine Plans – South East Inshore, South Inshore, South Offshore (Marine Management Organisation)	Water	A marine plan: • Sets out priorities and directions for future development within the plan area • Informs sustainable use of marine resources • Helps marine users understand the best locations for their activities, including where new developments may be appropriate. • Each of the 11 marine plan areas will have a marine plan with a long-term (20 years) view of activities and will be reviewed every three years. There will be ten marine plans as the North West will have a single plan following requests to have a single process and one plan for these areas. • All marine plan areas are scheduled to have a plan by 2021.
UK Marine Policy Statement (2011)	Water	The UK Marine Policy Statement (MPS) provides the policy framework for the marine planning system. It provides the context for marine plans. Marine plans put into practice the objectives for the marine environment that are identified in the MPS alongside the National Planning Policy Framework (NPPF) and the Localism Act 2011. Where there is no marine plan in place, the MPS sets the direction for decisions that affect the marine areas, such as granting licences for all public bodies.
Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for	Cross-cutting	The Marine Strategy Framework Directive aims to achieve Good Environmental Status (GES) of the EU's marine waters by 2020 and to protect the resource base upon which marine related economic and social activities depend. It is the first EU legislative instrument related to the protection of marine biodiversity, as it

community action in the field of marine environmental policy (Marine Strategy Framework Directive)		contains the explicit regulatory objective that "biodiversity is maintained by 2020", as the cornerstone for achieving GES.
Environment Agency (2009), Water Resources Strategy for England and Wales	Water	This is the national EA strategy for water resource management in the long term. It looks to 2050 and considers the impacts of climate change, the water environment, water resource and valuing water. Aims and objectives include: Ensure water is used efficiently in homes and buildings, and by industry and agriculture; Provide greater incentives for water companies and individuals to manage demand; Share existing water resources more effectively
Environment Agency (2010), Water Resources Action Plan for England and Wales	Water	The strategy has four main aims: Adaptation to and mitigation of climate change; A better water environment; Sustainable planning and management of water resources; and People valuing water and the water environment.
Defra (2013) Catchment Based Approach: Improving the quality of our water environment	Water	DEFRA believe that better coordinated action is desirable at the catchment level by those who use water or influence land management and that this requires greater engagement and delivery by stakeholders at the catchment as well as local level. They highlight that this is particularly important when trying to address the significant pressures placed on the water environment by diffuse pollution.
Defra (2005) Making space for water: taking forward a new government strategy for flood and coastal erosion risk management in England	Water	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.
Regional and local		
Site Improvement Plans for Natura 2000 sites: London & South East, Natural England	Biodiversity	Site Improvement Plans outline the priority measures needed to achieve and maintain the European species and habitats within a site in favourable condition. They include the following: • Provide a high level overview of the issues affecting the condition of the site • Identify the priority actions to address the issues • Identify the potential funding sources available
Environment Agency, The Wild Trout Trust, Atlantic Salmon Trust (2011) South Coast Sea Trout Action Plan	Biodiversity	The actions in this document, which are designed to focus effort on key actions to protect and improve sea trout populations fall into two groups: • Those that are relatively low cost habitat focused actions that can be led by the Wild Trout Trust and the Rivers Trusts, which will improve the success rate for spawning and juvenile life stages of the south coast sea trout population. • More complex and challenging issues, such as addressing major obstructions to fish passage, improving water quality, undertaking large scale habitat restoration and addressing the impact of abstraction, which require a co-ordinated approach from the Environment Agency working in partnership with other bodies.
Local Development Plans (Various)	Cross-cutting	Local Development Plans or Core Strategies are the main framework for planning in a local authorities and set out the long-term spatial vision to guide sustainable development. They include policies on key area such as housing, transport, the natural environment, employment and economic development, carbon reduction and resources, amongst others.

		The following local authorities fall within the SWS operational boundary and therefore their Local Plans/Core Strategies are relevant: • Adur; Arun; Ashford, Basingstoke and Deane; Bournemouth, Christchurch and Poole; Brighton and Hove; Canterbury; Chichester; Crawley; Dartford; Dover; East Hampshire; Eastbourne; Eastleigh; Fareham; Folkestone and Hythe; Gosport; Gravesham; Guildford; Hastings; Havant; Horsham; Isle of Wight; Lewes; Maidstone; Medway; Mid Sussex; Mole Valley; New Forest; Portsmouth; Rother; Sevenoaks; Southampton; Swale; Tandridge; Test Valley; Thanet; Thurrock; Tonbridge and Malling; Tunbridge Wells; Waverley; Wealden; West Berkshire; Wiltshire; Winchester; Worthing
Public Rights of Way Improvement Plans (ROWIPs)	Cross-cutting	ROWIPs outline how local authorities aim to improve public rights of way within their local area in order to ensure improved accessibility, connectivity and quality of the network for all.
Local level Green Infrastructure Plans and Strategies	Cross-cutting	Green Infrastructure Strategies set out how local authorities will improve provision of and access to quality green spaces.
South Downs National Park (2013) Partnership Management Plan, Shaping the future of your south downs national park 2014-2019	Cross-cutting	5- year strategy plan for the management of the South Down National Park.
Partnership Plan for the New Forest National Park (2015) An update of the National Park Management Plan with actions for 2015 -2020	Cross-cutting	5- year management plan for the New Forest National Park.
AONB Management Plans	Landscape	The Management Plans summarise the key issues facing the AONBs and outline the management policies and actions required to conserve these areas. The following Plans are relevant to the Southern Water region: Kent Downs; High Weald; Surrey Hills; Chichester Harbour; Isle Of Wight; North Wessex Downs
National Character Area (NCA) Profiles, Natural England	Landscape	The profiles for each outline the characteristics which are unique to that area and help to form distinctive sense of place. There are 17 NCAs within the SES operational area which include: • Greater Thames Estuary • North Kent Plain • Berkshire and Marlborough Downs • North Downs • Wealden Greensand • Low Weald • High Weald • South Downs • South Coast Plain • Isle of Wight • South Hampshire Lowlands • Thames Basin Heaths • Hampshire Downs • New Forest

		• Romney Marshes • Pevensey Levels • Salisbury Plain and West Wiltshire Downs
South East River Basin Management Plan (2015)	Water	The purpose of a river basin management plan is to provide a framework for protecting and enhancing the benefits provided by the water environment. To achieve this, and because water and land resources are closely linked, it also informs decisions on land-use planning. The following have been identified as key pressures for the basin: • Physical modifications - affecting 43% of water bodies in this river basin district • Pollution from waste water – affecting 40% of water bodies in this river basin district • Pollution from towns, cities and transport - affecting 9% of water bodies in this river basin district • Changes to the natural flow and level of water - affecting 7% of water bodies in this river basin district • Negative effects of invasive non-native species - affecting 2% of water bodies in this river basin district • Pollution from rural areas - affecting 30% of water bodies in this river basin district
River Basin Management Plans (RBMPs), Defra and Environment Agency (2015)	Water	RBMPs set out to provide a framework for protecting and enhancing the benefits provided by the water environment. To achieve this, and because water and land resources are closely linked, it also informs decisions on land-use planning.
Catchment Flood Management Plans (CFMPs), Defra and Environment Agency (2016)	Water	CFMPs set out the risk for each of the river basins in relation to flooding from rivers, the sea, surface water, groundwater and reservoirs across England and Wales. They do not cover coastal flooding which are covered by Shoreline Management Plans. The role of the CFMPs is to establish flood risk management policies which will deliver sustainable flood risk management for the long term. CFMPs should be used to inform planning and decision making by key stakeholders such as the Environment Agency, local authorities, Internal Drainage Boards, water companies and other utilities; transportation planners; landowners, farmers and land managers; the public and businesses to enhance their understanding of flood risk and how it will be managed. The CFMPs identify six generic flood risk management policies: • Policy 1- Areas of little or no flood risk where the Environment Agency will continue to monitor and advise: this policy will tend to be applied in those areas where there are very few properties at risk of flooding. It reflects a commitment to work with the natural flood processes as far as possible. • Policy 2 - Areas of low to moderate flood risk where the Environment Agency can generally reduce existing flood risk management actions: this policy will tend to be applied where the overall level of risk to people and property is low to moderate. • Policy 3 - Areas of low to moderate flood risk where the Environment Agency are generally managing existing flood risk effectively: this policy will tend to be applied where the risks are currently appropriately managed and where the risk of flooding is not expected to increase significantly in the future. • Policy 4 - Areas of low, moderate or high flood risk where the Environment Agency are already managing the flood risk effectively but where they may need to take further actions to keep pace with climate change: this policy will tend to be applied where the risks are currently deemed to be appropriately-managed, but where the risk of flooding is expected to significantly rise in the future. • Policy 5 - Areas of moderate to high flood risk where the Environment Agency can generally take further action to reduce flood risk: this policy will tend to be applied to those areas where the case for

		further action to reduce flood risk is most compelling, for example where there are many people at high risk, or where changes in the environment have already increased risk. • Policy 6 - Areas of low to moderate flood risk where the Environment Agency will take action with others to store water or manage run-off in: locations that provide overall flood risk reduction or environmental benefits. This policy will tend to be applied where there may be opportunities in some locations to reduce flood risk locally or more widely in a catchment by storing water or managing run-off. To select the most appropriate policy, the CFMPs consider how the social, economic and environmental objectives are affected by flood risk management activities under each policy option. The policies identified in the CFMPs will be delivered through a range of delivery plans, projects and actions.
WRSE Regional Plan	Water	WRSE are currently developing a Regional Plan to secure resilient and sustainable water supplies for future generations through a collaborative, regional approach. The WRSE regional plan aims to take a long-term view to water resource planning across the region to 2100 in order to secure a sustainable and resilient water supply. The WRSE regional plan will seek to: • Ensure there is enough water for a growing population and to support economic growth • Improve the environment by leaving more water in the region's rivers, streams and underground sources • Increase the region's resilience to severe drought and other extreme shocks and stresses • Address the impacts of climate change on demand for water and how much is available
Draft South East Marine Plan, Marine Management Organisation (2020)	Water	The south east inshore marine plan area stretches from Felixstowe in Suffolk to near Folkestone in Kent, covering approximately 1,400 kilometres of coastline, taking in a total of approximately 3,900 square kilometres of sea. The French marine area, east inshore and offshore marine plan areas and the south inshore marine plan area border the south east inshore marine plan area. The area overlaps with 42 local authorities and three Areas of Outstanding Natural Beauty. The River Thames has a large influence on the south east inshore marine plan area. The Plan sets out specific policy areas which include, but not limited to, co-existence, aquaculture, water quality, climate change, fisheries, marine litter, biodiversity, and net gain and natural capital. There are three key objectives, each of which have further aims associated with them: • Achieving a sustainable marine economy • Ensuring a strong, healthy and just society • Living within environmental limits
Environment Agency (2009) Water Resources Strategy Regional Action Plan for South East	Water	The management and use of water and land must be shown to be sustainable - environmentally, socially and economically.
Southern Water		
Environment Policy (2019)	Cross-cutting	Sets out Southern Water's environmental commitments which include the following, amongst others: • Prevent pollution • Provide sustainable and reliable water and wastewater services with minimise nuisance and carbon emissions

		• Minimise waste • Collaborate with customers, contractors, regulators, suppliers and other stakeholders • Protect the environment by promoting the sustainable and efficient use and conservation of water, energy and natural resources
Southern Water (2011) Strategic Statement 2015-40 and Southern Water (2013) updated Strategic Statement 2015-40 (Parts 1 to 4)	Cross-cutting	The plan details how Southern Water will deliver a value-for-money service for its customers to 2040
Southern Water (2013) Five Year Business Plan 2015-2020	Cross-cutting	It sets out how Southern Water will provide the value-for-money water and wastewater services to its customers.
WRMP 2020-2070 (2019)	Water	The Plan sets out how Southern Water will secure reliable water supplies across each of the water resource zones (WRZs) making up its supply area over the next 50 years. It includes detailed proposals that take account of challenges they know already exist, and a range of future uncertainties. The WRMP19 adopts a 'twin track' approach to addressing the forecast supply-demand deficit, with demand management (including leakage reduction) options to reduce water demand within Southern Water's supply area being considered alongside the development of options to enhance reliable water supply availability.
Drought Plan (2019)	Water	The Plan details the actions Southern Water will take to save and produce more water during a drought as well as outlining the actions customers and businesses will have to take. The supply of water in the Southern Water region comes from groundwater abstractions, river abstractions and reservoir abstractions. The Plan outlines the actions required across five key stages in a drought: Normal: No drought; Stage 1: Impending drought; Stage 2: Drought; Stage 3: Severe drought – phase 1; and Stage 4: Severe drought – phase 2.
Business Plan 2020-25 (2019)	Water	The Plan sets out a framework for Southern Water over the next five years to achieve their vision: "to create a resilient water future for customers in the South East". The vision is supported by five long term outcomes and five transformational programmes which includes the following: • Outcomes • Resources • Environment • Economy • Communities • Value • Transformational Programmes • Target 100 • Catchment First • Networks 2030 • Resource Hubs • Sustainable Drainage 2030
Southern Water (2011) Strategic Statement 2015-40 and Southern Water (2013)	Population and Human Health	The plan details how Southern Water will deliver a value-for-money service for its customers to 2040

updated Strategic Statement 2015-40 (Parts 1 to 4)		

C. Environmental baseline

Local authorities affected

Table 1: Local authorities in the Southern Water operational area

Local authority	County	RBD catchment
City of Portsmouth	City of Portsmouth	East Hampshire
City of Southampton	City of Southampton	East Hampshire, Test and Itchen
Christchurch	Dorset	New Forest
Eastbourne	East Sussex	Cuckmere and Pevensey Levels
Hastings	East Sussex	Cuckmere and Pevensey Levels, Rother
Lewes	East Sussex	Adur and Ouse, Cuckmere and Pevensey Levels
Rother	East Sussex	Cuckmere and Pevensey Levels, Medway, Rother
Wealden	East Sussex	Adur and Ouse, Cuckmere and Pevensey Levels, Medway, Rother
Basingstoke and Deane	Hampshire	Test and Itchen
East Hampshire	Hampshire	Arun and Western Streams, East Hampshire, Test and Itchen
Eastleigh	Hampshire	East Hampshire, Test and Itchen
Fareham	Hampshire	East Hampshire
Gosport	Hampshire	East Hampshire
Havant	Hampshire	Arun and Western Streams, East Hampshire
New Forest District	Hampshire	New Forest, Test and Itchen
Test Valley District	Hampshire	Test and Itchen
Wiltshire	Hampshire	Test and Itchen
Isle of Wight	Isle of Wight	Isle of Wight
Ashford	Kent	Medway, North Kent, Rother, Stour
Canterbury	Kent	North Kent, Stour
Dartford	Kent	Medway
Dover	Kent	Rother, Stour
Folkestone and Hythe	Kent	Rother, Stour
Gravesham	Kent	Medway
Maidstone	Kent	Medway, North Kent, Stour
Sevenoaks	Kent	Medway
Swale	Kent	Medway, North Kent, Stour
Thanet	Kent	Stour
Tonbridge and Malling	Kent	Medway
Tunbridge Wells	Kent	Medway, Rother

Local authority	County	RBD catchment
Medway	Medway	Medway
Guildford	Surrey	Arun and Western Streams
Mole Valley	Surrey	Arun and Western Streams
Tandridge	Surrey	Medway
Waverley	Surrey	Arun and Western Streams
The City of Brighton and Hove	The City of Brighton and Hove	Adur and Ouse
Thurrock	Thurrock	Outside the RBD catchments but within SWS operational area
West Berkshire	West Berkshire	Test and Itchen
Adur	West Sussex	Adur and Ouse
Arun	West Sussex	Adur and Ouse, Arun and Western Streams
Chichester	West Sussex	Arun and Western Streams, East Hampshire
Crawley	West Sussex	Outside the RBD catchments but within SWS operational area
Horsham	West Sussex	Adur and Ouse, Arun and Western Streams
Mid Sussex	West Sussex	Adur and Ouse, Arun and Western Streams, Medway
Worthing	West Sussex	Adur and Ouse, Arun and Western Streams
Wiltshire	Wiltshire	Test and Itchen

Biodiversity, flora and fauna

The SWS area of operation contains numerous Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites, Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Local Nature Reserves (LNR), Marine Conservation Zones (MCZ) and Biosphere Reserves[1]. The number and type of ecological sites across the region and within the 11 RBM catchments is presented in Table 2, Table 3 and shown in Figure D1 and D2 in Appendix D.

Table 2: Ecological sites in the SWS operational area

Designated site	Total number
SAC	38
SPA	18
Ramsar	13
SSSI	369

[1] Biosphere reserves in Europe & North America. Available at https://en.unesco.org/biosphere/eu-na [Accessed Aug 2021]

NNR	26
LNR	165
MCZ	14
Biosphere Reserve	2 (Brighton and Hove, and Isle of Wight)

Table 3: Ecological sites by RBM Catchment

Designated site	Adur and Ouse	Arun and Western Streams	Cuckmere and Pevensey Levels	East Hampshire	Isle of Wight	New Forest	Rother	Stour	Test and Itchen	Medway	North Kent
SAC	3	11	2	3	5	3	3	10	6	4	1
SPA	1	5	1	4	2	3	1	4	4	3	2
Ramsar	0	3	1	3	1	2	1	3	2	2	2
SSSI	33	67	23	27	41	13	24	35	44	62	5
NNR	2	4	2	4	1	1	2	5	1	2	2
LNR	24	19	10	31	8	6	5	15	13	27	4
MCZ	1	2	2	0	3	0	1	4	0	3	3
Biosphere Reserve	1	0	0	0	1	0	0	0	0	0	0

Under the Natural Environment and Rural Communities (NERC) Act 2006, Southern Water has a duty to have regard to the conservation of biodiversity in exercising its function. The duties relate to habitats and species of principal importance. Habitats designated under the NERC Act within the area include:

- Coastal and floodplain grazing marsh
- Coastal saltmarsh
- Coastal sand dunes
- Coastal vegetated shingle
- Deciduous woodland
- Good quality semi-improved grassland
- Lowland calcareous grassland
- Lowland dry acid grassland
- Lowland fens
- Lowland heathland

- Lowland meadows
- Maritime cliff and slope
- Mudflats
- No main habitat but additional habitats present
- Purple moor grass and rush pastures
- Reedbeds
- Saline lagoons
- Traditional orchard

Soil

The SWS area of operation is a hub for agriculture with cereal and livestock grazing being the most predominant type of farming[2].

The majority of rural land in the SWS area of operation is farmed, and it is noted that agricultural practices have a major influence on soil quality. Good soil structure is beneficial to water retention and crop yield. 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.

Agricultural land is classified on a scale of 1 to 5 where 1 is the highest quality and 5 is the lowest. The majority of agricultural land in the area is classified as Grade 3, with some Grade 1 and 2 land located to the east of the area, and some Grade 5 and urban land located to the west as shown in Figure D3 in Appendix D.

The south east of England and London has the largest area of licensed landfill sites of anywhere else in the country[3]. Currently, there are 145 authorised landfill sites and 1819 historic landfill sites across the SWS area of operation.

The geology of the SWS area of operation is diverse and includes bedrock aquifers, primarily of Principal and Secondary A type, and superficial aquifers.

[2] Defra (2020). Agricultural facts: overview of agricultural activity in the South East (including London). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/866815/regionalstatistics_southeast_20feb20.pdf
[3] Environment Agency (2002). Dealing with contaminated land in England. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/313967/dealing_with_contaminated_land_i.pdf

Water

The SWS area of operation is one of the driest areas in the UK and is classed as an area with serious water stress[4]. Around half of the water supply for the south east region of the UK comes from underground sources with some water resource zones relying completely on underground sources[5]. Precipitation during winter months is crucial for these sources meeting higher demand during spring and summer months. The anticipated population and economic growth alongside the projected changes in climate will likely continue to place additional stress on water availability and the natural environment within the SWS area of operation.

The main rivers in the SWS area of operation are shown in Figure D5 in Appendix D. There are two river basin districts within the area; Thames and South East. The Thames river basin district covers an area of 16,200km^2 and includes 17 management catchments which range from chalk streams and aquifers to tidal and coastal marshes[6]. The South East river basin district covers an area of 10,200km^2 and is made up of nine management catchments which range from chalk streams of the Test and Itchen catchments to the modified rivers of the Rother catchment[7].

River basin management catchments within the river basin districts that are included within the scope of the DWMP are:

- Thames:
    - North Kent; and
    - Medway
- South East:
    - Adur and Ouse;
    - Arun and Western Streams;
    - Cuckmere and Pevensey Levels;
    - East Hampshire;
    - Isle of Wight;
    - New Forest;
    - Rother;
    - Stour; and
    - Test and Itchen.

[4] Environment Agency (2013). Water Stressed Areas – Final Classification. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/244333/water-stressed-classification-2013.pdf
[5] WRSE (2020). Future water resource requirements for South East England. Available at: https://www.wrse.org.uk/media/anbhm2cb/wrse-future-water-resource-requirements-march-2020-3.pdf
[6] Defra and Environment Agency (2015). Part 1: Thames River Basin District – River Basin Management Plan. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/718342/Thames_RBD_Part_1_river_basin_management_plan.pdf
[7] Defra and Environment Agency (2015). Part 1: South East River Basin District – River Basin Management Plan. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/718337/South_East_RBD_Part_1_river_basin_management_plan.pdf

The River Basin Management Plan (RBMP) for the Thames and South East river basin districts highlight significant water management issues which prevent the sustainable management of water within each river basin. For both the river basin districts, physical modifications and pollution from wastewater affect the highest proportions of water bodies followed by pollution from rural areas.

Table 4: Water management issues

Water Management Issue	Percentage of water bodies affected	
	Thames	South East
Physical modifications	44%	43%
Pollution from wastewater	45%	40%
Pollution from towns, cities and transport	17%	9%
Changes to the natural flow and level of water	12%	7%
Negative effects of invasive non-native species	3%	2%
Pollution from rural areas	27%	30%

Source: Thames and South East RBMP (footnote 6 & 7)

The number of water bodies in the SWS area of operation is presented in Table 5.

Table 5: Number of water bodies in the SWS area of operation

Water body categories	South East	Thames	Total
Canal	6	0	6
Coastal	11	0	11
Groundwater	33	10	43
Lake	28	11	39
River	214	50	264
Transitional	23	8	31
Total	**315**	**79**	**394**

The WFD indicator of the health of the water environment is whether a water body is at good status or potential. This is an assessment of a range of quality elements relating to the biology and chemical quality of surface waters and quantitative and chemical quality of groundwater. To achieve good ecological status or potential, good chemical status or good groundwater status every single element assessed must be at good status or better. If one element is marginally below its threshold for good status, then the whole water body's status is classed as less than good. Table 6 and Table 7 summarise the current status of surface and groundwater water bodies in the SWS area of operation.

Table 6: WFD Ecological and chemical 2019 classification for surface water bodies

River basin district	Ecological status or potential					Chemical status	
	Bad	Poor	Moderate	Good	High	Fail	Good
South East	10	54	172	46	0	282	0
Thames	4	9	50	6	0	69	0

Table 7: WFD quantitative and chemical 2019 classification for groundwater water bodies

River basin district	Quantitative status		Chemical status	
	Poor	Good	Poor	Good
South East	12	21	16	17
Thames	6	4	8	2

There are seven man-made reservoirs owned by various water companies within the SWS area of operation. The four Southern Water surface water impounding reservoirs are Bewl Water on the Kent/Sussex boundary, and Weir Wood, Darwell and Powdermill situated in Sussex. Ardingly, Arlington and Bough Beech reservoirs are also located in the area, but are owned and operated by other water companies. The locations of these reservoirs is shown in Figure D5 in Appendix D.

Flood risk across the SWS area of operation is diverse and can occur from a wide range of sources including rivers and the sea, groundwater, reservoir and surface water. Climate change is projected to result in more extreme weather events which alongside projected increases in sea level is likely to have an impact on the future flood risk of the region.

The Thames river basin district has over 227,000 people at high risk of surface water flooding and over 107,000 people are at high risk of flooding from rivers and the sea[8]. Medway is one of the two primary flood risk areas (FRAs)[9] within the district (the other being London), which are areas with higher risk of surface water flooding.

The South East river basin district consists of one primary flood risk area, Brighton and Hove, and there are over 31,000 people at high risk of surface water flooding and over 36,000 people at high risk of flooding from rivers and the sea[10]. There has been notable and severe flooding occurring across the basin in recent years which resulted in significant impacts on communities, businesses and the natural environment.

Areas at risk of flooding from rivers and sea within the SWS area of operation are shown in Figure D5 in Appendix D.

[8] Environment Agency (2016). Thames River Basin District Flood Risk Management Plan 2015 – 2021. Available at: https://www.gov.uk/government/publications/thames-river-basin-district-flood-risk-management-plan
[9] Primary FRAs are defined in the River Basin Flood Risk Management Plans as areas where the risk of flooding from local flood risks is significant as designated under the Flood Risk Regulations
[10] Environment Agency (2016). South East River Basin District Flood Risk Management Plan 2015 – 2021. Available at: https://www.gov.uk/government/publications/south-east-river-basin-district-flood-risk-management-plan

Air

Air quality in the SWS area of operation is varied and there are certain areas with higher concentrations of air pollutants likely to be associated with transport or business activities. Air Quality Management Areas (AQMAs) are declared where the national air quality objectives are not being met[11]. Many of the RBD catchments within the SWS area of operation contain at least one AQMA, which are predominately designated for Nitrogen dioxide (NO_2) and Particulate Matter (PM_{10}) [12]. In total there are 68 AQMAs designated within the SWS area of operation, as detailed in Table 8 for the 11 RBD catchment areas, and shown in Figure D6 in Appendix D.

Table 8: AQMAs by RBD catchment areas

Designation	Adur and Ouse	Arun and Western Streams	Cuckmere and Pevensey	East Hampshire	Isle of Wight	New Forest	Rother	Stour	Test and Itchen	Medway	North Kent
AQMAs	9	4	0	9	0	1		5	14	20	4

Climatic factors

Current observations indicate that the UK is continuing to warm. 2020 was the third warmest year for the UK in a series from 1884, and the eighth warmest year for UK near-coastal sea-surface temperature (SST) in a series from 1870[13]. The most recent decade (2011–2020) has been on average 0.5°C warmer than the 1981–2010 average and1.1°C warmer than 1961–1990. Annual precipitation has increased across the UK in the last few decades. The most recent decade (2011–2020) has been on average 4% wetter than 1981–2010 and 9% wetter than1961–1990 for the UK overall.

The Met Office UK Climate Projections (UKCP) were updated for the first time since 2009 in December 2018 (UKCP18)[14]. The UKCP18 are largely the same as the previous projections where all areas of the UK are projected to be warmer, particularly during summer months. Rainfall is projected to vary seasonally and at a regional scale, however the UK is projected to have wetter winters and drier summers. The projected changes in temperature and precipitation for the south east of England by the 2050s (2040-2069), under the RCP8.5 scenario (high emissions scenario) are detailed in Table 9. The 1981-2010 baseline period and the central estimate, representing 'as likely as not' probability of change (50th percentile), was used for the following projections.

[11] Defra National Air Quality Objectives. Available at: https://uk-air.defra.gov.uk/assets/documents/National_air_quality_objectives.pdf
[12] Defra List of Local Authorities with AQMAs. Available at: https://uk-air.defra.gov.uk/aqma/list
[13] RMetS (2020). State of the UK Climate, vol 41, July 2021. Available at: State of the UK Climate 2020 (wiley.com)
[14] Met Office UKCP18. Available at: https://ukclimateprojections-ui.metoffice.gov.uk/

Table 9: Future climate projections by the 2050s under the RCP8.5 scenario

Climatic factor	Climate projections
Temperature	Annual mean temperatures are projected to increase by 2.0°C. Summer temperatures are projected to see the largest increase by 2.6°C and winter temperatures by 1.7°C. Mean maximum summer temperatures are projected to increase by 2.9°C.
Precipitation	Annual mean precipitation is projected to decrease by 1.1%. Seasonal variability is projected with a 22.9% decrease in precipitation during summer months and an increase of 11.5% during winter months.

Source: Met Office UKCP18 using the central probability estimate for a RCP8.5 scenario

Based on the local authorities which fall within the SWS area of operation[15], the total carbon dioxide (CO_2) emissions for 2018 across all sectors is estimated at 24,629 kilo tonnes (ktCO2) (not including Land use, land-use change, and forestry (LULUCF))[16].

Table 10 provides greater detail, showing that the transport sector contributed the highest proportion of emissions to the total in 2018 followed by the domestic and industrial sector. The LULUCF sector is estimated to be responsible for the removal of 1,279ktCO_2.

Table 10: Emissions (ktCO2) in the SWS area in 2018

County	Local authority	Industry and Commercial Total	Domestic Total	Transport Total	**Total across the sectors**	LULUCF Net Emissions	Per Capita Emissions (t)
West Sussex	Adur	43.9	83.3	97.4	**224.6**	-3.8	3.5
West Sussex	Arun	128.9	233.4	210.1	**572.5**	-27.5	3.4
Kent	Ashford	165.7	186.4	316.6	**668.8**	-70.2	4.6
Hampshire	Basingstoke and Deane	256.3	256.7	547.8	**1,060.8**	-61.7	5.7
Dorset	Bournemouth, Christchurch and Poole	383.3	529.1	543.2	**1,455.6**	-13.9	3.6
Brighton and Hove	Brighton and Hove	226.8	355.9	290.4	**873.1**	-4.6	3.0
Kent	Canterbury	159.1	214.3	231.5	**604.9**	-27.0	3.5

[15] CO2 emissions data covers the entirety of each local authority; however, it is acknowledged that not all of the relevant local authorities are located entirely within the SES operational area boundary. Therefore, at this stage of the SEA process the ktCO2 values indicated in the baseline are to be taken as an approximation.

[16] BEIS (2020). UK local authority and regional carbon dioxide emissions national statistics: 2005 to 2018. Available at: https://www.gov.uk/government/statistics/uk-local-authority-and-regional-carbon-dioxide-emissions-national-statistics-2005-to-2018

County	Local authority	Industry and Commercial Total	Domestic Total	Transport Total	**Total across the sectors**	LULUCF Net Emissions	Per Capita Emissions (t)
West Sussex	Chichester	256.7	206.2	306.6	**769.5**	-126.1	5.3
West Sussex	Crawley	213.1	135.4	248.6	**597.0**	-8.6	5.2
Kent	Dartford	119.4	144.1	386.0	**649.5**	-5.1	5.9
Kent	Dover	141.1	159.4	164.4	**464.8**	-13.2	3.9
Hampshire	East Hampshire	131.8	201.8	343.5	**677.1**	-51.1	5.2
East Sussex	Eastbourne	90.4	129.0	77.6	**297.0**	-4.4	2.8
Hampshire	Eastleigh	132.1	173.7	292.6	**598.4**	-5.7	4.5
Hampshire	Fareham	127.5	156.9	217.0	**501.4**	-5.7	4.3
Kent	Folkestone and Hythe	109.8	159.6	215.1	**484.5**	-25.5	4.1
Hampshire	Gosport	59.1	96.7	63.7	**219.4**	-1.8	2.6
Kent	Gravesham	137.5	140.0	200.0	**477.5**	-7.2	4.4
Surrey	Guildford	162.3	225.4	423.3	**811.0**	-57.5	5.1
East Sussex	Hastings	59.9	119.5	65.1	**244.5**	-2.8	2.6
Hampshire	Havant	89.9	168.1	171.4	**429.3**	-4.0	3.4
West Sussex	Horsham	191.2	227.8	301.6	**720.5**	-71.4	4.6
Isle of Wight	Isle of Wight	192.1	202.9	120.4	**515.4**	-30.5	3.4
East Sussex	Lewes	79.9	148.8	178.9	**407.7**	-25.4	3.7
Kent	Maidstone	190.1	238.1	419.3	**847.6**	-42.6	4.7
Medway	Medway	221.6	351.6	309.2	**882.4**	-10.5	3.1
West Sussex	Mid Sussex	161.9	227.8	314.7	**704.4**	-69.8	4.2
Surrey	Mole Valley	135.3	160.5	275.6	**571.4**	-50.2	6.0
Hampshire	New Forest	293.0	276.3	482.3	**1,051.6**	-117.2	5.2
Portsmouth	Portsmouth	260.9	235.0	293.0	**788.9**	-2.3	3.7
East Sussex	Rother	147.0	159.2	181.8	**488.0**	-74.8	4.3
Kent	Sevenoaks	105.7	206.4	541.9	**854.0**	-45.1	6.7
Southampton	Southampton	256.3	266.4	237.3	**759.9**	-6.0	3.0
Kent	Swale	632.5	192.8	353.8	**1,179.0**	-21.1	7.8

County	Local authority	Industry and Commercial Total	Domestic Total	Transport Total	**Total across the sectors**	LULUCF Net Emissions	Per Capita Emissions (t)
Surrey	Tandridge	77.0	156.3	407.7	**641.0**	-24.1	7.1
Hampshire	Test Valley	209.0	192.4	478.3	**879.7**	-56.6	6.6
Kent	Thanet	219.3	192.2	130.7	**542.2**	1.2	3.8
Thurrock	Thurrock	336.5	203.7	463.5	**1,003.7**	-7.3	5.8
Kent	Tonbridge and Malling	262.7	189.4	441.6	**893.7**	-25.9	6.6
Kent	Tunbridge Wells	121.5	186.7	165.6	**473.9**	-58.4	3.5
Surrey	Waverley	105.8	227.2	251.5	**584.5**	-62.3	4.2
East Sussex	Wealden	136.9	266.1	354.6	**757.6**	-141.5	3.8
West Berkshire	West Berkshire	308.3	252.3	754.1	**1,314.7**	-67.5	7.9
Wiltshire	Wiltshire	808.1	720.6	1,272.6	**2,801.3**	-106.8	5.4
Hampshire	Winchester	191.2	192.5	484.1	**867.9**	-49.1	6.6
West Sussex	Worthing	93.6	146.8	91.3	**331.8**	-3.1	3.0
Total		**6,615.6**	**7,059.7**	**10,953.6**	**24,628.8**	**-1,278.6**	**155.6**

Source: BEIS (2020). UK local authority and regional carbon dioxide emissions national statistics: 2005 to 2018

Landscape

The landscape across the SWS area of operation is diverse and is made up of a mixture of lowlands and small hills. The region also has a striking stretch of coastline including the cliffs of Dover, and several picturesque villages and hamlets. Agriculture plays an important role in the landscape, however the region also has densely populated areas. The Green Belt around London is an important aspect of the regional landscape which exists to prevent urban sprawl.

National Parks are designated to protect their outstanding landscape and countryside, wildlife and cultural heritage. There are 2 National Parks located within the SWS area of operation: the New Forest, which became designated in 2005; and the South Downs which became designated in 2010. New Forest National Park covers an area of 566km^2 and is made up of ancient woodland, open heathlands and coastline[17]. South Downs National Park is designated for its rolling hills, picturesque towns and villages, and dramatic cliffs[18]. National Parks are shown in Figure D7 in Appendix D.

[17] Visit Hampshire – New Forest National Park. Available at: https://www.visit-hampshire.co.uk/explore/areas-to-visit/new-forest
[18] South Downs National Park. Available at: https://www.southdowns.gov.uk/our-history/why-are-we-a-national-park/

National Trails have been designated by the government and are long distance walking, cycling and horse-riding routes through the best landscapes in England and Wales[19]. There are 16 trails in England and Wales, with 2 of the trails going through the SWS area of operation; the South Downs Way; and the North Downs Way. These are detailed in Table 11 and Table 12, and shown in Figure D7 in Appendix D.

Areas of Outstanding Natural Beauty (AONB) are protected to conserve and enhance their natural beauty and distinctiveness[20]. There are 6 AONB within the SWS area of operation which are detailed in Table 11, Table 12 and Table 13, and shown in Figure D7 in Appendix D.

National Character Areas (NCAs) divide England's landscape into 159 distinct areas and are defined by a unique combination of aspects such as landscape, biodiversity, geodiversity and economic activity[21]. There are 17 NCAs within the SWS area of operation, as detailed in Table 11, Table 12 and Table 14, and shown in Figure D8 in Appendix D.

Tranquillity is recognised as a natural resource and one which is beneficial to health and wellbeing, however infrastructure and development is putting more pressure on this special quality[22]. The Campaign for Rural England (CPRE) developed a tranquillity map for England to show the range of undisturbed or disturbed tranquillity areas across the country[23]. There are areas of high tranquillity distributed throughout the SWS area of operation with the least tranquil areas surrounding areas with higher population, particularly London and the surrounding area.

Table 11: Landscape designations totals

Designation	Total number
National Parks	2
National Trails	2
Areas of Outstanding Natural Beauty	6
National Character Areas	17

[19] The National Trials. Available at: https://www.nationaltrail.co.uk/en_GB/trails/
[20] Natural England (AONBs): designation and management. Available at: https://www.gov.uk/guidance/areas-of-outstanding-natural-beauty-aonbs-designation-and-management
[21] Natural England (2014). NCAs. Available at: https://www.gov.uk/government/publications/national-character-area-profiles-data-for-local-decision-making
[22] CPRE (2015). Give Peace a Chance. Available at: https://www.cpre.org.uk/wp-content/uploads/2019/11/CPRE_-_Give_peace_a_chance_-_May_2015.pdf
[23] CPRE (2007). Map of Tranquillity. Available at: https://www.cpre.org.uk/wp-content/uploads/2019/11/tranquillity_map_england_regional_boundaries_1.pdf

Table 12: Landscape Designations per RBD catchment area

Designation	Adur and Ouse	Arun and Western Streams	Cuckmere and Pevensey Levels	East Hampshire	Isle of Wight	New Forest	Rother	Stour	Test and Itchen	Medway	North Kent
National Character Areas	5	7	4	4	1	2	5	4	9	6	3
National Parks	1	1	1	1	0	1	0	0	2	0	0
National Trails	2	2	2	2			2	2	2	1	1
Areas of Outstanding Natural Beauty	1	3	1	1	1		2	1	1	3	1

Table 13: AONB

AONB	Description
Kent Downs	Kent Downs AONB consists of rolling rural land which meets the sea at the cliffs of Dover. The Kent Downs rise to over 240m and the river valleys of the Darent, Medway and Stour run through it. It supports a variety of wildlife in the unimproved chalk grassland and broadleaved woodlands
High Weald	High Weald AONB is made up of rolling hills, dissected by steep-sided gill streams and sandstone outcrops. There are small and irregular shaped fields and open heath and there is an abundance of interconnected ancient woodlands. Scattered farmsteads and hamlets also make up the area and there are narrow sunken lanes from the movement of animals
Surrey Hills	Surrey Hills AONB spans Surrey from east to west which together with the Green Belt prevents the advancing London sprawl. The deciduous woodlands of the AONB have ecological importance alongside the chalk grassland and unimproved heath. The built environment, including villages such as Shere and Abinger, is also part of the quality of the AONB.
Chichester Harbour	Chichester Harbour AONB is one of the few remaining undeveloped coastal areas in Southern England. It is a series of tidal inlets, with a narrow mouth to the sea, and wind-sculptured oaks and hawthorns line the shore. There are saltmarsh and mudflats which are important for wildlife and birds, supporting large flocks of Brent Geese, Dunlin and Little Egrets. The wide expanses and indicate creeks are also important for recreational boating.
Isle Of Wight	Half of the Isle of Wight is designated as an AONB in separate areas and include the principal landscape features of the interior's central and southern downlands and also much of the coastline. The AONB landscape is of considerable scientific and ecological importance and includes exceptional flora-rich chalk grasslands, the north

AONB	Description
	coast's major estuarial habitats and the geologically notable southern cliffs and landslips.
North Wessex Downs	North Wessex Downs AONB was designated to protect one of the largest tracts of chalk downland in southern England and perhaps one of the least affected by development. The AONB meets the Thames and the Chilterns AONB and loops south round the Kennet Valley. The AONB includes ancient woodlands and is of archaeological significance and includes a World Heritage Site.

Table 14: NCA

NCA	Description
Berkshire and Marlborough Downs	A vast area containing arable fields stretching across rolling Chalk hills with scattered settlements. The escarpment provides wide views of the Berkshire and Marlborough Downs with visible landmarks including chalk-cut horse figures, beech clumps and ancient monuments. Avebury stone circle is a popular visitor destination and part of a World Heritage Site, with numerous other Scheduled Monuments and heritage features across the landscape, although Heritage features are at risk from damage by cultivation and animal burrowing.
Greater Thames Estuary	A largely remote and tranquil landscape between the North Sea and rising ground inland, consisting of shallow creeks, drowned estuaries, mudflats and broad tracts of tidal salt marsh. Despite proximity to London, the NCA only has a few major settlements and small villages towards the higher ground. It contains some of the most scarcely populated sections of the English coast and is vastly different to the densely populated urban areas towards London. Sea defences protect large areas of reclaimed grazing marsh and its associated ancient fleet and ditch systems, and productive arable farmland. Historic military landmarks are characteristic features of the coastal landscape.
Hampshire Downs	Part of the central southern England belt of chalk, the Hampshire Downs rises 297m in the north-west and is located on the Hampshire-Wiltshire border. A steep scarp to the north delineates the Downs. The area overlooks the Thames Basin the Weald to the east. It is characterised by its elevated, open and rolling landscape covered by large arable fields with low hedgerows on thin chalk soils, scattered woodland blocks and shelterbelts. The Chalk is a large and important aquifer; hence groundwater protection and source inerrability designations cover most of the area. Catchment sensitive farming to control pollution, run-off and soil erosion is a vital activity. The aquifer feeds a number of small streams flowing north and east, although the dominant catchments are those of the rivers Test and Itchen, which flow in straight sided with relatively deeply incised valleys across most of the area. The Itchen is a SAC and the Test a designated SSSI. These rivers, with the watermeadows, peat soils, mires and fens of their flood plains, are the most important habitats of the area. The valleys are home to the main settlements, the local road system and important economic activities such as watercress growing and fly fishing.
High Weald	High Weald NCA is covered by ancient countryside and cited as one of the best surviving medieval landscapes in northern Europe. It encompasses the ridged and faulted sandstone core of the Kent and Sussex Weald and comprises a mixture of

NCA	Description
	fields, small woodlands and farmsteads with extensive connections to these areas through historic tracks and paths. The majority of the area (78%) is covered by the High Weald AONB with prominent medieval patterns of small pasture fields enclosed by thick hedgerows and shaws (narrow woodlands) remaining fundamental to the character of the landscape.
Isle of Wight	The Isle of Wight is a 380 km2 island separated from the south coast of England by the Solent. It is comprised of packages of farmed arable coastal plains, pastures and woodland, steep chalk downs, diverse estuarine seascapes and dramatic sea cliffs and stacks, such as the needles. The island is scientifically very important. Almost half of the island falls into an AONB, there are 41 SSSI and 395 SINCs, several dark sky observation areas and Special Protection Areas, home to wetland birds, rare invertebrates and rare plants. The geology of the island is diverse, but it is mainly dominated by Paleogene and Cretaceous sediments, often partly comprised of extremely well preserved dinosaur fossils. There are many important bronze age, iron age, and roman archaeological sites are found on the Isle of Wight The predominately rural island also bears host to popular seaside resorts, postmedieval towns, all attracting many tourists to come and visit and try a wide range of leisure activities.
Low Weald	A broad area of low lying clay which wraps around the northern, western and southern edges of the High Weald. Mostly agricultural land able to support pastoral farming as a result of the heavy clay soils, although lighter soils can be found to the east. The landscape is predominantly covered by densely wooded areas with a large amount of ancient woodland. Approximately 9% of the NCA is situated within the adjacent designated Surrey Hills, Kent Downs and High Weald AONB with 23% of the land categorised as greenbelt.
New Forest	The New Forest NCA, spanning from the lower Hampshire Avon Valley to industrialised Totton and Fawley is predominately comprised up by the New Forest National Park. The area is a lowland plateau, geologically comprised of Paleogenic deposits overlain by Quaternary gravels, and is home to some bronze age (and onwards) archaeological sites. The areas soils are acidic leading to unique European site habitats. The ancient area has been retained largely due to its designation as a William the Conqueror's royal hunting forest, the survival of grazing as part of a pastoral tradition, ancient Forest Law and more recent conservation policies. The centre of the NCA is comprised of open heathland and woodland where wild pigs and wild horses roam free through ancient oak and beech trees. Major urban areas are located at Ringwood, Fordingbridge and Lymington around the edge of the National Park, and large villages within it, notably Beaulieu, Brockenhurst, Burley, Lyndhurst and Sway. In the south-east the ancient Borough town of Christchurch (in Dorset) has spread to the east, over the Avon, extending in a large area of suburban housing along the coast to New Milton.
North Downs	Forming a chain of chalk hills, the North Downs NCA extends from Hogs Back in Surrey to the famous White Cliffs of Dover. The settlements in the area consist of traditional small villages and farms while twisting sunken lanes cut across the scarp

NCA	Description
	and are a feature of much of the dip slope. The beauty of the area is reflected by its location within the Kent Downs and Surrey Hills AONB.
North Kent Plain	The North Kent Plain is a strip of open, low and gently undulating land between the Thames Estuary to the north and the chalk of the Kent Downs to the south. It is a highly productive agricultural area with good quality soils used predominately for arable farming. Ancient woodland surrounds Blean, with additional woodland further west. Despite this, the landscape is mostly open and expansive, leading to the area being called as the “Garden of England”.
Penvensey Levels	This predominately rural NCA is a low-lying area is situated in East Sussex between Eastbourne and Bexhill. Over a third of the area is a SSSI and the entire area is a wetland of national and international conservation importance. The south east border is a long coastline of shingle beaches with a huge system of sea defences due to Pevensey Level’s high vulnerability to the effects of climate change. The NCA is framed by the steep scarp of the South Downs in the west and the higher ground of the High Weald in the north, with views of the English Channel to the south. The busy Victorian seafront of Eastbourne is the main settlement, attracting over 5 million visitors each year.
Romney Marshes	Romney Marshes are a low reclaimed marshland stretching from large shingle beaches, mudflats and coastal habitats of the English Channel over marshland and arable and grazing land to Hythe, Kent and Pett, Sussex. This have been anthropogenically modified via the use of drainage channels, gravel digging, military activity and tourist amenities. The area is scientifically important, and is a SAC, SPC, SSSI and proposed Ramsar site, as well as being home to some of the UK’s rarest species. The NCA acts as a corridor between other important habitats, such as the High Weald and the valleys of Rother and Brede.
Salisbury Plain and West Wiltshire Downs	An area dominated by its gently rolling chalk downland which forms part of the sweep of Cretaceous Chalk spanning the Dorset coast and across the Chilterns to north of the wash. The area is sparsely populated with a main focus on agriculture. There are few settlements, leading to a vast, open landscape and a strong sense of remoteness The plain is predominantly covered by its chalk grassland, one of the largest remaining areas of calcareous grassland in north western Europe The area is well protected with SPA, SAC and SSSI designations due to its rich populations of stone curlew, hen harrier and rare bumblebee species.
South Coast Plain	The South Coast Plain is a flat coastal landscape nestled between the dip slope of the South Downs and South Hampshire lowlands and the English Channel, the Solent and Southampton Water. The area is significantly urbanised, and hosts the site of the Portsmouth conurbation and a handful of large seaside towns which heavily rely on protection from the sea. The economies of these areas are intricately linked to marine and recreational activities. A very small percentage of the South Coast Plain is comprised of SSSIs. The area also hosts four SPAs, two SAC and four Ramsar sights. Despite the urban build up, the coastal area feels wide and open. The Isle of Wight can be seen from many places along the South Coast Plain.
The South Downs	The striking open rolling chalk hills and the remote woodland of the South Downs stretches across a spine of chalk from the Hampshire downs on the west and coastal cliffs of East Sussex in the East. The area is only eight percent urbanised, although

NCA	Description
	the rest of the NCA is largely influenced by agriculture and forestry. The South Downs Way National Trail stretches along the back of the northern scarp, and attracts many cyclists, hikers and horse riders. The Cretaceous chalk of the South Downs is very permeable and absorbs much of the rain in the NCA, replenishing the chalk aquifer below. This aquafer is often under stress as it supplies Brighton and surrounding areas. The coast of the South Downs often hosts a cliffy landscape, and a small portion of the NCA is recognised as heritage coast.
South Hampshire Lowlands	The South Hampshire Lowlands NCA stretches from Hampshire and the South Downs to Southampton Water. The large urban area of Southampton and its surrounding areas fills just under a third of the NCA. Otherwise the area is comprised of farmland, wetland and woodland. Much of this woodland is ancient, a legacy of the Forest of Bere, a Royal Hunting Forest that once spanned area. This woodland can be seen at West Walk near Wickham, Botley Wood at Swanwick and Ampfield Wood near Romsey. The mudflat and salt marsh wetlands of the area are home to breeding and overwintering waterfowl and waders. Three Habitats' sites cover parts of the area. The delicate and unique river areas of this NCA are home to otters. The geology of the South Hampshire Lowlands is mainly consisting of open marine, estuarine and freshwater Tertiary deposits.
Thames Basin Heaths	The Thames Basin Heaths covers westwards from Weybridge, Surrey to the countryside around Newbury in Berkshire. The London greenbelt incorporates countryside around Chobham and the River Wey and River Mole. The NCA housing the large urban conurbations of Bracknell and Camberley and the large M25 and M3 road network. Away from London, the settlement pattern is a mix of dispersed hamlets, farmsteads and houses interspersed with villages, and as well as parkland, ancient woodland and semi-natural grassland. A quarter of the NCA is woodland, with the majority planted on former heathland, commonly comprised of rhododendron and conifers. Common land is found across the NCA on deposits of Tertiary sands and gravels, leading to only rough pasture. Other land uses include military bases such as Aldershot, and plantations. Wilder areas are formed by wet and dry heathland, and are of international importance and are protected by SSSI and SAC statuses. These areas provide habitats for nightjars, Dartford warblers and woodlarks. Due to their proximity with urban settlements these areas often suffer from fly tipping and arson.
Wealden Greensand	Around 25% of the area contains extensive belts of woodland, including ancient woods and more recent conifer plantations. Area also features open areas of heath on acidic soils, river valleys and mixed farming with areas of fruit growing. Over half of area covered by South Downs National Park, Kent Downs AONB and Surrey Hills AONB and serves as a significant place of interest for landscape, geology and biodiversity. Underlying geology has shaped the scarp-and-dip slope topography with clear links apparent between vernacular architecture, industry and local geology. The area accommodates a mix of internationally and nationally designated sites related to biodiversity, including 3 SPAs 2 RAMSAR sites and 8 SACs.

Historic environment

The Southern Water region is rich in heritage with 43,611 listed buildings, 1,771 scheduled monuments, 848 conservation areas, 183 registered parks and gardens, 3 registered battlefields, 3 protected wrecks, 5 heritage coasts and 2 world heritage site (Canterbury Cathedral, St. Augustine's Abbey and St. Martin's Church). The total number of each of these assets within the Southern Water region is presented in Table 15. Scheduled monuments, registered parks and gardens, and registered battlefield are shown in Figure D9 in Appendix D.

Table 15: Historic environment assets

Asset	Description	Number	
Listed buildings	The statutory responsibility for listed buildings control lies with the individual Local Authorities. The Department for Digital, Culture, Media and Sport is responsible for compiling the statutory list of buildings of special architectural or historic interest and each building or structure of interest is classified under one of three Grades; I, II* and II depending on their significance (Grade I assessed as highest significance).	Grade I	955
		Grade II*	21,77
		Grade II	40,479
Registered Parks and Gardens	Historic England maintains a register of historic parks and gardens of special interest in England, these parks and gardens are as equally important as buildings and settlements and form part of an area's cultural heritage. However, unlike listed buildings and conservation areas, historical parks and gardens are not afforded legal protection within the UK. The registration of these historic parks and gardens is a 'material consideration' in the planning process, meaning that planning authorities must consider the impact of any proposed development on the landscapes' special character.	Grade I	12
		Grade II*	65
		Grade II	106
Scheduled Monuments	Scheduled Monuments are protected under the Ancient Monuments and Archaeological Areas Act 1979. The monuments are scheduled and recorded through Historic England, based on national importance and covering a diverse range of archaeological sites. Scheduled monuments are often in a ruinous or semi-ruinous condition or take on the form of earthworks. More complete structures of national significance are usually protected as listed buildings.	1771	
Conservation Areas	Conservation Areas are designated by local planning authorities under their powers. The areas are protected to preserve special areas of historical and architectural importance and can range from small villages, town centres and residential areas. Each	848	

Asset	Description	Number
	conservation area will have its own conservation area appraisal, which sets out how it should be protected.	
Protected Wreck	The Protection of Wrecks Act (1973) allows the Government to designate a wreck to prevent uncontrolled interference. Designated sites are identified as being likely to contain the remains of a vessel, or its contents, which are of historical, artistic, or archaeological importance.	3
Registered Battlefields	Historic England holds a Register of Historic Battlefields. Its purpose is to offer battlefields protection through the planning system, and to promote a better understanding of their significance and public enjoyment.	3
Heritage coast	Heritage coasts were established by Natural England to conserve the best stretches of undeveloped coast in England. A heritage coast is defined by agreement between the relevant maritime local authorities and Natural England.	5
World Heritage Sites	The United Nations Educational, Scientific and Cultural Organization (UNESCO) seeks to encourage the identification, protection and preservation of cultural and natural heritage around the world considered to be of outstanding value to humanity.	2

Table 16: Historic environment assets per RBD catchment area

Asset	Adur and Ouse	Arun and Western Streams	Cuckmere and Pevensey	East Hampshire	Isle of Wight	New Forest	Rother	Stour	Test and Itchen	Medway	North Kent
Listed buildings	4989	6069	1940	2154	1960	809	3820	6354	5024	8351	1498
Grade I Registered Parks and Gardens	2	2			1		1		1	4	
Grade II* Registered Parks and Gardens	9	11	5	2	1	3	2	5	11	19	
Grade II Registered	14	11	5	6	7	3	8	11	16	26	4

Asset	Adur and Ouse	Arun and Western Streams	Cuckmere and Pevensey	East Hampshire	Isle of Wight	New Forest	Rother	Stour	Test and Itchen	Medway	North Kent
Parks and Gardens											
Scheduled Monuments	201	305	131	81	120	132	101	158	312	194	24
Protected Wreck	0	0	0	1	1	0	0	1	0	0	0
Heritage Coast	0	0	1	0	2	0	1	2	0	0	0
World Heritage Sites	0	0	0	0	0	0	0	2	0	0	0

It is likely that most of the RBD catchments in the SWS area of operation will hold a Historic Environment Record (HER) which is a database of archaeological sites, listed buildings and other historic buildings, and finds of historic objects. There are hundreds of entries on the HERs from churches and houses to roman coin finds and medieval finds. There is also potential for unidentified heritage assets and archaeological remains to be present within the region.

Population and human health

The South East region (which covers the SWS operational area), has the highest population of all the regions of the UK, with an estimated population of 9,217,265 in mid-2020[24].

There are expected to be five million people within the SWS operational area by 2041[25].

Life expectancy at birth for both males and females in the South East region is better than the England average at around 80 years old and 84 years old respectively[26].

The percentage of the population describing their general health as very good, good, fairly good, not good, and very bad is shown in Table 17. The South-East region is aligned with the National Averages[27].

[24] Office for National Statistics (2021) Estimates of the population for the UK, England and Wales, Scotland and Northern Ireland [online] available at:
Estimates of the population for the UK, England and Wales, Scotland and Northern Ireland - Office for National Statistics (ons.gov.uk)
[25] Southern Water Ambition. Available at: https://www.southernwater.co.uk/media/1852/03_our_ambition.pdf
[26] Public Health England (2019). Public Health Profiles for South East. Available at: https://fingertips.phe.org.uk/profile/health-profiles/data#page/0/gid/1938132701/pat/15/par/E92000001/ati/6/are/E12000004/iid/90323/age/201/sex/4/cid/4/page-options/ovw-do-0
[27] ONS (2013). General Health in England and Wales. Available at:
https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/healthandwellbeing/articles/generalhealthinenglandandwales/2013-01-30#general-health-across-the-english-regions-and-wales

Table 17: Population Health by Region

Region	General health very good (%)	General health good (%)	General health fairly good (%)	General health bad(%)	General health very bad (%)
South East	49	35	12	3	1
England	47	34	13	4	1

Source: ONS (2013). General Health in England and Wales.

The South East region is the second largest contributor to the total UK economy, contributing around 14.5% of the total UK economy[28]. Gross Domestic Product (GDP) per head is £34,083 in the South East which is higher than the national UK average of £31,976.

For March to May 2021, the employment rate (those between ages 16 and 64) in the South East region was 77.7%, which was higher than the average for England at 75.1%. The unemployment rate for the same period in the South East region was 4.1%, lower than the average for England at 5.0%[29].

Tourism is an important sector within the economy in the South East, attracting visitors from across the UK and internationally. In 2019, there were 15.8 million domestic overnight trips to the South East[30], the second most visited region in the UK.

Material assets

Southern Water delivers an average of 563 million litres of drinking water each day to its customers[31]. Changes in water usage as a result of COVID-19 have increased customers' individual daily water consumption by around 7% to 137.6 litres per person, per day (2019–20: 126.5 litres). Water is collected and treated at one of the 205 service reservoirs and 81 treatment works. An average of 758 million litres of wastewater is recycled daily, removing waterwater at one of its 367 wastewater treatment works. Southern Water's leakage performance for 2020–21 was 98.5 Ml/d (2020: 94 Ml/d), which was higher than the target and largely due to extreme seasonal fluctuations in the weather, alongside the demand associated with increased customer usage due to COVID-19. A new target was set which aims to reduce leakage by 15% to 84.9 megalitres per day (Ml/d) by 2025, and reduce leakage by a further 40% by 2040 and 50% by 2050. Southern Water is actively pursuing measures to encourage its customers to reduce their water use and has set targets to reduce personal water consumption by 7%, to 122.7 litres per person, per day by 2025. Further, they aim to reduce personal water consumption to 100 litres per person, per day by 2040, with 55% of households meeting this target by 2025.

The Southern Water region boasts an extensive transport network which connects people, places and services both within the region and beyond to support the regional and national economy. It supports gateways for international trade, with Gatwick airport located immediately north of the SWS operational area,

[28] ONS (2019). Regional economic activity by gross domestic product, UK: 1998 to 2018. Available at: https://www.ons.gov.uk/economy/grossdomesticproductgdp/bulletins/regionaleconomicactivitybygrossdomesticproductuk/1998to2018
[29] ONS (2020). Regional labour market: Headline Labour Force Survey indicators for all regions (HI00). Available at: https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/datasets/headlinelabourforcesurveyindicatorsforallregionshi00
[30] Visit England (2021). Great Britain Tourist Annual Report 2019 – London and South East. Available at: https://www.visitbritain.org/sites/default/files/vb-corporate/gb_tourist_annual_report_2019.pdf
[31] Southern Water (2021) Southern Water Annual Report 2020-21 30055_southern-water-ar2021_full.pdf (annualreport2021.com)

and the two busiest UK ports located within the region. Southampton is a deep-sea port on the main international shipping line and Dover is where one seventh of the UK's trade passes through and is Europe's busiest ferry port[32]. The rail link to Europe via the Channel Tunnel Rail Link is also located within the region.

In 2019/20 the total amount of local authority managed waste was 25.6 million tonnes. The South East managed the largest tonnage of local authority collected waste in 2019/20 at 4.1 million tonnes, whilst London managed 3.6 million tonnes and the East managed 2.9 million tonnes in the same period[33]. Incineration accounts for the most common waste disposal method by local authorities in the region with the South East sending 44% of all waste for incineration, the East sending 30%, and London sending 63%. Recycling and composting is the second most common waste disposal method, accounting for 48% of total waste in the South East, 48% in the East, and 30% in London. Landfill waste is 6%, 15% and 3% in the South East, East and London respectively.

Future baseline

The SEA Regulations require that "the relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the Plan or Programme" is identified. Prediction of future trends is difficult because they depend on a wide range of global, national and regional factors and decision making. Key trends have been identified and from an initial review it is likely that the following trends will continue:

Biodiversity, Flora and Fauna - habitats and species are likely to continue to be protected through European and UK legislation. England's wildlife habitats have become increasingly fragmented and isolated, leading to declines in the provision of some ecosystem services, and losses to species populations'. Lawton (2010) recognises that future climate change, demographic change, economic growth, new technologies, societal preferences and changes in policy and regulatory environments may all have profound consequences[34]. However, new legislation such as the Environment Bill is likely to continue protection of biodiversity by providing a framework for a legally binding target of net gain within the planning system.

Soil – as the population increases it is likely that more brownfield land will be remediated and developed. There is potential for a loss of agricultural land through development pressures.

Water – water quality is likely to continue to be maintained and improved through legislation such as the WFD. The region is already water-stressed and projected economic and population growth will likely place further pressure on the region's water resources and water dependent environments. There is potential for an increased need for wastewater treatments as a result of WFD water quality standards combined with population increase. Given the energy intensity of wastewater treatment, the water industry CO_2 emissions may increase and further contribute to climate change.

Air - new development, economic growth and tourism may lead to increased car journeys and congestion within the area leading to localised air quality effects. Public transport improvements, electrification of railways, national air quality targets, European emissions standards for new vehicles, and a shift to electric vehicles should contribute to reducing future air quality impacts from motor vehicles.

[32] Transport for the South East (2018). Economic Connectivity Review. Available at: https://transportforthesoutheast.org.uk/wp-content/uploads/2018/07/FINAL-Economic-Connectivity-Review.pdf
[33] Defra (2021). Statistics on waste managed by local authorities in England in 2019/20. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/966114/Statistics_on_waste_managed_by_local_authorities_in_England_in_2019v3_accessible.pdf
[34] Lawton (2010). Making Space for Nature

Climatic Factors - the climate is expected to continue to change with annual average temperatures projected to increase, particularly in summer. Winters are projected to be wetter and summers drier. Climate change is projected to result in more extreme weather events, potentially causing or exacerbating periods of drought which alongside population and economic growth will impact water availability. Carbon and other greenhouse gas (GHG) emissions will continue to be emitted, however regulations and legislation will likely continue to promote the reduction in emissions through commitments to net zero. The water industry in the UK is aiming to become net zero by 2030[35].

Landscape – changing and continued development will affect the quality and character of landscapes.

Historic Environment - Historic England recently reported that heritage assets at risk are decreasing. There are now 181 fewer heritage assets at risks than in 2019 with successes in buildings and structures and archaeology[36]. Historic assets will likely continue to be protected through UK legislation. Development could put pressure on heritage assets and their setting.

Population and Human Health – water available for consumptive use may be affected by climate change whereby access to water is limited through more frequent droughts or floods. Population is projected to increase in the region and life expectancy is also higher than the nation average meaning that the numbers of elderly residents are likely to increase. As such, water demand will increase, and further pressure will be placed on water resources within the region.

Material Assets - regeneration and future investment and demand are likely to increase the number and quality of material assets such as housing, transport infrastructure, waste facilities, and community facilities.

[35] Available at: https://www.water.org.uk/news-item/water-industry-plans-to-reach-net-zero-carbon-by-2030/
[36] Historic England (2020). Heritage at Risk. Available at: https://historicengland.org.uk/advice/heritage-at-risk/findings/

D. Environmental baseline maps

See the separate file for the following drawings:

D1: European Ecologically Designated Areas

Identifying:

- Special Areas of Conservation (SAC)
- Special Protection Area (SPA)
- Ramsar
- Marine Conservation Zone
- Biosphere Reserve

D2: National Ecologically Designated Area

Identifying:

- National Nature Reserve (NNR)
- Local Nature Reserve (LNR)
- Site of Special Scientific Interest (SSSI)

D3: Agricultural Land Classification

D4: Geological Features

Identifying:

- Source protection zone
- WFD Groundwater Bodies (Cycle 2)

D5: Surface Water Features

Identifying:

- Main River
- Areas at Risk of Flooding from Rivers and Sea
- Reservoir

D6: Air Quality Management Areas

D7: Landscape and recreational designations and features

Identifying:

- Country Park

- Area of Outstanding Natural Beauty
- National Park
- National Trail
- Green Belt

D8: National Character Areas

D9: Heritage Environment Designations and Features

Identifying:

- Battlefield
- Registered Park or Garden
- Scheduled Monument
- World Heritage Site
- Heritage Coast England

E. Option type Issues and Opportunities

Type of Measures	Generic Option Categories	Examples of Generic Options	SEA Topic								
			Biodiversity Flora and Fauna	Soil	Water	Air	Climatic Factors	Landscape	Historic Environ-ment	Population Communi-ties and Human Health	Material Assets
Source (Demand) Measures (to reduce likelihood)	Control / Reduce surface water run-off	Natural Flood Management; rural land management and catchment management; SuDS including blue and green infrastructure; storm management	Opportunity: habitat creation, rewilding, natural state accessible, improved quality	Opportunity: increase infiltration and improve soil structure Opportunity: adopting farming principles and practices to increase biodiversity	Opportunity: improve water quality Opportunity: avoid flooding by slowing and storing water	Scoped out	Issue: short-term GHG emissions likely to be emitted during construction Opportunity: reduced GHG emissions in operation from asset improvement	Opportunity : to provide natural landscape	Scoped out	Opportunity: providing greater access to natural environments to improve well being and recreation	Issues: Use of materials required - likely that energy use will increase during construction phase Opportunity: Implement sustainable design measures.
	Reduce groundwat er levels	Reduce leakage from water supply pipes; pump away schemes to locally lower groundwater near sewer network	Opportunity: reduce impact on habitats from leaks and by diversion to less sensitive areas	Opportunity: reduce improve soil quality	Opportunity: improve water quality	Issue: additional tankers may generate air pollutants Opportunity: electric tanker fleet	Issue: additional pumping may generate additional emissions Opportunity: reduced GHG emissions in operation from asset improvement	Scoped out	Scoped out	Scoped out	Issue: additional energy use required for pumping solutions
	Improve **quality** of wastewater	Domestic and business customer education; incentives and behaviour change (reduce fats, oils, grease, wet wipes etc.); monitoring trade waste at source; on-site black water and/or greywater pre-treatment	Scoped out	Scoped out	Opportunity: reduce demand for water resources and wastewater treatment	Scoped out	Opportunity: Provides a better understand-ing of individual wastewater management and potential future needs	Scoped out	Scoped out	Opportunity: Increased awareness on drainage and wastewater management within the community.	Scoped out

Type of Measures	Generic Option Categories	Examples of Generic Options	SEA Topic								
			Biodiversity Flora and Fauna	Soil	Water	Air	Climatic Factors	Landscape	Historic Environ-ment	Population Communi-ties and Human Health	Material Assets
	Reduce the **quantity** / demand	Water efficient appliances; water efficient measures; blackwater and/or greywater re-use; treatment at source	Scoped out	Scoped out	Opportunity: reduce demand for water resources and wastewater treatment	Scoped out	Opportunity to promote energy efficiency, which reduces emissions	Scoped out	Scoped out	Scoped out	Opportunity: Implement sustainable design measures.
Pathway (Supply) Measures (to reduce likelihood)	Network improvements	Increase sewer network, storage and conveyance.	Issue: requirement for land may lead to habitat loss Opportunity: biodiversity net gain	Issue: soil quality loss	Opportunity: improve resilience of network to avoid flooding and spills to environment	Issue: short-term emissions of air pollutants likely during construction Opportunity: reduced emissions of air pollutants in operation from asset improvement	Issue: short-term GHG emissions likely to be emitted during construction Opportunity: reduced GHG emissions in operation from asset improvement	Scoped out	Issue: risk to uncovered archaeological artefacts from excavation	Issue: potential for amenity impacts on nearby communities during construction	Issues: Use of materials required - likely that energy use will increase Opportunity: Implement sustainable design measures Opportunity: additional infrastructure
	Improve Treatment Quality	Increase capacity and quality at existing wastewater treatment work or develop new works	Issue: requirement for land may lead to habitat loss Opportunity: biodiversity net gain	Issue: requirement for land may lead to loss of soils	Opportunity: contributes to improved water quality	Issue: short-term emissions of air pollutants likely during construction Opportunity: reduced emissions of air pollutants in operation from increased efficiencies in treatment	Issue: GHG emissions likely to increase due to construction Opportunity: reduced GHG emissions in operation from increased efficiencies in treatment	Issue: changes to the visual identity of the area	Issue: damage to uncovered archaeological artefacts from excavation	Issue: potential for amenity impacts on nearby communities during construction and operation	Issues: Use of materials required - likely that energy use will increase Opportunity: Implement sustainable design measures Opportunity: additional infrastructure and potential for supporting development

Type of Measures	Generic Option Categories	Examples of Generic Options	SEA Topic								
			Biodiversity Flora and Fauna	Soil	Water	Air	Climatic Factors	Landscape	Historic Environ-ment	Population Communi-ties and Human Health	Material Assets
											of resource hubs.
	Operational improvements	Improved efficiency in operational activities of assets	Scoped out	Scoped out	Opportunity: could reduce asset failures and avoid pollution incidents	Scoped out	Opportunity: asset management to consider whole life carbon consequences	Scoped out	Scoped out	Scoped out	Opportunity: increased serviceability of assets
	Wastewater Transfer to treatment elsewhere	Transfer flow to other network or treatment sites; transport sewage by tanker to other sites	Issue: risk of INNS transfer	Scoped out	Opportunity: contributes to improved water quality	Issue: additional emissions of air pollutants from additional transport	Issue: additional GHG emissions from additional transport and asset operation	Scoped out	Scoped out	Issue: Potential disturbance from additional traffic	Issue: potential for increase in road congestion and long term energy demand
Receptor Measures (to reduce consequences)	Mitigate impacts on Air Quality	Carbon neutrality; noise suppression /filtering; odour control and treatments	Scoped out	Scoped out	Scoped out	Opportunity: improve air quality and avoid odours	Opportunity: contribute to carbon neutral aims	Scoped out	Scoped out	Opportunity: reduce amenity effects	Scoped out
	Improve Land and Soils	Sludge soil enhancement	Opportunity: avoid risks to biodiversity	Opportunity: soil quality enhance-ment	Opportunity: avoid harmful contaminants	Scoped out	Scoped out	Opportunity: sustainable use of land	Scoped out	Scoped out	Scoped out
	Mitigate impacts on receiving waters	River enhancement, aeration	Opportunity: enhance river habitats and ecosystem	Scoped out	Opportunity: improve water quality	Scoped out	Issue: aeration or re-use may increase energy demand / emissions	Scoped out	Scoped out	Opportunity: improved rivers as recreational assets	Scoped out
	Reduce impact on properties	Property flood resilience; non-return valves; flood guards / doors; air brick covers	Scoped out	Scoped out	Opportunity: reduce flood risk	Scoped out	Scoped out	Scoped out	Scoped out	Opportunity: benefits to enjoying homes.	Opportunity: Implement sustainable design measures.

Type of Measures	Generic Option Categories	Examples of Generic Options	SEA Topic								
			Biodiversity Flora and Fauna	Soil	Water	Air	Climatic Factors	Landscape	Historic Environ-ment	Population Communi-ties and Human Health	Material Assets
Other	Study / Investigation	Additional data required; hydraulic model development; WQ monitoring and modelling	Scoped out	Scoped out	Opportunity: to better understand water environment	Scoped out	Scoped out	Scoped out	Scoped out	Scoped out	Scoped out

F.Assessment scoring criteria

SEA Objective	Datasets/ Key Themes	Effect	Description	
Biodiversity, Flora, Fauna: • Protect and enhance biodiversity, priority species, vulnerable habitats and habitat connectivity (no loss and improve connectivity where possible)	• SPA • SAC • Ramsar site • SSSIs • MPA • MCZ • NNR • LNR • Priority habitats and species • Non-designated sites • Terrestrial, aquatic and marine habitats, species and protected sites • Green networks and corridors (e.g. foraging areas and commuting routes, migration routes, hibernation areas etc. at all scales) • LWS (where available)	+++	Major 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 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. The option would result in a major reduction or management of INNS.
		++	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 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. The option would result in a moderate reduction or management of INNS.
		+	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 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. The option would result in a minor reduction or management of INNS.
		0	Neutral	The option would not result in any effects on designated or non-designated sites including habitats and/or species). It will not have an effect on INNS.
		-	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 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. The option would result in a minor increase or spread of INNS.
		--	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 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. The options would result in a moderate increase or spread of INNS.

SEA Objective	Datasets/ Key Themes	Effect	Description	
		---	Major 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 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. 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
Soil: • Protect and enhance the functionality, quantity and quality of soils	• Agricultural Land Classification • Landfill sites – authorised and historic • Mineral & Waste allocations (where available)	+++	Major Positive	The option would result in a major enhancement on the quality of soils through the implementation of catchment approaches, remediation or other measures.
		++	Moderate Positive	The option would result in a moderate enhancement on the quality of soils through the implementation of catchment approaches, remediation or other measures.
		+	Minor Positive	The option is 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 is not 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 results in land contamination.
		--	Moderate Negative	The option will result in a moderate loss of best and most versatile agricultural land or is in substantial conflict with existing land use. The option is partially overlying mineral resources leading to partial mineral sterilisation.
		---	Major Negative	The option will result in a major loss of best and most versatile agricultural land or is in substantial conflict with existing land use. The option results in land contamination. The option is 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
Water: • Increase resilience and reduce flood risk • Protect and enhance the quality of the	• Environment Agency Flood Defences • Environment Agency Main Rivers	+++	Major Positive	The option results in addressing failure of WFD Good Ecological Status / Good Ecological Potential. The option would result in a major improvement to flood risk. The option would result in a major improvements in water efficiency, reduces demand and improves resilience.

SEA Objective	Datasets/ Key Themes	Effect	Description	
water environment and water resources • Deliver reliable and resilient water supplies	• Flood Zones 2 and 3 • Surface Water Features • WFD River Waterbody Catchments • WFD River Waterbodies Cycle 2 • Bathing Waters (for desal options) • Shellfish Waters (desal options) • Source Protection Zones • WFD Groundwater bodies	++	Moderate Positive	The option achieves savings through demand management and does not require abstraction to achieve yield. The option contributes to addressing failure of WFD Good Ecological Status / Good Ecological Potential. The option would result in a moderate improvement to flood risk. The option would result in a moderate improvements in water efficiency, reduces demand and improves resilience.
		+	Minor Positive	The option achieves savings through demand management and does not require abstraction to achieve yield. The option would result in a minor improvement to flood risk. The option would result in a minor improvements in water efficiency, reduces demand and improves resilience.
		0	Neutral	The option would have no discernible effect on river flows or surface/coastal water quality or on groundwater quality or levels. The option would not have an effect on or be affected by flood risk.
		-	Minor Negative	The option would result in minor decreases in river flows. River and/or coastal water quality may be affected 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 or levels. The option is located in Flood Zone 2. The option would result in minor decreases in water efficiency, increases demand and reduces resilience.
		--	Moderate Negative	The option would result in moderate decreases in river flows. River and/or coastal water quality may be affected 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 likely deterioration of WFD classification. The option would result in moderate decreases in groundwater quality or levels. The option is located in Flood Zone 3. The option would result in moderate decreases in water efficiency, increases demand and reduces resilience.
		—	Major Negative	The option would result in major decreases in river flows. River and/or coastal water quality may be affected 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 or levels. The option is located in Flood Zone 2 or 3 and further contributes to flood risk. The option would result in major decreases in water efficiency, increases demand and reduces resilience.

SEA Objective	Datasets/ Key Themes	Effect	Description	
		?	Uncertain	From the level of information available the effect that the option would have on this objective is uncertain.
Air: • Reduce and minimise air emissions	• Air Quality Management Zones • Air quality monitoring sites	+++	Major 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 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.
Climate Factors: • Reduce embodied and operational carbon emissions • Reduce vulnerability to climate change risks and hazards	Option Carbon data UKCP18 climate data Sea level rise projections	+++	Major Positive	The option will generate additional zero carbon energy that can be fed back into the grid The option will result in a major increase in carbon sequestration.
		++	Moderate Positive	The option will be carbon neutral The option will increase resilience/decrease vulnerability to climate change effects. The option will reduce operational carbon emissions by between 100 and 1,000 tonnes CO_2e/year. The option will result in a moderate increase in carbon sequestration.
		+	Minor Positive	The option includes renewable energy sources that bring operational carbon to under 100 tonnes CO_2e/year The option will increase resilience/decrease vulnerability to climate change effects. The option will reduce operational carbon emissions by up to 100 CO_2e/year.
		0	Neutral	The option would have no discernible effect on greenhouse gas emissions, nor would the option increase resilience/decrease vulnerability to climate change effects.
		-	Minor Negative	The option will have a minor impact on resilience/decrease vulnerability to climate change effects. The option will generate operational carbon emissions of between 100 and 1,000 tonnes CO_2e/year.
		--	Moderate Negative	The option will have a moderate impact on resilience/significantly decrease vulnerability to climate change effects. The option will generate operational carbon emissions of between 1,000 and 10,000 CO_2e/year. The option will result in a moderate release of previously sequestered carbon.

SEA Objective	Datasets/ Key Themes	Effect	Description	
		---	Major Negative	The option will have a major impact on resilience/significantly decrease vulnerability to climate change effects. The option will generate operational carbon emissions of more than 10,000 tonnes CO_2e/year. The option will 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.
Landscape: • Conserve, protect and enhance landscape, townscape and seascape character and visual amenity	• Areas of Outstanding Natural Beauty • National Character Areas • Green Belt land • National Park	+++	Major Positive	The option would have a major positive contribution to designated landscape (AONB or National Park) management plan objectives The option results in new, above ground infrastructure that significantly enhances the local landscape, townscape or seascape.
		++	Moderate Positive	The option would have a moderate positive contribution to designated landscape management plan objectives 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 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.
Historic Environment • Conserve, protect and enhance the historic environment, including archaeology	• Listed buildings: - Grade I listed structures - Grade II* listed structures - Grade II listed structures • Registered Parks and Gardens:	+++	Major 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.

SEA Objective	Datasets/ Key Themes	Effect	Description	
	- Grade I Registered Parks and Gardens - Grade II* Registered Parks and Gardens - Grade II Registered Parks and Gardens • Protected Wreck • Registered Battlefields • Scheduled Monuments • Conservation Areas • World Heritage Sites	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 of significance of designated heritage assets and/or their setting, notwithstanding remedial recording of any elements affected.
		---	Major Negative	The option will 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 will be major damage to known, designated archaeology 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.
Population, Human Health • Maintain and enhance the health and wellbeing of the local community, including economic and social wellbeing • Maintain and enhance tourism and recreation	• Noise action important area • Indices of Multiple Deprivation 2015 • Functional site: - Schools - Medical facilities • OS Greenspace dataset: - Allotments - Bowling green - Cemetery - Golf course - Sports facility - Play space - Playing field - Public park or garden - Religious grounds - Tennis courts • Natural England - Country Parks	+++	Major Positive	The option leads to major positive effect on the health of local communities and will ensure that surface water and bathing water quality is maintained within statutory limits. The option creates new, and significantly enhances existing, recreational facilities, publicly accessible greenspace and/or tourism within the operational area.
		++	Moderate Positive	The option leads to positive effect on the health of local communities and will ensure that surface water and bathing water quality is maintained within statutory limits. The option enhances existing, recreational facilities, publicly accessible greenspace and/or tourism within the operational area
		+	Minor Positive	The option has a temporary positive effect on the health of local communities and will 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 has a temporary effect on human health (e.g. noise or air quality). The option reduces the availability and quality of existing recreational facilities and/or tourism within the operational area.
		--	Moderate Negative	The option results in the permanent removal of existing recreational facilities, publicly accessible greenspace and/or tourism within the operational area
		---	Major Negative	The option has a significant long-term effect on human health (e.g. noise or air quality). The option results in the removal of existing recreational facilities, publicly accessible greenspace and/or tourism within the operational area.

SEA Objective	Datasets/ Key Themes	Effect	Description	
	• National Parks • Section 15 open access areas • CRoW S4 Conclusive Registered Common Land	?	Uncertain	From the level of information available the effect that the option would have on this objective is uncertain.
Material Assets • Minimise resource use and waste production • Avoid negative effects on built assets and infrastructure	• Housing allocations (where available) • Transport: - Major roads – A roads - Major roads motorway - Railway line - National cycle route - National trails	+++	Major Positive	The option will re-use or recycle substantial quantities of waste materials and any new infrastructure will incorporate substantial sustainable design measures and materials. There will be no increase in energy consumption or energy will be from 100% renewable sources. The option improves national cycle routes or national trails.
		++	Moderate Positive	The option will re-use or recycle moderate quantities of waste materials and any new infrastructure will incorporate some sustainable design measures and materials. There will be no increase in energy consumption or energy will be from 90% renewable sources. The option improves national cycle routes or national trails.
		+	Minor Positive	The option will re-use or recycle a limited quantity of waste materials and any new infrastructure will incorporate some limited sustainable design measures and materials. There will be no increase in energy consumption or energy will be from 80% renewable sources. The option improves national cycle routes or national trails.
		0	Neutral	The option would not result in any effects on material assets.
		-	Minor Negative	The option will require new infrastructure with only limited opportunities for the re-use or recycling of waste materials. There are limited opportunities for sustainable design or the use of sustainable materials. The option results in a minor increase in energy consumption with no renewable energy options. The option results in a minor disruption on built assets and infrastructure, including transport.
		--	Moderate Negative	The option will require new infrastructure with only limited opportunities for the re-use or recycling of waste materials. The option results in a moderate increase in energy consumption with no renewable energy options. The option results in a moderate disruption on built assets and infrastructure, including transport links.
		---	Major Negative	The option will require significant new infrastructure that cannot be provided through the re-use or recycling of waste materials. There are no opportunities for sustainable design or the use of sustainable materials. The option results in a major increase in energy consumption with no renewable energy options. The option results in a major distribution on built assets and infrastructure, including transport links.
		?	Uncertain	From the level of information available the effect that the option would have on this objective is uncertain.