



SEA Environmental Report

Yorkshire Water's Drought Plan 2022

Report for Yorkshire Water Services Limited

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Environmental Assessment of Drought Plan 2022

Contact:

Anne Fairhead
Ricardo Energy & Environment
Bright Building, First Floor
Manchester Science Park
Manchester, M15 6GZ
United Kingdom

T: +44 (0) 1235 753 488

E: Anne.Fairhead@ricardo.com

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Author:

Ben Gouldman, Flora Whyte

Approved by:

Anne Fairhead

Date:

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Non- Technical Summary

Water companies in England and Wales are required to prepare and maintain statutory Drought Plans under the Water Industry Act 1991, as amended by the Water Act 2003 and in accordance with the Drought Plan Regulations 2005, the Drought Plan Direction 2020, and Environment Agency guidelines. The purpose of Yorkshire Water's Drought Plan is to demonstrate what actions will be taken to protect public water supplies during a drought and how they intend to minimise any resulting environmental impacts.

This Strategic Environmental Assessment (SEA) has prepared in support of the development Yorkshire Water's Drought Plan 2022. The Drought Plan provides a comprehensive statement of the actions Yorkshire Water will consider implementing during drought conditions to safeguard essential water supplies to customers and minimise environmental impact. It is consistent with Yorkshire Water's Water Resources Management Plan (WRMP), the objective of which is to set the strategic plan for the delivery of water resources to balance supply and demand over a 25-year period.

Drought Plans encompass a number of drought options that will only be implemented if and when required. Each drought is different in terms of its severity, season, location and duration and each combination of these factors may require a different response in terms of measures. In the context of drought planning, individual drought options are taken to constitute alternatives. Yorkshire Water's Drought Plan 2022 comprises a total of 63 drought options (58 supply side options (including 49 supply side standard options and 9 long term supply side options) and 5 demand options). This SEA also considers two Environment Agency drought order compensation flow reduction actions.

SEA of certain plans and programmes is a statutory requirement under the Environmental Assessment of Plans and Programmes Regulations 2004. The purpose of SEA is to provide high level and strategic protection of the environment by incorporating environmental considerations into the preparation of plans and policy. In the context of drought planning, SEA assists in the identification of the likely significant environmental effects of Yorkshire Water's drought management options and how any adverse impacts might be mitigated.

The SEA provides information on the relative environmental performance of alternatives, and is intended to make the decision-making process more transparent. The SEA can, therefore, be used to support the timing and implementation of drought options within the Drought Plan.

Yorkshire Water has also undertaken a Habitats Regulations Assessment (HRA) of its Drought Plan 2022, which has been carried out in parallel with the SEA and is reported separately in the HRA Screening Report. The HRA screening process identifies whether each drought option in the Drought Plan (either alone, in combination or with other plans or projects) is likely to have significant effects on the integrity of European designated sites, i.e. sites of international conservation importance. The findings of both the SEA and HRA have fed into the revision of the Drought Plan in an iterative process.

An SEA Scoping Report was issued in May 2020, and provided an opportunity for the statutory consultees to provide views on the proposed scope and level of detail of this SEA Environmental Report. Issues raised by consultees have been considered in preparing this report.

The findings of the SEA are presented within this Environmental Report, which accompanies Yorkshire Water's publication of the Drought Plan 2022.

Assessment Methodology

The assessment has been 'objectives-led'. SEA objectives have been derived from environmental objectives established in law, policy or other plans and programmes, and from a review of the baseline information. The SEA objectives have been categorised under the following topic areas: biodiversity, flora and fauna; population and human health; material assets and resource use; water; soil, geology and land use; air and climate; archaeology and cultural heritage; and landscape and visual amenity; and inter-relationships.

The overall findings of the SEA describe the extent to which objectives for each topic are met by each of the drought options.

The outputs of the assessment are a completed appraisal framework table for each drought option, and a colour coded summary matrix (ranging from major beneficial impacts to major adverse impacts) which provides a comparative assessment of the residual environmental effects of implementing each drought option (i.e. those impacts remaining after the implementation of mitigation measures).

A cumulative, or in-combination, assessment has also been undertaken which has involved examining the likely significant effects of each of the drought options in combination with each other and in combination with the implementation of other relevant plans and programmes.

Environmental Baseline

Urban areas in the west and south of Yorkshire are principally supplied from reservoirs in the Pennines. Reservoirs located in the Pennines and the valleys of the River Don, Aire, Wharfe, Calder, Nidd and Colne provide the largest upland sources of water in the region. Yorkshire Water operates over 100 impounding reservoirs of which two are major pumped storage reservoirs. The total storage capacity of all the supply reservoirs amounts to some 160,000 MI.

A review of the baseline and future environmental baseline was undertaken. The key sustainability issues from the review of the baseline conditions are summarised below.

Biodiversity, Fauna and Flora Key Issues

- The need to protect or enhance the region's biodiversity, particularly protected sites designated for nature conservation.
- The need to avoid activities likely to cause irreversible damage to natural heritage
- The need to take opportunities to improve connectivity between fragmented habitats.
- The need to control the spread of Invasive Non-Native Species (INNS). The need to engage more people in biodiversity issues so that they personally value biodiversity and know what they can do to help, including through recognising the value of the ecosystem services.

Population and Human Health Key Issues

- The need to ensure water supplies remain affordable especially for deprived or vulnerable communities.
- The need to ensure continued improvements in levels of health across the region, particularly in urban areas and deprived areas.
- The need to ensure public awareness of drought conditions and importance of maintaining resilient, reliable public water supplies without the need for emergency drought measures.
- The need to ensure water quantity and quality is maintained for other users including tourists, recreational users and other users such as farmers.
- The need to ensure a balance between different aspects of the built and natural environment that will help to provide opportunities for local residents and tourists, including opportunities for access to recreation resources and the natural and historic environment.
- The need to accommodate an increasing population.

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

Material Assets and Resource Use Key Issues

- The need to minimise the consumption of resources, including water and energy.
- The need to reduce the total amount of waste produced in the region, from all sources, and to reduce the proportion of this waste sent to landfill.
- The need to continue to reduce leakage from the water supply system.
- Daily consumption of water is higher than the national average in the area and consequently there is a continued need to encourage more efficient water use.

Water Key Issues

- The need to further improve the quality of the region's river, estuarine and coastal waters taking into account WFD status targets.
- The need to maintain the quantity and quality of groundwater resources taking into account WFD status targets.
- The need to improve the resilience, flexibility and sustainability of water resources in the region, particularly in light of potential climate change impacts on surface waters and groundwaters.
- The need to ensure sustainable abstraction to protect the water environment.
- The need to ensure that people understand the value of water.

Flooding is not viewed as a key issue for the SEA water topic, because none of the drought options involve the construction of permanent physical infrastructure within areas at risk of flooding.

Soil, Geology and Landscape Key Issues

- The need to protect geological features of importance and maintain and enhance soil function and health.
- The need to manage the land more holistically at the catchment level, benefitting landowners, other stakeholders, the environment and sustainability of natural resources (including water resources).
- The need to make use of previously developed land (brownfield land) and to reduce the prevalence of derelict land in the region.

Air and Climate Key Issues

- The need to reduce air pollutant and greenhouse emissions and limit air emissions to comply with air quality standards.
- The need to mitigate against climate change through the reduction in greenhouse gas emissions in order to contribute to risk reduction over the long term.
- The need to adapt to the impacts of climate change for example through, sustainable water resource management, water use efficiencies, specific aspects of natural ecosystems (e.g. connectivity) as well as accommodating potential opportunities of climate change.

Archaeology and Cultural Heritage Key Issues

- The need to conserve or enhance sites of archaeological importance and cultural heritage interest, particularly those which are sensitive to the water environment.

Landscape and Visual Amenity Key Issues

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

- The need to protect and improve the natural beauty of the region's National Parks, AONBs, and other areas of natural beauty.
- It is envisaged that landscape and designated sites will be maintained and enhanced for the enjoyment of the public.

Inter-relationships

It is noted that there are inter-relationships between SEA topics. These include impacts of changes to water flows and quality on biodiversity, the economy, recreation, tourism, navigation, cultural heritage and landscape. Inter-relationships that result in changes to individual effects are considered by evaluation of synergistic effects throughout the assessment.

Findings of the Assessments

The findings of the SEA are summarised below. **Table NTS1** sets out the SEA topics and objectives which are identified in **Tables NTS3** and **NTS4**.

For each SEA objective, a residual effects assessment was determined against a significance matrix (**Table NTS2**) which took into account the value/sensitivity of the receptor (e.g. air quality, river water quality, landscape value) and the magnitude of the assessed effect. This significance matrix comprised effects from 'major beneficial' to 'major adverse'. This colour coding was used to complete the columns for residual effects in the visual evaluation matrices summarised in **Tables NTS3** and **NTS4**.

Table NTS1: SEA topics and objectives

Topic	SEA objective
Biodiversity, fauna and flora	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species and consideration of adaptability to climate change) and to protect and enhance natural capital and the biodiversity and ecosystem services that contribute to the economy.
	1.2 To avoid introducing or spreading INNS.
Population and human health	2.1 To protect and improve health and well-being (including promoting the value of the water environment for health and wellbeing)
	2.2 To protect and enhance opportunities for formal and informal recreation.
	2.3 To promote a sustainable economy and thriving communities with good access to the services they need.
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.
	3.2 To promote efficient water resource management and the sustainable management of natural resources, ensuring water supply for homes and industry in the area is maintained.
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies.
	4.2 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.
	4.3 To ensure appropriate and sustainable management of abstractions (or compensation flow) to maintain water supplies whilst protecting ecosystem functions that rely on water resources.
	4.4 To promote water efficiency and measures that enable sustainable water use
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.
	5.2 To protect and enhance the ecosystem services function of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.
	5.3 To promote a catchment-wide approach to catchment land management.
Air and Climate	6.1 To maintain and improve air quality.
	6.2 To reduce greenhouse gas emissions.
	6.3 To consider the need for adaptive measures for climate change.
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.
Landscape and visual amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.

Table NTS2: Significance Matrix

Significance of Effect		Value/sensitivity of receptor		
		High	Medium	Low
Effect magnitude (includes scale of effect)	High	Major Adverse / Major Beneficial	Major Adverse / Major Beneficial	Moderate Adverse / Moderate Beneficial
	Medium	Major Adverse / Major Beneficial	Moderate Adverse / Moderate Beneficial	Minor Adverse / Minor Beneficial
	Low	Dependant on nature of impact/benefit	Minor Adverse / Minor Beneficial	Negligible

The definitions for 'significance' ratings as identified in the table above are provided below:

Major - effects represent key factors in the decision-making process. They are generally associated with sites and features of international, national or regional importance. If adverse, such resources/features are generally those which cannot be replaced or relocated.

Moderate - effects are likely to be important considerations at a regional or district scale. If adverse, they are likely to be of potential concern.

Minor - effects are not likely to be decision-making issues. Nevertheless, the cumulative effect of such issues may lead to an increase in the overall effects on a particular area or on a particular resource.

Negligible - effects which are not perceptible, being within normal bounds of variation or the margin of forecasting error.

Demand side options

Demand side measures serve to reduce pressure on water resources by reducing customer demand for water, and therefore reducing abstraction at source (**Table NTS3**). This will in turn contribute to reducing the amount of energy needed for water abstraction, treatment and distribution. Demand side measures typically provide beneficial effects such as maintaining surface and groundwater flows and promoting efficient and sustainable use of water. Adverse effects on landscaping and horticulture businesses may be associated with sprinkler and temporary use bans, and impacts on businesses due to water use restrictions would increase in severity and spread to other sectors (e.g. recreation and tourism) should ordinary or emergency drought orders be implemented. Impacts from implementation of drought orders could also extend to archaeology and cultural heritage, due to the influence on the setting of cultural assets. Minor adverse effects may also be associated with emissions of air pollutants and greenhouse gas emissions from leakage reduction programme activities.

Supply side options

Supply side options are mainly associated with impacts on surface waters and their ecology (**Table NTS4**). Reductions in surface water levels would also have the potential for adverse impacts on water quality, recreation and on landscape and visual amenity. The river abstraction options were found to have the greatest beneficial effects due to the large volumes of water they would provide. The assessment has found that adverse effects associated with the long-term options typically relate to construction of assets required to implement the options. As such, there would be adverse effects on material and resource use, emissions and construction impacts on biodiversity, flora and fauna.

Cumulative effects

The potential of Yorkshire Water's drought plan to interact with other plans, programmes or large projects was reviewed and it was determined that no cumulative effects will occur. However, there is potential for a number of Yorkshire Water's supply side options to produce cumulative effects.

Mitigation and Monitoring

Consideration of mitigation measures has been an integral part of the SEA process. The SEA appraisals have been based on residual impacts, i.e. those impacts likely to remain after the implementation of reasonable mitigation. Mitigation measures have been identified for each option on a case by case basis and are presented in the assessment framework appraisal tables.

During implementation of one or more drought options, appropriate monitoring will be undertaken to track any potential environmental effects which will in turn trigger deployment of suitable and practicable mitigation measures. Prior to implementation, Yorkshire Water will review the specific requirements for environmental monitoring in consultation with the Environment Agency and Natural England.

Consultation

Two opportunities are available for consultation bodies to be formally involved during the SEA process: during the scoping process; and at the environmental reporting stage.

Following publication of the final Drought Plan 2022, Yorkshire Water will prepare an SEA Post-Adoption Statement setting out how the SEA and any views expressed by the consultation bodies or the public have influenced the Drought Plan 2022.

Consultation bodies were invited to express their views on the Scoping Report and the scope of the SEA proposed in accordance with SEA Regulation 12(5).

The Scoping Report was issued on 26 May 2020 to the Environment Agency, Historic England and Natural England. The consultation period ran until 30 June 2020. The Statutory consultees were invited to comment on the report and the proposed scope of the SEA. Comments on the 2020 Scoping Report were received from Historic England and Natural England which did not require specific updates to the proposed approach but which have been taken into account during the preparation of the Environmental Report.

The Environmental Report of the Drought Plan 2022 was produced in accordance with the approach agreed by Yorkshire Water and taking into consideration the responses received from consultation bodies in response to the Scoping consultation. It provided assessments of the likely significant effects of the drought options considered and selected by Yorkshire Water.

The Draft Drought Plan 2022 and the SEA Environmental Report were issued to Defra in March 2021 and published on Yorkshire Water's website. A 7.5 week public consultation was held between 8 June and 29 July 2021.

The consultation bodies, as well as the public, were invited to express their views on this Environmental Report and use it as a reference point to express their views on the Drought Plan 2022.

Table NTS3: Visual Evaluation Matrix Summary for Demand Side Options

Option		SEA Topics and Objectives																	Commentary
		Biodiversity		Population and Human Health			Material Assets and Resource Use		Water				Soil, Geology and Land Use	Air and Climate			Archaeology and Cultural Heritage	Landscape	
		1.1	1.2	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	4.4	5.1	6.1	6.2	6.3	7.1	8.1	
Drought publicity campaigns	Adverse																		No adverse impacts have been identified for this drought measure.
	Beneficial																		Minor beneficial impacts includes reducing demand for water and securing essential supplies of water for customers/businesses. Reducing the demand for water will also have minor beneficial effects on maintaining surface water and groundwater levels/flows, sustainable management of abstraction and enabling long term improvements in water efficiency. Reducing water demand will also help to improve the resilience of water supplies to drought.
Emergency Drought Order	Adverse																		Major adverse effects are predicted for population and human health, including potential drinking water quality issues, impacts for water-dependent recreational assets and businesses/economy. An emergency drought order is not consistent with sustainable resource use or providing secure water supplies for people and businesses, and will cause significant disruption to domestic and commercial life. Other adverse effects include potential minor impacts on the setting of certain heritage assets and visual amenities.
	Beneficial																		Moderate to minor beneficial effects include a reduction in the demand for water, maintenance of water flows/levels and maintenance of a water supply to consumers in an extreme drought.
Increased leakage detection and repair activity	Adverse																		Minor adverse effects identified are associated with emissions to air (air pollutants and greenhouse gas emissions) as a result of construction activities and vehicle movements. All other adverse effects identified are negligible.
	Beneficial																		Minor to moderate beneficial effects have been identified with respect to sustainable provision of water through water savings that would have otherwise been lost to leakage after having been abstracted at source. These effects are generally considered to be long term and permanent in nature.
Introduction of a drought order to ban non-essential water uses	Adverse																		Moderate to major adverse effects associated with restriction of water use and impacts on recreation and tourism assets, the setting of heritage assets and local visual amenities. Restrictions of water use and impacts on businesses/economy could lead to major adverse effects.
	Beneficial																		Major beneficial effects as a result of maintenance of supply to consumers at times of drought. Minor beneficial effects in terms of the effects of reducing demand and improving the resilience of water supplies to drought, maintaining surface water and groundwater levels/flows and sustainable management of abstraction and supporting overall water efficiency.
Introduction of temporary use ban	Adverse																		A moderate adverse effect has been identified in terms of promoting a sustainable economy due to the effect of the ban on some businesses (e.g. landscaping/horticulture) that rely on domestic water-using appliances/uses (e.g. sprinklers/hosepipes).
	Beneficial																		Moderate beneficial impacts include reducing the demand for water and securing supply of water for customers/businesses. Reducing the demand for water will also have minor beneficial effects on maintaining surface water and groundwater levels/flows, sustainable management of abstraction and enabling long term improvements in water efficiency. Reducing water demand will also help to improve the resilience of water supplies to drought.

Table NTS3: Visual Evaluation Matrix Summary for Supply Side Options

Option		SEA Topics and Objectives																	Commentary
		Biodiversity		Population and Human Health			Material Assets and Resource Use		Water				Soil, Geology and Land Use	Air and Climate			Archaeology and Cultural Heritage	Landscape	
		1.1	1.2	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	4.4	5.1	6.1	6.2	6.3	7.1	8.1	
North Area Reservoirs: Drought Permits/Orders																			
North Area Reservoir 1	Adverse		None	None		None	None	None			None	None		None	None	None	None		The implementation of this drought option would result in a major adverse impact on flows and levels in receiving watercourses. This would be associated with a moderate adverse impact on water quality and a moderate adverse impact on a number of NERC and notable species. A reduction in the water levels would also result in a minor adverse impact on the landscape setting of several national trails that run alongside the reach.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
North Area Reservoir 2	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The implementation of this drought option would result in a major adverse impact on flows and levels in receiving watercourses. This would be associated with a minor adverse impact on water quality and a minor adverse impact on a number of NERC and notable species. A reduction in the water levels would also result in a minor adverse impact on the landscape setting of several national trails that run alongside the reach.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
North Area Reservoir 3	Adverse		None	None		None	None	None			None	None		None	None	None	None		The implementation of this option will result in major adverse effect on river flows and levels. There would be an associated moderate impact on water quality and NERC species including white clawed crayfish. There would also be negligible impacts on recreation, angling and visual amenity due to water level reduction.
	Beneficial	None	None		None		None	None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
North Area Reservoir 4	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The implementation of this drought option would result in a major adverse impact on flows and levels in receiving watercourses. This would be associated with a major adverse impact on water quality, in addition to moderate adverse impacts to biodiversity, whereby NERC Fish and Macroinvertebrate species may be affected by the drought option. Due to the option there may be some minor adverse impacts on geomorphology including bank erosion when higher flows return. The visual amenity of the an AONB may be adversely affected due to lower water levels.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with moderate beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and moderate beneficial impacts associated with the appropriate and sustainable management of water supplies.
North Area Reservoir 5	Adverse		None	None		None	None	None			None	None	None	None	None	None	None	None	The implementation of this drought option would result in a major adverse impact on flows and levels in receiving watercourses. This would be associated with a minor adverse impact on water quality and a moderate adverse impact on a number of NERC and notable species. A

Option		SEA Topics and Objectives																	Commentary
		Biodiversity		Population and Human Health			Material Assets and Resource Use		Water				Soil, Geology and Land Use	Air and Climate			Archaeology and Cultural Heritage	Landscape	
		1.1	1.2	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	4.4	5.1	6.1	6.2	6.3	7.1	8.1	
																			reduction in the water levels would also result in a negligible adverse impact on canoeing activities in the impacted reaches.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure, the appropriate and sustainable management of water supplies and bolstering resilience to climate change.
North West Area Reservoirs: Drought Permits/Orders																			
North West Area Reservoir 1	Adverse		None	None		None	None	None			None	None	None	None	None	None	None	None	Implementation of this drought option would result in a major adverse impact on water flows and levels. This would be associated with a moderate adverse impact on water quality and a moderate adverse impact on a number of NERC and notable species. A reduction in the flow level would also result in a moderate impact on the extensive non-club administered angling along the watercourse.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	Implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and moderate beneficial impacts associated with the appropriate and sustainable management of water supplies.
North West Area Reservoir 2	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The implementation of this drought option would result in a major adverse impact on water flows and levels in the watercourse. This would be associated with a moderate adverse impact on water quality and a moderate adverse impact on a number of NERC and notable species. A reduction in the flow level would also result in a minor adverse impact on the landscape setting of national trails.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and moderate beneficial impacts associated with the appropriate and sustainable management of water supplies.
North West Area Reservoir 3	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The implementation of this drought option would result in a major adverse impact on water flows and levels. This would be associated with a moderate adverse impact on water quality and a moderate adverse impact on a number of NERC and Notable species. A reduction in the flow level would also result in a minor adverse impact on the landscape setting of national trails.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and moderate beneficial impacts associated with the appropriate and sustainable management of water supplies.
North West Area Reservoir 4	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The implementation of this drought option would result in a major adverse impact on flow levels. This would be associated with a minor adverse impact on water quality and a moderate adverse impact on a number of NERC and notable species. A reduction in the flow level would also result in a minor adverse impact on the landscape setting of several national trails that run alongside the reach.

Option		SEA Topics and Objectives																	Commentary
		Biodiversity		Population and Human Health			Material Assets and Resource Use		Water				Soil, Geology and Land Use	Air and Climate			Archaeology and Cultural Heritage	Landscape	
		1.1	1.2	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	4.4	5.1	6.1	6.2	6.3	7.1	8.1	
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and moderate beneficial impacts associated with the appropriate and sustainable management of water supplies.
North West Area Reservoir 5	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		Implementation of this drought option would result in a major adverse impact on water flows. This would be associated with a minor adverse impact on water quality and a moderate adverse impact on a number of NERC and notable species. A reduction in the flow level would also result in a minor adverse impact on the landscape setting of several national trails that run alongside the reach. There is a minor (uncertain) potential impact on an organised angling club on the impacted reaches.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	Implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure, and moderate beneficial impacts associated with the appropriate and sustainable management of water supplies.
North West Area Reservoir 6	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		Implementation of this drought option would result in a major adverse impact on water flows and levels. This would be associated with a minor adverse impact on water quality and a number of NERC and Notable species due to the loss of habitat and the stranding of individuals. The reduction in the flow level would also result in a minor adverse impact on the landscape setting of national trails, which run alongside the impacted reaches.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure the appropriate and sustainable management of water supplies.
North West Area Reservoir 7	Adverse		None	None		None	None	None			None	None	None	None	None	None	None	None	Implementation of this drought option would result in a major adverse impact on water flows and levels. This would be associated with a moderate adverse impact on water quality and a moderate impact on a number of NERC and Notable species due to the stranding of individuals or groups; deterioration or loss of habitats; fragmentation of habitats; increased mortality; and changes in morphology or behaviour.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	Implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and moderate beneficial impacts associated with the appropriate and sustainable management of water supplies.
North West Area Reservoir 8	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		Implementation of this drought option would result in a major adverse impact on water flows and level. This would be associated with a moderate adverse impact on water quality, and a moderate adverse impact on a number of NERC and notable species. A reduction in the flow level of would also result in a minor adverse impact on the landscape setting of national trails which run alongside the watercourse.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of

Option		SEA Topics and Objectives																	Commentary
		Biodiversity		Population and Human Health			Material Assets and Resource Use		Water				Soil, Geology and Land Use	Air and Climate			Archaeology and Cultural Heritage	Landscape	
		1.1	1.2	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	4.4	5.1	6.1	6.2	6.3	7.1	8.1	
																			existing infrastructure and moderate beneficial impacts associated with the appropriate and sustainable management of water supplies.
North West Area Reservoir 9	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The implementation of this drought option would result in a major adverse impact on water flows and levels. This would be associated with a minor adverse impact on water quality and a moderate adverse impact on a number of NERC and notable species. A reduction in the flow level would also result in a minor adverse impact on the landscape setting of the national trails which run alongside the watercourse.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and moderate beneficial impacts associated with the appropriate and sustainable management of water supplies.
North West Area Reservoir 10	Adverse		None	None		None	None	None			None	None	None	None	None	None	None	None	The implementation of this drought option would result in a major adverse impact on water flows and levels. This would be associated with a minor adverse impact on water quality and a moderate adverse impact on a number of NERC and notable species due to fragmentation of habitats, increased mortality and changes in morphology or behaviour.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	Implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and moderate beneficial impacts associated with the appropriate and sustainable management of water supplies.
North West Area Reservoir 11	Adverse		None	None		None	None	None			None	None	None	None	None	None	None	None	Major adverse impact on water flows and levels. This would be associated with a minor adverse impact on water quality, and a moderate adverse impact on a number of NERC and notable species. The minor reduction in flows and levels would have a minor impact on casual angling.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	Minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and moderate beneficial impacts associated with the appropriate and sustainable management of water supplies.
North West Area Reservoir 12	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		Implementation of this drought option would result in a major adverse impact on water flows and levels. This would be associated with a minor adverse impact on water quality, and a moderate adverse impact on a number of NERC and notable species. A reduction in the flow level would also result in a minor adverse impact on the landscape setting.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and minor beneficial impacts associated with the appropriate and sustainable management of water supplies.

South Area Reservoirs: Drought Permits/Orders																			
South Area Reservoir 1	Adverse		None	None		None	None	None			None	None	None	None	None	None	None	None	Implementation of this drought option would result in a major adverse impact on water flows and levels in the impacted reaches. This would be associated with a moderate adverse impact on water quality and a moderate adverse impact on a number of NERC and notable species. A reduction in the water levels would also result in a minor adverse impact on informal angling and a fishery.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	Implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
South Area Reservoir 2	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		Implementation of this drought option would result in a major adverse impact on flow levels. This would be associated with a moderate adverse impact on water quality and a moderate adverse impact on a number of NERC and notable species. A reduction in the flow level would also result in a minor adverse impact on the landscape setting of several national trails that run alongside the reach. Angling activities on the reaches would also be subject to a moderate adverse impact.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	Implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
South Area Reservoir 3	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		Implementation of this drought option would result in a major adverse impact on water flows and levels in the watercourses. This would be associated with a moderate adverse impact on water quality and a moderate adverse impact on a number of NERC and notable species. A reduction in the water levels would also result in a minor adverse impact on canoeing and angling activities on the impacted reaches.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	Implementation of this drought option would be associated with moderate beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
South Area Reservoir 4	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The implementation of this drought option would result in a moderate adverse impact on flow levels in the impacted reaches This would be associated with a moderate adverse impact on water quality and a moderate adverse impact on a number of NERC and Notable species. A reduction in the flow level would also result in a minor adverse impact on the landscape setting of several national trails that run alongside the river reaches.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and bolstering resilience to climate change. There would also be moderate beneficial impacts associated with the appropriate and sustainable management of water supplies.
South Area Reservoir 5	Adverse		None	None		None	None	None			None	None		None	None	None	None		Implementation of this drought option would result in a major adverse impact on water flows and levels. This would be associated with a moderate adverse impact on water quality and a moderate adverse impact on a number of NERC and notable species. A reduction in the water level would also result in a minor adverse geomorphological impacts associated with the desiccation of river banks.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	Implementation of this drought option would be associated with moderate beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and bolstering resilience to climate change. There would also be minor beneficial impacts associated with the appropriate and sustainable management of water supplies.

South Area Reservoir 6	Adverse		None	None		None	None	None			None	None	None	None	None	None	None	None	The implementation of this drought option would result in a major adverse impact on flow levels. This would be associated with a moderate adverse impact on water quality and on a number of NERC and notable species. A reduction in the flow level would potentially impact the informal angling and canoeing on the impacted reaches, however, these impacts would be negligible under drought conditions.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	Implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
South West Area Reservoirs: Drought Permits/Orders																			
South West Area Reservoir 1	Adverse		None	None	None	None	None	None			None	None		None	None	None	None		The implementation of this drought option would result in a moderate adverse impact on water levels and flows. This would be associated with a moderate adverse impact on water quality, a moderate adverse impact on brown trout, white-clawed crayfish, grayling, bullhead and water vole and a minor impact on barbel. A reduction in water levels would also result in a negligible adverse impact on the landscape setting of the national trail.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
South West Area Reservoir 2	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The implementation of this drought option would result in a major adverse impact on water levels and flows in the receiving watercourses. This would be associated with a moderate adverse impact on water quality and a moderate adverse impact on a number of NERC and Notable species. A reduction in water levels would also result in a negligible adverse impact on the landscape setting of the national trail and a moderate adverse impact on angling.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with moderate beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and moderate beneficial impacts associated with the appropriate and sustainable management of water supplies.
South West Area Reservoir 3	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The implementation of this drought option would result in a major adverse impact on water levels and flows in the receiving watercourses. This would be associated with a moderate adverse impact on water quality, a moderate adverse impact on white-clawed crayfish, water vole and brown trout, and a minor impact on barbel, grayling and <i>Helophorus strigifrons</i> . A reduction in water levels would also result in a negligible adverse impact on the landscape setting of the national trail and a moderate adverse impact on angling.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with moderate beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
South West Area Reservoir 4	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The implementation of this drought option would result in a major adverse impact on water levels and flows. This would be associated with a moderate adverse impact on water quality and a minor to moderate adverse impact on a number of NERC and Notable species. A reduction in water levels would also result in a minor adverse impact on the landscape setting of the national trail and a minor adverse impact on angling.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
South West Area Reservoir 5 [EA Drought Order]	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The implementation of this drought option would result in a major adverse impact on water levels and flows in the receiving watercourses. This would be associated with a minor adverse impact on water quality, a moderate adverse impact on brown trout, white-clawed crayfish and water vole and a minor impact on bullhead. A reduction in water levels would also result in a minor adverse impact on the landscape setting of the national trail. Minor adverse impacts on the angling quality of the impacted reaches would also result.

	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and moderate beneficial impacts associated with the appropriate and sustainable management of water supplies.
South West Area Reservoir 6	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The implementation of this drought option would result in a major adverse impact on water levels and flows. This would be associated with a moderate adverse impact on water quality and a minor to major adverse impact on a number of NERC and Notable species. A reduction in water levels would also result in a minor adverse impact on the landscape setting of the national trail and a minor adverse impact on angling.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
South West Area Reservoir 7	Adverse		None	None		None	None	None			None	None	None	None	None	None	None	None	The implementation of this drought option would result in a major adverse impact on water levels and flows in the receiving watercourses. This would be associated with a moderate adverse impact on water quality and a moderate to major adverse impact on a number of NERC and Notable species. Minor adverse impacts on the angling quality of the impacted reaches would also result.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
South West Area Reservoir 8	Adverse		None	None		None	None	None			None	None	None	None	None	None	None	None	The implementation of this drought option would result in a major adverse impact on water levels and flows. This would be associated with a moderate adverse impact on water quality and a minor to major adverse impact on a number of NERC and Notable species. There would also be minor adverse effects on angling activities in the impacted reaches.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
South West Area Reservoir 9 [EA Drought Order]	Adverse		None	None		None	None	None			None	None	None	None	None	None	None	None	The implementation of this drought option would result in a major adverse impact on water levels and flows. This would be associated with a moderate adverse impact on water quality and a moderate to major adverse impact on a number of NERC and Notable species. A reduction in water levels would also result in a negligible adverse impact on the casual angling activities.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and minor beneficial impacts associated with the appropriate and sustainable management of water supplies.
South West Area Reservoir 10	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The implementation of this drought option would result in a major adverse impact on water levels and flows in the receiving watercourses. This would be associated with a moderate adverse impact on water quality, a major adverse impact on brown trout, a moderate impact for white-clawed crayfish, water vole, and bullhead, and a minor impacts regarding Grayling and barbel. A reduction in water levels would also result in a minor adverse impact on the landscape setting of the national trail and a moderate adverse impact on angling.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with moderate beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and with the appropriate and sustainable management of water supplies.

South West Area Reservoir 11	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The implementation of this drought option would result in a major adverse impact on water levels and flows in the receiving watercourses. This would be associated with a moderate adverse impact on water quality, a major adverse impact on brown trout, a moderate adverse impact on white-clawed fish, water vole and bullhead, and a minor adverse impact on barbel and grayling. A reduction in water levels would also result in a negligible adverse impact on the landscape setting of a national trail and an adverse impact on angling.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
South West Area Reservoir 12	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The implementation of this drought option would result in a major adverse impact on water levels and flows in the receiving watercourses. This would be associated with a moderate adverse impact on water quality and a major adverse impact on brown trout. A reduction in water levels would also result in a negligible adverse impact on the landscape setting of a national trail and a moderate adverse impact on angling.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
South West Area Reservoir 13	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The implementation of this drought option would result in a major adverse impact on water levels and flows. This would be associated with a moderate adverse impact on water quality, a moderate adverse impact on WFD status and a major impact for brown trout, moderate impact for water vole and a minor impact for bullhead, grayling and barbel. A reduction in water levels would also result in a minor adverse impact on the landscape setting of the national trail and a minor adverse impact on angling.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
South West Area Reservoir 14	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The implementation of this drought option would result in a moderate adverse impact on water levels and flows across the receiving water courses. This would be associated with a moderate adverse impact on water quality a major impact for brown trout, a moderate impact for water vole and a minor impact for bullhead. A reduction in water levels would also result in a minor adverse impact on the landscape setting of the national trail and a minor adverse impact on angling.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
South West Area Reservoir 15	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The implementation of this drought option would result in a major adverse impact on water levels and flows. This would be associated with a moderate (uncertain) adverse impact on water quality and a moderate to major adverse impact on a number of NERC and Notable species. A reduction in water levels would also result in a minor adverse impact on the landscape setting of the national trail and a minor adverse impact on angling.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
South West Area Reservoir 16	Adverse		None	None	None	None	None	None			None	None	None	None	None	None	None	None	The implementation of this drought option would result in a major adverse impact on water levels and flows. This would be associated with a minor adverse impact on water quality and a moderate adverse impact on a number of NERC and Notable species.

	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
South West Area Reservoir 17	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The implementation of this drought option would result in a major adverse impact on flows, however no risk to aquatic habitats are anticipated. Negligible impacts on aquatic communities and species are anticipated. A reduction in water levels would also result in a minor adverse impact on the landscape setting of national trails and a minor adverse impact on angling.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
South West Area Reservoir 19	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The implementation of this drought option would result in a major adverse impact on water levels and flows. This would be associated with a minor adverse impact on water quality and a moderate to major adverse impact on a number of NERC and Notable species. A reduction in water levels would also result in a minor adverse impact on the landscape setting of the national trail and a moderate adverse impact on angling.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and moderate beneficial impacts associated with the appropriate and sustainable management of water supplies.
South West Area Reservoir 18	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The implementation of this drought option would result in a major adverse impact on water levels and flows in the receiving watercourses. This would be associated with a minor adverse impact on water quality and a minor to major adverse impact on a number of NERC and Notable species. A reduction in water levels would also result in a minor adverse impact on the landscape setting of the national trail and a moderate adverse impact on an organised angling club
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
South West Area Reservoir 20	Adverse		None	None		None	None	None			None	None	None	None	None	None	None	None	The implementation of this drought option would result in a major adverse impact on water levels and flows. This would be associated with a moderate adverse impact on water quality and a moderate to major adverse impact on a number of NERC and Notable species. There would also be a minor adverse effect on casual angling in the reach.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
South West Area Reservoir 21	Adverse		None	None	None	None	None	None			None	None	None	None	None	None	None	None	The implementation of this drought option would result in a major adverse impact on water levels and flows. This would be associated with a moderate adverse impact on water quality and a moderate to major adverse impact on a number of NERC and Notable species.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
South West Area Reservoir 22	Adverse		None	None	None	None	None	None			None	None	None	None	None	None	None	None	The implementation of this drought option would result in a major adverse impact on water levels and flows. This would be associated with a minor adverse impact on water quality and a moderate to major adverse impact on a number of NERC and Notable species.

	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
River Options																			
Ouse increase abstraction	Adverse		None	None		None	None	None			None	None	None	None		None	None		The drought option would lead to a minor reduction in low flows, with associated reduction in wetted width and depth. There would be moderate risk to water quality associated with a number of intermittent discharges in the reach. The flow pressures would result in minor adverse impacts on the nearby SSSI and on Notable/NERC fish species due to the siltation of spawning gravels and exposure of habitats. The reduced flow level would also have a minor impact on the landscape setting of the numerous SSSIs in close proximity to the river.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The drought option would provide up to 60 Ml/d which would deliver major beneficial impacts on population and human health due to the large deployable output and continued water supply for economic activity. In the zone of influence of the drought option water availability is at least 50% so the option will deliver beneficial impacts with regard to sustainable water supply. The option utilises existing infrastructure so would have minor beneficial impacts on material assets and resource use, as no construction is required.
Ure increase abstraction	Adverse			None		None	None	None			None	None	None	None		None	None		The drought option would lead to a moderate reduction in low flows, with associated reduction in wetted width and depth of the watercourse. The risk of water quality deterioration is assessed as medium for dissolved oxygen and low for total ammonia and phosphate, except locally downstream where the risk for total ammonia is moderate. The impact on wetted width and depth, especially in shallow areas of the channel, would have a moderate to major impact on NERC/Notable species due to the siltation of spawning gravels and exposure of habitats. The reduced flow level would have a minor impact on the landscape setting of the national trail that runs alongside the watercourse and forms part of an AONB.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The drought option would provide 3.27 Ml/d which would deliver major beneficial impacts on population and human health due to the large deployable output and continued water supply for economic activity. In the zone of influence of the drought option water availability is at least 50% so the option will deliver beneficial impacts with regard to sustainable water supply. The option utilises existing infrastructure so would have minor beneficial impacts on material assets and resource use, as no construction is required.
Wharfe reduced regulated flow	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The drought option would lead to a moderate reduction in low flows, with associated reduction in wetted width and depth over the watercourse. Water quality throughout the study area is assessed as low risk of deteriorating with regards to total ammonia and medium risk for dissolved oxygen. The reduction in flow and associated reduction in wetted width and depth of the reaches would have moderate adverse impact on NERC fish species due to the siltation of spawning gravels. A significant reduction in the level would have a visual impact on the AONB, however, there is limited access to the impacted reach with no national trails.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The drought option would provide 22.7 Ml/d which would deliver major beneficial impacts on population and human health due to the large deployable output and continued water supply for economic activity. In the zone of influence of the drought option water availability is at least 70% so the option will deliver beneficial impacts with regard to sustainable water supply. The option utilises existing infrastructure so would have minor beneficial impacts on material assets and resource use, as no construction is required.
Wharfe increase annual abstraction	Adverse		None	None	None	None	None	None			None	None	None	None	None	None	None		The drought option would lead to a negligible reduction in flows, with a negligible reduction in wetted width and depth of the watercourse. Water quality throughout the study area is assessed as at a negligible risk of deteriorating. The reduction in flow and associated reduction in wetted width and depth of the reaches would have negligible adverse impact on NERC fish species. A negligible reduction in the level of the watercourse would have a negligible visual impact on the AONB. There is limited access to the impacted reach with no national trails.
	Beneficial	None	None		None			None	None	None	None	None	None	None	None		None	None	The drought option would provide water for public supply which would deliver moderate beneficial impacts on population and human health due to the medium deployable output and continued water supply for economic activity. The option will deliver beneficial impacts with regard to sustainable water supply. The option utilises existing infrastructure so would have minor beneficial impacts on material assets and resource use, as no construction is required.

Hull increase abstraction	Adverse		None	None		None	None	None			None	None	None	None	None	None	None	None	The drought option would have a minor hydrological impact which would result in a moderate risk to water quality deterioration in the upper reach associated with dissolved oxygen and total ammonia and major risk in the lower tidal reach based on modelled dissolved oxygen sag near the vicinity of a STW. This would result in moderate adverse impacts on river lamprey, brook lamprey and European eel due to mortality due to oxygen stress and gill clogging.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The drought option would provide 20.5 Ml/d which would deliver major beneficial impacts on population and human health due to the large deployable output and continued water supply for economic activity. The option utilises existing infrastructure so would have minor beneficial impacts on material assets and resource use, as no construction is required.
Derwent annual abstraction increase	Adverse		None	None	None	None	None	None			None	None	None	None	None	None	None		The drought option would lead to negligible impact on low flows, with negligible effects towards the wetted width and depth over 24 km of the watercourse. Water quality throughout the study area is assessed as at a negligible risk of deteriorating. All impacts to designated habitats (SSSI and NERC habitats) in the reach were screened with negligible adverse effects.
	Beneficial	None	None					None	None	None		None	None	None	None		None	None	The drought option would provide up to 20 Ml/d which would deliver moderate beneficial impacts on population and human health due to the medium deployable output and continued water supply for economic activity. The option utilises existing infrastructure so would have minor beneficial impacts on material assets and resource use, as no construction is required.
Long Term Drought Options																			
East Yorkshire Groundwater Option 2	Adverse					None		None			None	None				None			Potential moderate adverse impacts on ancient woodland. Potential minor adverse impacts on population and health due to noise, dust and vibration associated with the short-term construction phase. Potential minor adverse impacts on air and climate due to additional energy required for pumping water to provide 9 Ml/d and additional use of chemicals for water treatment. Negligible impacts on material assets due to use of existing infrastructure, there may be increased use of chemicals for treatment. Minor adverse impacts on water quality due to the potential pollution risk during construction. Moderate adverse impacts on water due to uncertainty around impacts on groundwater levels. Negligible adverse impacts on archaeology and landscape and visual amenity.
	Beneficial	None	None		None		None		None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial impacts associated with the appropriate and sustainable management of water supplies and minor beneficial impacts associated with bolstering resilience to climate change.
North Yorkshire Groundwater increase abstraction	Adverse		None	None	None	None		None			None	None	None			None	None	None	No impacts on the nearby SAC or SSSI. Minor adverse impacts associated with increased energy and material asset use such as chemicals to treat pumped water during operation. Negligible adverse impacts on water quality due to the minor baseflow reductions, which needs to be assessed further.
	Beneficial	None	None		None		None	None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with moderate beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial impacts associated with the appropriate and sustainable management of water supplies and bolstering resilience to climate change.
Ouse increase abstraction	Adverse			None		None		None			None	None				None			The implementation of this drought option would result in minor adverse impacts on biodiversity and designated sites due to the construction of the additional water treatment capacity and pipeline. There would be a minor adverse impact on the spread of invasive species due to flow and level changes. The water transfer would only result in minor adverse effects on water flows and levels. There would be major adverse effects on resource use energy use, minor impacts on air quality and moderate impacts on greenhouse emissions as a result of construction and operation of the new pipeline. There would also be minor adverse effects on the landscape setting of the surrounding countryside during the construction phase.
	Beneficial	None	None		None		None	None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers moderate beneficial impacts associated with the appropriate and sustainable management of water supplies and minor beneficial impacts associated with bolstering resilience to climate change.

Ouse water treatment works extension	Adverse			None		None		None			None	None				None		The implementation of this drought option would result in minor adverse impacts on biodiversity and designated sites due to the construction of the additional water treatment capacity and pipeline. There would be a minor adverse impact on the spread of invasive species due to the construction of the new treatment works in an area known to support invasive species. The water transfer would only result in minor adverse effects on water flows and levels. There would be moderate adverse effects on resource use energy use, air quality and greenhouse emissions as a result of the construction and operation of the new treatment works. There would also be minor adverse effects on the landscape setting of the surrounding countryside during the construction phase.
	Beneficial	None	None		None		None	None	None	None		None	None	None	None		None	The implementation of this drought option would be associated with major beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers major beneficial effects associated with bolstering resilience to climate change and moderate beneficial impacts associated with the appropriate and sustainable management of water supplies.
Ouse Raw Water Transfer	Adverse			None		None		None			None	None				None		The implementation of this drought option would result in minor adverse impacts on biodiversity and designated sites due to the construction of the pipeline. There would be a minor adverse impact on the spread of invasive species due to the construction of the new pipeline in an area known to support invasive species. The water transfer would result in minor adverse effects on water flows and levels and moderate adverse effects on water quality. There would be minor adverse effects on resource use energy use, air quality and greenhouse emissions as a result of the construction and operation of the new pipeline. There would also be minor adverse effects on the landscape setting of the surrounding countryside during the construction phase.
	Beneficial	None	None		None		None	None	None	None		None	None	None	None		None	The implementation of this drought option would be associated with major beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers major beneficial effects associated with bolstering resilience to climate change and moderate beneficial impacts associated with the appropriate and sustainable management of water supplies.
Tees- Derwent Pipeline	Adverse			None		None		None			None	None				None		The implementation of this drought option would result in minor adverse impacts on biodiversity and designated sites due to the construction of the new pipeline. The water transfer would only result in minor adverse effects on water flows and levels by altering the natural flow regime. There would be a minor adverse impact on the spread of INNS due to flow and level changes in the watercourse. There would be major adverse effects on resource use energy use, minor impacts on air quality and moderate impacts on greenhouse emissions as a result of the construction and operation of the new pipeline. There would also be moderate adverse effects on land-use and minor adverse effects on the landscape setting of the surrounding countryside during the construction phase.
	Beneficial	None	None		None		None	None	None	None		None	None	None	None		None	The implementation of this drought option would be associated with major beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers moderate beneficial effects associated with bolstering resilience to climate change and the appropriate and sustainable management of water supplies.
Tees – Swale transfer	Adverse			None		None					None					None		The implementation of this drought option would result in moderate adverse impacts on NERC species due to the risk of spreading disease through the transfer of deceased fish. The water transfer would only result in minor adverse effects on water flows and levels by altering the natural flow regime. As such, flow and level changes would not pose a great risk to the spread of existing invasive species populations, however, there is uncertainty as to the transfer scheme's overall potential impact regarding catchment river transfers and INNS risks. For example, the transmission of crayfish plague. Without effective mitigation this is considered of major concern. There would be moderate adverse effects on resource use energy use, minor impacts on air quality and moderate impacts on greenhouse emissions as a result of the construction and operation of the new pipeline. There would also be minor adverse effects on the landscape setting of the surrounding countryside during the construction phase.
	Beneficial	None	None		None		None	None	None	None		None	None	None	None		None	The implementation of this drought option would be associated with major beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers major beneficial effects associated with bolstering resilience to climate change and moderate beneficial impacts associated with the appropriate and sustainable management of water supplies.

North West Reservoir Abstraction	Adverse			None		None		None			None	None				None	None		Minor adverse impacts of construction on flora and fauna are possible, however there are no nearby designated sites. Minor adverse impacts on the spread of invasive species during construction, however if best practice is followed this should be mitigated. Minor adverse impacts on access for recreational use during construction phase. Minor adverse impact associated with construction and operation due to an increase in material use, energy consumption and greenhouse emissions. Minor adverse impact on landscape and visual amenity due to the proximity of the national trail. Negligible adverse impacts on water level in the reservoir, and the drought permit may reduce the occurrence of spill events. Negligible impacts on water quality within the reservoir, however North West Area Reservoir 9 is known to have water quality issues and this needs to be investigated further. Negligible adverse impact on soils due to the construction element, however this is assumed to be short term and of small scale.
	Beneficial	None	None		None		None	None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial impacts associated with the appropriate and sustainable management of water supplies and minor beneficial impacts associated with bolstering resilience to climate change.
Aire abstraction	Adverse			None		None		None			None	None				None			Major adverse impacts on biodiversity are possible due to operational impacts on NERC fish species, and construction impacts on NERC species such as badgers, bats, water voles are uncertain. The abstraction would have moderate adverse impacts on surface water flows and levels and water quality. Moderate adverse impacts on resources due to energy and resource use associated with construction and operation, resources should be sourced locally. Moderate adverse impacts of operation on water quality due to nearby STW. Minor adverse impacts on the spread of invasive species if best practice is followed. Negligible adverse impacts on recreation such as fishing. Negligible adverse impacts on land-use and geology and visual amenity. There are no nearby AONB and much of the construction element will be below ground once operational.
	Beneficial	None	None		None		None	None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with major beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers moderate beneficial impacts associated with the appropriate and sustainable management of water supplies and major beneficial impacts associated with bolstering resilience to climate change.

Legend

Colour		Significance of Effect
	Dark Green	Major Beneficial
	Mid Green	Moderate Beneficial
	Light Green	Minor Beneficial
	Negligible	Negligible
	Yellow	Minor Adverse
	Orange	Moderate Adverse
	Red	Major Adverse
	NONE APPLICABLE	NOT APPLICABLE

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1 Introduction

1.1 Background and Purpose of Report

Yorkshire Water Services Limited (Yorkshire Water) has prepared its Statutory Drought Plan (the 'Drought Plan 2022') for 2022 and has undertaken Strategic Environmental Assessment (SEA) of its Drought Plan. A Habitats Regulations Assessment (HRA) screening has been undertaken in parallel.

SEA is a statutory requirement for plans or programmes which could have significant environmental implications, and helps to identify where there are potential impacts and how any negative impacts might be mitigated. More information about SEA, and the rationale for applying it to the Drought Plan 2022, is provided in Section 1.2 below.

This Environmental Report is the second output of the SEA. In May 2020, a Scoping Report was issued for consultation¹ which summarised the baseline and framework that would be used for the assessment. Issues raised by consultees have been considered in preparing this Environmental Report (see Section 1.8 Consultation).

The Environmental Report presents the baseline information that sets the context for the assessment (Section 3) and provides details of the methods employed in undertaking the assessment (Section 4). The potential impacts of the various Drought Plan 2022 options are outlined in Section 5, with the impacts of the combinations of options included in the Drought Plan 2022 set out in Section 6. Information regarding mitigation and monitoring is provided in Section 7.

The SEA Environmental Report accompanies Yorkshire Water's publication of their Drought Plan 2022.

1.2 Application of SEA to Drought Planning

1.2.1 Overview of Strategic Environmental Assessment

SEA is a statutory requirement under the Environmental Assessment of Plans and Programmes Regulations 2004 (referred to as the SEA Regulations)².

The objectives of SEA is to:

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

The SEA Regulations requires preparation of an Environmental Report in which the likely significant effects on the environment of implementing the plan or programme, and reasonable alternatives taking into account the objectives and geographical scope of the plan or programme, are identified, described and evaluated.

It should be noted, however, that as stated in the Office of the Deputy Prime Minister (ODPM) SEA Guidelines³ *"It is not the purpose of the SEA to decide the alternative to be chosen for the plan or programme. This is the role of the decision-makers who have to make choices on the plan or programme to be adopted. The SEA simply provides information on the relative environmental performance of alternatives, and can make the decision-making process more transparent."* The SEA

¹ Ricardo (2020) Strategic Environmental Assessment of Yorkshire Water's Services Limited Draft Drought Plan 2021. Scoping Report. Prepared by Ricardo for Yorkshire Water Services Ltd. May 2020.

² The Environmental Assessment of Plans and Programmes Regulations 2004 (Statutory Instrument 2004 No. 1633) apply to any plan or programme which relates solely or in part to England.

³ Office of the Deputy Prime Minister (2005) A Practical Guide to the Strategic Environmental Assessment Directive.

can, therefore, be used to support the timing and implementation of actions within the plan, although this needs to be set in the context of applying SEA to drought planning, as described in Section 1.6 below.

The range of issues to be included in an SEA is set out in the SEA Regulations, and includes biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage, and landscape. As such, the full range of environmental and social effects which are likely to arise from implementation of the Drought Plan 2022 are considered

As identified above, the Government has produced SEA guidance⁴, which sets out the stages of the SEA process. This, together with guidance for undertaking SEA of Drought Plans, which has been produced on behalf of United Kingdom Water Industry Research (UKWIR)⁵, has been used to inform the methodology for the SEA. These documents provide the recommended best practice guidance for preparation SEAs of drought plans.

The Environment Agency's 2020 Drought Plan Guideline (DPG)⁶ also includes guidance on the preparation of SEA of Drought Plans. This has informed Yorkshire Water's Drought Plan 2022 and preparation of the SEA.

1.2.2 Applying Strategic Environmental Assessment to Drought Planning

Drought Plans encompass a group of measures that will only be implemented if and when required because of the unpredictable occurrence of a drought event, and thus the actual impact of the plan over its life is subject to very significant uncertainties. There may or may not be a drought during the period of the plan, and each drought is different in terms of severity, season, location, duration and influence of other abstractors within the catchment. Each combination of these factors may require a bespoke reaction in terms of measures.

It is impossible to predict in advance which and how many of the measures will be required, and in which order of priority, to respond to each particular drought event. Therefore, SEA of Drought Plans cannot provide a certain prediction of an overall environmental effect of adopting the plan, as its implementation is uncertain. However, for some resource zones with fewer drought options, it may be easier to predict which measures would be implemented in a drought scenario or it may be known that certain combinations would always be deployed simultaneously. The Environmental Report discusses these where relevant.

Instead of attempting to assess a number of potential scenarios, the SEA of Yorkshire Water's Drought Plan 2022 includes a cumulative effects assessment in order to ensure that options are not mutually exclusive, or that combinations would not cause significant adverse impacts.

The SEA of Yorkshire Water's Drought Plan 2022 is also focussed on the reactive and transient nature of the event when a Drought Plan is operational, while maintaining the strategic approach of an SEA. For this, it is important to consider the relationship between the Water Resource Management Plans (WRMP) and the Drought Plan. The Environmental Report, baseline review and establishment of the SEA framework attempt to separate the key issues and assessment approaches relevant to the Drought Plan 2022 from those more applicable to the WRMP. The assessment of individual options (Stage B of the SEA process) concentrates on effects resulting from the implementation of drought management actions rather than the 'natural' impacts of drought.

⁴ Office of the Deputy Prime Minister (2005). A Practical Guide to the Strategic Environmental Assessment Directive.

⁵ UKWIR (2021) Environmental Assessment Guidance for Water Resources Management Plans and Drought Plans (WR/02/S). Prepared by Ricardo Energy & Environment.

⁶ Environment Agency (2020) Water Company Drought Plan Guideline, December 2020 (Version 1.1)

1.2.3 Requirement for SEA and HRA of Yorkshire Water's Drought Plan

Undertaking a SEA of a Drought Plan helps guide decision making both in the preparation of the Drought Plan 2022 and during Drought Plan operation. For example, the SEA identifies the potential effects across a broad range of environmental topics which are focussed to the situation and established during the scoping phase. As every drought is different in terms of severity, location, duration and hence impact, the output of the SEA for each option will help guide option selection specific to the characteristics of any potential drought. The SEA also includes cumulative assessments to ensure that options are not mutually exclusive, or that combinations would not cause significant adverse impacts. This, therefore, informs decision making at Drought Plan development stage and ensures important strategic decisions are made early on in the process.

The SEA Scoping Report which was consulted on in May/June 2020 contained a description of the screening process. It concluded that SEA is required, taking into account a precautionary approach and uncertainties associated with whether it sets a framework for future development consent, and the unknown outcome of the Habitats Regulations Assessment screening (HRA) screening at that time.

A HRA⁷ has since been undertaken, and the outcome of the HRA screening is presented in a separate report⁸.

1.3 Yorkshire Water Services Limited Water Supply System and Drought Planning

1.3.1 Introduction

In the event of a severe drought, Yorkshire Water will need to carry out a range of management measures to ensure the provision of adequate supplies of wholesome water to its customers. The Yorkshire Water Drought Plan 2022 sets out the options for dealing with drought conditions, and takes account of recent legislative developments in drought management. Statutory demand management options available to water companies during drought have been extended through provisions in the Flood and Water Management Act 2010. Section 36 of this Act has amended the Water Industry Act 1991 provisions relating to hosepipe bans and allows companies to temporarily restrict a wider range of customer water use activities under a Temporary Use Ban without requiring a drought order. The Drought Direction 1991 was revoked and replaced by the Drought Direction 2011, which set out uses that still require a drought order in order to impose restrictions during a drought. This was updated by the Drought Plan (England) Direction 2020 which contains timeframes for submitting the draft Drought Plan to the Secretary of State.

1.3.2 Yorkshire Water: Water Resources and Supply System

Yorkshire Water's supply area is geographically bounded in the west and north by the Pennine Hills and the North York Moors respectively. The southern and eastern parts of the company's supply region are low lying and bounded by the North Sea to the East and the Yorkshire/Lincolnshire border to the south. Annual average rainfall in the region is highest in the Pennine areas whilst low lying areas average less than half as much rainfall each year and with little seasonal variation.

1.3.2.1 Yorkshire Water's Water Resources

Urban areas in the west and south of Yorkshire are principally supplied from reservoirs in the Pennines. Reservoirs located in the Pennines and the valleys of the River Don, River Aire, River Wharfe, River Calder, River Nidd and River Colne provide the largest upland sources of water in the region. Yorkshire Water operates over 100 impounding reservoirs, of which two are major pumped storage reservoirs. The total storage capacity of all the supply reservoirs amounts to some 160,000 million litres (ML).

⁷ Conservation of Habitats and Species Regulations 2017

⁸ Ricardo Energy and Environment (2022) Habitats Regulation Assessment Screening Report

In the eastern and northern parts of the region, river and groundwater abstractions, chiefly from the rivers of the North York Moors and the Yorkshire Wolds respectively, are the major water sources.

1.3.2.2 Yorkshire Water's Supply System

Approximately 45% of supply is derived from impounding reservoirs, 22% from boreholes and 33% from rivers. This varies from year to year depending on weather conditions. Yorkshire Water has an agreement with Severn Trent Water to abstract up to 21,550 Ml per year from the Derwent Valley Reservoirs in Derbyshire for supply to parts of Sheffield, dependent on the control lines in the reservoirs.

The majority of the company's water resources are connected together by a regional grid network. This enables highly effective conjunctive use of different water resources, which mitigates risk and allows optimal planning, source operation and resilient sources of supply both in drought and during floods.

1.3.2.3 Yorkshire Water's Water Resource Zones

The Yorkshire Water region is currently divided into two water resource zones for planning purposes. Each zone represents a group of customers who receive the same level of service for water supply reliability from either groundwater or surface water sources.

The Grid Surface Water Zone (SWZ) represents a highly integrated surface and groundwater zone that is dominated by the operation of lowland rivers and Pennine reservoirs. The East SWZ is supplied by a river abstraction and springs in the Whitby Area.

1.4 Yorkshire Water Drought Planning Process

1.4.1 Overview and timetable

Water companies in England and Wales are required to prepare and maintain Statutory Drought Plans under Sections 39B and 39C of the Water Industry Act 1991, as amended by the Water Act 2003 and in accordance with the DP Regulations 2005 and the DP Direction 2020, which set out the short operational steps a company will take before, during and after a drought

The Water Industry Act 1991 defines a Drought Plan as '*a plan for how the water undertaker will continue, during a period of drought, to discharge its duties to supply adequate quantities of wholesome water, with as little recourse as reasonably possible to drought orders or drought permits*'.

On 1 October 2010, Section 76 of the Water Industry Act 1991 was amended by the commencement of Section 36 of the Flood and Water Management Act 2010. The Water Use (Temporary Bans) Order 2010 also commenced on 1 October 2010 and provides definitions and clarifications on these activities.

The DP Direction 2020 states that all water company draft DPs should be sent to the Secretary of State prior to consultation before 1 April 2021. Water companies must then publish their DP as directed by Defra. A revised (final) DP must be published at least every 5 years from the date the previous DP was published.

Yorkshire Water last published its Statutory Drought Plan in May 2020. The Draft Drought Plan was prepared in 2017 and a Revised Draft Drought Plan was published in June 2018. However, in December 2018, Yorkshire Water applied for two new drought permits which were not previously featured in the Draft Drought Plan or Revised Draft Drought Plan. This constituted a material change to the Drought Plan and consequently, Yorkshire Water issued a formal letter to the Environment Agency, Natural England and Historic England, with its proposed approach for updating the revised draft Drought Plan. This was published for consultation in August 2019 followed by a Statement of Response in November 2019. The Final Drought Plan 2019 was published on 22 May 2020.

Following preparation and consultation Yorkshire Water have now prepared their Drought Plan 2022, which is anticipated to be published in 2022, encompassing the period 2022-2027.

Permission to abstract water, granted through licences issued by the Environment Agency and held and operated by Yorkshire Water, was subject to a 'Review of Consents' in accordance with Regulation 63 of the Conservation of Habitats and Species Regulations 2010 (as amended) (referred to as the Habitats Regulations). This Review of Consents was undertaken by the Environment Agency and included screening to determine a likely significant effect and Appropriate Assessment where likely significant effects are identified, to either affirm an abstraction licence or recommend action to amend the licence conditions. This was in order to ensure that the integrity of European sites is not at risk from the impacts of abstraction. Information provided by the outcomes of the Review of Consents was used to support the HRA screening of the Drought Plan 2022. HRA screening is being undertaken for all drought options to identify any requirements for Appropriate Assessment. This is being undertaken in parallel with the SEA.

Only those drought options which are relevant to the period encompassed by the Drought Plan 2022 (2022 to 2027) are considered in the SEA and HRA process. To this end, environmental effects of the Drought Plan 2022 options are considered within the context of the current licence operating conditions. Potential new sources (which Yorkshire Water may bring on line in the future), new drought options, or revisions to existing options which are only envisaged to become operational post 2027 have, therefore, been excluded from the SEA and HRA screening process. The same approach has also been taken with respect to cumulative plans, projects and programmes, in that only those that are likely to be effective in the period to 2027 are considered in the SEA.

1.4.2 Yorkshire Water's Drought Options

The Drought Plan 2022 identifies triggers that act as decision-points for implementing drought management actions and options. The nature of the triggers varies for each water resource zone, and the nature of the drought management actions or options that will be considered also varies depending on the prevailing drought conditions.

Drought management actions may be applied either company wide, by water resource zone or to target a specific geographic area depending on the nature of the drought event prevailing at the time. The Drought Plan 2022 contains a range of potential supply-side and demand-side drought management options available to Yorkshire Water, for example bringing reserve water sources into use, enhancing the capacity of supply assets to maximise use of available supplies, implementation of drought permits or drought orders and imposing temporary use bans.

Yorkshire Water's Drought Plan 2022 comprises a total of 63 drought options (49 supply side standard options, 9 long term supply options and 5 demand options). This SEA also considers two Environment Agency drought order compensation flow reduction actions.

The scope of the supply-side drought options is listed in **Table 1.1**. Demand-side options are designed to reduce the demand for water and the options available to Yorkshire Water are consistent between all resource zones (see **Table 1.2**).

Table 1.1 Supply-side drought management option examples

Supply Side Options	Comments	Option
Re-commissioning of unused or under-utilised licensed water sources	An option to maximise the use of any underutilised licensed resources will include mothballed and recently abandoned assets. These assets will be used to augment supplies or mitigate against the potential impact of drought orders or permits.	e.g. North West Reservoir Abstraction
Increasing the capacity of water supply assets to maximise use of existing licensed sources	This may comprise temporary or permanent measures to increase the capacity of assets such as pumping stations and water treatment works to increase the use of existing licensed water sources.	e.g. Ouse increased abstraction

Supply Side Options	Comments	Option
Reducing reservoir compensation releases or prescribed river flow conditions	Requires a drought order or permit	e.g. North Area Reservoir 4
Increasing existing abstraction licence volumes	Requires a drought order or permit	e.g. Ure increased abstraction

Table 1.2 Demand-side drought management options

Demand-side options	Comments
Drought publicity campaigns	Increased water efficiency messages via increased customer communications.
Increased leakage detection and repair activity	Ensure that all maintenance programmes are up-to-date and undertake additional leakage control, leading to demonstrable water savings.
Introduction of temporary use ban	Restrictions on the use of hosepipes for a range of uses, including the washing of vehicles and boats, watering gardens and sports grounds and filling of paddling pools.
Introduction of a drought order to ban non-essential water uses (defined in the Drought Direction 2011)	Drought order to restrict non-essential water uses to be applied for when reservoir stocks fall below the Drought Control Line
Emergency drought order to temporarily supply water by means of rota cuts or standpipes	An Emergency Drought order may be applied for in the event of an exceptional drought, in consultation and liaison with the Environment Agency, local authorities and the Consumer Council for Water. This situation would be extremely unlikely to occur and would not arise under a repeat of the worst recorded drought events in Yorkshire.

1.4.2.1 Supply-side options

Potential drought permit/order sites are identified in and **Table 1.3**. There are 49 supply side standard options, 9 long-term supply side options and two Environment Agency drought orders.

Table 1.3: Supply-side options

Water Source		Type of Drought Management Option
Grid Surface Water Resource Zone		
North Area	<u>Standard Option Reservoirs [5]:</u> North Area Reservoir 1, North Area Reservoir 2, North Area Reservoir 3, North Area Reservoir 4, North Area Reservoir 5	Compensation flow release reductions
	<u>Long Term Option [1]:</u> North Yorkshire Groundwater increased abstraction ⁹	Increase in abstraction
North West Area	<u>Standard Option Reservoirs [12]:</u> North West Area Reservoir 1, North West Area Reservoir 2, North West Area Reservoir 3, North West Area Reservoir 4, North West Area Reservoir 5, North West Area Reservoir 6, North West Area Reservoir 7, North West Area Reservoir 8, North West Area Reservoir 9, North West Area Reservoir 10, North West Area Reservoir 11, North West Area Reservoir 12	Compensation flow release reductions
	<u>LTO [1]:</u> North West Reservoir Abstraction	Increase in abstraction from Reservoir. Water abstracted from the reservoir would be transferred via a temporary pipeline to the aqueduct for subsequent treatment at Bradford WTW 1.
South Area	<u>Standard Option Reservoirs [6]:</u> South Area Reservoir 1, South Area Reservoir 2, South Area Reservoir 3, South Area Reservoir 4, South Area Reservoir 5, South Area Reservoir 6	Compensation flow or maintained flow release reductions
South West	<u>Standard Option Reservoirs [20]:</u> South West Area Reservoir 1, South West Area Reservoir 2, South West Area Reservoir 3, South West Area Reservoir 4, South West Area Reservoir 6, South West Area Reservoir 7, South West Area Reservoir 8, South West Area Reservoir 10, South West Area Reservoir 11, South West Area Reservoir 12, South West Area Reservoir 13, South West Area Reservoir 14, South West Area Reservoir 15, South West Area Reservoir 16, South West Area Reservoir 17, South West Area Reservoir 18, South West Area Reservoir 19, South West Area Reservoir 20, South West Area Reservoir 21, South West Area Reservoir 22	Compensation flow release reductions
South West (EA)	<u>Environment Agency Drought Order options [2]:</u> South West Area Reservoir 5, South West Area Reservoir 9	Compensation flow release reductions
Stand Alone	<u>Standard option [6]:</u> Ouse increased abstraction	Increase river abstraction rates at lower river flows
	Ure increased abstraction	Permit river abstraction at low flows
	Wharfe reduced regulated flow	Reduce river regulation requirements.
	Wharfe increased annual abstraction	Increase annual abstraction limit

⁹ This option was included in WRMP19 preferred solution and is scheduled to be brought into supply in 2022/23, however is included as a long term option in the drought plan until that time.

Water Source		Type of Drought Management Option
	Hull increased abstraction	Reduce hands-off river flow to enable increased abstraction.
	Derwent annual abstraction increase	Increase annual abstraction limit
	LTO: [7] East Yorkshire Groundwater Option 2 ¹⁰	Utilisation of existing abstraction which will require relocation of borehole.
	Tees – Swale transfer	Permit abstraction of up to 40 MI/d from the River Tees for transfer by pipeline to the River Swale, with subsequent re-abstraction of the discharged water further downstream from the Ouse increased abstraction.
	Tees - Derwent Pipeline <i>This option would not be additional to the River Tees to River Swale Transfer option. Only one of these two options would be implemented.</i>	Abstraction of up to 40 MI/d from the River Tees with construction of new pipelines to transfer the raw water to River Derwent Water Treatment Works.
	Aire abstraction	New river abstraction of up to 50 MI/d
	Ouse increased abstraction	Increase the abstraction capacity of the Ouse pumping station by 10 MI/d. This would enable the full daily abstraction licence volume to be abstracted from the Ouse increased abstraction when river flows exceed the prescribed flow set in the abstraction licence (or in a drought permit if granted).
	Ouse water treatment works extension	Additional river abstraction and water treatment capacity (additional 25 MI/d average abstraction) at Ouse abstraction, within existing abstraction licence conditions.
	Ouse Raw Water Transfer ¹¹	Additional river abstraction capacity of approximately 60 MI/d to enable the full average abstraction licence quantity of 96 MI/d average to be abstracted (130MI/d peak). New raw water pipeline to link to existing raw water pipeline Ouse pumping station to River Derwent Water Treatment Works 1.
East Surface Water Resource Zone		
None	N/A	N/A
East Groundwater Resource Zone		
None	N/A	N/A

¹⁰ This option was included in WRMP19 preferred solution and is scheduled to be brought into supply in 2025/26, however is included as a long term option in the drought plan until that time.

¹¹ It is most likely Yorkshire Water would only require one of the River Ouse options 1 and 2 but it is possible that they could also be developed as a combined scheme, but with the aggregate additional abstraction capacity limited to 60 MI/d to keep within the 96 MI/d average abstraction licence limit. This would give maximum treatment and water distribution flexibility.

The Drought Plan 2022 includes nine supply side options which Yorkshire Water would consider in the event of a long term drought lasting more than two years (see **Table 1.3**), strengthening the resilience of measures available to the company should a very severe and prolonged drought event occur. Historically there has not been a drought event in Yorkshire that has lasted more than two years. A three-year drought has never been experienced in the Yorkshire region since reliable records began, and there is a very low probability (greater than 1 in 400 years return period) of such an event occurring. Nevertheless, in accordance with national drought planning guidance, it is important for Yorkshire Water to demonstrate that it has considered what actions could be implemented if such a severe drought were to occur in the future. The long term options are also considered 'extreme' drought actions that Yorkshire Water would consider alongside other extreme actions should the severity of any future drought create a risk that measures such as pressure reduction¹².

The long term options considered in this report may need a drought permit or order, and as such would require a detailed environmental assessment report (EAR) to be produced to accompany any future application. These assessments would be produced in accordance with the Environment Agency Drought Plan Guidance¹³ and utilise all baseline data and information available at that time.

1.4.2.2 Drought Option Implementation and the Role of SEA

In its Drought Plan 2022, Yorkshire Water has set out the triggers that would lead to implementation of each of the drought options summarised above. These triggers are based on specified monthly water storage volumes in appropriate groupings of reservoirs (drought 'control lines'). Preceding actions are also set out that would occur in advance of the option being implemented (for example, a temporary use ban would be in place prior to applying for a drought permit for the Ouse increased abstraction in the months of April to September). Not all options would necessarily be required in any particular drought: the options required will be dependent on the geographical extent, magnitude, time of year and duration of a drought event.

Most of the options would only be contemplated once reservoir storage falls close to the relevant Drought Control Line for each reservoir storage group. For example, the temporary use ban would be implemented if projected storage six weeks ahead is forecast to cross the Drought Control Line; drought orders or permits would be applied for if storage approaches the Drought Control Line. There is a progressive and sequential approach to option implementation, with those options having the least impact on customers and/or the environment being implemented first, whilst those that have the greatest impact would only be implemented in the event of a very severe drought event (a drought of greater magnitude than any previously experienced drought event).

The SEA assessment of each of these options and their cumulative impacts provides a consistent and relative assessment of the impact of each option to inform the consideration of the appropriate sequencing of option implementation, alongside other factors such as practicability, risks to drinking water quality and security risks. It is noted that some drought options may have different environmental effects depending on the season of implementation (for example, a summer drought compared to a winter drought). As drought measures can theoretically be required and implemented at any time of year, overall impacts are assessed on a worst-case basis in the SEA.

The SEA outputs were used to review the Drought Plan 2022 option sequencing and, where appropriate, changes may be made to the Drought Plan 2022 to reflect the SEA assessment.

¹² These actions are defined as 'level 4 actions' in the Drought Plan 2022. In line with the 2020 DPG, Yorkshire Water has considered extreme actions in the Drought Plan, which are also known as 'more before 4' actions and would be implemented as a means to avoid level 4 actions.

¹³ Environment Agency (2020) Water Company Drought Plan Guideline, December 2020 (Version 1.2).

1.4.2.3 Supporting Information

Drought options included in the SEA and HRA screening will be documented by Yorkshire Water in the Drought Plan 2022, accompanied by drought management action forms as specified by the Drought Plan Guidance¹⁴. The information provided in these forms will be used to inform the SEA.

Environmental assessment studies of Yorkshire Water's drought permit / order sites have been carried out and information from these studies will be used to inform the SEA and HRA.

1.5 Drought Contingency Planning Environmental Assessments

Environmental Assessment Reports (EARs) have been prepared for the drought permits/order sites identified in **Table 1.3**, to support Yorkshire Water's Drought Plan 2022.

The aim of these studies was to produce environmental reports (EARs) that have been agreed with the Environment Agency and Natural England such that in the event of a drought, they are readily available for updating based on the prevailing drought situation at that time. The environmental studies consider all potentially affected habitats and species including, but not limited to, Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar features as well as any Site of Special Scientific Interest (SSSI) or species/habitats of principal importance for the conservation of biodiversity in England (identified in the Natural Environment and Rural Communities (NERC) Act 2006 Section 41) and local wildlife sites. The EAR also sets out the limits of the current data and also includes Environmental Monitoring Plan (EMP) recommendations for each drought permit/order site. These environmental studies, undertaken outside of an actual drought event, are intended to be used as the basis for the EAR to be prepared in support of a specific drought permit/order application, should the need arise.

Information from the assessments support this report and have been used to inform the SEA and HRA.

1.6 Stages of SEA Process

Table 1.4 is an extract from the Government's SEA guidance, the Practical Guide¹⁵ that sets out the main stages of the SEA process and the purpose of each task within the process. This Environmental Report represents Stage C: Tasks C1 of the SEA process. Specific guidance on the application of the SEA process to Drought Plans is provided in a best practice publication by UKWIR (2021)¹⁶.

¹⁴ Environment Agency (2020) Water Company Drought Plan guideline, April 2020

¹⁵ Office of the Deputy Prime Minister (2005). A Practical Guide to the Strategic Environmental Assessment Directive.

¹⁶ UKWIR (2021) Environmental Assessment Guidance for Water Resources Management Plans and Drought Plans (WR/02/S). Prepared by Ricardo Energy & Environment.

Table 1.4 SEA Stages and Tasks

SEA Stages and Tasks	Purpose
Stage A: Setting the context and objectives, establishing the baseline and deciding on the scope	
Task A1. Identifying other relevant plans, programmes and environmental protection objectives	To establish how the plan or programme is affected by outside factors to suggest ideas for how any constraints can be addressed, and to help identify SEA objectives
Task A2. Collecting baseline information	To provide an evidence base for environmental problems, prediction of effects, and monitoring; to help in the development of SEA objectives
Task A3. Identifying environmental problems	To help focus the SEA and streamline the subsequent stages, including baseline information analysis, setting of the SEA objectives, prediction of effects and monitoring.
Task A4. Developing SEA Objectives	To provide a means by which the environmental performance of the plan or programme and alternatives can be assessed.
Task A5. Consulting on the scope of the SEA	To ensure the SEA covers the likely significant environmental effects of the plan or programme.
Stage B: Developing and refining alternatives and assessing effects	
Task B1. Testing the plan or programme objectives against SEA objectives	To identify potential synergies or inconsistencies between the objectives of the plan or programme and the SEA objectives and help in developing alternatives.
Task B2. Developing strategic alternatives	To develop and refine strategic alternatives
Task B3. Predicting the effects of the plan or programme, including alternatives	To predict the significant environmental effects of the plan or programme and its alternatives
Task B4. Evaluating the effects of the plan or programme, including alternatives	To evaluate the predicted effects of the plan or programme and its alternatives and assist in the refinement of the plan or programme
Task B5. Mitigating adverse effects	To ensure that adverse effects are identified and potential mitigation measures are considered.
Task B6. Proposing measures to monitor the environmental effects of plan or programme implementation	To detail the means by which the environmental performance of the plan or programme can be assessed.
Stage C: Preparing the Environmental Report	
Task C1. Preparing the environmental report	To present the predicted environmental effects of the plan or programme, including alternatives, in a form suitable for public consultation and use by decision-makers.
Stage D: Consulting on the Draft Plan or programme and the Environmental Report	
Task D1. Consulting the public and consultation bodies on the draft plan or programme and the Environmental Report	<p>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.</p> <p>To gather more information through the opinions and concerns of the public</p>
Task D2. Assessing significant changes	To ensure that the environmental implications of any significant changes to the draft plan or programme at this stage are assessed and taken into account

SEA Stages and Tasks	Purpose
Task D3. Making decisions and providing information	To provide information on how the Environmental Report and consultees opinions were taken into account in deciding the final form of the plan or programme to be adopted
Stage E: Monitoring the significant effects of the plan or programme on the environment	
Task E1. Developing aims and methods for monitoring	To track the environmental effects of the plan or programme to show whether they are as predicted; to help identify adverse effects
Task E2. Responding to adverse effects	To prepare for appropriate responses where adverse effects are identified.

1.7 Structure of Environmental Report

This SEA Environmental Report presents the findings of Tasks B1 to C1 set out in **Table 1.4** and provides the consultation bodies with an opportunity to express their opinions on the findings of the assessment.

This Section (**Section 1**) of the report describes the overall purpose and process of the SEA and background to Yorkshire Water's water supply system and drought planning process. It also gives details of consultation on the SEA. The remainder of the report is structured as follows:

Section 2 – Policy Context, provides a review of other policies, plans and programmes which influence the Drought Plan 2022.

Section 3 – Environmental Baseline Review, sets out the key environmental issues Yorkshire Water has considered in the SEA, drawing on information on the current state of the environment within Yorkshire Water's water supply area.

Section 4 – Methodology, provides details of the methods employed in undertaking the assessment including the cumulative effects assessment methodology.

Section 5 – Assessment of Drought Options, presents the potential impacts of the various Drought Plan 2022 options against the SEA framework.

Section 6 – Cumulative Effects Assessment, discusses the potential in-combination impacts of drought options (intra-zone and inter-zone), demand management options and other plans and projects in the region.

Section 7 – Mitigation and Monitoring, discusses measures envisaged to prevent, reduce and offset any significant adverse effects of implementing the Drought Plan 2022 and monitoring to track the environmental effects to show whether they are as predicted, to help identify any adverse impacts and trigger deployment of mitigation measures.

1.8 Consultation

1.8.1 Overview

Two opportunities are available for consultation bodies to be formally involved during the SEA process: during the scoping process; and at the environmental reporting stage. These are discussed below.

Following publication of the final Drought Plan 2022, Yorkshire Water will prepare an SEA Post-Adoption Statement setting out how the SEA and any views expressed by the consultation bodies or the public have influenced the Drought Plan 2022.

1.8.2 Consultation on the Scoping Report

Consultation bodies were invited to express their views on the Scoping Report and the scope of the SEA proposed in accordance with SEA Regulation 12(5).

The Scoping Report was issued on 26 May 2020 to the Environment Agency, Historic England and Natural England. The consultation period ran until 30 June 2020. The Statutory consultees were invited to comment on the report and the proposed scope of the SEA.

1.8.3 Consultation on the Environmental Report

The Environmental Report of the Drought Plan 2022 was produced in accordance with the approach agreed by Yorkshire Water and taking into consideration the responses received from consultation bodies in response to the Scoping consultation. It provided assessments of the likely significant effects of the drought options considered and selected by Yorkshire Water.

The Draft Drought Plan 2022 and the SEA Environmental Report were issued to Defra in March 2021 and published on Yorkshire Water's website. A 7.5 week public consultation was held between 8 June and 29 July 2021.

The statutory consultation bodies (Environment Agency, Natural England and Historic England), as well as the public, were invited to express their views on the Environmental Report and were able to use it as a reference point in expressing their views on Yorkshire Water's Draft Drought Plan 2022.

A Statement of Response has been prepared which explains the changes Yorkshire Water will make to the Drought Plan (and accompanying documents, including the SEA) as a result of the consultation. Comments that were received through this consultation process have been taken into consideration in preparing subsequent updates to the SEA.

Following the publication of the Final Drought Plan 2022, Yorkshire Water will also publish a 'Post Adoption' Statement setting out how the SEA, and any views expressed by the consultation bodies or the public, influenced the Final Drought Plan 2022.

When the Drought Plan is implemented during an actual drought event, Yorkshire Water will monitor its effects on the environment, helping to ensure that the potential impacts identified in the SEA are considered in practice.

1.9 Quality Assurance

ODPM Guidance on SEA contains a Quality Assurance checklist to help ensure that the requirements of the SEA Regulations are met. The checklist is reproduced in **Appendix A, Table A1**, indicating where this Environmental Report meets the requirement.

2 Policy Context

2.1 Introduction

In accordance with the SEA Regulations, a summary of the key policy messages from the review of relevant policies, plans and programmes is presented in Section 2.2 (full review is presented in **Appendix B**. A summary of environmental baseline key issues is presented in Section 3 (full environmental baseline is presented in **Appendix C**).

2.2 Review of Policies, Plans and Programmes

2.2.1 Introduction

One of the first steps in undertaking SEA is to identify other relevant policies, plans, programmes and environmental protection objectives. The review of these other plans sets out to establish how Yorkshire Water's Drought Plan 2022 might be affected by other plans, to identify other environmental protection objectives which the Drought Plan 2022 should consider and to help to identify the objectives for the SEA.

Potentially relevant plans and programmes were identified at the international, national, regional and local level. If the plan or programme does not have a significant effect on achieving the objectives of the Drought Plan 2022 or the Drought Plan 2022 does not have a significant effect on achieving the objectives of the other plan or programme, it was not included.

The full list of international, national, regional and local policies, plans, programmes and strategies reviewed and the key messages, targets and how they relate to SEA topics and SEA objectives are provided in **Appendix B** and listed in **Table 2.1**.

Table 2.1: Key Policy Messages derived from the review of Plans, Policies and Programmes

SEA Topic	Key Messages	Policies
Biodiversity, flora and fauna	Protection and enhancement of biodiversity, particularly internationally and nationally designated sites and priority habitats and species, whilst also considering their ability to adapt to a changing climate	International: Convention on Biological Diversity, COP Decision X/2, Strategic Plan for Biodiversity 2011-2020 (2010) European Commission, The EU Biodiversity Strategy to 2020 (2011) European Commission, Birds Directive (2009/147/EC) European Commission, Marine Strategy Framework Directive (2008/56/EC) European Commission, Fresh Water Fish Directive (2006/44/EC) European Commission, Directive on Animal health requirements for aquaculture animals and products thereof, and on the prevention and control of certain diseases in aquatic animals (2006/88/EC) European Commission The Water Framework Directive (2000/60/EC) European Commission, Habitats Directive (1992/43/EEC) Ramsar Convention The Convention on Wetlands of International Importance (1971) The Bonn Convention on the Conservation of Migratory Species of Wild Animals (1983) The Bern Convention on the Conservation of European Wildlife and Natural Habitats (1979) United Nations (1992) Convention on Biological Diversity (CBD) National: Conservation of Habitats and Species Regulations 2017 Defra (2020) Enabling a Natural Capital Approach (ENCA) Defra (2015) The government's response to the Natural Capital Committee's third State of Natural Capital report Defra (2015) The Great Britain Invasive Non-native Species Strategy Defra (2011) Water for Life - Water White Paper Defra (2011) The Natural Choice: Securing the value of nature. The Natural Environment White Paper Defra (2011) Biodiversity 2020: A Strategy for England's Wildlife and Ecosystem Services Defra (2010) Delivering a Healthy Natural Environment. Ecosystem Approach Action Plan (updated)
	Promote a catchment-wide or landscape-scale approach to biodiversity management to ensure better protection of the natural environment and heritage.	
	To achieve favourable condition for priority habitats and species, including UK NERC habitats and species.	
	Avoidance of activities likely to cause irreversible damage to nature conservation and natural heritage.	
	Recognise the wider benefits of eco-system services through support for well-functioning ecosystems, respect environmental limits and capacities, and maintain/enhance coherent ecological networks, including provision for fish passage and connectivity for migratory/mobile species.	
	Strengthen the connections between people and nature and realise the value of biodiversity.	

SEA Topic	Key Messages	Policies
	Recognise importance of natural capital in supporting current and future development and seek to ensure natural capital is properly taken into account in all decision-making.	Defra (2010) Making Space for Nature: A Review of England's Wildlife Sites and Ecological Network
	A need to protect and, where possible, enhance the blue green infrastructure network, including green spaces and other environmental features. .	Defra (2011) UK National Ecosystem Assessment and Defra (2014) UK National Ecosystems Assessment Follow on, Synthesis of Key Findings
	To seek opportunities for biodiversity net gain from infrastructure development.	Defra (2015) The Great Britain Invasive Non-native Species Strategy
	Avoidance of activities likely to increase the risk of spread of Invasive Non-Native Species (INNS).	Defra (2008), England Biodiversity Strategy –climate change adaptation principles Defra (2007) Conserving Biodiversity in a Changing Climate, Guidance of Building Capacity to Adapt Environment Agency (2018) Creating a better place: Our ambition to 2020 Environment Agency (undated) Hydroecology: Integration for modern regulation Environment Agency (undated) WFD River Basin Characterisation Project Environment Agency CAMS (various) HM Government (2018) A Green Future: Our 25 Year Plan to Improve the Environment MHCLG (2012) National Policy Planning Framework Natural Environment and Rural Communities Act 2006 Salmon and Freshwater Fisheries Act 1975 The Environmental Damage (Prevention and Remediation) (England) Regulations 2015 The Eels Regulations 2009 (as amended) The Countryside and Rights of Way (CROW) Act 2000 Wildlife and Countryside Act 1981 (as amended) Water Resources Act 1991 (Amendment) Regulations 2009 SI3104 4CBG (2012) UK Post-2010 Biodiversity Framework Regional/Sub-regional: Canal & Rivers Trust (2015) North East Waterway Fisheries & Angling Action Plan Environment Agency and Defra (2015) Humber River Basin District River Basin Management Plan Biodiversity Action Plans (various) Natural England (2014) Site Improvement Plans (SIPs) for Natura 2000 Sites Natural England National Character Area (NCA) Profiles Leeds City Region (2017) Green and Blue Infrastructure Strategy North York Moors Park Authority (2019) National Park Management Plan 2019-2024

SEA Topic	Key Messages	Policies
		<p>Peak District National Park Authority (2018) Peak District National Park Management Plan 2018 – 2023</p> <p>Yorkshire Dales National Park Authority (2013) Yorkshire Dales National Park Management Plan 2013-2018</p>
Population and human health	Water resources play an important recreation role. A reliable and wholesome water supply is vital to public health protection. Effective water resource management can create opportunities for regeneration, tourism and the wider economy	<p>International:</p> <p>European Commission, Drinking Water Directive (1998/83/EC)</p> <p>European Commission, Ambient Air Quality Directive (2008/50/EC)</p> <p>European Commission, Floods Directive (2007/60/EC)</p> <p>European Commission, The Bathing Waters Directives (76/160/EEC & 2006/7/EC)</p> <p>United Nations Economic Commission for Europe (1998) Aarhus Convention - Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters</p> <p>The Environment Noise Directive (Directive 2002/49/EC)</p> <p>National:</p> <p>The Countryside and Rights of Way (CROW) Act, 2000</p> <p>Defra (2011) Water for Life -Water White Paper</p> <p>Defra (2011) The Natural Choice: securing the value of nature. The Natural Environment White Paper</p> <p>Defra (2007) The Air Quality Strategy for England, Scotland and Wales</p> <p>Defra (2005) Securing the Future; Delivering UK Sustainable Development Strategy</p> <p>Defra (2004) Rural Strategy</p> <p>Defra, Environment Agency, Natural England, Forestry Commission England (2016) Creating a great place for living</p> <p>Department of Energy and Climate Change (2011) Planning our electric future: a White Paper for secure, affordable and low carbon electricity</p> <p>Environment Agency (2018) Creating a better place: Our ambition to 2020</p> <p>HM Government (2018) A Green Future: Our 25 Year Plan to Improve the Environment</p> <p>HM Government (2016) National Infrastructure Delivery Plan 2016-2021</p> <p>HM Government (2014) National Infrastructure Plan</p> <p>HM Treasury (2015) Fixing the Foundations: creating a more prosperous nation.</p> <p>MHCLG (2019) National Planning Policy Framework 2019</p>
	The issue of water supply is becoming a development constraint in some areas, which is recognised as an issue in the National Planning Policy Framework.	
	To ensure all communities have a clean, safe and attractive environment in which people can take pride.	
	Increase awareness around the value and health benefits of water and encourage its sustainable use.	

SEA Topic	Key Messages	Policies
		<p>The Natural Environment and Rural Communities (NERC) Act (2006)</p> <p>Regional/Local:</p> <p>Leeds City Region (2017) Green and Blue Infrastructure Strategy</p> <p>Leeds City Region Enterprise Partnership & West Yorkshire Combined Authority (2016) Leeds City Region Strategic Economic Plan, 2016-2036</p> <p>Local Planning Authority (various) Local Plans/Local Development Plans</p> <p>North Yorkshire County Council (2019) Council Plan 2020-2024</p> <p>Public Rights of Way Improvement Plans (ROWIPs)</p> <p>West Yorkshire Combined Authority, Various Projects</p>
Material assets and resource use	Promote sustainable production and consumption whilst seeking to reduce the amount of waste generated by using materials, energy and water more efficiently	<p>International:</p> <p>European Commission (1999) Landfill of Waste Directive (99/31/EC)</p> <p>United Nations (2002) Commitments arising from the World Summit on Sustainable Development, Johannesburg</p> <p>National:</p> <p>Department of Energy and Climate Change (2011) National Policy Statements for Energy Infrastructure</p> <p>Defra (2011) Government Review of Waste Policy in England 2011</p> <p>Defra (2011), Water for Life, Water White Paper, November 2011</p> <p>Defra (2008) Future Water: the Government's water strategy for England</p> <p>Department for Business, Energy and Climate Change (2007) Energy White Paper: Meeting the Energy Challenge (Updated version expected Spring 2020)</p> <p>HM Government (2016) National Infrastructure Delivery Plan 2016-2021</p> <p>HM Treasury (2015) Fixing the Foundations: creating a more prosperous nation.</p> <p>HM Treasury Infrastructure UK (2014) National Infrastructure Plan</p> <p>Environment Agency (2013), Managing Water Abstraction</p> <p>Environment Agency (2010) Water Resources Action Plan for England and Wales</p> <p>Environment Agency (2009) Water Resources Strategy for England and Wales</p> <p>Environment Act 1995</p> <p>HM Government (2018) A Green Future: Our 25 Year Plan to Improve the Environment</p> <p>HM Government (2016) National Infrastructure Delivery Plan 2016-2021</p> <p>HM Treasury Infrastructure UK (2014) National Infrastructure Plan</p>
	Consider issues of water demand, water supply and water quality in the natural environment and ensure a sustainable use of water resources	
	Maintain a reliable public water supply and ensure there is enough water for human uses, as well as providing an improved water environment	
	Accelerating the transition to sustainable forms of energy and achieving regional renewable energy deployment targets	
	Minimise the production of waste, ensure waste management is in line with the 'waste hierarchy', and eliminate waste sent to landfill.	

SEA Topic	Key Messages	Policies
		<p>HM Treasury (2015) Fixing the Foundations: creating a more prosperous nation. HM Government, The Natural Choice: Securing the Value of Nature (2011). MHCLG (2019) National Planning Policy Framework 2019 Natural Environment White Paper, June 2011 Natural Resources Wales, Drought Plan The Water Act, 2003</p> <p>Regional/Local: National Park Authorities Management Plans Water Company (various) Drought Plans adjacent to supply area Yorkshire Water Services Ltd, Final Water Resources Management Plan 2019</p>
Water	Reduce the sources of flooding and harm to people, and the natural, built and historic environment caused by floods and promote sustainable flood risk management measures	<p>International: European Commission, Drinking Water Directive (1998/83/EC) European Commission, Floods Directive (2007/60/EC) European Commission, The Water Framework Directive (2000/60/EC)) European Commission, Urban Waste Water Treatment Directive (1991/271/EEC) European Commission Environmental Liability Directive (2004/35/EC) European Commission Revised Bathing Water Quality Directive (76/160/EEC) European Commission Urban Waste Water Treatment Directive (91/271/EEC) European Commission Nitrates Directive (91/676/EEC)</p> <p>National: Defra (2012) The UK Climate Change Risk Assessment 2012 Evidence Report Defra (2011) Water for Life - Water White Paper Defra (2011) The Natural Choice: Securing the value of nature. The Natural Environment White Paper Defra (2008) Future Water: the Government's water strategy for England Defra (2005) Making Space for Water Environment Agency (2017) Drought response: our framework for England Environment Agency (2013) Managing Water Abstraction</p>
	Promote sustainable water resource management, including a reduction in water consumption	
	Maintain and improve water quality (surface waters, groundwater and bathing waters)	
	Expanding the scope of water protection to all waters, surface waters and groundwater	

SEA Topic	Key Messages	Policies
	Improve the quality of the water environment and the ecology which it supports, and continue to provide high levels of drinking water quality	Environment Agency (2011) National Flood and Coastal Risk Management Strategy for England Environment Agency (2010) Water Resources Action Plan for England and Wales Environment Agency (2009) Water Resources Strategy for England and Wales Environment Agency CAMS (various) Environment Agency Catchment Flood Management Plans Environment Agency (1999) Restoring Sustainable Abstraction Programme Strategy Process Environment Agency and Defra (2015) Anglian river basin district, River basin management plan Environment Agency and Natural Resources Wales (2016) Severn river basin district flood risk management plan 2015-2021 Environment Agency and other lead authorities Shoreline Management Plans Environment Agency, Drought response: our framework for England (2015) Flood and Water Management Act (2010) HM Government (2018) A Green Future: Our 25 Year Plan to Improve the Environment MHCLG (2019) National Planning Policy Framework 2019 The Water Act (2003) The Water Environment (WFD) (England and Wales) Regulations 2003 Water Industry Act 1991 was amended by the commencement of Section 36 of the Flood and Water Management Act 2010 Water Resources Act 1991 (Amendment) (England and Wales) Regulations 2009 SI3104 The Water Resources Management Plan Regulations 2007 UKTAG WFD Guidance Documents (various dates) DEFRA (2016) Guiding principles for water resources planning for water companies operating wholly or mainly in England The State of the Environment: Water Resources 2018
	Ensure appropriate management of abstractions and protect flow and level variability across the full range of regimes from low to high conditions	Regional/Local: Neighbouring water company WRMPs (2019) and Drought Plans (2018/19) Environment Agency (2016) Humber river basin district flood risk management plan 2015-2021 Environment Agency, CAMS (various) Leeds City Region (2017) Green and Blue Infrastructure Strategy
	Encourage more efficient use of water and promote awareness of water sustainability.	

SEA Topic	Key Messages	Policies
		<p>National Park Authorities Management Plans</p> <p>Yorkshire Water Services Ltd, Final Water Resources Management Plan 2019</p> <p>Water Level Management Plans and River Restoration Plans:</p> <ul style="list-style-type: none"> • Environment Agency (2010) Restoring the River Hull Headwaters, River Restoration Plan. • River Hull Advisory Board (2015) River Hull Integrated Catchment Strategy (RHICS) • Environment Agency (2010) Restoring the Yorkshire River Derwent, Technical Report. • Yorkshire Esk Rivers Trust (2014) River Esk 3 Year Action Plan (2014-2017) • Natural England (2013) Restoring the River Wharfe SSSI: A River Restoration Plan • Natural England (2010) Restoring the Yorkshire Derwent • Environment Agency (2006) Pevensy Levels SSSI: Water Level Management Plan
Soil, geology and land use	Maintain the quality and diversity of geology and soils, which can be lost or damaged by insensitive development	<p>International:</p> <p>Council of Europe (2003) European Soils Charter</p> <p>European Commission (2006) Thematic Strategy for Soil Protection</p> <p>European Commission (1999) Landfill of Waste Directive (99/31/EC)</p> <p>National:</p> <p>The Countryside and Rights of Way (CROW) Act 2000</p> <p>Defra (2009) Safeguarding our Soils – A Strategy for England</p> <p>Defra (2004) The First Soil Action Plan for England</p> <p>Defra (2004) Rural Strategy 2004</p> <p>Defra (2002) The Strategy for Sustainable Farming and Food – facing the future</p> <p>Environment Agency (2007) Soil a precious resource: Strategy for protecting, managing and restoring soil</p> <p>MHCLG (2018) National Planning Policy Framework 2018</p> <p>Natural England (2011) UK Geodiversity Action Plan</p>
	Ensure that soils will be protected and managed to optimise the varied functions that soils perform for society (e.g. supporting agriculture and forestry, protecting cultural heritage, supporting biodiversity, as a platform for construction), in keeping with the principles of sustainable development.	
	Promote catchment-wide approach to land use management in order to benefit natural resources, reduce pollution and develop resilience to climate change.	

SEA Topic	Key Messages	Policies
	Promote mixed use developments, and encourage multiple benefits from the use of land in urban and rural areas, recognising that some open land can perform many functions.	Wildlife and Countryside Act 1981 (as amended) Regional/local: Natural England - National Character Area (NCA) profiles Local Geodiversity Action Plans (LGAPs) Local Planning Authority (various) Local Plans/Local Development Plans Peak District National Park Authority (2018), Peak District National Park Management Plan 2018-2023 Yorkshire Dales National Park Authority (2019), Yorkshire Dales National Park Management Plan 2019-24
Air and climate	To reduce the health risk and environmental degradation from main air pollutants without imposing unacceptable economic or social costs	International: The Paris Agreement (2016), The Cancun Agreement (2011) & Kyoto Agreement (1997) European Commission (2008) Ambient Air Quality Directive (2008/50/EC) European Commission (2009) Promotion of the use of energy from renewable sources Directive (2009/28/EC) European Commission (2005) Thematic Strategy on Air Pollution National: Defra (2013) The National Adaptation Programme: Making the country resilient to a changing climate Defra (2012) The UK Climate Change Risk Assessment 2012 Evidence Report DECC (2011) Planning our electric future: a White Paper for secure, affordable and low carbon electricity DECC (2011) National Policy Statements for Energy Infrastructure DECC (2007) Energy White Paper: Meeting the Energy Challenge (New Energy White Paper expected Spring 2020) Department of Trade and Industry (2003), Energy White Paper. Our Energy Future: Creating a Low Carbon Economy Defra (2012) The UK Climate Change Risk Assessment 2012 Evidence Report Defra (2008), England Biodiversity Strategy –climate change adaptation principles Defra (2008) Future Water: the Government's water strategy for England
	Cut the UK's carbon dioxide emissions by at least 100% by the year 2050, including through the contributions being made by water companies to reduce GHG emissions associated with water supply.	
	Reduce the effects of air pollution on ecosystems.	
	Improve overall air quality	
	Sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and the cumulative impacts on air quality from individual sites in local areas.	
	Minimise energy consumption, support the use of sustainable/renewable energy and improve resilience to climate change.	

SEA Topic	Key Messages	Policies
	Build in adaption to climate change to future planning and consider the level of urgency of associated risks of climate change impacts accordingly.	<p>Defra (2007) The Air Quality Strategy for England, Scotland and Wales Defra (2007) Conserving Biodiversity in a Changing Climate: Guidance on Building Capacity to Adapt English Heritage, now known as Historic England (2008) Climate Change and the Historic Environment HM Government (2018) A Green Future: Our 25 Year Plan to Improve the Environment HM Government (2016) National Infrastructure Delivery Plan 2016-2021 MHCLG (2018) National Planning Policy Framework 2018 Natural England National Character Area (NCA) Profiles The Climate Change Act 2008 The Energy Act 2013 UKCIP (2018) UK Climate Projections UKCP18 (2018)</p> <p>Regional/Local: Yorkshire Water Services Ltd, Final Water Resources Management Plan 2019 Leeds City Region (2017) Green and Blue Infrastructure Strategy Leeds City Region Enterprise Partnership & West Yorkshire Combined Authority (2016) Leeds City Region Strategic Economic Plan, 2016-2036 Local Planning Authority (various) Local Plans/Local Development Plans North Yorkshire County Council (2019) Council Plan 2020-2024 West Yorkshire Combined Authority, Various Projects</p>
Archaeology and cultural heritage	Built development in the vicinity of historic buildings could have implications for the setting and/or built fabric	<p>International: Granada Convention (1985) Convention for the Protection of the Architectural Heritage of Europe Valletta Convention (1992) Convention on the Protection of Archaeological Heritage of Europe (revised) The World Heritage Convention (UNESCO) 1972 – a global instrument for the protection of cultural and natural heritage.</p>

SEA Topic	Key Messages	Policies
	Ensure any adverse effects to heritage should be minimised or avoided altogether, particularly to World Heritage Sites	European Commission (2007), Floods Directive (2007/60/EC) National: Ancient Monuments and Archaeological Areas Act 1979 Department for Culture, Media and Sport (2001) The Historic Environment – A Force for the Future Defra (2011) The Natural Choice: securing the value of nature, The Natural Environment White Paper Defra (2011) UK National Ecosystem Assessment Defra (2004) The First Soil Action Plan for England HM Government (2018) A Green Future: Our 25 Year Plan to Improve the Environment MHCLG (2018) National Planning Policy Framework 2018 English Heritage, (now known as Historic England) (2008), Climate Change and the Historic Environment English Heritage (2016), English Heritage, now known as Historic England (2016) Heritage at Risk Historic England (2015) Historic Environment Good Practice Advice in Planning Note 3 Historic England (2013) Strategic Environmental Assessment, Sustainability Appraisal and the Historic Environment Planning (Listed Buildings and Conservation Areas) Act 1990 Regional/Local: AONB Management Units (various) AONB Management Plans English Heritage, (now known as Historic England) Heritage at Risk Register: Yorkshire and Humber (2011) English Heritage, Heritage at Risk Register: North East (2011) Visit England, Yorkshire and the Humber Regional Summary – Research and Highlights (2010) Hadrian's Wall Heritage Ltd, Hadrian's Wall Management Plan 2014 – 2019 (2014) North York Moors Park Authority, National Park Management Plan (2019) Peak District National Park Authority (2018), Peak District National Park Management Plan 2018 – 2023 Yorkshire Dales National Park Authority (2019), Yorkshire Dales National Park Management Plan 2019-2024 Saltaire World Heritage Site Management Plan 2014 Fountain Abbey / Studley Royal World Heritage Site Management Plan 2015 - 2021
	Ensure active management of the Region's environmental and cultural assets. Ensure protection and enhancement of historic assets and their settings, particularly those of international and national importance.	
	Promote heritage and landscape as central to the culture of the region and conserve and enhance distinctive characteristics of landscape and settlements, particularly in the Peak District, North York Moors and Yorkshire Dales National Parks.	

SEA Topic	Key Messages	Policies
Landscape and visual amenity	Protection and enhancement of urban and rural landscapes (including designated landscapes, landscape character and the countryside).	International: Council of Europe (2006) European Landscape Convention Council of Europe (2000) European Landscape Convention (Florence Convention) The Marine Coastal Act (2009) National: The Countryside and Rights of Way (CROW) Act (2000) Historic England (2015) Historic Environment Good Practice Advice in Planning Note 3 HM Government (2018) A Green Future: Our 25 Year Plan to Improve the Environment MHCLG (2018) National Planning Policy Framework 2018 Defra (2011) The Natural Choice: Securing the value of nature. The Natural Environment White Paper Defra (2010) Making Space for Nature: A Review of England's Wildlife Sites and Ecological Network Wildlife and Countryside Act 1981 (as amended) Regional/Local: AONB Management Units (various) AONB Management Plans Hadrian's Wall Partnership Board (2015), Hadrian's Wall Management Plan 2015-2019 Natural England - National Character Area (NCA) profiles Visit England, Yorkshire and the Humber Regional Summary – Research and Highlights (2010) Leeds City Region (2017) Green and Blue Infrastructure Strategy North York Moors Park Authority, National Park Management Plan (2019) Peak District National Park Authority (2018), Peak District National Park Management Plan 2018 – 2023 Yorkshire Dales National Park Authority (2019), Yorkshire Dales National Park Management Plan 2019-2024 Site Improvement Plans: Yorkshire and Humber (http://publications.naturalengland.org.uk/category/5171232873906176) West Yorkshire Combined Authority, Various Projects
	Enhance the value of the countryside by protecting the natural environment for this and future generations	
	Take account of the different roles and character of different areas, promoting the vitality of main urban areas, protecting the Green Belts around them, recognising the intrinsic character and beauty of the countryside and supporting thriving rural communities within it.	
	Promote landscape as central to the culture of the region and conserve and enhance distinctive characteristics of landscape and settlements, particularly in the Peak District, North York Moors and Yorkshire Dales National Parks	
	Enhance the value of the countryside by protecting the natural environment for this and future generations.	
	Ensure good access to valued areas of landscape character in sustainable ways to enhance its enjoyment and value by visitors and stakeholders. This includes protecting National trails and Public Rights of Way.	

3 Environmental Baseline Review

3.1 Introduction

An essential part of the SEA process is to identify the current baseline conditions and their likely evolution. It is only with knowledge of existing conditions that impacts of the Drought Plan 2022 can be identified, mitigated and subsequently monitored.

The SEA Regulations requires that the evolution of baseline conditions of the plan area (that would take place with or without implementation of the plan) is identified. This is useful when determining impact significance, particularly with regards to baseline conditions that may already be improving or worsening and the rate of such change.

Full environmental baseline data is presented in **Appendix C** and have been drawn from a variety of sources, including a number of the plans, policies and programmes reviewed as part of the SEA process given in **Table 2.1**. This environmental baseline review also summarises the likely future trends for the environmental issues being considered (where information is available). The key issues arising from the review of baseline conditions are summarised in Section 3.4.

The baseline assessment has drawn on data for the county of Yorkshire, as this region is very closely related to Yorkshire Water's water supply operating boundaries. The Drought Plan 2022 includes a River Tees to River Swale transfer drought permit/order option and a River Tees abstraction and pipeline option (see **Table 1.3**); consequently, appropriate baseline information relating to the areas affected by these two options outside of the Yorkshire Water supply boundary has also been included (see **Figure 1.3**).

3.2 Limitations of the data and assumptions made

Most of the information used in the baseline information relates to the Yorkshire region as a whole. Baseline information is also drawn on which relates to the North East region with respect to the Tees Swale transfer and is focussed only on potential impacts within a 10 km "corridor" of the rivers and pipeline routes of that scheme. As such, this baseline information may not identify the more localised issues that are not necessarily reflective of the general trends of the region. For example, this may include locally important sites for recreation or any localised differences in environmental quality.

Data have generally been sourced from national or regional bodies where information is collected for the Yorkshire region using consistent methods. This allows for a more effective comparison between the regional and national averages; however, reliance on these data sets has in some cases meant that information is a number of years old.

The EARs (see Section 1.5) support this report and have also been used to inform the SEA assessment. The limitations of data used within the EARs (e.g., biodiversity data, River Habitat Surveys (RHS) etc.) are discussed within the individual EARs.

3.3 Overview

The Yorkshire Water region has a varied landscape with the Pennines stretching to the West, the North York Moors are in the North whilst the southern and eastern parts of the region are low lying. Annual average rainfall across the region varies; highest near the Pennines, whilst low lying areas average less than half the volume of rainfall each year, with little seasonal variation.

Urban areas in the west and south of Yorkshire are principally supplied from reservoirs in the Pennines. Reservoirs located in the Pennines and the valleys of the River Don, Aire, Wharfe, Calder, Nidd and Colne provide the largest upland sources of water in the region. Yorkshire Water operates over 100

impounding reservoirs of which two are major pumped storage reservoirs. The total storage capacity of all the supply reservoirs amounts to some 160,000 million litres (MI).

The Yorkshire Water region is currently divided into two water resource zones for planning purposes (**Figure 1.1**). Each zone represents a group of customers who receive the same level of service for water supply reliability from either groundwater or surface water sources. The Grid Surface Water Zone (SWZ) represents a highly integrated surface and groundwater zone that is dominated by the operation of lowland rivers and Pennine reservoirs (**Figure 1.2**). The East SWZ is supplied by a river abstraction and springs in the Whitby Area.

The baseline has been reviewed for each of the SEA topics, and is presented in full in **Appendix C**. Key issues identified from the baseline are presented in **Section 3.4**.

3.4 Key Issues

3.4.1 Biodiversity, Fauna and Flora Key Issues

The key sustainability issues arising from the baseline assessment for biodiversity are:

- The need to protect or enhance the region's biodiversity, particularly protected sites designated for nature conservation.
- The need to avoid activities likely to cause irreversible damage to natural heritage
- The need to take opportunities to improve connectivity between fragmented habitats.
- The need to control the spread of Invasive Non-Native Species (INNS). The need to engage more people in biodiversity issues so that they personally value biodiversity and know what they can do to help, including through recognising the value of the ecosystem services.

3.4.2 Population and Human Health Key Issues

The key sustainability issues arising from the baseline assessment for population and human health are:

- The need to ensure water supplies remain affordable especially for deprived or vulnerable communities.
- The need to ensure continued improvements in levels of health across the region, particularly in urban areas and deprived areas.
- The need to ensure public awareness of drought conditions and importance of maintaining resilient, reliable public water supplies without the need for emergency drought measures.
- The need to ensure water quantity and quality is maintained for other users including tourists, recreational users and other users such as farmers.
- The need to ensure a balance between different aspects of the built and natural environment that will help to provide opportunities for local residents and tourists, including opportunities for access to recreation resources and the natural and historic environment.
- The need to accommodate an increasing population.
- Sites of nature conservation importance, heritage assets, water resources, important landscapes and public rights of way contribute to recreation and tourism opportunities and subsequently health and well-being and the economy.

3.4.3 Material Assets and Resource Use Key Issues

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

- The need to minimise the consumption of resources, including water and energy.

- The need to reduce the total amount of waste produced in the region, from all sources, and to reduce the proportion of this waste sent to landfill.
- The need to continue to reduce leakage from the water supply system.
- Daily consumption of water is higher than the national average in the area and consequently there is a continued need to encourage more efficient water use.

3.4.4 Water Key Issues

The key issues arising from the baseline assessment for water are:

- The need to further improve the quality of the region's river, estuarine and coastal waters taking into account WFD status targets.
- The need to maintain the quantity and quality of groundwater resources taking into account WFD status targets.
- The need to improve the resilience, flexibility and sustainability of water resources in the region, particularly in light of potential climate change impacts on surface waters and groundwaters.
- The need to ensure sustainable abstraction to protect the water environment.
- The need to ensure that people understand the value of water.

Flooding is not viewed as a key issue for the SEA water topic, because none of the drought options involve the construction of permanent physical infrastructure within areas at risk of flooding.

3.4.5 Soil, Geology and Landscape Key Issues

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

- The need to protect geological features of importance and maintain and enhance soil function and health.
- The need to manage the land more holistically at the catchment level, benefitting landowners, other stakeholders, the environment and sustainability of natural resources (including water resources).
- The need to make use of previously developed land (brownfield land) and to reduce the prevalence of derelict land in the region.

3.4.6 Air and Climate Key Issues

The key sustainability issue arising from the baseline assessment for air and climate is:

- The need to reduce air pollutant and greenhouse emissions and limit air emissions to comply with air quality standards.
- The need to mitigate against climate change through the reduction in greenhouse gas emissions in order to contribute to risk reduction over the long term.
- The need to adapt to the impacts of climate change for example through, sustainable water resource management, water use efficiencies, specific aspects of natural ecosystems (e.g. connectivity) as well as accommodating potential opportunities of climate change.

3.4.7 Archaeology and Cultural Heritage Key Issues

The key sustainability issue arising from the baseline assessment for archaeology and cultural heritage is:

- The need to conserve or enhance sites of archaeological importance and cultural heritage interest, particularly those which are sensitive to the water environment.

3.4.8 Landscape and Visual Amenity Key Issues

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

- The need to protect and improve the natural beauty of the region's National Parks, AONBs, and other areas of natural beauty.
- It is envisaged that landscape and designated sites will be maintained and enhanced for the enjoyment of the public.

3.4.9 Inter-relationships

It is noted that there are inter-relationships between SEA topics. These include impacts of changes to water flows and quality on biodiversity, the economy, recreation, tourism, navigation, cultural heritage and landscape. Inter-relationships that result in changes to individual effects are considered by evaluation of synergistic effects throughout the assessment.

4 Methodology

4.1 Introduction

This section describes the methodology that has been used to undertake the SEA of the drought options in Yorkshire Water's Drought Plan 2022.

What the SEA Regulations require:

According to Regulation 12:

- (2) *The report shall identify, describe and evaluate the likely significant effects on the environment of –*
- (a) implementing the plan or programme; and*
 - (b) reasonable alternatives taking into account the objectives and the geographical scope of the plan or programme*

According to Schedule 2, the Environmental Report should include:

- 6. *The likely significant effects on the environment, including short, medium and long-term effects, permanent and temporary effects, positive and negative effects and secondary, cumulative and synergistic effects...*
- 8. *An outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information.*

4.2 Assessment Methodology and SEA Framework

This section outlines the assessments that have been carried out in the SEA to identify the environmental effects of the drought options listed in Yorkshire Water's Drought Plan 2022.

The environmental assessments of the drought options are 'objectives-led'. Establishing assessment objectives is a recognised way of considering the environmental effects of a plan and comparing the effects of alternatives. SEA objectives are often derived from environmental objectives established in law, policy or other plans and programmes, or from a review of baseline information and environmental problems (based on the SEA topics listed in Section 3.4).

An assessment framework of objectives has been developed based on:

- The current state of the environment in the Yorkshire Water supply area (see Section 3.3).
- The key environmental issues identified (see Section 3.4).
- The key policy messages and environmental protection objectives identified in the review of policies, and other plans and programmes (see Section 2). It is important that the assessment takes these objectives into account as this will help it to highlight any area where the Drought Plan 2022 will help or hinder the achievement of the objectives of other plans (e.g. at local, national and international level – see review of Plans, Policies and Programmes in Section 2.2).

Final SEA objectives are set out in **Table 4.1**, alongside the key messages identified from the review of policies, plans and programmes and the key issues from the review of baseline information. The

following sections describe how Yorkshire Water used these SEA objectives in the assessment of the environmental effects of the drought options. These SEA objectives are intended to reflect changes that contribute to sustainability. By assessing each drought option against the objectives, it is more apparent where drought options might have a negative impact, and where options could be developed to reduce potential impacts.

As well as the overall SEA objectives, a number of key questions have been developed for each SEA topic. These key questions prompt the assessment and ensure it considers all the relevant aspects. The assessment of each option required the following information, some of which was available from the Drought Plan 2022 (e.g. Appendix 4):

- Details of each potential drought management measure;
- Likelihood and predicted frequency of deployment of the measure;
- Construction (where applicable) and operational/implementation details;
- Relevant information contained in Environmental Assessment Reports (EARs) relating to drought permit options;
- Benefits to the water supply-demand position in a drought (taking uncertainty into account); and
- Key elements of the baseline environment, such as location of designated sites, priority habitats and species, landscape areas or heritage assets, recreational facilities and other environmental features.

Table 4.1: SEA Objectives and Assessment Approach

SEA Topic	Policies, Plans and Programmes Key Messages	Baseline Key Issues	SEA Objectives	Indicator Questions
<i>Biodiversity, flora and fauna</i>	<p>Protection and enhancement of biodiversity, particularly internationally and nationally designated sites and priority habitats and species, whilst also considering their ability to adapt to a changing climate</p> <p>Promote a catchment-wide or landscape-scale approach to biodiversity management to ensure better protection of the natural environment and heritage.</p> <p>To achieve favourable condition for priority habitats and species, including UK NERC habitats and species.</p> <p>Avoidance of activities likely to cause damage to nature conservation and natural heritage.</p> <p>Recognise the wider benefits of eco-system services through support for well-functioning ecosystems, respect environmental limits and capacities, and maintain/enhance coherent ecological networks, including provision for fish</p>	<p>The need to protect and enhance the region's biodiversity, particularly protected sites designated for nature conservation.</p> <p>The need to take opportunities to improve connectivity between fragmented habitats and take a catchment-scale or landscape-scale approach to biodiversity management.</p> <p>The need to avoid activities likely to cause irreversible damage to the natural environment and natural heritage, particularly irreplaceable habitat such as ancient woodland.</p> <p>The need to engage more people in biodiversity issues so that they personally value biodiversity and know what they can do to help, including though recognising the value of the ecosystem services.</p> <p>The need to control the spread of Invasive Non-native Species (INNS)</p>	<p>1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species and consideration of adaptability to climate change) and to protect and enhance natural capital and the biodiversity and ecosystem services that contribute to the economy.</p> <p>1.2 To avoid introducing or spreading INNS.</p>	<p>Will it avoid damage to aquatic, transitional and terrestrial species and habitats including fish populations (particularly migratory fish)?</p> <p>Will it enhance aquatic, transitional and terrestrial species and habitats?</p> <p>Will it protect the most important sites for nature conservation?</p> <p>Will it minimise habitat fragmentation and protect connectivity?</p> <p>Will it provide opportunities for new habitat creation or restoration and link existing habitats?</p> <p>Will it ensure the sustainable management of natural habitats, taking into account climate change adaptability?</p> <p>Will it affect WFD compliance e.g. good ecological potential/status?</p> <p>Will it protect natural capital and ecosystems from natural capital?</p>

SEA Topic	Policies, Plans and Programmes Key Messages	Baseline Key Issues	SEA Objectives	Indicator Questions
	<p>passage and connectivity for migratory/mobile species.</p> <p>Strengthen the connections between people and nature and realise the value of biodiversity.</p> <p>Recognise importance of natural capital in supporting current and future development and seek to ensure natural capital is properly taken into account in all decision-making.</p> <p>A need to protect and, where possible, enhance the blue green infrastructure network, including green spaces and other environmental features. .</p> <p>To seek opportunities for biodiversity net gain from infrastructure development.</p> <p>Protection and enhancement of natural capital. Ecosystem services from natural capital contributes to the economy and therefore should be protected and, where possible, enhanced.</p> <p>Avoidance of activities likely to increase the risk of spread</p>			<p>Will it improve access to nature for people?</p> <p>Will it limit, reduce or increase the risk of spread of Invasive Non-native Species (INNS)?</p>

SEA Topic	Policies, Plans and Programmes Key Messages	Baseline Key Issues	SEA Objectives	Indicator Questions
	of Invasive Non-Native Species (INNS).			
Population and human health	<p>Water resources play an important recreation role. A reliable and wholesome water supply is vital to public health protection. Effective water resource management can create opportunities for regeneration, tourism and the wider economy.</p> <p>The issue of water supply is becoming a development constraint in some areas, which is recognised as an issue in the National Planning Policy Framework.</p> <p>To ensure all communities have a clean, safe and attractive environment in which people can take pride.</p> <p>To ensure reliable and sustainable supplies of water are maintained for all.</p> <p>Increase awareness around the value and health benefits of water and encourage sustainable use.</p>	<p>The need to ensure essential water supplies are safeguarded to all communities to protect public health and economic activity.</p> <p>The need to help provide opportunities to local residents and tourists, including opportunities for access to recreation resources and the natural and historic environment.</p> <p>The need to ensure all communities contribute to sustainable management of natural resources, and for support to be provided to community-led initiatives.</p> <p>The need to promote the health benefits of drinking water and efficient use of water.</p>	<p>2.1 To protect and improve health and well-being (including promoting the value of the water environment for health and wellbeing).</p> <p>2.2 To protect and enhance opportunities for formal and informal recreation.</p> <p>2.3 To promote a sustainable economy and thriving communities with good access to the services they need.</p>	<p>Will it help to ensure access to a resilient and secure supply of drinking water?</p> <p>Will it help to promote healthy communities and protect from risks to health and wellbeing?</p> <p>Will it protect or enhance opportunities for recreation?</p>
Material assets and resource use	Promote sustainable production and consumption whilst seeking to reduce the amount of waste generated	The need to minimise the consumption of resources, including water and energy.	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources,	Will it help to minimise the demand for water?

SEA Topic	Policies, Plans and Programmes Key Messages	Baseline Key Issues	SEA Objectives	Indicator Questions
	<p>by using materials, energy and water more efficiently.</p> <p>Consider issues of water demand, water supply and water quality in the natural environment and ensure a sustainable use of water resources.</p> <p>Maintain a reliable public water supply and ensure there is enough water for human uses, as well as providing an improved water environment.</p> <p>Accelerating the transition to sustainable forms of energy and achieving regional renewable energy deployment targets</p> <p>Minimise the production of waste, ensure waste management is in line with the 'waste hierarchy', and eliminate waste sent to landfill.</p>	<p>The need to ensure all communities contribute to sustainable management of natural resources, and for support to be provided to community-led initiatives.</p> <p>The need to reduce the total amount of waste produced in the region, from all sources, and to reduce the proportion of this waste sent to landfill.</p>	<p>minimise the generation of waste, encourage its re-use and eliminate waste sent to landfill.</p> <p>3.2 To promote efficient water resource management and the sustainable management of natural resources, ensuring water supply for homes and industry in the area is maintained.</p>	<p>Will it increase efficiency in water use?</p> <p>Will it minimise greenhouse gas emissions through energy efficiency?</p> <p>Will it minimise waste?</p> <p>Will it enable efficient water resource management and ensure maintenance of supply?</p>
Water	<p>Maintain and improve water quality (surface waters and groundwater).</p> <p>Improve the quality of the water environment and the ecology which it supports, and continue to provide high</p>	<p>The need to further improve the quality of the region's river, lake, estuarine and coastal waters.</p> <p>The need to maintain the quantity and quality of groundwater resources.</p>	<p>4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies.</p> <p>4.2 To avoid adverse impact on surface and groundwater levels and flows, including</p>	<p>Will it minimise risks of adverse effects on water quality?</p> <p>Will it affect WFD compliance (supporting elements to Good Ecological</p>

SEA Topic	Policies, Plans and Programmes Key Messages	Baseline Key Issues	SEA Objectives	Indicator Questions
	<p>levels of drinking water quality.</p> <p>Expand the scope of water protection to all waters, surface waters and groundwater.</p> <p>Ensure appropriate management of abstraction and protect flow and level variability across the full range of regimes from low to high conditions.</p> <p>Develop a resilient and flexible water management approach to cope with changing climate, population and economic conditions.</p> <p>Balance the abstraction of water for supply with the other functions and services the water environment performs or provides.</p> <p>Encourage more efficient use of water and promote awareness of water sustainability.</p>	<p>The need to manage and operate water resources sustainably to protect flow and level variability in rivers and groundwaters.</p>	<p>when this impacts on habitats and/or navigation.</p> <p>4.3 To ensure appropriate and sustainable management of abstractions (or compensation flow) to maintain water supplies whilst protecting ecosystem functions that rely on water resources.</p> <p>4.4 To promote water efficiency and measures that enable sustainable water use.</p>	<p>Potential/Status, including hydromorphology)?</p> <p>Will it affect bathing water compliance?</p> <p>Will it avoid contamination of groundwater?</p> <p>Will it help to minimise risks associated with unsustainable abstraction of ground and surface waters?</p> <p>Will it abstract from a water resource with resource availability (with reference to CAMS status and WFD considerations)?</p> <p>Will it affect WFD compliance e.g. Good Environmental Status?</p> <p>Will it affect river basin management plans?</p> <p>Will it alter the flow or level regime or residence time of surface waters or groundwaters?</p> <p>Will it enable flexible control over the level of abstraction at short notice in response to changing environmental conditions?</p> <p>Will it enable a sustainable use of water resources that</p>

SEA Topic	Policies, Plans and Programmes Key Messages	Baseline Key Issues	SEA Objectives	Indicator Questions
				<p>balances demand for water with environmental protection?</p> <p>Will it encourage efficient water use?</p> <p>Will it contribute towards improving the awareness of water sustainability and its true value?</p>
Soil, geology and land use	<p>Maintain the quality and diversity of geology and soils, which can be lost or damaged by insensitive development.</p> <p>Ensure that soils will be protected and managed to optimise the varied functions that soils perform for society (e.g. supporting agriculture and forestry, protecting cultural heritage, supporting biodiversity, as a platform for construction), in keeping with the principles of sustainable development.</p> <p>Promote catchment-wide approach to land use management in order to benefit natural resources, reduce pollution and develop resilience to climate change.</p>	<p>The need to protect geological features of importance and maintain and enhance soil function and health.</p> <p>The need to make use of previously developed land in urban areas, and to reduce the prevalence of derelict land in the region.</p>	5.1 To protect and enhance the quality and quantity of soils and to protect and enhance geodiversity.	<p>Will it avoid damage to and protect geologically important sites?</p> <p>Will it avoid damaging the quality of agricultural land?</p> <p>Will it protect, maintain and enhance soil function and health?</p> <p>Will it avoid contributing to coastal erosion?</p>

SEA Topic	Policies, Plans and Programmes Key Messages	Baseline Key Issues	SEA Objectives	Indicator Questions
	Promote mixed use developments, and encourage multiple benefits from the use of land in urban and rural areas, recognising that some open land can perform many functions.			
Air and climate	<p>Cut the UK's carbon dioxide emissions by at least 100% by the year 2050, including through the contributions being made by water companies to reduce GHG emissions associated with water supply.</p> <p>Reduce the effects of air pollution on ecosystems. Improve overall air quality.</p> <p>Sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and the cumulative impacts on air quality from individual sites in local areas.</p> <p>Minimise energy consumption, support the use of sustainable/renewable energy and improve resilience to climate change.</p>	<p>The need to mitigate against climate change through the reduction in greenhouse gas emissions from all sectors of the economy in order to contribute to climate change risk reduction over the long term.</p> <p>The need to reduce air pollutant and greenhouse gas emissions arising from industrial processes, energy production and transport and limit air emissions to comply with air quality standards.</p> <p>The need to adapt to the impacts of climate change, including through resilience planning, ensuring resilient and sustainable water resource management, active management of specific aspects of natural ecosystems (e.g. connectivity) and accommodating potential</p>	<p>6.1 To maintain and improve air quality.</p> <p>6.2 To reduce greenhouse gas emissions.</p> <p>6.3 To consider the need for adaptive measures for climate change.</p>	<p>Will it minimise the need for energy?</p> <p>Will it increase efficiency in the use of energy?</p> <p>Will it reduce or minimise greenhouse gas emissions?</p> <p>Will it reduce vulnerability to potential impacts of climate change on water supply and demand?</p> <p>Will it take into account the need for adaptability to climate change?</p>

SEA Topic	Policies, Plans and Programmes Key Messages	Baseline Key Issues	SEA Objectives	Indicator Questions
	Build in adaption to climate change to future planning and consider the level of urgency of associated risks of climate change impacts accordingly.	opportunities of climate change. The need to ensure all communities contribute to sustainable energy use and to support community- led initiatives.		
Archaeology and cultural heritage	<p>Protection and enhancement of historic assets and their settings, particularly those of international and national importance.</p> <p>Built development in the vicinity of historic buildings could have implications for the setting and/or built fabric.</p> <p>Ensure any adverse effects to heritage should be minimised or avoided altogether, particularly to World Heritage Sites.</p> <p>Ensure active management of the Region's environmental and cultural assets. Ensure protection and enhancement of historic assets and their settings, particularly those of international and national importance.</p> <p>Promote heritage and landscape as central to the</p>	<p>The need to protect and enhance heritage assets, particularly those which are sensitive to the water environment.</p> <p>The need to have positive strategies for the conservation and enjoyment of the historic environment, particularly for heritage assets that are most at risk of neglect or decay.</p>	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.	<p>Will it avoid damage to and protect the historic environment, heritage assets and their settings, places and spaces that enhance local distinctiveness, landscape/townscape character and appearance?</p> <p>Will it avoid damage to and protect archaeologically important sites?</p> <p>Will it avoid damage to important wetland areas with potential for paleo-environmental deposits?</p>

SEA Topic	Policies, Plans and Programmes Key Messages	Baseline Key Issues	SEA Objectives	Indicator Questions
	culture of the region and conserve and enhance distinctive characteristics of landscape and settlements, particularly in the Peak District, North York Moors and Yorkshire Dales National Parks.			
Landscape and visual amenity	<p>Protection and enhancement of urban and rural landscapes (including designated landscapes, landscape character and the countryside).</p> <p>Take account of the different roles and character of different areas, promoting the vitality of main urban areas, protecting the Green Belts around them, recognising the intrinsic character and beauty of the countryside and supporting thriving rural communities within it.</p> <p>Enhance the value of the countryside by protecting the natural environment for this and future generations.</p> <p>Ensure good access to valued areas of landscape character in sustainable ways to enhance its</p>	<p>The need to protect and improve the natural beauty of the region's National Parks, AONBs and other areas of high landscape and visual amenity value.</p> <p>The need to protect the integrity of Green Belt land, maintaining their openness and permanence.</p> <p>The need to ensure good design for the built environment as a key aspect of sustainable development.</p>	<p>8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.</p>	<p>Will it result in changes to access to the countryside and open space?</p> <p>Will it avoid adverse impacts and enhance designated landscapes including the protection of OUV features?</p> <p>Will it improve access to the countryside and open space?</p> <p>Will it avoid indirect effects on the landscape resulting from effects of abstraction and low river flows?</p> <p>Will it avoid cumulative effects on landscape features and character from a range of actions and developments?</p>

SEA Topic	Policies, Plans and Programmes Key Messages	Baseline Key Issues	SEA Objectives	Indicator Questions
	<p>enjoyment and value by visitors and stakeholders. This includes protecting National trails and Public Rights of Way.</p>			

4.3 Primary Assessment

The appraisal framework set out in **Table 4.1** has been used to assess each of the drought options against the SEA objectives. The appraisal framework was applied to test the performance of the drought options against the SEA objectives. This assessment supported development of Yorkshire Water's Drought Plan 2022, and will inform the selection of options should a drought result in the Drought Plan 2022 becoming operational.

In the context of drought planning, individual drought options are taken to constitute alternatives. Yorkshire Water's Drought Plan 2022 comprises a total of 63 drought options (58 supply side options (including 9 long term options) and 5 demand options). This SEA also considers two Environment Agency drought order compensation flow reduction actions. Each of these 'alternatives' (individual drought options) were therefore assessed using the appraisal framework set out in **Table 4.2**. The assessment therefore provides information on the relative environmental performance of alternatives, and is intended to make the decision-making process more transparent. The SEA can, therefore, be used to support the timing and implementation of drought options within the Drought Plan 2022.

The appraisal framework (**Table 4.2**) is structured as follows:

- The first and second columns set out the SEA topics and objectives.
- The scale of the effect, which might relate to either geographical scale or the size of the population affected, is identified in the third column on a scale of small, medium to large.
- The impact evaluation includes consideration of the nature of the impact, certainty of effect, duration and permanence (fourth, fifth and sixth columns of **Table 4.2**) in compliance with criteria for determining the likely significance of effects specified in the SEA Directive Article 3(5) and Annex II, and the SEA Regulations Part 2, Regulation 9(2a) and Schedule 1. With respect to duration of temporary effects, short-term impacts are defined as those that last for up to six months, medium term impacts are those that extend for six months to two years whilst longer term temporary impacts are assessed as those that extend to two to five years. A 'significant long term' temporary impact category is used for those temporary effects that continue beyond five years in duration.
- The seventh column identifies the magnitude of the effect on a scale of low, medium and high.
- The value/sensitivity of the receptor(s) is identified in the eighth column on a scale of low, medium and high.
- The ninth column provides a brief commentary and evaluation of the impact of the drought option on the objectives for each topic, with reference to the key questions proposed in **Table 4.1**. This brief commentary assumes the implementation of best practice in implementing the option, therefore the effects are referred to as residual and are largely temporary. Potential mitigation measures for any identified adverse effects arising from each option are identified within the appraisal framework.
- The residual adverse and beneficial effects (after application of best practice approaches and any appropriate mitigation measures) are identified in the tenth and eleventh columns respectively. These were identified separately so as to avoid mixing adverse and beneficial effects. The commentary in column nine, combined with the magnitude (column seven) and value/sensitivity (column eight) informs the residual adverse or beneficial effects.

Where qualitative and/or quantitative information is available for an option (e.g. as identified by an EAR etc.), this was used to inform the assessment.

As described in Section 1.5, EARs have been produced for the supply side drought permit options and these were used to inform the SEA for these options. The EARs define the significance of effects on identified sensitive features based on fragility of the receptors and the likely magnitude of impact experienced. The assessment of effects on water quality described in the EARs took into consideration the requirements of the WFD. Important information held within the EARs is borne out in the commentary of the assessment table if relevant, and the level of significance largely guided the SEA level of significance for the objectives that are informed by the EARs (see **Table 4.1** above).

Objectives or key questions that are not supported by information presented in the EARs are evaluated using spatial analysis, professional judgement and appropriate guidelines.

Equally, where detailed environmental and socio-economic assessments of non-drought permit/order options were carried out (e.g. in relation to water use restrictions), these were also used to inform the SEA.

Table 4.2: SEA Appraisal Framework

Topic	SEA objective	Scale of effect: geographical &/or population affected (Small/Medium/Large)	Certainty of effect (Low/Medium/High)	Duration of effect (short/medium/long term)	Permanence of effect (permanent/temporary)	Magnitude of effect (Low/Medium/High)	Value/sensitivity of receptor (Low/Medium/High)	Potential residual effect on sensitive receptors (assuming good practice construction methods)	Residual Adverse Effect (likely to remain after reasonable mitigation)	Residual Beneficial Effect (likely to remain after reasonable mitigation)
Biodiversity, fauna and flora	1.1 To conserve and enhance biodiversity, including designated sites of nature conservation interest and protected habitats and species (with particular regard to avoiding the effects of over-abstraction on sensitive sites, habitats and species and consideration of adaptability to climate change) and to protect and enhance natural capital and the biodiversity and ecosystem services that contribute to the economy.									
	1.2 To avoid introducing or spreading INNS.									
Population and human health	2.1 To protect and improve health and well-being (including promoting the value of the water environment for health and wellbeing)									
	2.2 To protect and enhance opportunities for formal and informal recreation.									
	2.3 To promote a sustainable economy and thriving communities with good access to the services they need.									
Material assets and resource use	3.1 To reduce, and make more efficient, the domestic, industrial and commercial consumption of resources, minimise the generation of waste, encourage its re-use and									

Topic	SEA objective	Scale of effect: geographical &/or population affected (Small/ Medium/ Large)	Certainty of effect (Low/ Medium/ High)	Duration of effect (short/ medium /long term)	Permanence of effect (permanent/ temporary)	Magnitude of effect (Low/ Medium/ High)	Value/ sensitivity of receptor (Low/ Medium/ High)	Potential residual effect on sensitive receptors (assuming good practice construction methods)	Residual Adverse Effect (likely to remain after reasonable mitigation)	Residual Beneficial Effect (likely to remain after reasonable mitigation)
	eliminate waste sent to landfill.									
	3.2 To promote efficient water resource management and the sustainable management of natural resources, ensuring water supply for homes and industry in the area is maintained.									
Water	4.1 To maintain or improve the quality of rivers, lakes, groundwater, estuarine and coastal waterbodies.									
	4.2 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation.									
	4.3 To ensure appropriate and sustainable management of abstractions (or compensation flow) to maintain water supplies whilst protecting ecosystem functions that rely on water resources.									
	4.4 To promote water efficiency and measures that enable sustainable water use									
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology and the quality and quantity of soils.									

Topic	SEA objective	Scale of effect: geographical &/or population affected (Small/ Medium/ Large)	Certainty of effect (Low/ Medium/ High)	Duration of effect (short/ medium /long term)	Permanence of effect (permanent/ temporary)	Magnitude of effect (Low/ Medium/ High)	Value/ sensitivity of receptor (Low/ Medium/ High)	Potential residual effect on sensitive receptors (assuming good practice construction methods)	Residual Adverse Effect (likely to remain after reasonable mitigation)	Residual Beneficial Effect (likely to remain after reasonable mitigation)
	5.2 To protect and enhance the ecosystem services function of land, soils and geology, including carbon sequestration, flood attenuation, pollutant filtration and nutrient cycling.									
	5.3 To promote a catchment-wide approach to catchment land management.									
Air and Climate	6.1 To maintain and improve air quality.									
	6.2 To reduce greenhouse gas emissions.									
	6.3 To consider the need for adaptive measures for climate change.									
Archaeology and cultural heritage	7.1 To conserve and enhance the historic environment, heritage assets and their settings and protect archaeologically important sites.									
Landscape and visual amenity	8.1 To protect, enhance the quality of and improve access to designated and undesignated landscapes, townscapes and the countryside.									

For each SEA objective, a residual effects assessment was determined against a significance matrix (**Figure 4.1**) which took into account the value/sensitivity of the receptor (e.g. air quality, river water quality, landscape value) and the magnitude of the assessed effect. This significance matrix comprised effects from 'major beneficial' to 'major adverse'. For the box signifying low magnitude and high receptor value/sensitivity, this could result in a greater than 'moderate' effects being assigned dependent on the sensitivity/value of the receptor. This colour coding was used to complete the columns for residual effects in the appraisal framework.

The resulting significance of effects is used in the prioritisation of options. Also, where major adverse effects are predicted, broad measures envisaged to prevent, reduce and as fully as possible offset these effects on the environment (as a result of implementing the Drought Plan 2022) are outlined where relevant/appropriate.

Figure 4.1 Significance Matrix

Significance of Effect		Value/sensitivity of receptor		
		High	Medium	Low
Effect magnitude (includes scale of effect)	High	Major Adverse / Major Beneficial	Major Adverse / Major Beneficial	Moderate Adverse / Moderate Beneficial
	Medium	Major Adverse / Major Beneficial	Moderate Adverse / Moderate Beneficial	Minor Adverse / Minor Beneficial
	Low	Dependant on nature of impact/benefit	Minor Adverse / Minor Beneficial	Negligible

The definitions for 'significance' ratings as identified in the table above are provided below:

Major - effects represent key factors in the decision-making process. They are generally associated with sites and features of international, national or regional importance. If adverse, such resources/features are generally those which cannot be replaced or relocated.

Moderate - effects are likely to be important considerations at a regional or district scale. If adverse, they are likely to be of potential concern.

Minor - effects are not likely to be decision-making issues. Nevertheless, the cumulative effect of such issues may lead to an increase in the overall effects on a particular area or on a particular resource.

Negligible - effects which are not perceptible, being within normal bounds of variation or the margin of forecasting error.

For the '**high**' effect magnitude (top row), a major effect significance is assigned for both high and medium value receptors to reflect the magnitude of the effect.

For the '**low**' effect magnitude and '**high**' value receptor (bottom left box), the significance of effect could be minor, moderate or major dependent on the precise nature of the impact or benefit.

All options— both supply-side measures and demand management measures – will be assessed and to the same level of detail, in line with the SEA legislative requirements, national SEA guidance and the

UKWIR SEA guidance. The level of detail to be developed for the environmental assessment of each measure will be consistent with the strategic nature of SEA.

The appraisal framework for each option includes a summary comprising an overview of the adverse and beneficial effects. The assessment matrices are provided in **Appendix D**.

Table 4.3 Example SEA Appraisal Framework Summary

Option	[name of option]												
Summary commentary of scheme adverse effects	[summary]												
SEA objectives adverse effects summary													
Summary commentary of scheme beneficial effects	[summary]												
SEA objectives beneficial effects summary													

An appraisal framework table (example provided in **Table 4.3**) has been completed for each drought option (as identified in Section 1) and presented in full in **Appendix D**. The summary of the assessment is presented in Section 5 as a colour-coded visual evaluation (VE) matrix. The VE matrix summarises the likely significance of impacts (which are discussed in full in the completed appraisal framework tables in **Appendix D**).

4.4 Secondary, Cumulative and Synergistic Environmental Effects Assessment

Schedule 2(6) of the SEA Regulations requires the assessment of “*The likely significant effects on the environment, including short, medium and long-term effects, permanent and temporary effects, positive and negative effects, and secondary, cumulative and synergistic effects....*” From here on in “*cumulative effects*” is taken to include secondary and synergistic effects.

Because the combination of options that would be deployed in any one drought cannot be predetermined (Section 6) a dedicated cumulative effects assessment in order to ensure that options are not mutually exclusive, or that combinations would not cause significant adverse impacts has been undertaken. This involved examining the likely significant effects of each of the drought options individually, in combination with each other, and in combination with the implementation of other plans and programmes. In assessing these effects, consideration has been given to other factors which may affect the receiving environment in the short, medium and long term.

The following cumulative assessments have been undertaken (see Section 6 for results):

1. Within Yorkshire Water’s entire water supply area, assessment of cumulative impacts of each demand management drought option with every other demand management drought option. Note that demand management drought options are consistent across the whole of Yorkshire

Water's region. Demand management measures serve to reduce pressure on water resources by reducing the demand for water. Therefore, demand management measures have not been assessed in detail against each supply side and drought permit/order option, other than to acknowledge that they will have a net positive effect by reducing pressure on water resources.

2. For each supply side option, assessment of the cumulative impacts of the option with Yorkshire Water's existing abstraction licences that operate within the zone of influence of the drought option.
3. For each supply side option, assessment of cumulative impacts with any other supply side option. Mutually exclusive options (e.g. those that draw upon the same resource or use the same site) have been identified.
4. Assessment of cumulative impacts of Yorkshire Water's Drought Plan 2022 with drought options included in Environment Agency Drought Plans.
5. Assessment of cumulative impacts of Yorkshire Water's Drought Plan 2022 with drought options included in the Canal and River Trust Drought Plans.
6. Assessment of cumulative impacts of Yorkshire Water's Drought Plan 2022 with drought options included in other neighbouring water company Drought Plans.
7. Assessment of cumulative impacts of Yorkshire Water's Drought Plan 2022 with other relevant policies and plans.

Neighbouring water companies will be invited to consult on the Drought Plan 2022 and Yorkshire Water will also communicate with neighbouring companies regarding the schemes in their respective plans. This enables potential effects with other plans to be identified, particularly in the context of spatial and temporal proximity. This is especially important in identifying potential water resources impacts, although licence changes would always be subject to further investigation by the companies themselves and the Environment Agency. Potential cumulative effects with wider plans were also be assessed. If effects are identified they can be ameliorated with early stage mitigation and associated monitoring.

Drought Plans comprise a group of measures, the implementation of which are dependent on the particular drought conditions experienced and are subject to temporal, spatial and other factors. The exact timing of implementation of drought options will not be known until a drought is experienced. One of the limitations of the cumulative or in-combination assessment of Yorkshire Water's Drought Plan 2022 is that whilst an environmental appraisal of each drought option can be undertaken, the lack of predictability of which options will be implemented in any particular drought event means that it may be impossible to provide an accurate cumulative assessment of the impacts of the plan for a possible future drought event.

Cumulative assessments of drought options with each other have been undertaken assuming as a worst case that the operation of the two options could occur simultaneously. Spatial proximity and therefore potential impacts on a common receptor is the primary consideration (e.g. the same designated area or reach of river).

Due to the uncertainty of timing of implementation of drought options, assessment of each drought option with every other drought option has been undertaken with the intention that in the event of a drought, the findings of the SEA will be reviewed and a cumulative assessment made of the options proposed for implementation at that time, based on the findings of the one-on-one assessments presented in Sections 5.3 and 5.4.

4.5 Limitations of the Study

SEA is a high level assessment aimed at highlighting potential environmental concerns. The environmental data used in this assessment is based on that which is readily available from existing sources, e.g. statutory organisations, and environmental assessments of drought permit/order options already undertaken by Yorkshire Water. No primary research or survey work has been carried out specifically to inform the SEA and, therefore, it is possible that at the individual option level, there may be additional environmental issues that could have an influence on a drought option.

Limitations of the cumulative, or in-combination assessment of Yorkshire Water's Drought Plan 2022 should also be noted as discussed in Section 4.4, as implementation of drought options are dependent on the particular drought conditions experienced meaning that it may be impossible to provide an accurate cumulative assessment of the impacts of the plan for a possible future drought event.

It should be noted that the environmental assessment reports (EARs) which have been prepared for the drought permits/order sites to support Yorkshire Water's Drought Plan 2022 (see Section 1.5) have been undertaken in accordance with the Environment Agency Drought Plan Guidance. This states that the level of detail included in the EAR should be based on the level of risk posed by the action that is being assessed (e.g. based on the scale of the impact, the expected frequency of use or the importance or sensitivity of the site). The required level of assessment has been undertaken to help inform any potential residual effects of each drought option. The limitations of the data used for each assessment are discussed in the EARs.

The following information is incorporated from the EARs: impacts on environmental features such as NERC Species, designated sites, landscape and recreation; impact on hydrological flow and associated changes in geomorphological function and water quality. Where particular limitations or outstanding issues are known, these are briefly described in the SEA appraisal tables for the relevant drought option concerned.

5 Assessment of Drought Options

5.1 Drought Options Under Consideration

Demand management schemes which have been assessed are common to all zones and are listed in **Table 1.1** Supply side and drought permit/order drought options which have been assessed for both WRZs are listed in **Table 1.2** and **Table 1.3**.

5.2 Assessment of Schemes Against SEA Objectives

Assessment of drought options has been carried out in accordance with the methodology described in Section 4. Appraisal framework assessment tables have been completed for each drought option, and are presented in full in **Appendix D**. A summary of the assessment is presented in this section as colour-coded VE matrices. For each drought option and each SEA topic and SEA objective listed in the left hand column of **Table 4.1**, the VE matrix summarises the likely significance of residual impacts. The colour coding represents a range from significant adverse impact in red through to significant beneficial impacts in dark green.

Legend

Colour		Significance of Effect
	Dark Green	Major Beneficial
	Mid Green	Moderate Beneficial
	Light Green	Minor Beneficial
	Negligible	Negligible
	Yellow	Minor Adverse
	Orange	Moderate Adverse
	Red	Major Adverse
	NONE APPLICABLE	None

5.3 Demand Side Options

A visual summary of SEA conclusions for each of the demand side options in Yorkshire Water's Drought Plan 2022 is provided in **Table 5.1**. The completed appraisal tables for each of the drought options are provided in **Appendix D**.

Overall, demand side measures serve to reduce pressure on water resources by reducing customer demand for water, and therefore reducing abstraction at source. This will in turn contribute to reducing the amount of energy needed for water abstraction, treatment and distribution. Demand side measures typically provide beneficial effects such as maintaining surface and groundwater flows and promoting efficient and sustainable use of water. Adverse effects on landscaping and horticulture businesses may be associated with sprinkler and temporary use bans, and impacts on businesses due to water use restrictions would increase in severity and spread to other sectors (e.g., recreation and tourism) should ordinary or emergency drought orders be implemented. Impacts from implementation of drought orders could also extend to archaeology and cultural heritage, due to the influence on the setting of cultural assets. Minor adverse effects may also be associated with emissions of air pollutants and greenhouse gas emissions from leakage reduction programme activities.

Table 5.1: Visual Evaluation Matrix Summary for Demand Side Options

Option		SEA Topics and Objectives																	Commentary
		Biodiversity		Population and Human Health			Material Assets and Resource Use		Water				Soil, Geology and Land Use	Air and Climate			Archaeology and Cultural Heritage	Landscape	
		1.1	1.2	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	4.4	5.1	6.1	6.2	6.3	7.1	8.1	
Drought publicity campaigns	Adverse																		No adverse impacts have been identified for this drought measure.
	Beneficial																		Minor beneficial impacts includes reducing demand for water and securing essential supplies of water for customers/businesses. Reducing the demand for water will also have minor beneficial effects on maintaining surface water and groundwater levels/flows, sustainable management of abstraction and enabling long term improvements in water efficiency. Reducing water demand will also help to improve the resilience of water supplies to drought.
Emergency Drought Order	Adverse																		Major adverse effects are predicted for population and human health, including potential drinking water quality issues, impacts for water-dependent recreational assets and businesses/economy. An emergency drought order is not consistent with sustainable resource use or providing secure water supplies for people and businesses, and will cause significant disruption to domestic and commercial life. Other adverse effects include potential minor impacts on the setting of certain heritage assets and visual amenities.
	Beneficial																		Moderate to minor beneficial effects include a reduction in the demand for water, maintenance of water flows/levels and maintenance of a water supply to consumers in an extreme drought.
Increased leakage detection and repair activity	Adverse																		Minor adverse effects identified are associated with emissions to air (air pollutants and greenhouse gas emissions) as a result of construction activities and vehicle movements. All other adverse effects identified are negligible.
	Beneficial																		Minor to moderate beneficial effects have been identified with respect to sustainable provision of water through water savings that would have otherwise been lost to leakage after having been abstracted at source. These effects are generally considered to be long term and permanent in nature.
Introduction of a drought order to ban non-essential water uses	Adverse																		Moderate to major adverse effects associated with restriction of water use and impacts on recreation and tourism assets, the setting of heritage assets and local visual amenities. Restrictions of water use and impacts on businesses/economy could lead to major adverse effects.
	Beneficial																		Major beneficial effects as a result of maintenance of supply to consumers at times of drought. Minor beneficial effects in terms of the effects of reducing demand and improving the resilience of water supplies to drought, maintaining surface water and groundwater levels/flows and sustainable management of abstraction and supporting overall water efficiency.
Introduction of temporary use ban	Adverse																		A moderate adverse effect has been identified in terms of promoting a sustainable economy due to the effect of the ban on some businesses (e.g. landscaping/horticulture) that rely on domestic water-using appliances/uses (e.g. sprinklers/hosepipes).
	Beneficial																		Moderate beneficial impacts include reducing the demand for water and securing supply of water for customers/businesses. Reducing the demand for water will also have minor beneficial effects on maintaining surface water and groundwater levels/flows, sustainable management of abstraction and enabling long term improvements in water efficiency. Reducing water demand will also help to improve the resilience of water supplies to drought.

5.4 Supply Side Options

A visual summary of the findings of the SEA for each of the drought permit/order options is provided in **Table 5.2**. The following subsections present these findings, indicating which options perform best across the SEA objectives. The completed appraisal tables for each of the drought options are provided in **Appendix D**.

5.4.1 Standard Drought Permit/Order Options

The assessment of drought permit/order options found that the majority of options would have a major adverse effect on surface water flows and levels in the receiving watercourses; with the exception of, South West Area Reservoir 1, South Area Reservoir 4, South West Area Reservoir 14 and the river abstraction options. Impacts would be restricted to the low flow regimes of the watercourses and would be short-term and temporary. Associated impacts on water quality vary from negligible to major; with river abstraction options Wharfe increase in annual abstraction and Derwent annual abstraction increase performing best on this SEA objective. The North Area Reservoir 2, and North West Area Reservoir 6, options would only have minor adverse effects on biodiversity, flora and fauna and the Wharfe increase in annual abstraction, Derwent annual abstraction increase and South West Reservoir 17 would have negligible effects while all the other options would be associated with moderate adverse effects. Adverse effects on recreation and landscape associated with lower water levels in the impacted watercourses would be minimal, ranging from none to minor across all of the options.

All the drought permit/order options would deliver minor to major beneficial effects on human health and economic activity through maintaining water supply during drought conditions. The options require no construction activities, so there would be minor beneficial effects associated with use of existing infrastructure. The options would also be associated with minor beneficial effects associated with the appropriate and sustainable management of water supplies and bolstering resilience to climate change.

The Ouse increased abstraction, Wharfe reduced regulated flow and Hull increased abstraction options have the greatest beneficial effects, as they would deliver large volumes of water during drought events. These options provide major beneficial effects with respect to SEA objectives regarding protecting and enhancing human health and well-being, enabling access to essential services and providing a resilient water supply for customers and the economy.

5.4.2 Long-term Drought Options

The long-term options cannot be implemented without prior construction and planning activity and so are not considered appropriate for implementation in the first two years of a drought (and there are sufficient alternative options that do not require any construction activity to ensure essential supplies can be maintained to customers). As such, the long-term options are not directly comparable with the drought permit/order options discussed in the previous section. The SEA process has been used to carry out strategic environmental impact comparison of the nine alternative options that might be required if a drought extended to a third consecutive year. The assessments have taken account of the HRA assessments where appropriate, along with findings from environmental reports.

The majority of the long-term options are associated with adverse effects relating to the consumption of resources, air quality and impacts on terrestrial species and habitats due to the construction activities involved. North West Area Reservoir 9 and North Yorkshire Groundwater increased abstraction options perform best across these objectives as they do not require large scale construction activities and make use of existing infrastructure. The North West Area Reservoir 9 and North Yorkshire Groundwater increased abstraction options would also be associated with the lowest adverse effects on biodiversity, flora and fauna.

The environmental implications of the Tees – Swale transfer and Aire abstraction are greater than for the other options. In these cases, the impact assessments indicate potentially major adverse impacts on biodiversity, flora and fauna. However, these options also have major beneficial effects, as they

would deliver large volumes of water during drought events. These options provide major beneficial effects associated with protecting and enhancing human health and well-being, enabling access to essential services and providing a resilient water supply for customers and the economy.

These conclusions will need to be weighed against other factors, such as practicability, spatial distribution of drought intensity, supply-demand needs and potential risks to drinking water quality (including Drinking Water Safety Plan risk assessment regulations) in determining which option would be implemented first. None of the options are of sufficient environmental impact to exclude them from the Drought Plan 2022 as options for a third year of drought. Inclusion of all options provides Yorkshire Water with the greatest flexibility to meet what would be a very challenging situation (i.e. third consecutive year of drought) and demonstrates that alternative options are available in case any single option cannot be implemented – or has to cease operation due to observed environmental, drinking water quality or other risks.

In-Drought Monitoring

In line with the Environmental Monitoring Plan, all options would require drought baseline environmental monitoring to be instigated in the second year of drought to examine the prevailing environmental conditions and review the environmental impact risks. This includes, for example, obtaining an understanding of the prevailing distribution of signal crayfish, crayfish plague and other diseases and invasive non-native species in the Tees catchment to inform decisions on the risks associated with the Tees – Swale transfer option. The monitoring data will inform decisions on the most appropriate options to implement in consultation with the Environment Agency and Natural England.

Non-drought baseline monitoring

It is recommended that further investigations and/or monitoring are undertaken to improve the baseline understanding of the environmental risks where there are currently uncertainties in the impact assessment for these longer-term drought options. This will improve confidence in the environmental assessments to enable better informed decisions on the most appropriate option to implement in a third year of a drought.

Table 5.2: Visual Evaluation Matrix Summary for Supply Side Options

Option			SEA Topics and Objectives																Commentary	
			Biodiversity		Population and Human Health			Material Assets and Resource Use		Water				Soil, Geology and Land Use	Air and Climate			Archaeology and Cultural Heritage		Landscape
1.1	1.2	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	4.4	5.1	6.1	6.2	6.3	7.1	8.1				
North Area Reservoirs: Drought Permits/Orders																				
North Area Reservoir 1	Adverse		None	None		None	None	None			None	None		None	None	None	None		The implementation of this drought option would result in a major adverse impact on flows and levels in receiving watercourses. This would be associated with a moderate adverse impact on water quality and a moderate adverse impact on a number of NERC and notable species. A reduction in the water levels would also result in a minor adverse impact on the landscape setting of several national trails that run alongside the reach.	
	Beneficial	None	None		None			None	None	None		None	None	None		None	None		The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.	
North Area Reservoir 2	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The implementation of this drought option would result in a major adverse impact on flows and levels in receiving watercourses. This would be associated with a minor adverse impact on water quality and a minor adverse impact on a number of NERC and notable species. A reduction in the water levels would also result in a minor adverse impact on the landscape setting of several national trails that run alongside the reach.	
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.	
North Area Reservoir 3	Adverse		None	None		None	None	None			None	None		None	None	None	None		The implementation of this option will result in major adverse effect on river flows and levels. There would be an associated moderate impact on water quality and NERC species including white clawed crayfish. There would also be negligible impacts on recreation, angling and visual amenity due to water level reduction.	
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.	
North Area Reservoir 4	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The implementation of this drought option would result in a major adverse impact on flows and levels in receiving watercourses. This would be associated with a major adverse impact on water quality, in addition to moderate adverse impacts to biodiversity, whereby NERC Fish and Macroinvertebrate species may be affected by the drought option. Due to the option there may be some minor adverse impacts on geomorphology including bank erosion when higher flows return. The visual amenity of the an AONB may be adversely affected due to lower water levels.	
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with moderate beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and moderate beneficial impacts associated with the appropriate and sustainable management of water supplies.	
North Area Reservoir 5	Adverse		None	None		None	None	None			None	None	None	None	None	None	None	None	The implementation of this drought option would result in a major adverse impact on flows and levels in receiving watercourses. This would be associated with a minor adverse impact on water quality and a moderate adverse impact on a number of NERC and notable species. A reduction in the water levels would also result in a negligible adverse impact on canoeing activities in the impacted reaches.	

Option		SEA Topics and Objectives																	Commentary
		Biodiversity		Population and Human Health			Material Assets and Resource Use		Water				Soil, Geology and Land Use	Air and Climate			Archaeology and Cultural Heritage	Landscape	
		1.1	1.2	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	4.4	5.1	6.1	6.2	6.3	7.1	8.1	
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure, the appropriate and sustainable management of water supplies and bolstering resilience to climate change.
North West Area Reservoirs: Drought Permits/Orders																			
North West Area Reservoir 1	Adverse		None	None		None	None	None				None	None	None	None	None	None	None	Implementation of this drought option would result in a major adverse impact on water flows and levels. This would be associated with a moderate adverse impact on water quality and a moderate adverse impact on a number of NERC and notable species. A reduction in the flow level would also result in a moderate impact on the extensive non-club administered angling along the watercourse.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	Implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and moderate beneficial impacts associated with the appropriate and sustainable management of water supplies.
North West Area Reservoir 2	Adverse		None	None		None	None	None				None	None	None	None	None	None		The implementation of this drought option would result in a major adverse impact on water flows and levels in the watercourse. This would be associated with a moderate adverse impact on water quality and a moderate adverse impact on a number of NERC and notable species. A reduction in the flow level would also result in a minor adverse impact on the landscape setting of national trails.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and moderate beneficial impacts associated with the appropriate and sustainable management of water supplies.
North West Area Reservoir 3	Adverse		None	None		None	None	None				None	None	None	None	None	None		The implementation of this drought option would result in a major adverse impact on water flows and levels. This would be associated with a moderate adverse impact on water quality and a moderate adverse impact on a number of NERC and Notable species. A reduction in the flow level would also result in a minor adverse impact on the landscape setting of national trails.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and moderate beneficial impacts associated with the appropriate and sustainable management of water supplies.
North West Area Reservoir 4	Adverse		None	None		None	None	None				None	None	None	None	None	None		The implementation of this drought option would result in a major adverse impact on flow levels. This would be associated with a minor adverse impact on water quality and a moderate adverse impact on a number of NERC and notable species. A reduction in the flow level would also result in a minor adverse impact on the landscape setting of several national trails that run alongside the reach.

Option		SEA Topics and Objectives																	Commentary
		Biodiversity		Population and Human Health			Material Assets and Resource Use		Water				Soil, Geology and Land Use	Air and Climate			Archaeology and Cultural Heritage	Landscape	
		1.1	1.2	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	4.4	5.1	6.1	6.2	6.3	7.1	8.1	
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and moderate beneficial impacts associated with the appropriate and sustainable management of water supplies.
North West Area Reservoir 5	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		Implementation of this drought option would result in a major adverse impact on water flows. This would be associated with a minor adverse impact on water quality and a moderate adverse impact on a number of NERC and notable species. A reduction in the flow level would also result in a minor adverse impact on the landscape setting of several national trails that run alongside the reach. There is a minor (uncertain) potential impact on an organised angling club on the impacted reaches.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	Implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure, and moderate beneficial impacts associated with the appropriate and sustainable management of water supplies.
North West Area Reservoir 6	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		Implementation of this drought option would result in a major adverse impact on water flows and levels. This would be associated with a minor adverse impact on water quality and a number of NERC and Notable species due to the loss of habitat and the stranding of individuals. The reduction in the flow level would also result in a minor adverse impact on the landscape setting of national trails, which run alongside the impacted reaches.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure the appropriate and sustainable management of water supplies.
North West Area Reservoir 7	Adverse		None	None		None	None	None			None	None	None	None	None	None	None	None	Implementation of this drought option would result in a major adverse impact on water flows and levels. This would be associated with a moderate adverse impact on water quality and a moderate impact on a number of NERC and Notable species due to the stranding of individuals or groups; deterioration or loss of habitats; fragmentation of habitats; increased mortality; and changes in morphology or behaviour.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	Implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and moderate beneficial impacts associated with the appropriate and sustainable management of water supplies.
North West Area Reservoir 8	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		Implementation of this drought option would result in a major adverse impact on water flows and level. This would be associated with a moderate adverse impact on water quality, and a moderate adverse impact on a number of NERC and notable species. A reduction in the flow level of would also result in a minor adverse impact on the landscape setting of national trails which run alongside the watercourse.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of

Option		SEA Topics and Objectives																	Commentary
		Biodiversity		Population and Human Health			Material Assets and Resource Use		Water				Soil, Geology and Land Use	Air and Climate			Archaeology and Cultural Heritage	Landscape	
		1.1	1.2	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	4.4	5.1	6.1	6.2	6.3	7.1	8.1	
																			existing infrastructure and moderate beneficial impacts associated with the appropriate and sustainable management of water supplies.
North West Area Reservoir 9	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The implementation of this drought option would result in a major adverse impact on water flows and levels. This would be associated with a minor adverse impact on water quality and a moderate adverse impact on a number of NERC and notable species. A reduction in the flow level would also result in a minor adverse impact on the landscape setting of the national trails which run alongside the watercourse.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and moderate beneficial impacts associated with the appropriate and sustainable management of water supplies.
North West Area Reservoir 10	Adverse		None	None		None	None	None			None	None	None	None	None	None	None	None	The implementation of this drought option would result in a major adverse impact on water flows and levels. This would be associated with a minor adverse impact on water quality and a moderate adverse impact on a number of NERC and notable species due to fragmentation of habitats, increased mortality and changes in morphology or behaviour.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	Implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and moderate beneficial impacts associated with the appropriate and sustainable management of water supplies.
North West Area Reservoir 11	Adverse		None	None		None	None	None			None	None	None	None	None	None	None	None	Major adverse impact on water flows and levels. This would be associated with a minor adverse impact on water quality, and a moderate adverse impact on a number of NERC and notable species. The minor reduction in flows and levels would have a minor impact on casual angling.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	Minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and moderate beneficial impacts associated with the appropriate and sustainable management of water supplies.
North West Area Reservoir 12	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		Implementation of this drought option would result in a major adverse impact on water flows and levels. This would be associated with a minor adverse impact on water quality, and a moderate adverse impact on a number of NERC and notable species. A reduction in the flow level would also result in a minor adverse impact on the landscape setting.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and minor beneficial impacts associated with the appropriate and sustainable management of water supplies.
South Area Reservoirs: Drought Permits/Orders																			

Option		SEA Topics and Objectives																	Commentary
		Biodiversity		Population and Human Health			Material Assets and Resource Use		Water				Soil, Geology and Land Use	Air and Climate			Archaeology and Cultural Heritage	Landscape	
		1.1	1.2	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	4.4	5.1	6.1	6.2	6.3	7.1	8.1	
South Area Reservoir 1	Adverse		None	None		None	None	None			None	None	None	None	None	None	None	None	Implementation of this drought option would result in a major adverse impact on water flows and levels in the impacted reaches. This would be associated with a moderate adverse impact on water quality and a moderate adverse impact on a number of NERC and notable species. A reduction in the water levels would also result in a minor adverse impact on informal angling and a fishery.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	Implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
South Area Reservoir 2	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		Implementation of this drought option would result in a major adverse impact on flow levels. This would be associated with a moderate adverse impact on water quality and a moderate adverse impact on a number of NERC and notable species. A reduction in the flow level would also result in a minor adverse impact on the landscape setting of several national trails that run alongside the reach. Angling activities on the reaches would also be subject to a moderate adverse impact.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	Implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
South Area Reservoir 3	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		Implementation of this drought option would result in a major adverse impact on water flows and levels in the watercourses. This would be associated with a moderate adverse impact on water quality and a moderate adverse impact on a number of NERC and notable species. A reduction in the water levels would also result in a minor adverse impact on canoeing and angling activities on the impacted reaches.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	Implementation of this drought option would be associated with moderate beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
South Area Reservoir 4	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The implementation of this drought option would result in a moderate adverse impact on flow levels in the impacted reaches This would be associated with a moderate adverse impact on water quality and a moderate adverse impact on a number of NERC and Notable species. A reduction in the flow level would also result in a minor adverse impact on the landscape setting of several national trails that run alongside the river reaches.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and bolstering resilience to climate change. There would also be moderate beneficial impacts associated with the appropriate and sustainable management of water supplies.
South Area Reservoir 5	Adverse		None	None		None	None	None			None	None		None	None	None	None		Implementation of this drought option would result in a major adverse impact on water flows and levels. This would be associated with a moderate adverse impact on water quality and a moderate adverse impact on a number of NERC and notable species. A reduction in the water level would also result in a minor adverse geomorphological impacts associated with the desiccation of river banks.

Option		SEA Topics and Objectives																	Commentary
		Biodiversity		Population and Human Health			Material Assets and Resource Use		Water				Soil, Geology and Land Use	Air and Climate			Archaeology and Cultural Heritage	Landscape	
		1.1	1.2	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	4.4	5.1	6.1	6.2	6.3	7.1	8.1	
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	Implementation of this drought option would be associated with moderate beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and bolstering resilience to climate change. There would also be minor beneficial impacts associated with the appropriate and sustainable management of water supplies.
South Area Reservoir 6	Adverse		None	None		None	None	None			None	None	None	None	None	None	None	None	The implementation of this drought option would result in a major adverse impact on flow levels. This would be associated with a moderate adverse impact on water quality and on a number of NERC and notable species. A reduction in the flow level would potentially impact the informal angling and canoeing on the impacted reaches, however, these impacts would be negligible under drought conditions.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	Implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
South West Area Reservoirs: Drought Permits/Orders																			
South West Area Reservoir 1	Adverse		None	None	None	None	None	None			None	None		None	None	None	None		The implementation of this drought option would result in a moderate adverse impact on water levels and flows. This would be associated with a moderate adverse impact on water quality, a moderate adverse impact on brown trout, white-clawed crayfish, grayling, bullhead and water vole and a minor impact on barbel. A reduction in water levels would also result in a negligible adverse impact on the landscape setting of the national trail.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
South West Area Reservoir 2	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The implementation of this drought option would result in a major adverse impact on water levels and flows in the receiving watercourses. This would be associated with a moderate adverse impact on water quality and a moderate adverse impact on a number of NERC and Notable species. A reduction in water levels would also result in a negligible adverse impact on the landscape setting of the national trail and a moderate adverse impact on angling.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with moderate beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and moderate beneficial impacts associated with the appropriate and sustainable management of water supplies.
South West Area Reservoir 3	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The implementation of this drought option would result in a major adverse impact on water levels and flows in the receiving watercourses. This would be associated with a moderate adverse impact on water quality, a moderate adverse impact on white-clawed crayfish, water vole and brown trout, and a minor impact on barbel, grayling and <i>Helophorus strigifrons</i> . A reduction in water levels would also result in a negligible adverse impact on the landscape setting of the national trail and a moderate adverse impact on angling.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with moderate beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.

Option		SEA Topics and Objectives																	Commentary
		Biodiversity		Population and Human Health			Material Assets and Resource Use		Water				Soil, Geology and Land Use	Air and Climate			Archaeology and Cultural Heritage	Landscape	
		1.1	1.2	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	4.4	5.1	6.1	6.2	6.3	7.1	8.1	
South West Area Reservoir 4	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The implementation of this drought option would result in a major adverse impact on water levels and flows. This would be associated with a moderate adverse impact on water quality and a minor to moderate adverse impact on a number of NERC and Notable species. A reduction in water levels would also result in a minor adverse impact on the landscape setting of the national trail and a minor adverse impact on angling.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
South West Area Reservoir 5 [EA Drought Order]	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The implementation of this drought option would result in a major adverse impact on water levels and flows in the receiving watercourses. This would be associated with a minor adverse impact on water quality, a moderate adverse impact on brown trout, white-clawed crayfish and water vole and a minor impact on bullhead. A reduction in water levels would also result in a minor adverse impact on the landscape setting of the national trail. Minor adverse impacts on the angling quality of the impacted reaches would also result.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and moderate beneficial impacts associated with the appropriate and sustainable management of water supplies.
South West Area Reservoir 6	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The implementation of this drought option would result in a major adverse impact on water levels and flows. This would be associated with a moderate adverse impact on water quality and a minor to major adverse impact on a number of NERC and Notable species. A reduction in water levels would also result in a minor adverse impact on the landscape setting of the national trail and a minor adverse impact on angling.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
South West Area Reservoir 7	Adverse		None	None		None	None	None			None	None	None	None	None	None	None	None	The implementation of this drought option would result in a major adverse impact on water levels and flows in the receiving watercourses. This would be associated with a moderate adverse impact on water quality and a moderate to major adverse impact on a number of NERC and Notable species. Minor adverse impacts on the angling quality of the impacted reaches would also result.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
South West Area Reservoir 8	Adverse		None	None		None	None	None			None	None	None	None	None	None	None	None	The implementation of this drought option would result in a major adverse impact on water levels and flows. This would be associated with a moderate adverse impact on water quality and a minor to major adverse impact on a number of NERC and Notable species. There would also be minor adverse effects on angling activities in the impacted reaches.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought

Option		SEA Topics and Objectives																	Commentary
		Biodiversity		Population and Human Health			Material Assets and Resource Use		Water				Soil, Geology and Land Use	Air and Climate			Archaeology and Cultural Heritage	Landscape	
		1.1	1.2	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	4.4	5.1	6.1	6.2	6.3	7.1	8.1	
																			conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
South West Area Reservoir 9 [EA Drought Order]	Adverse		None	None		None	None	None			None	None	None	None	None	None	None	None	The implementation of this drought option would result in a major adverse impact on water levels and flows. This would be associated with a moderate adverse impact on water quality and a moderate to major adverse impact on a number of NERC and Notable species. A reduction in water levels would also result in a negligible adverse impact on the casual angling activities.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and minor beneficial impacts associated with the appropriate and sustainable management of water supplies.
South West Area Reservoir 10	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The implementation of this drought option would result in a major adverse impact on water levels and flows in the receiving watercourses. This would be associated with a moderate adverse impact on water quality, a major adverse impact on brown trout, a moderate impact for white-clawed crayfish, water vole, and bullhead, and a minor impacts regarding Grayling and barbel. A reduction in water levels would also result in a minor adverse impact on the landscape setting of the national trail and a moderate adverse impact on angling.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with moderate beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and with the appropriate and sustainable management of water supplies.
South West Area Reservoir 11	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The implementation of this drought option would result in a major adverse impact on water levels and flows in the receiving watercourses. This would be associated with a moderate adverse impact on water quality, a major adverse impact on brown trout, a moderate adverse impact on white-clawed fish, water vole and bullhead, and a minor adverse impact on barbel and grayling. A reduction in water levels would also result in a negligible adverse impact on the landscape setting of a national trail and an adverse impact on angling.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
South West Area Reservoir 12	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The implementation of this drought option would result in a major adverse impact on water levels and flows in the receiving watercourses. This would be associated with a moderate adverse impact on water quality and a major adverse impact on brown trout. A reduction in water levels would also result in a negligible adverse impact on the landscape setting of a national trail and a moderate adverse impact on angling.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.

Option		SEA Topics and Objectives																	Commentary
		Biodiversity		Population and Human Health			Material Assets and Resource Use		Water				Soil, Geology and Land Use	Air and Climate			Archaeology and Cultural Heritage	Landscape	
		1.1	1.2	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	4.4	5.1	6.1	6.2	6.3	7.1	8.1	
South West Area Reservoir 13	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The implementation of this drought option would result in a major adverse impact on water levels and flows. This would be associated with a moderate adverse impact on water quality, a moderate adverse impact on WFD status and a major impact for brown trout, moderate impact for water vole and a minor impact for bullhead, grayling and barbel. A reduction in water levels would also result in a minor adverse impact on the landscape setting of the national trail and a minor adverse impact on angling.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
South West Area Reservoir 14	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The implementation of this drought option would result in a moderate adverse impact on water levels and flows across the receiving water courses. This would be associated with a moderate adverse impact on water quality a major impact for brown trout, a moderate impact for water vole and a minor impact for bullhead. A reduction in water levels would also result in a minor adverse impact on the landscape setting of the national trail and a minor adverse impact on angling.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
South West Area Reservoir 15	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The implementation of this drought option would result in a major adverse impact on water levels and flows. This would be associated with a moderate (uncertain) adverse impact on water quality and a moderate to major adverse impact on a number of NERC and Notable species. A reduction in water levels would also result in a minor adverse impact on the landscape setting of the national trail and a minor adverse impact on angling.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
South West Area Reservoir 16	Adverse		None	None	None	None	None	None			None	None	None	None	None	None	None	None	The implementation of this drought option would result in a major adverse impact on water levels and flows. This would be associated with a minor adverse impact on water quality and a moderate adverse impact on a number of NERC and Notable species.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
South West Area Reservoir 17	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The implementation of this drought option would result in a major adverse impact on flows, however no risk to aquatic habitats are anticipated. Negligible impacts on aquatic communities and species are anticipated. A reduction in water levels would also result in a minor adverse impact on the landscape setting of national trails and a minor adverse impact on angling.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought

Option		SEA Topics and Objectives																	Commentary
		Biodiversity		Population and Human Health			Material Assets and Resource Use		Water				Soil, Geology and Land Use	Air and Climate			Archaeology and Cultural Heritage	Landscape	
		1.1	1.2	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	4.4	5.1	6.1	6.2	6.3	7.1	8.1	
																			conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
South West Area Reservoir 19	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The implementation of this drought option would result in a major adverse impact on water levels and flows. This would be associated with a minor adverse impact on water quality and a moderate to major adverse impact on a number of NERC and Notable species. A reduction in water levels would also result in a minor adverse impact on the landscape setting of the national trail and a moderate adverse impact on angling.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and moderate beneficial impacts associated with the appropriate and sustainable management of water supplies.
South West Area Reservoir 18	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The implementation of this drought option would result in a major adverse impact on water levels and flows in the receiving watercourses. This would be associated with a minor adverse impact on water quality and a minor to major adverse impact on a number of NERC and Notable species. A reduction in water levels would also result in a minor adverse impact on the landscape setting of the national trail and a moderate adverse impact on an organised angling club
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
South West Area Reservoir 20	Adverse		None	None		None	None	None			None	None	None	None	None	None	None	None	The implementation of this drought option would result in a major adverse impact on water levels and flows. This would be associated with a moderate adverse impact on water quality and a moderate to major adverse impact on a number of NERC and Notable species. There would also be a minor adverse effect on casual angling in the reach.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
South West Area Reservoir 21	Adverse		None	None	None	None	None	None			None	None	None	None	None	None	None	None	The implementation of this drought option would result in a major adverse impact on water levels and flows. This would be associated with a moderate adverse impact on water quality and a moderate to major adverse impact on a number of NERC and Notable species.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
South West Area Reservoir 22	Adverse		None	None	None	None	None	None			None	None	None	None	None	None	None	None	The implementation of this drought option would result in a major adverse impact on water levels and flows. This would be associated with a minor adverse impact on water quality and a moderate to major adverse impact on a number of NERC and Notable species.

Option		SEA Topics and Objectives																	Commentary
		Biodiversity		Population and Human Health			Material Assets and Resource Use		Water				Soil, Geology and Land Use	Air and Climate			Archaeology and Cultural Heritage	Landscape	
		1.1	1.2	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	4.4	5.1	6.1	6.2	6.3	7.1	8.1	
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial effects associated with use of existing infrastructure and the appropriate and sustainable management of water supplies.
River Options																			
Ouse increase abstraction	Adverse		None	None		None	None	None			None	None	None	None		None	None		The drought option would lead to a minor reduction in low flows, with associated reduction in wetted width and depth. There would be moderate risk to water quality associated with a number of intermittent discharges in the reach. The flow pressures would result in minor adverse impacts on the nearby SSSI and on Notable/NERC fish species due to the siltation of spawning gravels and exposure of habitats. The reduced flow level would also have a minor impact on the landscape setting of the numerous SSSIs in close proximity to the river.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The drought option would provide up to 60 Ml/d which would deliver major beneficial impacts on population and human health due to the large deployable output and continued water supply for economic activity. In the zone of influence of the drought option water availability is at least 50% so the option will deliver beneficial impacts with regard to sustainable water supply. The option utilises existing infrastructure so would have minor beneficial impacts on material assets and resource use, as no construction is required.
Ure increase abstraction	Adverse			None		None	None	None			None	None	None	None		None	None		The drought option would lead to a moderate reduction in low flows, with associated reduction in wetted width and depth of the watercourse. The risk of water quality deterioration is assessed as medium for dissolved oxygen and low for total ammonia and phosphate, except locally downstream where the risk for total ammonia is moderate. The impact on wetted width and depth, especially in shallow areas of the channel, would have a moderate to major impact on NERC/Notable species due to the siltation of spawning gravels and exposure of habitats. The reduced flow level would have a minor impact on the landscape setting of the national trail that runs alongside the watercourse and forms part of an AONB.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The drought option would provide 3.27 Ml/d which would deliver major beneficial impacts on population and human health due to the large deployable output and continued water supply for economic activity. In the zone of influence of the drought option water availability is at least 50% so the option will deliver beneficial impacts with regard to sustainable water supply. The option utilises existing infrastructure so would have minor beneficial impacts on material assets and resource use, as no construction is required.
Wharfe reduced regulated flow	Adverse		None	None		None	None	None			None	None	None	None	None	None	None		The drought option would lead to a moderate reduction in low flows, with associated reduction in wetted width and depth over the watercourse. Water quality throughout the study area is assessed as low risk of deteriorating with regards to total ammonia and medium risk for dissolved oxygen. The reduction in flow and associated reduction in wetted width and depth of the reaches would have moderate adverse impact on NERC fish species due to the siltation of spawning gravels. A significant reduction in the level would have a visual impact on the AONB, however, there is limited access to the impacted reach with no national trails.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The drought option would provide 22.7 Ml/d which would deliver major beneficial impacts on population and human health due to the large deployable output and continued water supply for economic activity. In the zone of influence of the drought option water availability is at least 70% so the option will deliver beneficial impacts with regard to sustainable water supply. The option utilises existing infrastructure so would have minor beneficial impacts on material assets and resource use, as no construction is required.

Option		SEA Topics and Objectives																	Commentary
		Biodiversity		Population and Human Health			Material Assets and Resource Use		Water				Soil, Geology and Land Use	Air and Climate			Archaeology and Cultural Heritage	Landscape	
		1.1	1.2	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	4.4	5.1	6.1	6.2	6.3	7.1	8.1	
Wharfe increase annual abstraction	Adverse		None	None	None	None	None	None			None	None	None	None	None	None	None		The drought option would lead to a negligible reduction in flows, with a negligible reduction in wetted width and depth of the watercourse. Water quality throughout the study area is assessed as at a negligible risk of deteriorating. The reduction in flow and associated reduction in wetted width and depth of the reaches would have negligible adverse impact on NERC fish species. A negligible reduction in the level of the watercourse would have a negligible visual impact on the AONB. There is limited access to the impacted reach with no national trails.
	Beneficial	None	None		None			None	None	None	None	None	None	None	None		None	None	The drought option would provide water for public supply which would deliver moderate beneficial impacts on population and human health due to the medium deployable output and continued water supply for economic activity. The option will deliver beneficial impacts with regard to sustainable water supply. The option utilises existing infrastructure so would have minor beneficial impacts on material assets and resource use, as no construction is required.
Hull increase abstraction	Adverse		None	None		None	None	None			None	None	None	None	None	None	None	None	The drought option would have a minor hydrological impact which would result in a moderate risk to water quality deterioration in the upper reach associated with dissolved oxygen and total ammonia and major risk in the lower tidal reach based on modelled dissolved oxygen sag near the vicinity of a STW. This would result in moderate adverse impacts on river lamprey, brook lamprey and European eel due to mortality due to oxygen stress and gill clogging.
	Beneficial	None	None		None			None	None	None		None	None	None	None		None	None	The drought option would provide 20.5 Ml/d which would deliver major beneficial impacts on population and human health due to the large deployable output and continued water supply for economic activity. The option utilises existing infrastructure so would have minor beneficial impacts on material assets and resource use, as no construction is required.
Derwent annual abstraction increase	Adverse		None	None	None	None	None	None			None	None	None	None	None	None	None		The drought option would lead to negligible impact on low flows, with negligible effects towards the wetted width and depth over 24 km of the watercourse. Water quality throughout the study area is assessed as at a negligible risk of deteriorating. All impacts to designated habitats (SSSI and NERC habitats) in the reach were screened with negligible adverse effects.
	Beneficial	None	None					None	None	None		None	None	None	None		None	None	The drought option would provide up to 20 Ml/d which would deliver moderate beneficial impacts on population and human health due to the medium deployable output and continued water supply for economic activity. The option utilises existing infrastructure so would have minor beneficial impacts on material assets and resource use, as no construction is required.
Long Term Drought Options																			
East Yorkshire Groundwater Option 2	Adverse					None		None			None	None				None			Potential moderate adverse impacts on ancient woodland. Potential minor adverse impacts on population and health due to noise, dust and vibration associated with the short-term construction phase. Potential minor adverse impacts on air and climate due to additional energy required for pumping water to provide 9 Ml/d and additional use of chemicals for water treatment. Negligible impacts on material assets due to use of existing infrastructure, there may be increased use of chemicals for treatment. Minor adverse impacts on water quality due to the potential pollution risk during construction. Moderate adverse impacts on water due to uncertainty around impacts on groundwater levels. Negligible adverse impacts on archaeology and landscape and visual amenity.
	Beneficial	None	None		None		None		None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial impacts associated with the appropriate and sustainable management of water supplies and minor beneficial impacts associated with bolstering resilience to climate change.

Option		SEA Topics and Objectives																	Commentary
		Biodiversity		Population and Human Health			Material Assets and Resource Use		Water				Soil, Geology and Land Use	Air and Climate			Archaeology and Cultural Heritage	Landscape	
		1.1	1.2	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	4.4	5.1	6.1	6.2	6.3	7.1	8.1	
North Yorkshire Groundwater increase abstraction	Adverse		None	None	None	None		None			None	None	None			None	None	None	No impacts on the nearby SAC or SSSI. Minor adverse impacts associated with increased energy and material asset use such as chemicals to treat pumped water during operation. Negligible adverse impacts on water quality due to the minor baseflow reductions, which needs to be assessed further.
	Beneficial	None	None		None		None	None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with moderate beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial impacts associated with the appropriate and sustainable management of water supplies and bolstering resilience to climate change.
Ouse increase abstraction	Adverse			None		None		None			None	None				None			The implementation of this drought option would result in minor adverse impacts on biodiversity and designated sites due to the construction of the additional water treatment capacity and pipeline. There would be a minor adverse impact on the spread of invasive species due to flow and level changes. The water transfer would only result in minor adverse effects on water flows and levels. There would be major adverse effects on resource use energy use, minor impacts on air quality and moderate impacts on greenhouse emissions as a result of construction and operation of the new pipeline. There would also be minor adverse effects on the landscape setting of the surrounding countryside during the construction phase.
	Beneficial	None	None		None		None	None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers moderate beneficial impacts associated with the appropriate and sustainable management of water supplies and minor beneficial impacts associated with bolstering resilience to climate change.
Ouse water treatment works extension	Adverse			None		None		None			None	None				None			The implementation of this drought option would result in minor adverse impacts on biodiversity and designated sites due to the construction of the additional water treatment capacity and pipeline. There would be a minor adverse impact on the spread of invasive species due to the construction of the new treatment works in an area known to support invasive species. The water transfer would only result in minor adverse effects on water flows and levels. There would be moderate adverse effects on resource use energy use, air quality and greenhouse emissions as a result of the construction and operation of the new treatment works. There would also be minor adverse effects on the landscape setting of the surrounding countryside during the construction phase.
	Beneficial	None	None		None		None	None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with major beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers major beneficial effects associated with bolstering resilience to climate change and moderate beneficial impacts associated with the appropriate and sustainable management of water supplies.
Ouse Raw Water Transfer	Adverse			None		None		None			None	None				None			The implementation of this drought option would result in minor adverse impacts on biodiversity and designated sites due to the construction of the pipeline. There would be a minor adverse impact on the spread of invasive species due to the construction of the new pipeline in an area known to support invasive species. The water transfer would result in minor adverse effects on water flows and levels and moderate adverse effects on water quality. There would be minor adverse effects on resource use energy use, air quality and greenhouse emissions as a result of the construction and operation of the new pipeline. There would also be minor adverse effects on the landscape setting of the surrounding countryside during the construction phase.

Option		SEA Topics and Objectives																	Commentary
		Biodiversity		Population and Human Health			Material Assets and Resource Use		Water				Soil, Geology and Land Use	Air and Climate			Archaeology and Cultural Heritage	Landscape	
		1.1	1.2	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	4.4	5.1	6.1	6.2	6.3	7.1	8.1	
	Beneficial	None	None		None		None	None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with major beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers major beneficial effects associated with bolstering resilience to climate change and moderate beneficial impacts associated with the appropriate and sustainable management of water supplies.
Tees- Derwent Pipeline	Adverse			None		None		None			None	None				None			The implementation of this drought option would result in minor adverse impacts on biodiversity and designated sites due to the construction of the new pipeline. The water transfer would only result in minor adverse effects on water flows and levels by altering the natural flow regime. There would be a minor adverse impact on the spread of INNS due to flow and level changes in the watercourse. There would be major adverse effects on resource use energy use, minor impacts on air quality and moderate impacts on greenhouse emissions as a result of the construction and operation of the new pipeline. There would also be moderate adverse effects on land-use and minor adverse effects on the landscape setting of the surrounding countryside during the construction phase.
	Beneficial	None	None		None		None	None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with major beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers moderate beneficial effects associated with bolstering resilience to climate change and the appropriate and sustainable management of water supplies.
Tees – Swale transfer	Adverse			None		None					None					None			The implementation of this drought option would result in moderate adverse impacts on NERC species due to the risk of spreading disease through the transfer of deceased fish. The water transfer would only result in minor adverse effects on water flows and levels by altering the natural flow regime. As such, flow and level changes would not pose a great risk to the spread of existing invasive species populations, however, there is uncertainty as to the transfer scheme's overall potential impact regarding catchment river transfers and INNS risks. For example, the transmission of crayfish plague. Without effective mitigation this is considered of major concern. There would be moderate adverse effects on resource use energy use, minor impacts on air quality and moderate impacts on greenhouse emissions as a result of the construction and operation of the new pipeline. There would also be minor adverse effects on the landscape setting of the surrounding countryside during the construction phase.
	Beneficial	None	None		None		None	None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with major beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers major beneficial effects associated with bolstering resilience to climate change and moderate beneficial impacts associated with the appropriate and sustainable management of water supplies.
North West Reservoir Abstraction	Adverse			None		None		None			None	None				None	None		Minor adverse impacts of construction on flora and fauna are possible, however there are no nearby designated sites. Minor adverse impacts on the spread of invasive species during construction, however if best practice is followed this should be mitigated. Minor adverse impacts on access for recreational use during construction phase. Minor adverse impact associated with construction and operation due to an increase in material use, energy consumption and greenhouse emissions. Minor adverse impact on landscape and visual amenity due to the proximity of the national trail. Negligible adverse impacts on water level in the reservoir, and the drought permit may reduce the occurrence of spill events. Negligible impacts on water quality within the reservoir, however North West Area Reservoir 9 is known to have water quality issues and this needs to be investigated further. Negligible adverse impact on soils due to the construction element, however this is assumed to be short term and of small scale.

Option		SEA Topics and Objectives																	Commentary
		Biodiversity		Population and Human Health			Material Assets and Resource Use		Water				Soil, Geology and Land Use	Air and Climate			Archaeology and Cultural Heritage	Landscape	
		1.1	1.2	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	4.4	5.1	6.1	6.2	6.3	7.1	8.1	
	Beneficial	None	None		None		None	None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with minor beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers minor beneficial impacts associated with the appropriate and sustainable management of water supplies and minor beneficial impacts associated with bolstering resilience to climate change.
Aire abstraction	Adverse			None		None		None			None	None				None			Major adverse impacts on biodiversity are possible due to operational impacts on NERC fish species, and construction impacts on NERC species such as badgers, bats, water voles are uncertain. The abstraction would have moderate adverse impacts on surface water flows and levels and water quality. Moderate adverse impacts on resources due to energy and resource use associated with construction and operation, resources should be sourced locally. Moderate adverse impacts of operation on water quality due to nearby STW. Minor adverse impacts on the spread of invasive species if best practice is followed. Negligible adverse impacts on recreation such as fishing. Negligible adverse impacts on land-use and geology and visual amenity. There are no nearby AONB and much of the construction element will be below ground once operational.
	Beneficial	None	None		None		None	None	None	None		None	None	None	None		None	None	The implementation of this drought option would be associated with major beneficial impacts on human health and economic activity through maintaining water supply during drought conditions. This drought option also delivers moderate beneficial impacts associated with the appropriate and sustainable management of water supplies and major beneficial impacts associated with bolstering resilience to climate change.

Legend

Colour		Significance of Effect
	Dark Green	Major Beneficial
	Mid Green	Moderate Beneficial
	Light Green	Minor Beneficial
	Negligible	Negligible
	Yellow	Minor Adverse
	Orange	Moderate Adverse
	Red	Major Adverse
	NONE APPLICABLE	NOT APPLICABLE

5.5 Habitats Regulations Assessment Screening Report of Drought Plan Summary

Yorkshire Water has undertaken the first stage in the HRA process, Screening, on its Drought Plan 2022 options list. It has been carried out in parallel with the SEA and is reported separately in the HRA Screening Report. The screening stage establishes whether any schemes have the potential for a Likely Significant Effect (LSE) on the integrity of a European designated site.

HRA screening of the Drought Plan 2022 has indicated that LSE on the North Pennine Dales Meadows SAC could not be ruled out as a result of the implementation of the North Yorkshire Groundwater increased abstraction drought option. An Appropriate Assessment has been undertaken and is provided as part of the HRA Screening Report. The Appropriate Assessment concludes that abstraction from the proposed North Yorkshire Groundwater increased abstraction drought option will not have an adverse effect on the qualifying features of the North Pennine Dales Meadows SAC.

The HRA screening concludes there are no further LSE on the Humber Estuary European Marine site (EMS) or other European Designated Sites within the drought option areas.

5.6 Summary

In general, the demand side options were found to have beneficial impacts on SEA objectives for population and human health and material assets and resource use. Adverse impacts have been identified with respect to other users where restrictions of water use are involved and also for cultural heritage and emissions.

Impacts on SEA objectives for drought permit/order options were mainly associated with impacts on surface waters and their ecology. Reductions in surface water levels also have the potential for adverse impacts on water quality, recreation and on landscape and visual amenity. The river abstraction options were found to have the greatest beneficial effects due to the large volumes of water they would provide, while two reservoir options in the North area were found to have the least adverse effects.

The assessment has found that adverse effects associated with the long-term options typically relate to additional energy requirements, emissions and materials used to maintain supply. Adverse effects on surface water flows and levels, water quality and biodiversity would be associated with these options. The best performing long-term options against these criterion include North West Reservoir 9 abstraction and North Yorkshire Groundwater increased abstraction. However, the other options deliver more beneficial effects on population and human health due to higher deployable outputs.

The assessment showed that a distinction can be made between options that would be considered more sustainable than others and this can be used to inform the order in which they would be implemented.

6 Cumulative Assessment

6.1 Introduction

The cumulative assessments presented in this section have been carried out in line with the methodology described in **Section 4.4**.

6.2 Demand Side Options

6.2.1 Cumulative effects of demand management options

The matrix in **Figure 6.1** illustrates potential incompatibility and cumulative impacts between demand management schemes.

Figure 6.1: Cumulative Impacts Matrix, Demand Management Measures

Leakage reduction					
Sprinkler and hose pipe ban					
Temporary use ban					
Drought order to ban non-essential use					
Emergency drought order					
Demand Management Options	Media / water efficiency campaign	Leakage reduction	Sprinkler and hose pipe ban	Temporary use ban	Drought order to ban non-essential use

Legend:

	No cumulative effects identified or beneficial cumulative effects anticipated
	Adverse impacts anticipated
	Options are sequential
	Uncertain – Insufficient information available to undertake assessment

No cumulative impacts between demand side options have been identified.

It is acknowledged that the demand management options 'Drought Order to ban Essential Use' and 'Emergency Drought Order' are sequential. The 'Drought Order to ban Essential Use' will remain in place while the 'Emergency Drought Order' is operational, but it is the worst case scenario for demand management and effects between the two options are not additive.

6.2.2 Cumulative effects with supply side and drought permit / order options

Demand management measures serve to reduce pressure on water resources and will have a positive influence on both supply side and drought permit/order options by reducing customer demand for water, and therefore reducing the abstraction at source.

6.3 Cumulative Effects Between Supply Side Options

This section considers the cumulative effects associated with implementation of all drought options (including strategic long term alternatives) across the Yorkshire Water operational area. The potential cumulative impacts of options within individual areas are considered in the EARs. Each EAR considers the worst case scenario in which it is assumed that all options are implemented simultaneously within an individual area. This is with the exception of the long-term strategic options, which have been assessed individually (noting that hydrological screening of impacts of these options has been considered, including in combination with the standard drought options in the Long Term Option Screening Report

Due to the uncertainty of the timing/implementation of the various supply side drought options, the cumulative impacts of drought options across multiple areas has not been assessed in detail. In practice, in the event of a drought the findings of the environmental assessment reports (EARs) would be reviewed and a cumulative assessment made of the precise options proposed for implementation at that time.

Figure 6.2 provides a framework as a basis for capturing cumulative effects that could arise from simultaneous deployment of two or more drought option groups (excluding long-term options), and lists potentially impacted river reaches and estuaries.

Figure 6.2: Cumulative Effects between Drought Options at the Catchment Level

South area reservoir group	Upper Humber						
South West area reservoir group	Upper Humber	Upper Humber					
North West area reservoir group	Tidal Ouse, Upper Humber	Upper Humber	Aire, tidal Ouse, Upper Humber				
Increased Ouse pumping capacity	Ouse, Upper Humber	Upper Humber	Tidal Ouse, Upper Humber	Tidal Ouse, Upper Humber			
Ure increased abstraction	Ure, Swale, Ouse, Upper Humber	Upper Humber	Tidal Ouse, Upper Humber	Tidal Ouse, Upper Humber	Ouse Upper Humber		
Wharfe reduced regulated flow	Wharfe	Upper Humber	Tidal Ouse, Upper Humber	Tidal Ouse, Upper Humber	Tidal Ouse, Upper Humber	Tidal Ouse, Upper Humber	
R. Wharfe annual Increase	None	None	None	None	None	None	None
Hull increased abstraction	None	None	None	None	None	None	None
R. Derwent abstraction increase	None	None	None	None	None	None	None
Drought Option/Reservoir Group	North area reservoir group	South area reservoir group	South West area reservoir group	North West area reservoir group	Increased Ouse pumping capacity	Ure increased abstraction	Ure increased abstraction

The following sections consider each of the potential sources of cumulative hydrological impacts identified in **Figure 6.2**.

The River Ouse

The North Area Reservoir 1, North Area Reservoir 2, Ure increased abstraction and North Area Reservoir 3 options would result in a flow reduction. This would be considered a negligible hydrological impact.

The increased Ouse pumping capacity

Three reservoirs of the North reservoir group (North Area Reservoir 1, North Area Reservoir 2 and North Area Reservoir 3), the Ouse increased abstraction drought option and the Ure increased abstraction drought option could, if simultaneously deployed, impact flows downstream of the Ouse pumping station. The cumulative hydrological impact would be considered minor in winter and moderate in summer, which will require further assessments in summer should all five options be deployed simultaneously.

Tidal Ouse

The Rivers Aire and Wharfe discharge into the tidal River Ouse, downstream of Naburn Weir, meaning that simultaneous operation of the Calder Reservoir group, the North-West reservoir group, the North reservoir group, and the Ouse increased abstraction, Ure increased abstraction and Wharfe increased

abstraction options could potentially impact freshwater flows in the tidal Ouse. This flow reduction would be considered as negligible.

The River Ure

The simultaneous implementation of the North Area Reservoir 1 and Ure increased abstraction options would result in a moderate cumulative hydrological impact on the River Ure.

The River Swale

The North Area Reservoir 1, North Area Reservoir 2 and Ure increased abstraction options could cause a flow reduction to the Ure. This level of reduction would be considered a negligible impact.

The River Wharfe

North Area Reservoir 4 and Wharfe increased abstraction drought options could cause reductions in flow in the River Wharfe downstream. This level of reduction would be considered a minor impact.

The River Aire

Potential impacts of simultaneous deployment of all drought options in the North West Area and South Area reservoir groups could result in a minor hydrological impact on the River Aire.

The Humber Estuary

There are potential hydrological cumulative effects on the Humber Estuary. However, results of a detailed assessment of the impacts of the Drought Plan 2008 on the Humber Estuary SAC/SPA, undertaken by Scott Wilson for Yorkshire Water and reported in February 2011¹⁷, found that there would be no effect on the qualifying interests for which the Estuary is designated a SAC/SPA. This remains applicable to the Drought Plan 2022 as it contains the same options, except for the addition of the Hull increased abstraction. This additional option would not alter the conclusions of the detailed assessment.

Long-term Options

The Tees – Swale transfer would increase flows in the River Ouse by up to 40 Ml/d (less transfer losses) and would not have any adverse cumulative effects downstream with the Ouse abstraction options. There are no cumulative effects associated with the Tees – Derwent Pipeline option.

The cumulative effect assessment does not identify impacts so severe as to preclude any option from being retained in the Drought Plan 2022 for consideration in a very severe drought that has extended into a third successive year. Decisions as to which option or options to pursue in the unlikely event of such drought conditions will depend on how much additional water would be required to maintain essential water supplies to customers, prevailing river and environmental conditions (informed by drought monitoring), and the actual supply-side options already implemented in the preceding two years. The decisions would also need to take full account of other material factors including the spatial distribution of drought impacts, practicability and timescales for option implementation, drinking water quality risks and construction risks.

¹⁷ Scott Wilson (2011). Yorkshire Water Drought Plan: Assessment of Possible Impact on Humber Estuary SPA/SAC. Final Report Revision 2 February 2011. Report for Yorkshire Water.

6.4 Cumulative Effects with Yorkshire Water's Existing Abstraction Licences

The supply-side options in the drought plan will generally operate simultaneously with Yorkshire Water's abstractions permitted under its water source abstraction licences. The supply-side options do not conflict with the abstraction of water under normal licence conditions and are mutually compatible.

The SEA assessment of each supply-side option has assessed the additional environmental impact of abstracting more water (or reducing compensation flow releases) over and above the pressures on the environment already in place from existing licensed abstractions.

It should be noted that in drought conditions, the amount of water being abstracted from the environment will, in many cases, be less than the full licensed abstraction volumes due to river flow restrictions in abstraction licences and/or lower inflows or river flows precluding full abstraction. It is for this reason that drought permits and orders are required to be able to increase the amount of water available for abstraction.

6.5 Habitats Regulations Assessment Cumulative Assessment

Yorkshire Water has undertaken the first stage in the HRA process, Screening, on its Drought Plan 2022 options list. It has been carried out in parallel with the SEA and is reported separately in the HRA Screening Report, which incorporates relevant appendices to document a Stage 2 Appropriate Assessment for relevant options. The screening stage establishes whether any schemes have the potential for a Likely Significant Effect (LSE) on the integrity of a European designated site. In-combination effects of Yorkshire Water's Drought Plan 2022 with its WRMP19, the Environment Agency's regional Drought Plans, and other water company WRMPs and Drought Plans, were not considered likely to have significant adverse effects on European designated sites.

6.6 Cumulative Effects with existing relevant Programmes, Plans, Policies and Projects

6.6.1 Other water company Drought Plans

Assessment of the potential for cumulative impacts with drought options listed in neighbouring water companies' Drought Plans has been undertaken.

It should be noted that not all Drought Plans are necessarily reviewed on the same timescales as Yorkshire Water's Drought Plan 2022. The information used to carry out these assessments is considered to be the most up to date information at available at time of writing, but the assessments should be reviewed at the time of drought option implementation to ensure that no changes to the neighbouring water company drought option has been made in the intervening period, and that the assessment, therefore, remains valid.

6.6.1.1 Severn Trent

The Severn Trent Water 2018 drought plan sets out the bulk supply agreement with Yorkshire Water. In 1989, Severn Trent Water and Yorkshire Water entered into an agreement for the supply of untreated water from the Derwent Valley reservoirs to South Area Reservoir 6. The agreement secured a maximum of 21,550MI per year (59MI/d) until March 2084 with the purpose of replacing the Derwent Valley Acts and Orders 1889-1969.

The amount that can be taken by both Yorkshire Water and Severn Trent Water is set in operating guidelines based on the principle that Yorkshire Water is entitled to 24.1% of the available water. The minimum supply rate set in the guidelines between Severn Trent Water and Yorkshire Water is 35MI/d.

However, there is provision in the agreement to modify these rules and this was carried out in 1995/96, 2003 and 2018. In the event of serious drought in Severn Trent Water's region, Yorkshire Water could assist by taking a reduced supply from the Derwent Valley reservoirs (Yorkshire Water have agreed with Severn Trent Water that they will endeavour to reduce their minimum transfer to 15MI/d if required). The response from Yorkshire Water will depend upon the prevailing water resource situation in Yorkshire, but could result in the South Area reservoir drought permit options being implemented earlier in the event of a drought, and reduced supplies from the Derwent Valley reservoirs to Yorkshire Water. As such, there would be no cumulative impacts with Severn Trent's drought plan.

6.6.1.2 United Utilities

No cumulative impacts between drought options in the United Utilities Water Final Drought Plan 2018 have been identified.

6.6.1.3 Northumbrian Water

The Final Northumbrian Water Drought Plan 2019 describes the discussions with Yorkshire Water regarding potential transfers of water from the River Tees to supply Yorkshire Water, as discussed in earlier sections. The Final Drought Plan identifies operation of the Kielder Water reservoir transfer scheme and that this would be operated in accordance with the Kielder Operating Agreement. The water supplied from Northumbrian Water would be supplied only when surplus water is available in the Northumbrian Water supply area and under the conditions of the Kielder Operating Agreement. Consequently, no cumulative impacts are anticipated.

6.6.1.4 Anglian Water Services Limited

No cumulative impacts between drought options in the Anglian Water Services Final Drought Plan 2019 have been identified. There is only a very small (0.31 MI/d) transfer of water from Yorkshire Water to Anglian Water Services, which would not materially impact on any of the Yorkshire Water drought options.

6.6.2 Water Resource Management Plans

The existing (2019) Water Resources Management Plan for Yorkshire Water¹⁸ includes no plans to develop new water resources in the foreseeable future and therefore it does not have cumulative effects with the Drought Plan 2022. The Water Resources Management Plan is currently being reviewed by Yorkshire Water and this may result in a number of options currently included in the Drought Plan 2022 being developed as permanent schemes to balance supply and demand. However, if this were to occur, there are sufficient other alternative options remaining in the Drought Plan 2022 to provide the required flexibility and robustness.

Existing Water Resources Management Plans for neighbouring water companies do not include actions that would have cumulative effects with the Yorkshire Water Drought Plan 2022. Cumulative effects with measures set out in relevant River Basin Management Plans will need to be monitored over the coming years as decisions are made on the precise actions to be taken to achieve Good Ecological Status or Potential under the Water Framework Directive.

6.6.3 Environment Agency National Drought Action Plan

Assessment of the potential for cumulative impacts of supply side and drought permit/order options with drought options listed in the Environment Agency Yorkshire Area Drought Plan 2020¹⁹ has been undertaken.

The information used to carry out these assessments is considered to be the most up to date information available at time of writing, but the assessments should be reviewed at the time of actual drought option

¹⁸ Yorkshire Water Services Limited 2019. Final Water Resources Management Plan. April 2020.

¹⁹ Environment Agency 2020. Yorkshire and North East Drought Plan. Version 1. January 2012.

implementation to ensure that no changes to the Environment Agency Drought Plan have been made in the intervening period, and that the assessment therefore remains valid.

Drought actions and triggers are given in the Environment Agency's Drought Plan. Actions described include communications (internal and external), monitoring and potential drought order applications to protect the environment. Of these actions, those which are applicable for cumulative assessment with Yorkshire Water's drought options are external communications and potential environmental drought orders.

External communications will have positive cumulative effects with Yorkshire Water's media/water efficiency campaign demand side option, as drought communication messages may reinforce each other, thereby resulting in increased demand savings and greater recognition by the public to use water wisely.

Environment Agency environmental drought order actions have the potential to have cumulative impacts with Yorkshire Water's drought options. However, no specific potential drought order applications are defined in the Environment Agency's plan, although the situation should be checked in the event of a drought in case any specific need for a drought order application is being considered.

In summary, no cumulative impacts of options in Environment Agency Drought Plans and Yorkshire Water's drought options are anticipated. However, due to the uncertainties of potential locations, and potential revisions to the Environment Agency's plan, this should be considered further at the time of any potential application for drought permits/orders by Yorkshire Water.

6.6.4 Canal and River Trust Drought Plans

The Canal and River Trust²⁰ (formerly British Waterways) is currently in the process of updating its internal Drought Plan. Their previous Drought Plan has not been published, but discussions with the Canal and River Trust have indicated that their Drought Plan measures would not have cumulative impacts with those of Yorkshire Water. The Trust operates a number of reservoirs in the Yorkshire Water region to supply their navigation systems, as well as operating various navigable waterways and canals. Liaison with the Trust about drought management actions would be useful in a drought as some of the Yorkshire Water drought permit/order options may have the potential for adverse impacts on river abstractions used to support some of the navigable waterways in Yorkshire, such as the Aire Navigation.

6.6.5 Cumulative effects with any other identified relevant Plans or Policies

No cumulative effects are identified with other relevant existing plans and policies, including national policy statements, national or regional infrastructure plans or with local planning authority plans.

²⁰ Canal and Rivers Trust Putting Water into Waterways Water Resources Strategy 2015-2020.

7 Mitigation and Monitoring

7.1 Overview

Key stages of the SEA process comprise Task B5: *Mitigating adverse effects*, Task B6: *Proposing measures to monitor the environmental effects of plan or programme implementation* and Stage E: *Monitoring the significant effects of the plan or programme on the environment* (see Section 1.6, **Table 1.4**). The sections below describe how these tasks have been addressed and how Yorkshire Water intend to ensure that mitigation measures are implemented for any adverse effects that are identified and the means by which the environmental performance of the Drought Plan 2022 can be assessed.

7.2 Mitigation

Consideration of mitigation measures has been an integral part of the SEA process. The methodology for the assessment of the drought options is provided in Section 4. The SEA appraisals have been based on residual impacts, i.e. those impacts likely to remain after the implementation of reasonable mitigation. Certain assumptions have been made regarding this:

- Where suitable mitigation measures are known and identified (e.g. as informed through EARs, where available, or Yorkshire Water's drought management action forms in the Drought Plan 2022 (see Appendix 4), these have been taken into account, such that the resultant residual impact has been determined. Full details of proposed mitigation measures can be found in the Drought Plan 2022 Environmental Monitoring Plan.
- In line with recommendations made in the UKWIR SEA Guidance²¹ the SEA appraisals have assumed the implementation of reasonable mitigation, such as the use of good construction practice. This is particularly applicable to unused supply-side options which are currently non-commissioned and which do not operate as 'business as usual', and would require recommissioning in the event of use as a drought option.
- No mitigation is proposed for abstraction licences which are issued by the Environment Agency based on an assessment of the potential impacts on the environment. These licences already contain flow constraints at low flows or conditions associated with an operating agreement. This is applicable to all supply-side options which would operate with existing abstraction licence limits which have been subject to the Environment Agency's Review of Consents process.

7.3 Monitoring

Monitoring is required to track the environmental effects to show whether they are as predicted, to help identify any adverse impacts and trigger deployment of mitigation measures.

Drought Plans encompass a basket of measures that will only be implemented if and when required because of the unpredictable occurrence of a drought event, and thus the actual impact of the plan over its life is subject to very significant uncertainties.

Yorkshire Water's Drought Plan 2022 includes a range of possible measures to allow Yorkshire Water to respond to a particular drought in the most appropriate way. It is impossible to predict in advance which and how many of the measures will be required, and in which order of priority, to respond to each particular drought event. Correspondingly, it is therefore difficult to prescribe monitoring for the effects of the Drought Plan 2022 as a whole, and more appropriate to consider monitoring for drought options with significant environmental effects should these options be implemented during an actual drought.

As described in Section 1.5, EARs have been prepared. The EARs include detailed Environmental Monitoring Plans (EMPs). A summary of the monitoring requirements can be found in Appendix 4

²¹ UKWIR (2021) *Strategic Environmental Assessment and Habitats Regulations Assessment of Drought Plans* (UKWIR Project WR/02/S). Prepared by Ricardo Energy and Environment.

(Drought Management Actions) The Drought Plan Guidance requires the environmental assessment and EMPs to be updated regularly. The monitoring requirements will be assessed in more detail through this process. As described in the Drought Plan 2022, in the event of a drought requiring the implementation of drought option(s), Yorkshire Water will review the requirement for environmental monitoring in consultation with the Environment Agency and Natural England.

Appendix A: Quality Assurance Checklist

ODPM Guidance²² on SEA contains a Quality Assurance checklist to help ensure that the requirements of the SEA Directive are met. The checklist is reproduced in Table A1, indicating where this Environmental Report meets the requirements.

Table A1 Quality Assurance Checklist

Checklist item	Comments
Objectives and context	
The plan's or programme's purpose and objectives are made clear.	The purpose of the Drought Plan is set out in Section 1 of this Environmental Report.
Environmental issues and constraints, including international and EC environmental protection objectives, are considered in developing objectives and targets.	Objectives of other relevant plans and programmes are set out in Section 2.2 and Appendix B.
SEA objectives, where used, are clearly set out and linked to indicators and targets where appropriate.	SEA objectives are set out in Section 4.2 of this Environmental Report.
Links with other related plans, programmes and policies are identified and explained.	Links are identified in Section 2 and Appendix B of this Environmental Report.
Conflicts that exist between SEA objectives, between SEA and plan objectives and between SEA objectives and other plan objectives are identified and described	Cumulative effects such as those associated with the Drought Plan and other plans are addressed in Section 6. Yorkshire Water has not identified any objectives for the Drought Plan, hence there are no conflicts with the SEA objectives.
Scoping	
Consultation Bodies are consulted in appropriate ways and at appropriate times on the content and scope of the Environmental Report.	The Scoping Report is a part of the consultation process required to meet the requirements of the SEA Regulations and was circulated to consultees. The consultation process is described in Section 1.8
The assessment focuses on significant issues.	The scope of the assessment reflects the geographic extent of Yorkshire Water's water resource zones, and provides a comprehensive approach to assessment (reflecting the large number of interactions dependent on the continued supply of water) which has enabled the subsequent assessment to determine which impacts are considered to be significant.
Technical, procedural and other difficulties encountered are discussed; assumptions and uncertainties are made explicit.	Difficulties and assumptions are set out in Section 4.5 of this Environmental Report.

²² Office of the Deputy Prime Minister (2005) A Practical Guide to the Strategic Environmental Assessment Directive.

Checklist item	Comments
Reasons are given for eliminating issues from further consideration.	The SEA objectives provide a comprehensive basis for assessment. Changes (additions or removal of SEA objectives) are described in Section 4.3.1 .
Alternatives	
Realistic alternatives are considered for key issues, and the reasons for choosing them are documented.	The appraisal framework was used to assess drought options, as set out in this Environmental Report.
Alternatives include 'do minimum' and/or 'business as usual' scenarios wherever relevant.	
The environmental effects (both adverse and beneficial) of each alternative are identified and compared.	Assessment of alternatives (the drought options) have been considered in this Environmental Report.
Inconsistencies between the alternatives and other relevant plans, programmes or policies are identified and explained.	Assessment of alternatives (the drought options) have been considered in this Environmental Report.
Reasons are given for selection or elimination of alternatives.	Assessment of alternatives (the drought options) have been considered in this Environmental Report.
Baseline information	
Relevant aspects of the current state of the environment and their likely evolution without the plan or programme are described.	The current state of the environment and predicted future baseline is set out in Section 3 and Appendix C of this Environmental Report for each SEA topic.
Environmental characteristics of areas likely to be significantly affected are described, including areas wider than the physical boundary of the plan area where it is likely to be affected by the plan.	The environmental characteristics of the Yorkshire Water's water supply area, and bordering regions where appropriate, are described in Section 1.3.
Difficulties such as deficiencies in information or methods are explained.	Difficulties and limitations are set out in Section 3.2 (and Section 4.5 for wider methodology).
Prediction and evaluation of likely significant environmental effects	
Effects identified include the types listed in the Directive (biodiversity, population, human health, fauna, flora, soil, water, air, climate factors, material assets, cultural heritage and landscape), as relevant; other likely environmental effects are also covered, as appropriate.	Potential effects have been set out in the Environmental Report in Section 5, Section 6 and Appendix D.
Both positive and negative effects are considered, and the duration of effects (short, medium or long-term) is addressed.	The nature and duration of potential effects have been set out in the Environmental Report, using an appraisal framework set out in Section 4 of this Environmental Report. Effects are assessed in Sections 5 and 6 and Appendix D of the Environmental Report.

Checklist item	Comments
Likely secondary, cumulative and synergistic effects are identified where practicable.	These effects have been identified and described in Section 6 of this Environmental Report.
Inter-relationships between effects are considered where practicable.	These effects have been considered within the assessment in Section 5 and Appendix D and also in Section 6 of this Environmental Report where practicable.
The prediction and evaluation of effects makes use of relevant accepted standards, regulations, and thresholds.	Relevant standards have been used where appropriate in undertaking the assessment in the Environmental Report.
Methods used to evaluate the effects are described.	The Environmental Report includes information on the methods used for evaluation of potential effects in Section 4.
Mitigation measures	
Measures envisaged to prevent, reduce and offset any significant adverse effects of implementing the plan or programme are indicated.	Mitigation measures for potential negative effects have been incorporated into the assessment undertaken in preparing the Environmental Report, and are described in Section 7.2.
Issues to be taken into account in project consents are identified.	Such mitigating measures, if required, will be highlighted against the drought options. It is noted that Environmental Assessment Reports which include Environmental Management Plans have been prepared for most of the Drought Permit / Order sites.
The Environmental Report	
Is clear and concise in its layout and presentation.	The Environmental Report is clear and concise. See Section 1.7.
Uses simple, clear language and avoids or explains technical terms.	The Environmental Report uses simple, clear language, and explain technical terms, as appropriate.
Uses maps and other illustrations where appropriate.	The Environmental Report has used maps and illustrations where appropriate.
Explains the methodology used.	The SEA methodology has been described in Section 1.6 and Section 4 of the Environmental Report.
Explains who was consulted and what methods of consultation were used.	The consultation process is described in Section 1.8.
Identifies sources of information, including expert judgement and matters of opinion.	Sources of information have been detailed in the Environmental Report.
Contains a non-technical summary covering the overall approach to the SEA, the objectives of the plan, the main options considered, and any changes to the plan resulting from the SEA.	The Environmental Report includes a Non-Technical Summary.
Consultation	

Checklist item	Comments
The SEA is consulted on as an integral part of the plan-making process.	<p>This Scoping Report and Environmental Report are part of the consultation process required to meet the requirements of the SEA Directive. Both have been circulated to consultees.</p> <p>The consultation process is described in Section 1.8.</p>
Consultation Bodies and the public likely to be affected by, or having an interest in, the plan or programme are consulted in ways and at times which give them an early and effective opportunity within appropriate time frames to express their opinions on the draft plan and Environmental Report.	<p>The Scoping Report and Environmental Report are part of the consultation process required to meet the requirements of the SEA Directive. Both have been/will be circulated to consultees.</p> <p>The consultation process is described in Section 1.8.</p>
Decision-making and information on the decision	
The environmental report and the opinions of those consulted are taken into account in finalising and adopting the plan or programme.	<p>Responses from consultation on the Environmental Report of the Drought Plan will be incorporated into the development of the final Environmental Report. After finalisation of the Drought Plan, a statement will be published describing how the SEA and the responses to consultation have been taken into account during the preparation of the Drought Plan.</p>
An explanation is given of how they have been taken into account.	<p>Consultation responses, and how they have been incorporated in the final Environmental Report have been incorporated in the report. After finalisation of the Drought Plan, a statement will be published describing how the SEA and the responses to consultation have been taken into account during the preparation of the Drought Plan.</p>
Reasons are given for choosing the plan or programme as adopted, in the light of other reasonable alternatives considered.	<p>This is set out in the Drought Plan.</p>
Monitoring measures	
Measures proposed for monitoring are clear, practicable and linked to the indicators and objectives used in the SEA.	<p>See Section 7.3 of this Environmental Report which provides an overview of proposals for monitoring.</p>
Monitoring is used, where appropriate, during implementation of the plan or programme to make good deficiencies in baseline information in the SEA.	<p>Suggestions for monitoring have been made in the Environmental Report (see Section 7.3), with monitoring taking place following implementation of the Drought Plan, further to consultation with regulatory authorities including the Environment Agency, Natural England and Historic England.</p>
Monitoring enables unforeseen adverse effects to be identified at an early stage. (These effects	<p>Suggestions for monitoring have been made in the Environmental Report (see Section 7.3),</p>

Checklist item	Comments
may include predictions which prove to be incorrect.)	with monitoring taking place following implementation of the Drought Plan, further to consultation with regulatory authorities including the Environment Agency, Natural England and Historic England.
Proposals are made for action in response to significant adverse effects.	Mitigation measures for adverse effects are suggested in the Environmental Report (see Section 7.2).

Appendix B: Review of Policy, Plans and Programmes

The findings of the review of policy, plans and programmes are set out in **Table B1**. The purpose of the review and the key findings are set out in Section 2.2 of this Environmental Report. This table sets out the purpose and objectives of the policy, plans and programmes, their potential relationship with Yorkshire Water's Drought Plan 2022 and the potential implications of the plan objectives for the objectives of the SEA.

Table B1: Summary of the Policy, Plans and Programmes reviewed and their link to the Strategic Environmental Assessment

Objectives identified in the Policy, Plan or Programme		Influences on the Drought Plan 2022 and the SEA objectives
International		
The Bern Convention (1979) <i>The Convention on the Conservation of European Wildlife and Natural Habitats</i>		
International convention which aims to ensure conservation of wild flora and fauna species and their habitats. Special attention is given to endangered and vulnerable species, including endangered and vulnerable migratory species specified in appendices. Enforced in European legislation through the Habitats Directive (92/43/EEC) and Birds Directive (79/409/EEC).		The SEA should seek to promote the protection and enhancement of biodiversity.
The Bonn Convention (1983) <i>The Convention on the Conservation of Migratory Species of Wild Animals</i>		
Aims to conserve terrestrial, marine and avian migratory species by protecting endangered, conserving or restoring the places where they live, mitigating obstacles to migration and controlling other factors that might endanger such species. Enforced in European legislation through the Habitats Directive (92/43/EEC) and Birds Directive (79/409/EEC).		The implementation of the Drought Plan 2022 may influence biodiversity in the north west and as such the SEA should seek to maintain or enhance the quality of habitats and biodiversity.
The Paris Agreement (2016), Cancun Agreement (2011) and Kyoto Agreement (1997)		
The agreement represent key steps forward in capturing plans to reduce greenhouse gas emissions and to help developing nations protect themselves from climate impacts and build their own sustainable futures. It includes a shared vision to keep global temperature rise to below two degrees Celsius.		The SEA should consider the need for water companies to seek to promote a reduction in greenhouse gas emissions in carrying out its service activities.
Granada Convention (1985) <i>Convention for the Protection of the Architectural Heritage of Europe</i>		
To reinforce and promote policies for the conservation and enhancement of Europe's heritage.		The SEA should take into account the need to conserve heritage.
Valletta Convention (1992) <i>Convention on the Protection of Archaeological Heritage of Europe (revised)</i>		
The Valletta Convention is one of a series of Conventions for the protection of the cultural heritage produced by the Council of Europe over the last fifty years.		The SEA should take into account the need to conserve heritage.
Council of Europe (2003) <i>European Soils Charter</i>		
Sets out common principles for protecting soils across the EU and will help.		The SEA should seek to ensure that the quality of the regions land, including soils, is protected or enhanced.

Objectives identified in the Policy, Plan or Programme	Influences on the Drought Plan 2022 and the SEA objectives
Council of Europe (2006), <i>European Landscape Convention</i>	
<p>European Landscape Convention (ELC) is the first international convention to focus specifically on landscape. Natural England implements the European Landscape Convention in England. The aims of the 2009/10 action are:</p> <ul style="list-style-type: none"> • Lead on improving the protection, planning and management of all England's landscapes • Raise the quality, influence and effectiveness of policy and practical instruments • Increase the engagement in and enjoyment of landscapes by the public • Collaborate with partners across the UK and Europe. 	<p>The implementation of the Drought Plan 2022 may influence landscape or the enjoyment of landscapes in the YWSL SEA study area and as such the SEA should consider the need to maintain or enhance the quality of the region's landscapes and the potential enjoyment of these landscapes.</p>
European Commission (2001) Directive 2001/42/EC on the Assessment of the Effects of Certain Plans and Programmes on the Environment (SEA Directive)	
<p>The SEA Directive provides the following requirements for consultation:</p> <ul style="list-style-type: none"> • Authorities which, because of their environmental responsibilities, are likely to be concerned by the effects of implementing the plan or programme, must be consulted on the scope and level of detail of the information to be included in the Environmental Report. These authorities are designated in the SEA Regulations as the Consultation Bodies (Consultation Authorities in Scotland). • The public and the Consultation Bodies must be consulted on the draft plan or programme and the Environmental Report, and must be given an early and effective opportunity within appropriate time frames to express their opinions. • Other EU Member States must be consulted if the plan or programme is likely to have significant effects on the environment in their territories. • The Consultation Bodies must also be consulted on screening determinations on whether SEA is needed for plans or programmes under Article 3(5), i.e. those which may be excluded if they are not likely to have significant environmental effects. 	<p>The Directive sets the basis for SEA as a whole and therefore indirectly covers all objectives.</p>
European Commission (2011), <i>The EU Biodiversity Strategy to 2020</i>	
<p>The strategy aims to halt the loss of biodiversity and ecosystem services in the EU and help stop global biodiversity loss by 2020. It reflects the commitments taken by the EU in 2010, within the international Convention on Biological Diversity.</p>	<p>The implementation of the Drought Plan 2022 may influence biodiversity in the YWSL area and as such the SEA should take account of the need to maintain or enhance the quality of habitats and biodiversity.</p>
European Commission (2009), <i>Birds Directive (2009/147/EC)</i>	
<p>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).</p>	<p>The SEA should seek to protect and conserve important bird habitats.</p>

Objectives identified in the Policy, Plan or Programme		Influences on the Drought Plan 2022 and the SEA objectives
European Commission (2009), <i>Promotion of the use of energy from renewable sources Directive (2009/28/EC)</i>		
This promotes the use of energy from renewable sources.		The SEA should take account of the need to seek to promote the use of renewable energy.
European Commission (2008) <i>Marine Strategy Framework Directive (2008/56/EC)</i>		
<p>The Directive sets out a framework for an ecosystem-based approach to the management of human activities which supports the sustainable use of marine goods and services. The overarching goal of the Directive is to achieve 'Good Environmental Status' (GES) by 2020 across Europe's marine environment. Each member state is required to develop a marine strategy for their waters to protect and conserve the marine environment, prevent its deterioration, and, where possible, restore marine ecosystems in affected areas. The strategies must contain:</p> <ul style="list-style-type: none"> • An initial assessment of the current environmental status; • A determination of what GES means for those waters; • Targets and indicators designed to show whether a Member State is achieving GES; • A monitoring programme to measure progress towards GES; • A programme of measures designed to achieve or maintain GES <p>The Directive also requires Marine Protected Areas (MPAs) to be established to support the achievement of GES.</p>		The Drought Plan 2022 may have some influence on the marine environment and the SEA should seek to protect and conserve this.
European Commission (2008) <i>Ambient Air Quality Directive (2008/50/EC)</i>		
The 2008 directive sets legally binding limits for concentrations in outdoor air of major air pollutants that impact public health such as particulate matter (PM10 and PM2.5) and nitrogen dioxide (NO2). There are also indirect effects as these pollutants can combine in the atmosphere and contribute to greenhouse gases which can be transported great distances by weather systems.		The implementation of the Drought Plan 2022 may have some influence on air quality, either directly or indirectly, through construction or operational activities. The SEA should take account of the need to ensure that the region's air quality is maintained or enhanced, and that emissions of air pollutants are kept to a minimum. seek to help meet regional air quality targets.
European Commission (2007), <i>Floods Directive (2007/60/EC)</i>		
The Directive's aim is to reduce and manage the risks that floods pose to human health, the environment, cultural heritage and economic activity. The Directive shall be carried out in coordination with the Water Framework Directive, notably by flood risk management plans and river basin management plans being coordinated, and through coordination of the public participation procedures in the preparation of these plans.		The SEA should seek to ensure that flood risk in the region is not adversely affected by the implementation of the Drought Plan 2022.
European Commission (2006), <i>Fresh Water Fish Directive (2006/44/EC)</i>		
The Directive seeks to protect those fresh water bodies identified by Member States as waters suitable for sustaining fish		The SEA should seek to promote the protection of river and lake water quality in order to maintain and develop suitable

Objectives identified in the Policy, Plan or Programme	Influences on the Drought Plan 2022 and the SEA objectives
<p>populations. For those waters, it sets physical and chemical water quality objectives for salmonid waters and cyprinid waters.</p> <p>The Directive is designed to protect and improve the quality of rivers and lakes to encourage healthy fish populations.</p>	<p>environments that will sustain fresh water fish populations.</p>
<p>European Commission (2006), <i>Animal health requirements for aquaculture animals and products thereof, and on the prevention and control of certain diseases in aquatic animals</i> (2006/88/EC)</p>	
<p>The Directive establishes:</p> <p>Animal health requirements for the placing on the market, importation and transit of aquaculture animals and their products;</p> <p>Minimum measures to prevent diseases in aquaculture animals;</p> <p>Minimum measures to be taken in response to suspected or established cases of certain diseases in aquatic animals.</p>	<p>The implementation of the Drought Plan 2022 may influence biodiversity in the north west and as such the SEA should seek to maintain or enhance the quality of habitats and biodiversity.</p>
<p>European Commission (2006) <i>Thematic Strategy for Soil Protection</i></p>	
<p>The Thematic Strategy for Soil Protection consists of a Communication from the Commission to the other European Institutions, a proposal for a framework Directive (a European law), and an Impact Assessment.</p>	<p>The SEA assessment framework should include soils.</p>
<p>European Commission (2004), <i>Environmental Liability Directive</i> (2004/35/EC)</p>	
<p>The Directive establishes a framework for environmental liability based on the "polluter pays" principle, with a view to preventing and remedying environmental damage.</p>	<p>The SEA should seek to ensure that the Drought Plan 2022 avoids causing direct or indirect damage to the aquatic environment or contamination of land that creates a significant risk to human health.</p>
<p>European Commission (2000), <i>The Water Framework Directive</i> (2000/60/EC)</p>	
<p>This Directive establishes a framework for the protection of inland surface waters, transitional waters, coastal water and groundwater. It also encourages the sustainable use of water resources.</p> <p>Key objectives are general protection of the aquatic ecology, specific protection of unique and valuable habitats, protection of drinking water resources, and protection of bathing water.</p>	<p>The SEA should seek to promote the protection and enhancement of all water resources.</p>
<p>European Commission (1999) <i>Landfill of Waste Directive</i> (99/31/EC)</p>	
<p>The Directive aims at reducing the amount of waste landfilled; promoting recycling and recovery; establishing high standards of landfill practice across the EU, and preventing the shipping of waste from one Country to another.</p> <p>The objective of the Directive is to prevent or reduce as far as possible negative effects on the environment (in particular on surface water, groundwater, soil, air and human health) from the landfilling of waste, by introducing stringent technical requirements for waste and landfills.</p>	<p>The Drought Plan 2022 should take the effects on waste to landfill into account.</p> <p>The SEA assessment should consider the effects on water, soil, air, human health and waste.</p>
<p>European Commission (1998), <i>Drinking Water Directive</i> (1998/83/EC)</p>	

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<p>The objective of the Drinking Water Directive is to protect the health of the consumers in the European Union and to make sure the water is clean and of good quality.</p> <p>To make sure drinking water everywhere in the EU is healthy, clean and tasty, the Drinking Water Directive sets standards for the most common substances (so-called parameters) that can be found in drinking water. A total of 48 microbiological and chemical parameters must be monitored and tested regularly.</p>	<p>The SEA should seek to ensure that objectives address water quality in the region, particularly drinking water quality.</p>
European Commission (1992), <i>Habitats Directive (1992/43/EC)</i>	
<p>The aim of the Directive is to promote the maintenance of biodiversity by requiring Member States to take measures to maintain or restore natural habitats and wild species listed on the Annexes to the Directive at a favourable conservation status, introducing robust protection for those habitats and species of European importance.</p>	<p>The impacts of the Drought Plan 2022 options on internationally designated sites and species must be considered as part of the SEA.</p>
European Commission (1991) The Nitrates Directive (91/676/EEC)	
<p>The Nitrates Directive is designed to reduce water pollution caused by nitrate from agriculture. The directive requires Defra and the Welsh Assembly Government to identify surface or groundwaters that are, or could be high in nitrate from agricultural sources.</p> <p>Once a water body is identified as being high in nitrate all land draining to that water is designated a Nitrate Vulnerable Zone. Within these zones, farmers must observe an action programme of measures which include restricting the timing and application of fertilisers and manure, and keeping accurate records.</p>	<p>The Drought Plan 2022 should be consistent with the aim to reduce water pollution caused by nitrate from agriculture.</p> <p>The SEA assessment framework should include water quality.</p>
European Commission (1991), <i>Urban Waste Water Treatment Directive (1991/271/EC)</i>	
<p>The Directive's objective is to protect the environment from the adverse effects of urban waste water discharges and discharges from certain industrial sectors and concerns the collection, treatment and discharge of domestic waste water, mixture of waste water and waste water from certain industrial sectors.</p>	<p>The SEA should seek to maintain, protect and improve water quality across the region.</p>
<p>European Commission, The Bathing Waters Directives</p> <p>Council Directive 76/160/EEC of 8 December 1975 concerning the quality of bathing water and Directive 2006/7/EC of the European Parliament and of the Council of 15 February 2006 concerning the management of bathing water quality and repealing Directive 76/160/EEC</p>	
<p>The Bathing Waters Directives include mandatory standards for the quality of bathing waters (excluding water indented for therapeutic bathing purposes and water used in swimming pools). It sets the minimum quality criteria to be met by bathing water:</p> <ul style="list-style-type: none"> • The physical, chemical and microbiological parameters • The mandatory limit values and indicative values for such parameters; • The minimum sampling frequency and method of analysis or inspection of such water. <p>In March 2006, a revised Bathing Water Directive was adopted and become law in the UK in March 2008. As well as stricter water quality standards, it contains a requirement to provide more detailed and standardised information</p>	<p>The Drought Plan 2022 will need to comply with set limits.</p> <p>The SEA assessment should take into account the effects of options on the water quality at designated bathing waters.</p>

Objectives identified in the Policy, Plan or Programme		Influences on the Drought Plan 2022 and the SEA objectives
about bathing waters across Europe. Directive 2006/7/EC will repeal the Directive 76/160/EEC in 2014.		
Council of Europe (2000) <i>European Landscape Convention (Florence Convention)</i>		
The European Landscape Convention is an international convention focusing specifically on landscape. The UK Government signed the European Landscape Convention in 2006 and it became binding from March 2007.		The SEA should take landscape quality into account and include water quality in the assessment framework.
Ramsar Convention (1971) <i>The Convention on Wetlands of International Importance</i>		
The Convention on Wetlands (Ramsar, Iran, 1971) (the "Ramsar Convention") is an intergovernmental treaty that embodies the commitments of its member countries to maintain the ecological character of their Wetlands of International Importance and to plan for the "wise use", or sustainable use, of all of the wetlands in their territories.		The impacts of the Drought Plan 2022 options on important wetland habitats must be considered as part of the SEA.
United Nations (1992), <i>Convention on Biological Diversity (CBD)</i>		
The main objectives are: <ul style="list-style-type: none"> • Conservation of biological diversity • Sustainable use of its components • Fair and equitable sharing of benefits arising from genetic resources 		The commitment to conserving biological diversity must be considered in any Drought Plan 2022 options and the SEA should seek to promote the protection and enhancement of biodiversity.
United Nations Economic Commission for Europe (1998) <i>Aarhus Convention - Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters</i>		
The Aarhus Convention grants the public rights regarding access to information, public participation and access to justice, in governmental decision-making processes on matters concerning the local, national and transboundary environment. It focuses on interactions between the public and public authorities. The Aarhus Convention has been ratified by the European Community, which has begun applying Aarhus-type principles in its legislation, notably the Water Framework Directive (Directive 2000/60/EC).		The Convention is designed to improve the way ordinary people engage with government and decision-makers on environmental matters. It helps to ensure that environmental information is easy to get hold of and easy to understand. The SEA should seek to provide easily understood information to the public on the environmental implications of the Drought Plan 2022 and its constituent options.
The Environment Noise Directive (Directive 2002/49/EC)		
The END aims to define a common approach intended to avoid, prevent or reduce on a prioritised basis the harmful effects, including annoyance, due to the exposure to environmental noise. It also aims to provide the basis for developing EU measures to reduce noise emitted by major sources, in particular road and rail vehicles and infrastructure, aircraft, outdoor and industrial equipment and mobile machinery.		The SEA assessment framework should include for the protection against excessive noise.
United Nations (2002), <i>Commitments arising from the World Summit on Sustainable Development, Johannesburg</i>		

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<p>The World Summit on Sustainable Development proposed broad-scale principles which should underlie sustainable development and growth.</p> <p>It included objectives such as:</p> <ul style="list-style-type: none"> • Greater resource efficiency • Work on waste and producer responsibility • New technology development • Push on energy efficiency • Integrated water management plans needed • Minimise significant adverse effects on human health and the environment from chemicals by 2020. 	<p>These commitments are the highest level definitions of sustainable development. The Drought Plan 2022 should be influenced strongly by all of these themes and should seek to take its aims into account.</p> <p>The SEA should seek to promote the achievement of the sustainable development objectives outlined in this plan.</p>
<p>The World Heritage Convention (UNESCO) 1972 – a global instrument for the protection of cultural and natural heritage.</p>	
<p>A global instrument for the protection of cultural and natural heritage. Signatories commit themselves to refraining from 'any deliberate measures which might damage, directly or indirectly, the cultural and natural heritage' of their World Heritage Sites. The city of Bath is the closest UNESCO designated site.</p>	<p>The Drought Plan 2022 and SEA should take account of the need to protect scheduled monuments and archaeological areas.</p>
<p>National</p>	
<p>Ancient Monuments and Archaeological Areas Act 1979</p>	
<p>This act addresses the protection of scheduled monuments including the control of works affecting scheduled monuments. It also addresses archaeological areas.</p>	<p>The Drought Plan 2022 and SEA should take account of the need to protect scheduled monuments and archaeological areas.</p>
<p>The Climate Change Act 2008</p>	
<p>This act sets carbon targets for 2050. Originally the target was for net carbon account for 2050 at least 80% lower than 1990 baseline., however, this was revised in 2019 to be at least 100% lower in line with the net zero ambition.</p>	<p>This target needs to be taken into account by the SEA.</p>
<p>Conservation of Habitats and Species Regulations 2017</p>	
<p>These regulations consolidate all the various amendments made to the Conservation (Natural Habitats) Regulations 1994 in England.</p> <p>The regulations provide for the designation and protection of 'European sites', the protection of 'European species', and the adaptation of planning and other controls for the protection of European Sites. They are the principal means by which the Habitats Directive is transposed in England as such its main objective is to promote the maintenance of biodiversity.</p>	<p>The Drought Plan 2022 must fully comply with the Regulations.</p> <p>The impacts of the Drought Plan 2022 options on biodiversity and protected species and sites must be considered as part of the SEA.</p>
<p>The Countryside and Rights of Way (CROW) Act, 2000</p>	
<p>The Act provides for increased public access to the countryside and strengthens protection for wildlife.</p> <p>The main provisions of the Act are as follows:</p>	<p>The Drought Plan 2022 may have an effect on public access to the countryside.</p>

Objectives identified in the Policy, Plan or Programme	Influences on the Drought Plan 2022 and the SEA objectives
<ul style="list-style-type: none"> • Extends the public's ability to enjoy the countryside whilst also providing safeguards for landowners and occupiers • Creates new statutory right of access to open country and registered common Land Use Consultants • Modernises Right of Way system • Gives greater protection to SSSIs • Provides better management arrangements for AONBs • Strengthens wildlife enforcement legislation. 	<p>The SEA should include objectives that take into account public access, protection of SSSIs and the management of relevant landscape designations.</p>
The Cabinet Office (2020) Our Plan to Rebuild: The UK Government's COVID-19 Strategy	
<p>The SEA must consider the potential influence on future events, and the national economy that the UK Government's COVID-19 Strategy may have.</p>	<p>The SEA must consider the potential influence on future events, and the national economy that the UK Government's COVID-19 Strategy may have.</p>
HM Treasury (2021) Build Back Better: our plan for growth	
<p>Outlines the government focus on growth in infrastructure, Skills and innovation. With focus on ensuring this growth supports levelling up the whole of the UK, and supports the transition to Net Zero.</p>	<p>The SEA should take into account the UK Government's focus on growth, and the transition to a carbon-zero economy by 2030.</p>
Department of Energy and Climate Change (2011) National Policy Statements for Energy Infrastructure	
<p>The energy National Policy Statements (NPSs) set out national policy against which proposals for major energy projects will be assessed and decided on by the Infrastructure Planning Commission. The purpose of the NPSs is to develop a clear, long-term policy framework which facilitates investment in the necessary new infrastructure (by the private sector) and in energy efficiency. It highlights that the construction, operation and decommissioning of infrastructure can lead to increased demand for water, involve discharges to water and cause adverse ecological effects resulting from physical modifications to the water environment.</p>	<p>The SEA should consider the cumulative effects of the Drought Plan 2022 and any major energy proposals which may affect the availability of water in the Yorkshire Water supply area.</p>
Department of Energy and Climate Change (2011) Planning our electric future: a White Paper for secure, affordable and low carbon electricity	
<p>This white paper outlines a package of reforms so that by 2030 there will be a flexible, smart and responsive electricity system, powered by a range of low carbon sources of electricity. This includes engaging with consumers on energy use. Decarbonisation is important in meeting the 2050 targets.</p>	<p>The implementation of the Drought Plan 2022 may have an influence upon Yorkshire Water total energy use. The SEA should seek to promote energy efficiency, as well as seeking to reduce the effects of climate change through greenhouse gas emissions. The SEA should also promote the use of renewable energy, where relevant.</p>
Department for Business, Energy and Climate Change (2007) Energy White Paper: Meeting the Energy Challenge	
<p>Meeting the energy challenge', sets our international and domestic energy strategy, in the shape of four policy goals:</p>	<p>The implementation of the Drought Plan 2022 may have an influence upon Yorkshire Water's total energy use. The SEA should seek to promote energy efficiency, as well as seeking to reduce</p>

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<ul style="list-style-type: none"> • Aiming to cut CO2 emissions by some 60% by about 2050, with real progress by 2020 • Maintaining the reliability of energy supplies • Promoting competitive markets in the UK and beyond • Ensuring every home is heated adequately and affordably. <p>A new Energy White Paper is due to be published Spring 2020 and will roadmap the</p>	<p>the effects of climate change through greenhouse gas emissions. The SEA should also promote the use of renewable energy, where relevant.</p>
<p>Department for Business, Energy and Industrial Strategy (2020) Energy White Paper: Powering our Net Zero Future</p>	
<p>The Energy White Paper outlines the strategies that will be adopted towards the UK's ambition of net zero emissions by 2050. The strategy will be threefold:</p> <ul style="list-style-type: none"> • Transform current energy supply. • Support a 'green' economic recovery through expansion of green industry, jobs and export opportunities. • A fair deal for customers, protecting the fuel poor by balancing investment against bill impacts. 	<p>The implementation of the Drought Plan 2022 may have an influence upon Yorkshire Water's total energy use. The SEA should seek to promote energy efficiency, as well as seeking to reduce the effects of climate change through greenhouse gas emissions. The SEA should also promote the use of renewable energy, where relevant.</p>
<p>Defra, Environment Agency, Natural England, Forestry Commission England (2016) Creating a great place for living</p>	
<p>In 2016 Defra produced a report that set out objects to great a great place for living, The objectives are related to the following topics:</p> <ul style="list-style-type: none"> • Environment – a cleaner, healthier environment, benefiting people and the economy; • Food and farming – a world-leading food and farming industry; • Rural – a thriving rural economy, contributing to national prosperity and wellbeing; • Protection – a nation better protected against floods, animal and plant diseases and other hazards, with strong response and recovery capabilities; • Excellent Delivery – Excellent delivery, on time and to budget with outstanding value for money; • An outstanding organisation – an organisation striving to be the best, focused on outcomes and constantly challenging itself. 	<p>The SEA must take into account impacts of the drought options (construction and operation) on the environment, as well as the population and human health and land use (which will impact on the food and farming and rural objectives).</p>
<p>Defra (2020) Enabling a Natural Capital Approach (ENCA)</p>	
<p>ENCA resources are a mixture of data, guidance and tools that enable individuals/organisations to understand natural capital and know how to take it into account. The aims of ENCA are to:</p> <ul style="list-style-type: none"> • Build capacity among users to assess and value the natural environment by providing comprehensive information and resources • Reduce search costs for analysts and decision makers • Provide a platform to update tools and guidance as knowledge develops • Identify new evidence and areas for development <p>The guidance is a comprehensive document providing information and resources for Natural Capital, covering the natural capital framework, economic valuation of the environment, how project or policy appraisal can incorporate natural capital, natural capital</p>	<p>The SEA will help to inform future development by YWSL and therefore should consider the effect of the drought options on opportunities for natural capital.</p>

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accounting principles and methods, benefits and challenges and applying natural capital at a local level.		
Defra (2015) The government's response to the Natural Capital Committee's third State of Natural Capital report		
<p>This provides a number of recommendations such as:</p> <p>Agreement for the development of a 25 year plan for a healthy natural economy. This includes helping organisations understand the economic, social and cultural value the impact their actions have on it and how to use the knowledge for better decisions; identify most important and threatened environmental assets; protection of designated areas; address outstanding monitoring and data issues to enable better decisions about strategic investments in natural capital.</p> <p>Assigning institutional responsibility for monitoring the state of natural capital.</p> <p>Organisations that manage land and water assets should create a register of natural capital for which they are responsible.</p>		<p>Outputs from the SEA process will help to inform any future potential development by Yorkshire Water of Natural Capital Accounting (NCA) approaches to assessing environmental asset performance. Government (led by HM Treasury and Defra) is increasingly using NCA to support future environmental policy and decision-making, and there may be future expectations on water companies to follow suit.</p>
Defra (2015) The Great Britain Invasive Non-native Species Strategy		
<p>The Strategy is intended to provide a strategic framework, updated from the 2008 framework, within which the actions of government departments, their related bodies and key stakeholders can be better co-ordinated. Its overall aim is to minimise the risks posed, and reduce the negative impacts caused, by invasive non-native species in Great Britain.</p>		<p>The implementation of the Drought Plan 2022 may influence biodiversity in the north west and as such the SEA should seek to maintain or enhance the quality of habitats and biodiversity.</p>
Defra (2014), River Basin Planning Guidance		
<p>Aims to give guidance on practical implementation of the Water Framework Directive (WFD).</p> <p>The river basin planning process involves setting environmental objectives for all groundwater and surface waters (including estuaries and coastal waters) within the river basin district, and devising programmes of measures to meet those objectives.</p>		<p>The Drought Plan 2022 should take into account the contents of this statutory guidance</p>
Defra (2017) The UK Climate Change Risk Assessment 2017		
<p>Outlines the UK and devolved Government's views on the key climate change risks and opportunities that the UK faces.</p>		<p>The SEA should take into account the need for climate change adaptation.</p>
Defra (2012) National Policy Statement for Waste Water		
<p>National Policy Statement (NPS) sets out Government policy for the provision of major waste water infrastructure. It will be used by the Infrastructure Planning Commission (IPC) to guide its decision making on development consent applications for waste water developments that fall within the definition of Nationally Significant Infrastructure Project (NSIP) as defined in the Planning Act 2008.</p>		<p>The SEA should seek to ensure the Drought Plan 2022 considers any unforeseen NSIP proposals that come forward prior to adoption which may affect water resources in the Yorkshire Water area.</p>
Defra (2011) Biodiversity 2020: A Strategy for England's Wildlife and Ecosystem Services		
<p>The objective for the next decade is: 'to halt overall biodiversity loss, support healthy well-functioning ecosystems and establish coherent ecological networks, with more and better places for nature for the benefit of wildlife and people.' Four action areas are:</p>		<p>The SEA must consider impacts on biodiversity. The implementation of the Drought Plan 2022 may influence biodiversity in the area and as such the SEA should seek to maintain or enhance</p>

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<p>A more integrated large-scale approach to conservation on land and at sea</p> <p>Putting people at the heart of biodiversity policy</p> <p>Reducing environmental pressures</p> <p>Improving our knowledge.</p>	<p>the quality of habitats and biodiversity, and take regards of priority species.</p>
Defra (2011) Government Review of Waste Policy in England 2011	
<p>The review is guided by the “waste hierarchy”, EU obligations and targets on waste management, carbon impacts, environmental objectives and the costs and benefits of different policy options.</p> <p>The Governments vision include a move beyond the current throwaway society to a “zero waste economy” in which material resources are re-used, recycled or recovered wherever possible, and only disposed of as the option of very last resort.</p>	<p>The Drought Plan 2022 may involve options that involve the generation of waste (e.g. either through construction requirements or operation of supply side options). The SEA should seek to enhance recycling and minimise the amount of waste going to landfill.</p>
Defra (2011) Water for Life - Water White Paper	
<p>This sets out market reform in the water sector.</p>	<p>The Drought Plan 2022 should take into account the contents of this paper.</p>
Defra (2011) The Natural Choice: securing the value of nature, The Natural Environment White Paper	
<p>Addresses the Government’s approach to valuing economic and social benefits of a healthy natural environment while continuing to recognise nature’s intrinsic value. It describes the vision of the Government for this to be the first generation to leave the natural environment of England in a better state than it inherited, requiring placing the value of nature at the heart of decision-making – in Government, local communities and businesses. Approaches to mainstream the value of nature across society include:</p> <ul style="list-style-type: none"> • facilitating greater local action to protect and improve nature; • creating a green economy, in which economic growth and the health of our natural resources sustain each other, and markets, business and Government better reflect the value of nature; • strengthening the connections between people and nature to the benefit of both; and • showing leadership in the European Union and internationally, to protect and enhance natural assets globally 	<p>The Drought Plan 2022 supports the provisioning service of freshwater through ensuring security of supply during times of drought. The media campaigns that form part of the Demand side Drought Plan 2022 options may contribute towards increasing the awareness of the population to the value the provisioning services of water. Other related ecosystem services may include:</p> <ul style="list-style-type: none"> • Provisioning Services: Biodiversity • Regulating Services: Water Regulation • Cultural services: Recreation and ecotourism • Cultural services: Cultural heritage values • Cultural services: Aesthetic <p>The SEA should ensure the Drought Plan 2022 effects the related provisioning services in the least damaging way through informing the Drought Plan 2022 formulation and selection of Drought Plan 2022 options during times of Drought.</p>
<p>Defra (2011) UK National Ecosystem Assessment</p> <p>Defra (2014) UK National Ecosystems Assessment Follow on, Synthesis of Key Findings</p>	
<p>Ecosystems services from natural capital contribute to the economic performance of the nation.</p>	<p>For the purposes of the readership integrating an ecosystems services approach into the SEA is not being undertaken. However, it is realised that</p>

Objectives identified in the Policy, Plan or Programme	Influences on the Drought Plan 2022 and the SEA objectives
<p>Information and tools to enable decision makers to understand the wider value of ecosystems and their associated services.</p>	<p>through the 'Objective-led' approach, many of the services relevant to the Drought Plan 2022 can be considered through the objectives and key questions for example:</p> <p>Provisioning Services: Freshwater</p> <p>Provisioning Services: Biodiversity</p> <p>Regulating Services: Water Regulation</p> <p>Cultural services: Recreation and ecotourism</p> <p>Cultural services: Cultural heritage values</p> <p>Cultural services: Aesthetic</p> <p>The SEA should ensure the Drought Plan 2022 effects the related provisioning services in the least damaging way through informing the Drought Plan 2022 formulation and selection of Drought Plan 2022 options during times of Drought.</p> <p>In the event of further guidance being issued on incorporating ESA into SEA, the anticipated approach is sufficiently flexible that it should be able to accommodate this (subject to timing).</p>
<p>Defra (2010) Making Space for Nature: A Review of England's Wildlife Sites and Ecological Network</p>	
<p>This independent review of England's wildlife sites and the connections between them sets objectives and recommendations to help achieve a healthy natural environment that will allow our plants and animals to thrive.</p>	<p>The SEA should seek to maintain or enhance the quality of habitats and biodiversity.</p>
<p>Defra (2009) Safeguarding our soils – A Strategy for England</p>	
<p>The new Soil Strategy for England – Safeguarding our Soils – outlines the Government's approach to safeguarding our soils for the long term. It provides a clear vision to guide future policy development across a range of areas and sets out the practical steps that we need to take to prevent further degradation of our soils, enhance, restore and ensure their resilience, and improve our understanding of the threats to soil and best practice in responding to them.</p> <p>The Governments vision is that: By 2030, all England's soils will be managed sustainably and degradation threats tackled successfully. This will improve the quality of England's soils and safeguard their ability to provide essential services for future generations.</p>	<p>The SEA should seek to ensure that the quality of the regions soils and their management is protected or enhanced.</p>
<p>Defra (2009) Construction code of practice for the sustainable use of soils on construction sites</p>	
<p>This Code of Practice was developed to assist anyone involved in construction to better protect and enhance the soil resources with which they work. The key messages include; consideration of sustainable drainage systems on site, preparation of Soil Resource Plan and to safeguard and utilise on-site soil resources where possible.</p>	<p>Some drought options may have associated construction.</p> <p>The SEA should seek to ensure that the quality of the regions soils and their management is protected or enhanced</p>

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Defra (2009) The Groundwater Regulations 2009		
The Groundwater Regulations are designed to implement a daughter directive to the European Water Framework Directive and prevent or limit the inputs of polluting substances into groundwater.		The SEA should include an objective relating to the effects of options on groundwater quality.
Defra (2008) Future Water: the Government's water strategy for England		
<p>This strategy is the high level Government document which outlines how the Government wants the water sector to look by 2030, considering issues of water demand, water supply, water quality in the natural environment, surface water drainage, river and coastal flooding, greenhouse gas emissions and charging.</p> <p>that "by 2030 at the latest, we have:</p> <p>Improved the quality of our water environment and the ecology which it supports, and continued to provide high levels of drinking water quality from our taps</p> <p>Sustainably managed risks from flooding and coastal erosion, with greater understanding and more effective management of surface water</p> <p>Ensured a sustainable use of water resources, and implemented fair, affordable and cost-reflective charges.</p>		The SEA should seek to ensure that the themes included in the strategy objectives are also reflected in the SEA objectives, particularly around water quality in the region, the quality of aquatic ecology, drinking water quality, resource use, energy use and greenhouse gas emissions, and adaptation to climate change.
Defra (2008) England Biodiversity Strategy –climate change adaptation principles		
Government strategy presenting five principles that are fundamental to conserving biodiversity during climate change. The precautionary principle underlies all the principles.		The SEA must consider the impacts on biodiversity whilst also taking into account the potential for future climate change.
Defra (2007) The Air Quality Strategy for England, Scotland and Wales		
This strategy identifies air quality objectives and policy options to further improve air quality in the UK from into the long term. The options are intended to provide important benefits to quality of life and help protect the environment as well as the direct benefits to public health.		The implementation of the Drought Plan 2022 may have some influence on air quality, either directly or indirectly through construction or operation activities. The SEA should seek to ensure that the region's air quality is maintained or enhanced, and that emissions of air pollutants are kept to a minimum.
Defra (2007), Conserving Biodiversity in a Changing Climate: Guidance on Building Capacity to Adapt		
The guiding principles described in this document summarise current thinking on how to reduce the impacts of climate change on biodiversity and how to adapt existing plans and projects in the light of climate change. The guidance is intended to inform implementation of the UK Biodiversity Action Plan, taking account of climate change is relevant to the fulfilment of many international agreements and obligations affecting the UK.		The SEA must consider the impacts on biodiversity whilst also taking into account the potential for future climate change.
Defra (2006) Shoreline Management Plan Guidance		
A shoreline management plan (SMP) is a coastal defence management tool. It is a large-scale assessment of the risks associated with coastal processes and helps to reduce these risks to people and the developed, historic and natural environment.		The SEA should take into account the effects of the Drought Plan 2022 on areas with a SMP.

Objectives identified in the Policy, Plan or Programme		Influences on the Drought Plan 2022 and the SEA objectives
This guidance document sets out Defra's strategy for managing flooding and coastal erosion.		
Defra (2005) Making space for water: taking forward a new government strategy for flood and coastal erosion risk management in England		
The strategy outlines how to manage the risks from flooding and coastal erosion in the UK. The strategy aims to reduce the threat of flooding to people and their property, and to deliver the greatest environmental, social and economic benefit, consistent with the Government's sustainable development principles.		The SEA should seek to ensure that flood risk in the region is not adversely affected by the implementation of the Drought Plan 2022.
Defra (2005) Securing the Future: Delivering UK Sustainable Development Strategy		
The strategy for sustainable development aims to enable all people to satisfy their basic needs and enjoy a better quality of life without compromising the quality of life of future generations. The strategy places a focus on protecting natural resources and enhancing the environment.		The SEA must seek to ensure that objectives relating to sustainable development, sustainable resource use and protecting the natural environment, are considered when assessing the potential impacts of the Drought Plan 2022.
Defra (2004) The First Soil Action Plan for England		
This plan is a comprehensive statement on the state of the UK's soils and how Government and other partners were working together to improve them. Ensure that England's soils will be protected and managed to optimise the varied functions that soils perform for society (e.g. supporting agriculture and forestry, protecting cultural heritage, supporting biodiversity, as a platform for construction), in keeping with the principles of sustainable development.		The SEA should seek to ensure that the quality of the region's land, including soils, is protected or enhanced.
Defra (2004) Rural Strategy		
The strategy sets out rural and countryside policy, and draws upon from lessons learnt following the rural white paper. Objectives include supporting economic and social regeneration across rural England and enhance the value of the countryside and protect the natural environment for this and future generations.		The implementation of certain Drought Plan 2022 options may have an effect upon rural communities and the countryside. The SEA should also seek to ensure that the quality of the region's landscapes, natural resources and biodiversity are maintained or enhanced.
Defra (2002) The Strategy for Sustainable Farming and Food – facing the future		
This strategy sets out how industry, Government and consumers could work together to secure a sustainable future for our farming and food industries. The strategy's objectives are to support the viability and diversity of rural and urban economies and communities, respect and operate within the biological limits of natural resources (especially soil, water and biodiversity) and achieve consistently high standards of environmental performance by reducing energy consumption, by minimising resource inputs, and use renewable energy wherever possible.		The implementation of the Drought Plan 2022 may have some indirect links with the food industry, through ensuring the availability of water for food based activities. The SEA should also seek to promote the most effective use of the region's natural resources, including soil, biodiversity and energy resources.
Defra and Environment Agency (2019) How to Write and Publish a Drought Plan, <i>Consultation draft</i> .		
This draft sets out how to assess the environmental effects of actions to maintain supply and how to mitigate. An environmental assessment must include details of changes as a result of actions to:		The SEA must take into account the approach to environmental assessment and what needs to be done to mitigate or reduce adverse effects and provide

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<p>Water flow or level regimes</p> <p>Water quality</p> <p>Ecology (sensitive features, habitats and species)</p> <p>Designated sites (habitats and species)</p> <p>Fish populations (in particular migratory fish)</p> <p>Additionally, an assessment must include effects on WFD status and consider effects on river basin management plans.</p> <p>Assessments should also take into account the Handbook for Scoping Projects: Environmental Assessment and the EclA Guidelines.</p> <p>For SEAs of a Drought Plan, guidance should be followed in the DCLG (2005) Practical Guide to the Strategic Environmental Assessment Directive and UKWIR (2012) Strategic Environmental Assessment and Habitats Regulations Assessment: Water Resources Management Plans and Drought Plans.</p> <p>Need to identify what needs to be done to mitigate or reduce adverse effects and provide compensation for effects that remain following mitigation. This includes the identification of pre-drought, in-drought and post drought mitigation actions.</p>	<p>compensation for effects that remain following mitigation.</p>
Environment Agency (2020) EA2025: Creating a Better Place	
<p>This plan sets out the EA's vision to creating a better place for people and wildlife whilst maintaining the core purpose of protecting the environment and promoting sustainable development. The plan sets out 3 long term goals:</p> <ul style="list-style-type: none"> • A nation resilient to climate change • Health air, land and water • Green growth and a sustainable future. 	<p>The Drought Plan 2022 and SEA should take into account the objectives set out in the Agency's plan.</p>
Defra (2020), Drought Plan Direction 2020 (England)	
<p>Sets out the timescales for water companies to develop and consult on Drought Plans.</p>	<p>The Drought Plan 2022 and SEA will take account of the statutory requirements of this Direction.</p>
Defra (2016) Guiding principles for water resources planning for water companies operating wholly or mainly in England	
<p>This identifies the key policy priorities to be addressed in WRMPs. This includes protecting and enhancing the environment and the promotion of efficient water use and reducing leakage.</p>	<p>The Drought Plan 2022 is closely aligned to the WRMP, and the SEA needs to take account of this guidance.</p>
Department for Culture, Media and Sport (2001) <i>The Historic Environment – A Force for the Future</i>	
<p>This strategy outlines the Governments policy regarding the historic environment. The strategy has key aims and objectives that demonstrate the contribution the historic environment makes to the country's economic and social well-being.</p>	<p>The implementation of the Drought Plan 2022 may have an influence on the heritage of the region, particular if options affect surface water levels. The SEA should seek to ensure any adverse effects on heritage assets are minimised or avoided.</p>
The Energy Act 2013	

Objectives identified in the Policy, Plan or Programme	Influences on the Drought Plan 2022 and the SEA objectives
This provides the legislative framework for delivering secure, affordable and low carbon energy. It includes provisions for decarbonisation,	The implementation of the Drought Plan 2022 may have an influence upon Yorkshire Water's total energy use. The SEA should seek to promote energy efficiency, as well as seeking to reduce the effects of climate change through greenhouse gas emissions. The SEA should also promote the use of renewable energy, where relevant.
Environment Act, 1995	
The Environment Act set up the EA to manage resources and protect the environment in England.	The SEA should seek to promote the protection and enhancement of all water resources without having negative effects on other aspects of the Environment.
Environment Agency (2013), <i>Managing Water Abstraction</i>	
This sets out how the EA manages water resources in England.	The SEA should consider the range of impacts that changes to abstractions could have on the environment, including water bodies, biodiversity, and water users.
Environment Agency (2011) National Flood and Coastal Risk Management Strategy for England	
This strategy provides the overarching framework for future action by all risk management authorities to tackle flooding and coastal erosion in England, building on existing approaches. Risk should be managed in a co-ordinated way within catchments and along the coast and balance the needs of communities, the economy and the environment. This strategy will form the framework within which communities have a greater role in local risk management decisions and sets out the Environment Agency's strategic overview role in flood and coastal erosion risk management (FCERM).	The SEA should ensure the Drought Plan 2022 contributes to the reduction in flood risk and coastal erosion
Environment Agency (2010), <i>Water Resources Action Plan for England and Wales</i>	
<p>The strategy has four main aims:</p> <ul style="list-style-type: none"> • Adaptation to and mitigation of climate change; • A better water environment; • Sustainable planning and management of water resources; • People valuing water and the water environment. 	The SEA should seek to ensure that strategy objectives are also reflected in the SEA objectives particularly regarding the sustainable management of water resources and protecting the environment.
Environment Agency (2009), <i>Water Resources Strategy for England and Wales</i>	
<p>Launched on 30 March 2009, covering the actions that the Environment Agency believes need to be taken to ensure that there is enough water for people and wildlife in the face of future pressures. These include:</p> <ul style="list-style-type: none"> • climate change • population growth • diffuse pollution 	The SEA should seek to ensure that strategy objectives are also reflected in the SEA objectives, particularly around water resource use and availability in the region.

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<ul style="list-style-type: none"> water for wildlife and wetlands 		
Environment Agency (2007) <i>Soil: A Precious Resource</i>		
<p>The soil strategy identifies the Environment Agency's priorities, sets out their role and says what action is to be taken to protect, manage and restore soil. Damaged soil structure can lead to flooding, water pollution and can affect the landscape and archaeological features. The strategy also outlines the part managing soils can play in mitigating climate change.</p>		<p>The Drought Plan 2022 should ensure the sustainable management of soil resources. SEA objectives should reflect and consider relevant priorities from the <i>Soil: A Precious Resource</i> publication.</p>
Environment Agency (2004) <i>Catchment Flood Management Plans: Guidelines – Volume 1 Policy</i>		
<p>These guidelines support the EA's strategy for flood risk management and work towards achieving the government's strategy for flood and coastal erosion flood risk management. The aims of Catchment Flood Management Planning is:</p> <ul style="list-style-type: none"> To promote sustainable flood risk management measures To reduce the sources of flooding and harm to people, and the natural, built and historic environment caused by floods To support the delivery of the Government's and others' policies and targets, and the Environment Agency's environmental vision. 		<p>The Drought Plan 2022 links to this plan where it affects flood risk or land management, for example through changes in abstraction or water storage. The SEA should consider how the Drought Plan 2022 may affect flood risk across the region.</p>
Environment Agency (2018), <i>Water Resources Planning Guideline: Interim update</i>		
<p>Technical guidelines published jointly by Defra, Environment Agency and Ofwat for the 2019 Water Resource Management Plans for England.</p>		<p>The SEA should seek to ensure that water supplies and resources are maintained or enhanced in line with the Water Resources Planning Guidelines.</p>
Environment Agency, <i>Shoreline Management Plans</i>		
<p>A large-scale assessment of the risks associated with coastal processes with the aim to help reduce these risks to people and the developed, historic and natural environments. Coastal processes include tidal patterns, wave height, wave direction and the movement of beach and seabed materials.</p> <p>The second generation of Shoreline Management Plans (SMPs) are in production, covering the entire 6000 kilometres of coast in England and Wales. This generation of plans aim to incorporate sea level rise resulting from climate change and current defences with limited life and improvement requirements.</p>		<p>The SEA should seek to promote a reduction of the risks identified in the Shoreline Management Plans.</p>
Environment Agency (undated), <i>WFD River Basin Characterisation Project: Technical Assessment Method - River abstraction and flow regulation</i>		
<p>This paper describes the method used to assess the likelihood of river water bodies achieving the relevant WFD objectives as a result of artificial influences on low river flows.</p>		<p>Implementation of the Drought Plan 2022 may impact river water quality. The SEA should seek to promote the protection and enhancement of biodiversity and river water quality across the region.</p>
Environment Agency (undated) <i>Hydroecology: Integration for modern regulation</i>		

Objectives identified in the Policy, Plan or Programme	Influences on the Drought Plan 2022 and the SEA objectives
This paper describes clear way forward in terms of hydroecology and a strategic direction to its development and application.	The Drought Plan 2022 and SEA should ensure relevant ecological considerations are integral to water resource evaluation and management decisions across the range of temporal and spatial scales.
English Heritage, now known as Historic England (2008) Climate Change and the Historic Environment	
Sets out the current thinking on the implications of climate change for the historic environment. It is intended both for the heritage sector and also for those involved in the wider scientific and technical aspects of climate change; in the development of strategies and plans relating to the impact of climate change; or in projects relating to risk assessment, adaptation and mitigation.	The SEA should seek to assess the implications of the Drought Plan 2022 in combination with climate change and the potential impacts on heritage and the historic environment.
Flood and Water Management Act, 2010 as amended	
The Flood and Water Management Act 2010 aims to provide better, more comprehensive management of flood risk for people, homes and businesses. It aims improve efficiency in the water industry, improve the affordability of water bills for certain groups and individuals, and help ensure continuity of water supplies to the consumer.	The SEA should seek to ensure that flood risk in the region is not adversely affected by the implementation of the Drought Plan 2022 and that water supplies across the region are maintained.
Historic England, Heritage at Risk	
Heritage at Risk is a national programme that aims to identify the endangered sites (historic buildings and places with increased risks of neglect and decay) and then help secure them for the future. Regional Heritage at Risk Registers were most recently published in 2019.	The SEA should seek to protect and enhance heritage and landscape.
Historic England (2019) Heritage Counts 2019: There's No Place Like Old Homes: Re-Use and recycle to Reduce Carbon	
This report by Historic England highlights the importance of the built historic environment and why it has a vital role in the journey towards a low carbon future. The study recognises the built environment as one of the largest carbon polluters and how using and re-using historic assets will avoid emitting more carbon.	The SEA should consider the findings of this report and the effect building has on heritage assets and climate change.
Historic England (2015) Historic Environment Good Practice Advice in Planning Note 3	
This provides guidance on managing change within settings of heritage assets. This includes archaeological remains, historic buildings, sites, areas and landscapes.	The SEA should take into account effects on settings of heritage assets.
Historic England (2013) Strategic Environmental Assessment, Sustainability Appraisal and the Historic Environment	
Guidance for addressing the historic environment in Strategic Environmental Assessment or Sustainability Appraisal. It identifies the recommended list of plans, programmes and policies for review, approach to baseline review, potential sustainability issues.	The SEA should consider the potential effects of the Drought Plan 2022 on the historic environment, particularly designated assets and their settings, and to important wetland areas with potential for paleo-environmental deposits. Historic characterisation can supplement information about designations. Sustainability issues, objectives and indicators identified in this

Objectives identified in the Policy, Plan or Programme	Influences on the Drought Plan 2022 and the SEA objectives
	document should be taken into account in the SEA.
HM Government (2018) A Green Future: Our 25 Year Plan to Improve the Environment	
<p>This plan sets out government action to help the natural world regain and retain good health. It aims to deliver cleaner air and water in cities and rural landscapes, protect threatened species and provide richer wildlife habitats – using a natural capital approach to better-inform policy.</p> <p>By adopting the plan, the government aims to achieve clean air; clean and plentiful water; thriving plants and wildlife; a reduced risk of harm from environmental hazards such as flooding and drought; using resources from nature more sustainably and efficiently; and, enhanced beauty, heritage and engagement with the natural environment. In addition, the plan will set out to manage pressures on the environment through; mitigating and adapting to climate change, minimising waste, managing exposure to chemicals and enhancing biosecurity.</p> <p>The six key areas for action are:</p> <ul style="list-style-type: none"> • Using and managing land sustainably, which includes embedding an ‘environmental net gain’ principle for development (including housing and infrastructure) • Recovering nature and enhancing the beauty of landscapes • Connecting people with the environment to improve health and wellbeing • Increasing resource efficiency, and reducing pollution and waste • Securing clean, productive and biologically diverse seas and oceans • Protecting and improving the global environment 	<p>The Drought Plan 2022 may influence the environmental benefits and pressures identified in the Environment Plan, such as:</p> <ul style="list-style-type: none"> • Clean air • Clean and plentiful water • Thriving plants and wildlife • Reducing risks of harm from environmental hazards • Using resources from nature more sustainably and efficiently • Enhancing beauty, heritage and engagement with the natural environment • mitigating and adapting to climate change • minimising waste • managing exposure to chemicals • enhancing biosecurity <p>The SEA should ensure that the impacts of any drought options on the 25-year goals set out in the Environment Plan are fully considered, whilst taking into account environmental net gain and natural capital approach, which the government have identified as principle themes.</p>
HM Government (2016) National Infrastructure Delivery Plan 2016-2021	
<p>This plan updates and replaces the previous National Infrastructure Plan and takes a targeted approach to infrastructure investment and delivery across different sectors over five years. These are all critical to support economic growth through the expansion of private sector businesses across all regions and industries, to enable competitiveness and to improve the quality of life of everyone in the UK. The plan recognises the pressure on future water and waste services from population growth and climate change.</p>	<p>The Drought Plan 2022 could result in the production of additional waste. The SEA should seek to reduce the production of waste and ensure it is treated in line with the widely adopted ‘waste hierarchy’ and not sent to landfill. The Drought Plan 2022 can contribute to the providing resilient water services.</p>
HM Treasury (2015) Fixing the Foundations: creating a more prosperous nation.	
<p>This document sets out a 15-point plan that the government will put into action to boost the UK’s productivity growth, centred around two key pillars: encouraging long-term investment, and promoting a dynamic economy. It sets out the government’s long term strategy for tackling the issues that matter most for productivity growth.</p>	<p>The Drought Plan 2022 should have regard to the points included in the plan</p>

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Marine and Coastal Access Act 2009		
The Marine and Coastal Access Act sets out a number of measures, including the establishment of Marine Conservation Zones (MCZs) and Marine Spatial Plans. I		<p>The Drought Plan 2022 should have regard to effects on coastal areas.</p> <p>The SEA should take into account the effects of the measures of coastal environments where relevant.</p>
MHCLG (2019) National Planning Policy Framework 2019		
<p>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:</p> <ul style="list-style-type: none"> • 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 (including providing net gains for biodiversity); • Conserving and enhancing the historic environment; • Facilitating the sustainable use of minerals. <p>Reservoirs are included within the definition of open space - of public value due to opportunities for sport and recreation and providing a visual amenity.</p>		<p>The Drought Plan 2022 and SEA should take account of the key components of sustainable development and seek to promote biodiversity net gain. Also, reservoirs contribute to recreation and visual amenity.</p>
Natural Environment and Rural Communities Act, 2006		
<p>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.</p> <p>The Natural Environment and Rural Communities Act is designed to help achieve a rich and diverse natural environment and thriving rural communities.</p>		<p>The SEA should seek to maintain or enhance the quality of habitats and biodiversity. The impacts of the Drought Plan 2022 on any designated features, as highlighted in the Natural Environment and Rural Communities Act, should be addressed.</p>
Planning (Listed Buildings and Conservation Areas) Act 1990		
This addresses listed buildings including prevention of deterioration and damage and preservation and enhancement of conservation areas.		<p>The Drought Plan 2022 and SEA should take account of the need to protect listed buildings and conservation areas.</p>
Salmon and Freshwater Fisheries Act, 1975		
The Act lays down the present basic legal framework within which salmon and freshwater fisheries in England are regulated.		<p>The Act Provides statutory requirements for maintaining fish passage. The SEA will cover fish passage as an element of</p>

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<p>Proposals have been made to extend the legislation to apply to more fish species e.g. coarse fish, eel and lamprey species. These proposals are currently under review.</p> <p>The Act covers legislation on fishing methods and related offences, obstructions to fish passage, salmon and freshwater fisheries administration and law enforcement. Proposed extensions to the legislation (under review) include the provision of fish passes and screening of water abstraction and discharge points for coarse fish, eel and lamprey species.</p>	<p>at least one sustainability objective. The SEA should seek to address any potential issues or effects on existing measures to address fish passage.</p>
The Environmental Damage (Prevention and Remediation) (England) Regulations 2015	
<p>These regulations amend the 2009 regulations and provide additional protection to habitats and species identified on Annexes 1 and 2 of the EC Habitats Directive (92/43/EEC), SSSIs and, in some cases, classified waterbodies from environmental damage where an operator has intended to cause damage or been negligent to the potential for damage.</p> <p>Applies to the most serious categories of environmental damage, including:</p> <ul style="list-style-type: none"> • Contamination of land that results in a significant risk of adverse effects on human health • Adverse effects on surface water or groundwater consistent with a deterioration in the water's status • Adverse effects on the integrity of a Site of Special Scientific Interest (SSSI) or on the conservation status of species and habitats protected by EU legislation outside SSSIs. 	<p>The SEA should seek to ensure that the guidance provided by the regulations is considered when assessing the Drought Plan 2022.</p>
The Eels Regulations 2009	
<p>Implement European Council Regulations 1100/2007 establishing measures for the recovery of the stock of European eel. The Regulations will help implement delivery Eel Management Plans. They address eel records and re-stocking, close season and reduction of fishing effort, passage of eels and entrainment.</p> <p>The key objective is to ensure that at least 40% of the potential production of silver eels returns to the sea to spawn. This will be achieved by reducing exploitation of all life-stages of the eel and restoration of their habitats.</p>	<p>The SEA should seek to maintain or enhance the quality of habitats and biodiversity, and take regard of protected species identified. This should include migratory fish species and their migratory passage.</p>
UKTAG on the WFD e.g. Phase 3 Review of Environmental Standards	
<p>UKTAG prepares technical guidance designed to facilitate consistent implementation of the WFD in the UK.</p> <p>This report identifies standards for certain chemicals known as specific pollutants, developments in assessments of risk to groundwater, non-native species, standards for flows in rivers, standards for levels in lakes, standards for acidity in rivers and standards in intermittent discharges.</p>	<p>The SEA should seek to ensure that the guidance provided by the plan are considered when assessing the Drought Plan 2022, especially with respect to objectives relating to ecology, water quality and water quantity. The SEA should also ensure the guidance in the plan is used in relation to other related regulations for example the Habitats Directive. The guidance could contribute to the formulation of any criteria for assessing significance of effects.</p>
UKCIP (2009) UK Climate Projections UKCP09	
<p>The UKCP09 Projections provide a basis for studies of impacts and vulnerability and decisions on adaptation to climate change in</p>	<p>The Drought Plan 2022 does take account of UKCP09 projections as its</p>

Objectives identified in the Policy, Plan or Programme	Influences on the Drought Plan 2022 and the SEA objectives
<p>the UK over the 21st century. Projections are given of changes to climate, and of changes in the marine and coastal environment; recent trends in observed climate are also discussed.</p> <p>The methodology gives a measure of the uncertainty in the range of possible outcomes; a major advance beyond previous national scenarios</p> <p>The Projections will allow planners and decision-makers to make adaptations to climate change. In order to do so they need as much good information as possible on how climate change will evolve. They are one part of a UK government programme of work to put in place a new statutory framework on, and provide practical support for, adaptation.</p>	<p>formulation through the WRMP process which takes account of climate change in its supply and demand projections. The SEA should also use UKCP09 projections in the broader assessment of climate change effects and any potential cumulative effects. For example the ecological requirements of aquatic habitats that may be affected by the Drought Plan 2022 will also be influenced by climate change.</p>
The Water Act, 2003	
<p>The Water Act 2003 is in three Parts, relating to water resources, regulation of the water industry and other provisions. The four broad aims of the Act are:</p> <ul style="list-style-type: none"> • The sustainable use of water resources • Strengthening the voice of consumers • A measured increase in competition • The promotion of water conservation. 	<p>The implementation of the Drought Plan 2022 may have an effect through its role in maintaining supplies of water. The SEA should seek to promote sustainable use of water resources.</p>
The Water Environment (WFD) Regulations, 2003	
<p>These Regulations make provision for the purpose of implementing in river basin districts within England and Wales. The Water Framework Directive (2000/60/EC) of the European Parliament. The Regulations require a new strategic planning process to be established for the purposes of managing, protecting and improving the quality of water resources.</p>	<p>The SEA should seek to promote the protection and enhancement of all water resources. The SEA should seek to maintain, protect and improve water quality across the region and ensure efficient use of resources.</p>
Water Resources Act, 1991 (Amendment) Regulations 2009 SI3104	
<p>Amends Water Resources Act 1991 by extending the use of Water Protection Zones and Works Notices, in particular to deal with harm to aquatic ecosystems caused by the physical characteristics of a water course or lake, such as quantity, structure and substrate of river/lake bed.</p> <p>Aligns the Water Resources Act with the hydromorphological requirements of the WFD</p>	<p>The SEA should include objectives that cover hydromorphological aspects and seek to ensure that hydromorphological features within the plan are maintained or enhanced.</p>
Natural England (2011) <i>UK Geodiversity Action Plan</i>	
<p>The UKGAP sets out of framework for geodiversity action across the UK. It provides a shared context and direction for the protection and enhancement of geodiversity through a common aim, themes, objectives and targets which link national, regional and local activities. The UKGAP consists of six broad themes:</p> <ol style="list-style-type: none"> 1. Furthering our understanding of geodiversity 2. Influencing planning policy, legislation and development design 3. Gathering and maintaining information on our geodiversity 4. Conserving and managing our geodiversity 5. Inspiring people to value and care for our geodiversity 6. Sustaining resources for our geodiversity 	<p>The Drought Plan 2022 should have regard to the aims and objectives of the UKGAP.</p> <p>The SEA framework should consider effects of options on geodiversity and outline enhancement and mitigation opportunities where these are identified.</p>

Objectives identified in the Policy, Plan or Programme		Influences on the Drought Plan 2022 and the SEA objectives
Water Industry Act 1991 was amended by the commencement of Section 36 of the Flood and Water Management Act 2010		
This makes provision for general duties of water undertakers including those associated with water resources management plans and sets out supply duties.		The Drought Plan 2022 must take into account this legislation.
The Water Resources Management Plan Regulations 2007		
This provides the legislation for the preparation of water resources management plans.		The Drought Plan 2022 should take account of these requirements.
Water UK (2016) Water Resources Planning Framework (2015-2065)		
<p>Water UK worked with companies, regulators, academics and NGOs to create this long-term Water Resources Planning Framework. The report breaks new ground by deploying new modelling techniques and by looking 50 years ahead across the whole of England and Wales. This high level strategy and framework considers:</p> <ul style="list-style-type: none"> • A sector-wide view of future resilience and options for improving that resilience; and • An assessment of variation in levels of service and potential minimum levels of service for customers and the environment, accounting for costs and benefits at a national, regional and sub-regional level, which includes the wider social impacts of drought and drought resilience. 		The Drought Plan 2022 should take into account the considerations of the strategy and framework.
<i>Wildlife and Countryside Act, 1981</i>		
<p>The Act is the principle mechanism for providing legislative protection of wildlife in Great Britain.</p> <p>Species listed in Schedule 5 of the Act are protected from disturbance, injury, intentional destruction or sale. Other provisions outlaw certain methods of taking or killing listed species. This Act is brought up to date regularly to ensure the most endangered animals are on the schedule.</p> <p>The Act also improved protection for the most important wildlife habitats.</p>		Some aspects of the Drought Plan 2022 may have effects on habitats and species in the Yorkshire Water supply area and beyond. The SEA should seek to maintain or enhance the quality of habitats and biodiversity, and take regard of protected species and habitats.
Regional		
Canal & River Trust (2015) <i>North East Waterway Fisheries & Angling Action Plan</i>		
<p>The action plan sets out several issues of importance to the local angling communities across the North East. Addressing these issues aims to improve the angling experience, fish stocks and the water environment. The actions are grouped under 10 themes, which include:</p> <ul style="list-style-type: none"> • Develop & improve access to the fishery. • Fish passage and migration. • Predation & non-native species • Fisheries and water quality and quantity. 		<p>The Drought Plan 2022 should seek to avoid harm to fisheries.</p> <p>The SEA assessment framework should include the protection or enhancement of factors affecting fisheries.</p>
Environment Agency (2017) Drought response: our framework for England		

Objectives identified in the Policy, Plan or Programme	Influences on the Drought Plan 2022 and the SEA objectives
<p>This framework describes how drought affects England and how the EA works close with the government, water companies and others to manage the effects of drought on people, business and the environment. Specifically, the framework sets out:</p> <ul style="list-style-type: none"> • How drought affects different parts of England • Who is involved in managing drought and how we work together • How the agency and others take action to manage drought • How we monitor and measure the impacts of drought to advise senior management and government on the prospects and possible action • How we report on drought and communicate with others 	<p>The supply of water resources in the region may be affected by future drought, therefore this framework is linked closely with the Drought Plan 2022.</p> <p>The SEA should seek to address the causes of drought, and include objectives which seek to address the causes of drought, and where possible ensure that the symptoms of droughts are minimised.</p>
<p>Environment Agency and Defra (2015) Water for life and livelihoods. Part 1: Humber river basin district, River basin management plan</p>	
<p>Provides a framework for protecting and enhancing the benefits provided by the water environment. It provides baseline classification of waterbodies, statutory objectives for protected areas and for water bodies and a programme of measures to achieve statutory objectives.</p>	<p>The Drought Plan 2022 will need to ensure that it is consistent with the principles of the River Basin Management Plan and that it does not adversely affect the issues identified as significant water management issues.</p>
<p>English Heritage, now known as Historic England, Heritage at Risk Register: North West (2018) West Midlands (2018)</p>	
<p>Historic England Corporate Plan 2015-2018 is reducing the risk to heritage assets.</p> <p>In order to achieve this aim we are working to:</p> <ul style="list-style-type: none"> • Better understand the nature and extent of risk • Encourage others to save and re-use heritage at risk • Build the capacity of the sector to deliver solutions for heritage at risk • Provide advice and grants to help remove heritage from the register 	<p>It is unlikely the Drought Plan 2022 will have an effect on the Heritage at Risk Register.</p>
<p>Yorkshire Water Services Ltd (2020), <i>Water Resources Management Plan 2019</i></p>	
<p>See WRMP.</p>	<p>The Drought Plan 2022 will take into account the objectives of YWSL's WRMP.</p>
<p>Yorkshire Water Services Ltd (2019), <i>Our PR19 Plan, Price Review 2019</i></p>	
<p>The business plan sets out the company's strategy for the delivery of water and wastewater services for the years 2020-2025. The plan is based on a strong understanding of the needs and wants of customers and stakeholders, the duties and responsibilities YWSL must meet and the impact on Yorkshire in the widest sense.</p> <p>The commitments of the plan are centred around 5 Big Goals which have been strongly supported by customers:</p> <ol style="list-style-type: none"> 1. Customers: understanding needs and wants to ensure a service tailored and personalised to meet the needs. 	<p>The Drought Plan 2022 should seek to support the Business Plan and the SEA framework should consider and echo the priorities set out in the Business Plan.</p>

Objectives identified in the Policy, Plan or Programme	Influences on the Drought Plan 2022 and the SEA objectives
<ol style="list-style-type: none"> 2. Water Supply: provision of safe water, not waste water and always protect the environment 3. Environment: remove surface water from sewers and recycle all wastewater, protecting the environment from sewer flooding and pollution 4. Transparency: be a global benchmark for openness and transparency. 5. Bills: use innovation to improve service, eradicate waste and reduce costs so no one needs to worry about paying bills. 	
Water Company (various) Drought Plans adjacent to supply area	
<p>This looks at the management of water resources to maintain service to customers during drought in the surrounding areas. The plans considered include;</p> <ul style="list-style-type: none"> • Severn Trent Draft Drought Plan 2019-2024 • United Utilities Final Drought Plan 2018 • Northumbrian Water Final Drought Plan 2019 • Anglian Water Revised Draft Drought Plan 2019 	<p>Assessment of the potential for cumulative impacts of supply side and drought permit/order options with drought options listed in neighbouring water companies' drought plans has been undertaken.</p> <p>The assessments should be reviewed at the time of drought option implementation to ensure that no changes to the neighbouring water company drought option has been made in the intervening period, and that the assessment, therefore, remains valid.</p>
Water Resources Management Plans from adjacent water companies	
<p>These set out the plans to manage water resources by companies in adjacent areas, including:</p> <ul style="list-style-type: none"> • Severn Trent Final Water Resources Management Plan 2019 • United Utilities Final Water Resources Management Plan 2019 • Northumbrian Water Final Water Resources Management Plan 2019 • Anglian Water Water Resources Management Plan 2019 	<p>The Drought Plan 2022 should not conflict with the other water company operations especially drought options that may be operated simultaneously.</p>
Sub-regional	
River Restoration and Water Level Management Plans	
<p>There are a number of proposed river restoration projects in the Yorkshire region such as:</p> <ul style="list-style-type: none"> • Environment Agency (2010) Restoring the River Hull Headwaters, River Restoration Plan. • River Hull Advisory Board (2015) River Hull Integrated Catchment Strategy (RHICS) • Environment Agency (2010) Restoring the Yorkshire River Derwent, Technical Report. • Yorkshire Esk Rivers Trust (2014) River Esk 3 Year Action Plan (2014-2017) • Natural England (2013) Restoring the River Wharfe SSSI: A River Restoration Plan • Natural England (2010) Restoring the Yorkshire Derwent • Environment Agency (2006) Pevensey Levels SSSI: Water Level Management Plan 	<p>The Drought Plan 2022 may have an effect on River Restoration Plans for non-Natura 2000 sites. The SEA should include objectives that take into account the objectives of these sites where relevant.</p>
AONB Management Units (various) <i>AONB Management Plans</i>	

Objectives identified in the Policy, Plan or Programme	Influences on the Drought Plan 2022 and the SEA objectives
<p>The following AONBs are present in the Yorkshire Water area: Howardian Hills, Nidderdale and Forest of Bowland plus a further AONB within a 5km corridor of the Tees-Swale transfer option. The management plans for AONBs contain actions to ensure the protection and enhancement of the landscape.</p>	<p>The SEA should consider the effects of options on landscapes, including designated landscapes.</p>
<p>Defra (2010), <i>Eel Management Plans for the United Kingdom</i>: Humber River Basin District; Eel Management Plans for the United Kingdom: Northumbrian River Basin District</p>	
<p>These plans aim to achieve an escapement of silver eel to the spawning population that equals or exceeds a target set at 40 per cent of the potential biomass that would be produced under conditions with no anthropogenic disturbance due to fishing, water quality or barriers to migration.</p> <p>The aim of each Eel Management Plan is to describe the nature of the eel population and fishery in the RBD, to assess whether the stock is meeting its 40 per cent escapement target, and to present management actions that will ensure the long-term viability of the eel population.</p>	<p>The SEA should consider the potential impacts of the Drought Plan 2022 on eel populations and escapement targets.</p>
<p>Environment Agency (2013) Abstraction Licensing Strategies (Catchment Abstraction Management Strategies (CAMS) process)</p>	
<p>The Water Framework Directive's main objectives are to protect and enhance the water environment and ensure the sustainable use of water resources for economic and social development. Catchment Abstraction Management Strategies (CAMS) set out how we will manage the water resources of a catchment and contribute to implementing the WFD. CAMS contribute to the WFD by:</p> <ul style="list-style-type: none"> • providing a water resource assessment of rivers, lakes, reservoirs, estuaries and groundwater referred to as water bodies under the WFD; • identifying water bodies that fail flow conditions expected to support good ecological status; • preventing deterioration of water body status due to new abstractions; • providing results which inform River Basin Management Plans (RBMPs) 	<p>The Drought Plan 2022 operation may have the potential to affect several of the CAMs objectives. The SEA will include objectives that take into account the objectives of the CAMs where relevant.</p>
<p>Hadrian's Wall Partnership Board (2015), Hadrian's Wall Management Plan 2015-2019</p>	
<p>Objectives include:</p> <ul style="list-style-type: none"> • Informed management of the world heritage site; • Maintaining boundaries of the world heritage site. • Protect the outstanding universal value (OUV) of the site using appropriate legislation, planning policy, guidance and management measures. • To maintain effective protection and management of the undesignated remains. • To pre-empt where possible direct and indirect threats to the OUV. • To manage the archaeological remains in the world heritage site. • To achieve a sustainable balance whereby the OUV can be conserved within current and future land use. 	<p>The SEA should ensure that there are no negative direct or indirect impacts, for example during construction, on the world heritage site.</p>
<p>Leeds City Region (2017) Green and Blue Infrastructure Strategy</p>	

Objectives identified in the Policy, Plan or Programme	Influences on the Drought Plan 2022 and the SEA objectives
<p>Priorities include:</p> <ul style="list-style-type: none"> • Effective water management and flood risk reduction • Build green and blue infrastructure into physical development and housing • Enhance green and blue corridors and networks • Heighten community access to and enjoyment of green and blue infrastructure • Plant and manage more trees and woodland • Restore the uplands and manage them sustainably • Business growth, jobs, skills and education 	<p>Options in the Drought Plan 2022 have potential to cause social, economic and environmental impacts.</p> <p>The SEA assessment framework should consider the effects of the Drought Plan 2022 on the achievement of the strategy's key priorities and the effects on water management, natural capital, landscape and biodiversity.</p>
<p>Leeds City Region Enterprise Partnership & West Yorkshire Combined Authority (2016) Leeds City Region Strategic Economic Plan, 2016-2036</p>	
<p>The Leeds City Region economy is the biggest outside of London and this plan aims to make full use of the areas assets and address long-term challenges, unlocking opportunities and fulfilling the City Region's exceptional potential. The four priority areas are: Growing business; Skilled people, Better jobs; Clean energy and environmental resilience; and, Infrastructure for growth.</p>	<p>The SEA should ensure alignment with the objectives of the plan in and around the Leeds City Region.</p>
<p>Local Biodiversity Action Plans (various)</p>	
<p>Local biodiversity action plan objectives include those associated with maintaining and safeguarding the current extent of protected designations and recognised habitats and achieving favourable status for these areas.</p> <p>The Yorkshire Water assessment area covers many Local BAPs.</p>	<p>The Drought Plan 2022 may have an effect on BAP objectives. The SEA should include objectives that take into account the objectives of the BAP where relevant (e.g. conservation designation status).</p>
<p>Local Planning Authority (various) Land Use Plans</p>	
<p>The Yorkshire Water area covers a large number of Local Planning Authorities. The main objectives of the existing and emerging Land Use Plans in these areas are related to the sustainable development of the area.</p>	<p>SEA should seek to ensure the Drought Plan 2022 options should be consistent with the Land Use Plans of those local authorities that will be affected by the option.</p>
<p>Local Geodiversity Action Plans (LGAPs)</p>	
<p>Local Geodiversity Action Plans (LGAPs) set out actions to conserve, enhance and promote the geodiversity of a particular area. They aim to identify, conserve and enhance the best sites that represent the geological history of an area. They also aim to promote geological sites, provide a local geodiversity audit and influence local planning policy.</p> <p>Currently, LGAPs exist or are in development for Derbyshire and the Peak District, Doncaster, West Yorkshire, Northeast Yorkshire, the Yorkshire Dales, North Pennines AONB.</p>	<p>Drought Plan 2022 options should take into account the aims of the LGAPs.</p> <p>The SEA assessment should consider effects of options on geodiversity and outline enhancement and mitigation opportunities where these are identified.</p>
<p>Local Planning Authority (various) Local Plans/Local Development Plans</p>	
<p>The Yorkshire Water assessment area includes a large number of Local Planning Authorities, identified as:</p> <ul style="list-style-type: none"> - North Yorkshire County Council - East Riding of Yorkshire - Kingston upon Hull City Council 	<p>The Drought Plan 2022 should take into account the Local Plans and emerging Local Plans.</p> <p>The SEA assessment framework should consider the effects of the Drought Plan 2022 on the achievement of the Plans'</p>

Objectives identified in the Policy, Plan or Programme	Influences on the Drought Plan 2022 and the SEA objectives
<ul style="list-style-type: none"> - City of York Council - Barnsley Metropolitan Borough Council - Bradford Council - Calderdale Council - Doncaster Council - Leeds City Council - Rotherham Metropolitan Borough Council - Scarborough Borough Council - Sheffield City Council - Wakefield Council - Craven District Council - Hambleton District Council - Harrogate Borough Council - Kirklees Council - Richmondshire District Council - Ryedale District Council - Selby District Council - Yorkshire Dales National Park - North Yorkshire Moors National Park - Peak District National Park - North Pennines National Park 	<p>visions and the effects of options on sustainable land use.</p>
Local Wildlife Trust Strategies (various)	
<p>There are a number of local Wildlife Trusts in the Yorkshire Water area, including:</p> <ul style="list-style-type: none"> • Yorkshire Wildlife Trust • Sheffield and Rotherham Wildlife Trust • Lancashire Wildlife Trust • Derbyshire Wildlife Trust • Tees Valley Wildlife Trust 	<p>The Drought Plan 2022 should take into account the key objectives of Wildlife Strategies and protect local wildlife.</p> <p>The SEA assessment framework should consider the effects of options on biodiversity.</p>
Natural England National Character Area (NCA) Profiles	
<p>There are 27 NCAs within Yorkshire Water's operating boundary. Each of these have individual objective relating to specific landscapes, habitats and species.</p> <p>Generalised objectives for each of these include:</p> <p>Conserve characteristic historic structures</p> <p>Protect the area's rich and diverse archaeology</p> <p>Protect the area's high levels of tranquillity</p> <p>Protect, manage and enhance the good rights of way network</p> <p>Manage and enhance existing habitats</p> <p>Encourage the maintenance of traditional land management practices</p> <p>Protect, and encourage sympathetic management</p>	<p>The Drought Plan 2022 may have an effect on NCAs. The SEA should include objectives that take into account the objectives of the NCAs where relevant (e.g. manage and enhance existing habitats).</p>

Objectives identified in the Policy, Plan or Programme	Influences on the Drought Plan 2022 and the SEA objectives
Protect and manage geological features Plan for climate change mitigation and adaptation	
North Yorkshire County Council (2019) Council Plan 2020-2024	
<p>The North Yorkshire Council Plan is centred around key ambitions which will enable the county to be a thriving country which adapts to a changing world and remains a special place for everyone to live, work and visit. The key ambitions are:</p> <ul style="list-style-type: none"> • Leading for North Yorkshire • Every child and young person has the best possible start in life • Every adult has a longer, healthier and independent life • North Yorkshire is a place with a strong economy and a commitment to sustainable growth • Innovative and forward thinking council 	<p>There may be some social, economic and environment effects associated with the implementation of the Drought Plan 2022 that may have effect upon the sustainable development and regeneration of the North Yorkshire county.</p> <p>The SEA should seek to address the potential social, economic and environmental effects.</p>
North York Moors National Park (2016) North York Moors National Park Management Plan: A Wider View	
<p>The vision for the North York Moors National park is to be a place:</p> <ul style="list-style-type: none"> • managed with care and concern for future generations • where the diversity and distinctiveness of the landscape, villages and buildings is cherished • where biological and cultural diversity, and other special qualities are conserved and enhanced • where the environment and way of life is respected and well understood • where communities are more self-sustaining and economic activity engenders environmental and recreational benefits. • that is special to people and that provides pleasure inspiration and spiritual wellbeing where calm and quality of life are celebrated • where natural resources are managed sustainably and environmental limits are recognised 	<p>Effective management of water resources is vital for continued economic, cultural and sustainable development. The Drought Plan 2022 may have an effect upon the theme of promoting a sustainable economy and thriving communities and access to the national park and recreational opportunities for local communities and visitor</p> <p>The SEA should seek to protect the landscapes of the national park; encourage continued development of the local economy and cultural heritage; and the protection of natural resources and biodiversity. The SEA should also include objectives relating to health and well-being, in particular how recreational opportunities may influence this and those relating to sustainable economy and thriving communities.</p>
Public Rights of Way Improvement Plans (ROWIPs)	
<p>Objectives include those associated with each local authority's rights of way improvement plans.</p>	<p>The Drought Plan 2022 operation may have the potential to affect the objectives of the ROWIPs. The SEA will include objectives that take into account the objectives of the ROWIPs where relevant.</p>
Peak District National Park Authority (2018), <i>Peak District National Park Management Plan 2018-2023</i>	
<p>The National Park Management Plan provides the framework that encourages everyone to work together to achieve national park purposes. It is not a plan for an individual organisation or group but a plan for the place. It is, therefore, a partnership plan. It is the single most important strategic document for the Peak District National Park. It shares with everyone what the main issues and</p>	<p>Effective management of water resources is vital for continued economic, cultural and sustainable development. The Drought Plan 2022 should recognise the importance of climate change as an issue for the north west's natural landscapes. The Drought Plan 2022 may also have an effect upon</p>

Objectives identified in the Policy, Plan or Programme	Influences on the Drought Plan 2022 and the SEA objectives
<p>priorities are. It then sets out how, together, we are going to tackle those issues over the next five years.</p> <p>Compared with the previous management plan, fresh challenges have emerged through the nation's pending departure from the European Union alongside developing ideas in how we should manage protected landscapes. This has created a remarkable opportunity for us to shape the Peak District National Park in a fresh and innovative way whilst ensuring its special qualities are enhanced for the benefit of all.</p>	<p>on the theme of promoting a sustainable economy and thriving communities and access to the national park and recreational opportunities for local communities and visitor</p> <p>The SEA should seek to protect the landscapes of the national park; encourage continued development of the local economy and cultural heritage; and the protection of natural resources and biodiversity. The SEA should also include objectives relating to health and well-being, in particular how recreational opportunities may influence this and those relating to sustainable economy and thriving communities.</p>
West Yorkshire Combined Authority, <i>Various Projects</i>	
<p>The West Yorkshire Combined Authority are responsible for delivering a variety of projects that will improve the lives of those living in the region. These projects are centred around key areas including:</p> <p>Economy:</p> <ul style="list-style-type: none"> Local Industrial Strategy (2019) Housing and Regeneration (various schemes and projects) Flood Alleviation (Hebden Bridge Food Alleviation; Natural Flood Management -River Calder, Colne and Upper Aire; Wyke Beck; Leeds Flood Alleviation Scheme; Skipton Flood Alleviation) Clean energy and Environmental Resilience <p>Transport</p> <ul style="list-style-type: none"> Infrastructure for growth (30+ transport schemes) <p>More are available to view at: https://www.westyorks-ca.gov.uk/projects/</p>	<p>There could be some social, economic and environment effects associated with the implementation of the Drought Plan 2022 that may have effect with a particular focus upon a number of social, health and infrastructure related issues in the West Yorkshire area.</p>
Yorkshire Dales National Park Authority (2019), Yorkshire Dales National Park Management Plan 2019-24	
<p>The National Park Management Plan is the most important document for the Yorkshire Dales National Park. It is, in effect, a five year work programme for a whole range of organisations operating across the area.</p> <p>By 2040, it will be:</p> <ul style="list-style-type: none"> A distinctive, living, working, cultural landscape that tells the ongoing story of generations of people interacting with their environment. A friendly, open and welcoming place with outstanding opportunities to enjoy its special qualities. Home to the finest variety of wildlife in England. Resilient and responsive to the impacts of climate change, storing more carbon each year than it produces. Providing an outstanding range of benefits for the nation based on its natural resources, landscape and cultural heritage, which underpin a flourishing local economy. Home to strong, self-reliant and balanced communities with good access to the services they need. 	<p>Effective management of water resources is vital for continued economic, cultural and sustainable development. The Drought Plan 2022 may also have an effect upon providing services for communities, access to the national park and recreational opportunities for local communities and visitors and the protection of biodiversity.</p> <p>The SEA should seek to protect the landscapes of the national park; encourage continued development of the local economy and cultural heritage; and the protection of natural resources and biodiversity. The SEA should also include objectives relating to providing access to services for communities and for health and well-being, in particular how recreational opportunities may influence this.</p>

Appendix C: Environmental Baseline Review

1.1 Biodiversity, fauna and flora

1.1.1 Baseline

Biodiversity is defined as the variety of plants (flora) and animals (fauna) in an area, and their associated habitats. The value of biodiversity conservation is recognised from an international to a local scale. Biodiversity has importance in its own right and has value in terms of quality of life and amenity. The Yorkshire Water supply area includes a number of sites that are designated as important for biodiversity at an international, national or local level (see **Appendix C Figure 1.1**). Special Protection Areas (SPA)²³, Special Areas of Conservation (SAC)²⁴ and Ramsar²⁵ sites are listed in **Table C1**.

Table C1 Special Protection Areas, Special Areas of Conservation and Ramsar within Yorkshire Water supply area

Site and Designation	Water Resource Zone
SPA	
North York Moors	Grid; East SW; East GW (within WRZs)
Hornsea Mere	Grid (within WRZ)
Flamborough Head and Filey Coast	East GW (within WRZ)
Lower Derwent Valley	Grid (within WRZ)
North Pennine Moors	Grid (within WRZ)
Peak District Moors (South Pennine Moors Phase 1)	Grid (within WRZ) and East of YW supply area
Humber Estuary	Grid (within WRZ) and South/South East of YW supply area
South Pennine Moors Phase 2	Grid (within WRZ) and East of YW supply area
Thorne & Hatfield Moors	Grid (within WRZ)
North Pennine Moors	Grid (within WRZ) and North of YW supply area
North Pennine Moors	Kielder (Tees-Swale option, river and pipe transfer)
SAC	
Flamborough Head	East GW (within WRZ)
Ingleborough Complex	Grid (within WRZ)
Beast Cliff-Whitby (Robin Hood's Bay)	East SW (within WRZ)
Lower Derwent Valley	Grid (within WRZ)
Strensall Common	Grid (within WRZ)

²³ Special Protection Areas (SPAs) are strictly protected sites classified in accordance with Article 4 of the EC Directive on the conservation of wild birds (79/409/EEC), also known as the Birds Directive, which came into force in April 1979. They are classified for rare and vulnerable birds, listed in Annex I to the Birds Directive, and for regularly occurring migratory species. www.jncc.org.uk

²⁴ Special Areas of Conservation (SACs) are strictly protected sites designated under the EC Habitats Directive. Article 3 of the Habitats Directive requires the establishment of a European network of important high-quality conservation sites that will make a significant contribution to conserving the 189 habitat types and 788 species identified in Annexes I and II of the Directive (as amended). www.jncc.org.uk

²⁵ Ramsar sites are wetlands of international importance designated under the Ramsar Convention.

Site and Designation	Water Resource Zone
North Pennine Moors	Grid (within WRZ) and North of YW supply
River Derwent	Grid (within WRZ)
Kirk Deighton	Grid (within WRZ)
Arnecliffe & Park Hole Woods	East SW (within WRZ)
Ox Close	Grid (within WRZ)
North York Moors	Grid; East SW; East GW (within WRZ) and North of YW supply area
Craven Limestone Complex	Grid (within WRZ)
Skipwith Common	Grid (within WRZ)
North Pennine Dales Meadows	Grid (within WRZ) and West of YW supply area
Ellers Wood & Sand Dale	East GW (within WRZ)
Fen Bog	East SW (within WRZ)
South Pennine Moors	Grid (within WRZ) and West/South West of YW supply area
Hatfield Moor	Grid (within WRZ)
Denby Grange Colliery Ponds	Grid (within WRZ)
Thorne Moor	Grid (within WRZ)
Humber Estuary	Grid (within WRZ) and South/South East of YW supply area
River Eden	Directly North of Grid WRZ
Rochdale Canal	~4km West of Grid WRZ
Asby Complex	~3km North of Grid WRZ
Border Mires, Kielder-Butterburn	Kielder (Tees-Swale option)
North Pennines Dales Meadows	Kielder (Tees-Swale option)
Tyne & Allen River Gravels	Kielder (Tees-Swale option)
North Pennines Moors	Kielder (Tees-Swale option, , river and pipe transfer)
Moorhouse and Upper Teesdale	Kielder (Tees-Swale option, , river and pipe transfer)
Ramsar	
Malham Tarn	Grid (within WRZ)
Humber Estuary	Grid (within WRZ) and South/South East of YW supply area
Lower Derwent Valley	Grid (within WRZ)

Table C2 provides numbers of Sites of Special Scientific Interest (SSSI)²⁶ and National Nature Reserves (NNRs)²⁷ and Marine Conservation Zones (MCZs)²⁸ within each WRZ in Yorkshire Water's supply area. SSSIs and NNRs relate to the country's best wildlife and geological sites. These are shown on **Appendix C Figure 1.1**.

Table C2: Nationally Designated Nature Conservation Sites

Water Resource Zone	Number of SSSIs	Number of NNRs	Number of MCZs
Grid	Total in Yorkshire Water supply area:	Total in Yorkshire Water supply area:	Total in Yorkshire Water supply area:
East GW	368	11	2
East SW			
Kielder (Tees-Swale option – river transfer)	Total in Tees-Swale Transfer 5 km corridor: 33	Total in Tees-Swale Transfer 5 km corridor: 1	Total in Tees-Swale Transfer 5 km corridor: 0
Kielder (Tees-Swale option – pipe transfer)	Total in Tees-Swale Transfer 5 km corridor: 32	Total in Tees-Swale Transfer 5 km corridor: 1	Total in Tees-Swale Transfer 5 km corridor: 0

In addition to the NNRs listed above, there are 134 Local Nature Reserves (LNRs)²⁹ within the SEA Study Area.

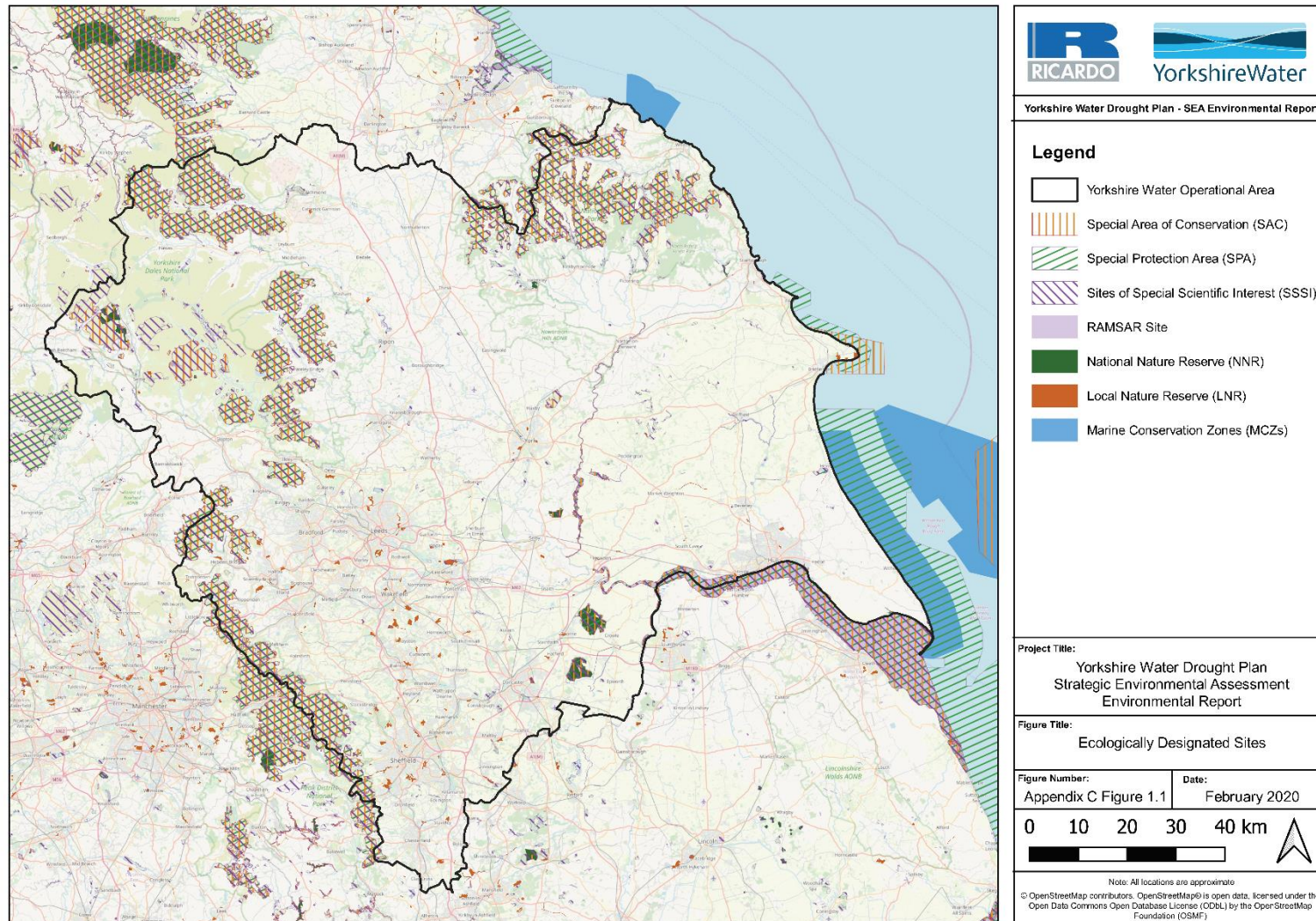
²⁶ Natural England has responsibility for identifying and protecting the SSSIs in England under the Wildlife and Countryside Act 1981 (as amended by the Countryside and Rights of Way Act 2000). www.naturalengland.org.uk

²⁷ NNRs are protected under Sections 16 to 29 of the National Parks and Access to the Countryside Act, 1949 and the Wildlife and Countryside Act, 1981.

²⁸ The Marine and Coastal Access Act 2009 allows for the creation of Marine Conservation Zones (MCZs). MCZs protect a range of nationally important marine wildlife, habitats, geology and geomorphology, and can be designated anywhere in English and Welsh territorial and UK offshore waters.

²⁹ a LNR is a statutory designation made under Section 21 of the National Parks and Access to the Countryside Act 1949, and amended by Schedule 11 of the Natural Environment and Rural Communities Act 2006, by principal local authorities.

Figure 1.1 Designated Sites



There are a range of designated Natural Environment and Rural Communities (NERC) Act Section 41 habitats within the Yorkshire Water supply area³⁰. NERC habitats include rivers and streams, blanket bogs, reedbeds, fens and meadows. NERC priority species include:

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

Natural England has defined a series of 120 Natural Areas as a means to conserve nature in England. They are areas of countryside identified by the unique combination of physical attributes, wildlife, land use and culture. Key messages regarding habitat type relevant to the Yorkshire Water supply area are presented in **Table C3** and **Table C4**.

³⁰ Defra (accessed May 2017) MAGIC Interactive map: Habitat Inventories (<http://magic.defra.gov.uk/>)

Table C3 Natural Character Areas in the Yorkshire Water Supply Area

Natural Area	WRZ	Region	Key Features
North Pennines	Grid	Yorkshire	Expansive moorlands, grasslands and flower-rich meadows are important features; Upland bogs and acid grassland cover much of the area; The area attracts large numbers of insects, waders and birds of prey; Varied geology (including gorges, shakeholes, caves and pavements) and associated waterfalls are important features.
Tees Lowlands	Grid	North East	Low lying land adjacent to the River Tees; Grazing marsh, open water and wetlands are important features.
Yorkshire Dales	Grid	Yorkshire	Glaciated, upland landscape of rounded hills and moors; Geologically important karst limestone landforms, cave systems and exposures of carboniferous rocks with associated habitats of international importance.
Forest of Bowland	Grid	Yorkshire	The area is dominated by rolling heather moorland and blanket bog; Internationally important grouse and sheep populations;
Lancashire Plain and Valleys	Grid	Yorkshire	Intensively farmed area with arable, horticulture and dairy farming; Significant area for wintering waders and wildfowl due to the area's proximity to internationally important estuaries; Numerous field ponds supporting great crested newt populations; Water vole populations present in the network of field drains of the coastal plain.
Southern Pennines	Grid	Yorkshire/ North West	Upland areas of heather moorland, blanket bog and acid grassland are essential character of the area Internationally important populations of red grouse, curlew, merlin, golden plover, dunlin and short-eared owl.
Pennine Dales Fringe	Grid	Yorkshire	Rolling landscapes at the transition between the Pennines and Yorkshire Dales.
Vale of York and Mowbray	Grid	Yorkshire	Riverine habitats such as Lower Derwent Valley supporting internationally important flood meadow grasslands and breeding/wintering bird populations; Important heathland areas.
North York Moors and Hills	Grid; East SW, East GW	Yorkshire	Large expanse of open heather moorland, supporting vegetation and breeding birds (in particular Golden Plover and Merlin); Species-rich limestone grassland and calcareous fens on southern fringe of the area.
Vale of Pickering	Grid; East SW, East GW	Yorkshire	Floodplain grasslands (supported by the River Derwent) which are particularly important for breeding and wintering bird populations.
Yorkshire Wolds	Grid; East GW	Yorkshire	Crescent-shaped area of hills with near-vertical cliffs; Small spring-fed flushes arising from the Western escarpment and the coastal parts of the Wolds.

Table C4 Natural England Natural Areas within the Yorkshire Water Supply Area (or Tees-Swale Corridor)

Natural Area	WRZ	Region	Key Messages
Holderness	Grid; East GW	Yorkshire	Low lying plain of boulder clay, with areas of gravel and sand; Area supports a variety of wildlife associated with the river Hull and adjacent wetlands.
Humber Estuary	Grid	Yorkshire	Internationally important site Migratory wildfowl, Vast expanses of exposed mudflats.
Humberhead Levels	Grid	Yorkshire	Plains dominated by major river systems (Ouse and Trent); Peatland areas internationally important for their nature conservation features.
Southern Magnesian Limestone	Grid	Yorkshire	Base-rich flushes, river and streams forming important wetland features; Important geological sections including limestone gorges and caves containing Pleistocene sediments.
Coal Measures	Grid	Yorkshire	Area characterised by dense populations of towns/cities developed as a result of underlying coal fields (Shales and sandstones of late Carboniferous age c. 320-295 million years old).
Dark Peak	Grid	Yorkshire	Area of peat covered hills dissected by narrow cloughs; Dominated by upland heather and blanket bog; Reservoirs are key characteristic feature of the area.
Derbyshire Peak Fringe and Lower Derwent	Grid	Yorkshire	Area dominated by rivers and reservoirs providing important habitats for pondweeds, great crested newts, migrating waders and wildfowl.
Border Uplands	Kielder (NWL)	North East	Area of peat and glacial drift covered hills; Dominated by moorland and blanket bog; Rivers are of considerable ecological importance.

Invasive Non-native Species

Invasive non-native species are widespread across the river catchments of Yorkshire. These species include terrestrial plants such as Himalayan Balsam and Giant Hogweed; aquatic macrophytes such as Floating Pennywort and New Zealand Stonecrop and; aquatic invertebrates, notably Signal Crayfish and Zebra Mussels ([Table C5](#)). Implementation of Yorkshire Water's Drought Plan 2022 options are not expected to increase the distribution of these invasive non-native species. Impacts to the physical environment as a result of these options will lead to increased mortality of invasive non-native species and the impairment of pathways to further distribution as a consequence of reduced river flows. Nonetheless, the distribution of invasive species will be assessed in the SEA report and the spread of invasive species forms a key question with regards to biodiversity in Section 3.1.

Table C5: Recorded Number of Key Invasive Species of Main Rivers of Yorkshire from 1985 to 2015

	Zebra Mussels <i>Dreissena polymorpha</i>	Signal Crayfish <i>Pacifastacus leniusculus</i>	Himalayan Balsam <i>Impatiens glandulifera</i>	Japanese Knotweed <i>Fallopia japonica</i>	Giant Hogweed <i>Heracleum mantegazzianum</i>	Floating Pennywort <i>Hydrocotyle ranunculoides</i>
1985-1990	-	3	-	-	-	-
1991-1995	-	-	-	10	3	-
1996-2000	3	13	-	29	12	-
2001-2005	11	25	-	7	3	-
2006-2010	11	54	51	7	13	48
2011-2015	1	3	83	3	1	1
Total	26	98	134	56	32	49

Works being undertaken to demonstrate compliance with the Eel Regulations

During AMP5 (2010-2015) the Environment Agency reviewed the compliance of relevant assets such as river intakes, against the 2009 Eels Regulations, which seek to reverse the rapid decline in eel populations over recent years. The Regulations aim to achieve 40 percent escapement of adult eels relative to the level of escapement under pristine conditions. As a result of this review, YWSL were served notice to deliver solutions to prevent eel impingement and entrainment at three of their river intake sites as a matter of high priority (i.e. solutions delivered by 2020). Specialist aquatic and fish engineering consultants APEM Ltd were commissioned to undertake an independent review of compliance and confirmed that the intake screens at two of the sites were partially compliant with the Regulations, and therefore only relatively minor modifications were required. The schemes of work at both these sites were delivered in 2019. The third site required a much bigger scheme to ensure compliance with the Regulations and will be completed by September 2021.

No further YWSL assets have been identified as being non-compliant by the review and so no further schemes are expected to be delivered during AMP7 and beyond.

1.1.2 Future Baseline

It is not expected that many additional sites will be designated under international or national legislation throughout the course of the Drought Plan 2022, therefore the focus is placed on achieving the conservation objectives set for each of these sites. A range of measures are included in the management plans for each site to contribute towards the objectives and, assuming sufficient resources are in place, it is likely that the condition of these sites will be improved over the next two or three decades. A similar trend is likely for achievement of objectives associated with the NERC priority habits.

The number of locally designated sites may increase slightly in response to growing community activities and the development of local environmental initiatives. An improving trend in condition of these

sites is also anticipated with greater resources (particularly voluntary resources) devoted to their protection and enhancement.

The Defra 25 Year Environment Plan³¹ includes a commitment to restore restoring 75% terrestrial and freshwater protected sites to favourable condition and to create or restore 500,000 hectares of wildlife-rich habitat outside the protected site network, focusing on priority habitats as part of a wider set of land management changes providing extensive benefits. The 25 Year Plan also proposed an adoption of 'Biodiversity Net Gain' approach to development, an approach introduced into national planning policy in 2019 and which will be mandated by the upcoming Environment Bill.

The 25 year Plan also includes a commitment to support land management at landscape and catchment level and to support the adoption of long-term sustainable land management practices to significantly expand wildlife habitat and provide opportunities for species and ecosystem recovery.

Climate change is anticipated to have an impact on wildlife in the future by exacerbating existing pressures such as changes to the timing of seasonal activity, and water scarcity. It is acknowledged that there is a need to allow wildlife to adapt to the impacts of climate change. Climate may limit species' distributions indirectly though the impact of invasive species on native species along climatic gradients³². It will affect the abundance and diversity of natural enemies, competitors and species that constitute resources, as well as a species' ability to compete for resources or resist natural enemies.

1.1.3 Key Issues

The key sustainability issues arising from the baseline assessment for biodiversity are:

- The need to protect or enhance biodiversity, ecological functions and biodiversity connectivity within YWSL's supply and source areas, particularly protected sites designated for nature conservation
- The need to avoid activities likely to cause irreversible damage to natural heritage.
- The need to take opportunities to improve connectivity between fragmented habitats to create functioning habitat corridors.
- The need to control the spread of Invasive Non-Native Species (INNS).
- The need to recognise the importance of allowing wildlife to adapt to climate change.
- The need to engage more people in biodiversity issues so that they personally value biodiversity and know what they can do to help, including through recognising the value of the ecosystem services.

1.2 Population and Human Health

1.2.1 Baseline

Population

The North East / Yorkshire and the Humber region has centres of densely populated urban areas within a generally more sparsely populated wider area. Kingston upon Hull is the most densely populated area with a mid-2018 average population density of 3,486 people per km², compared to an average of 430 in England as a whole. The latest population (mid-2018) estimates³³ for the North East and Yorkshire and the Humber regions are 2.66 and 5.48, respectively. When comparing population and household statistics and projections (**Table C6**), it is important to note that whilst the population growth rate for the

³¹ <https://www.gov.uk/government/publications/25-year-environment-plan>

³² Pateman & Hodgson (2015) Biodiversity Climate change impacts report card technical paper. Available from: <http://www.nerc.ac.uk/research/partnerships/lwec/products/report-cards/biodiversity/papers/source06/>

³³ Population estimates for UK, England and Wales, Scotland and Northern Ireland: Mid-2018.

whole of England over the period 2016-2026 is 5.9%, Yorkshire and The Humber and the North East expect to see lower growth rates of 3.5% and 1.9%, respectively. Household growth projections for the period 2020-2041 show a similar pattern for the regions with projected increases of 7.4% for Yorkshire and the Humber and 5.2% for the North East, both predicting smaller growth compared to the whole of England.

Table C6 Population³⁴ and Household³⁵ statistics and projections (millions)

Period	2016	2020	2026	2041	% change over period	
Region	Population	No. Households	Population	No. Households	Population	No. Households
Yorkshire & Humber	5.43	2.33	5.62	2.50	3.5	7.4
North East of England	2.64	1.17	2.72	1.23	1.9	5.2
England	55.3	23.5	58.5	26.0	5.9	10.5

Human Health and Deprivation

The Drought Plan 2022 has the potential to influence quality of life, including human health, well-being, amenity and community, through actions to maintain essential water supplies during drought conditions. There could be beneficial (e.g. actions to provide additional supply of water will help safeguard public health) or adverse impacts (e.g. noise and disruption from temporary infrastructure required to pump water).

For the Yorkshire and the Humber region, 2011 Census data suggests that 80% of the population claimed to be in 'very good health' or 'good health', this was slightly below the national average of 81.2%. In the same responses, 5% stated their health was 'bad', above the national average of 4.3%. The North East region had the least favourable general health; just 44% reported 'very good health' and 7.4% stated their health was 'bad' or 'very bad'.

It has been shown that, in some cases, people in disadvantaged areas experience greater exposure to negative impacts on human health including air pollution, flooding, and proximity to large industrial and waste management sites. The Index of Multiple Deprivation combines a number of indicators, chosen to cover a range of economic, social and housing issues, into a single deprivation score for each Lower Super Output Area in the UK. This allows each area to be ranked relative to one another according to their level of deprivation. The Indices are used widely to analyse patterns of deprivation, identify areas that would benefit from special initiatives or programmes and as a tool to determine eligibility for specific funding streams.

Data relating to drinking water quality, pollution incidents and air quality, which could also be affected by the DP, and as a result affect amenity and human health are covered in separate sections of this report.

Economy and Employment

Both the Yorkshire and the Humber and North East regions are polycentric areas with a large and diverse economy. Traditionally, these regions have been dominated by heavy industries such as mining and manufacturing and whilst the latter remains an important component of both regional economies, evidence suggests these regions are transitioning to more diversified business sectors.

Gross value added (GVA) is an indicator that has been developed to measure the economic contribution of individual firms, industries or sectors in the United Kingdom. In 2017, The GVA for Yorkshire and the Humber and the North East was £116,772 billion and £53,235 billion, respectively, which translates to

³⁴ Office for National Statistics (2018) Subnational population projections for England: 2016-based,

³⁵ Office for National Statistics (2018) Household projections in England: 2016-based

£21,426 and £20,129 per head³⁶. These were between 27-36% below the UK national average of £27,555 per person.

The average gross weekly earnings for full-time employees in the Yorkshire and the Humber in 2019 was £538 and £533 for the North East, which are both below the national average of £585/week³⁷. Unemployment rates for the regions were above the national average in 2018 (4.0%) at between 5.0 and 5.5%. However, between 2017 and 2018, Yorkshire and the Humber saw the second largest regional increase in employment rates (1.1%) meanwhile the North East saw a decrease of 0.5%³⁸.

The COVID-19 pandemic has impacted the economy in numerous ways; from lockdown restrictions forcing the closure of businesses to limits on mobility. In 2020 UK Gross Domestic Product (GDP) fell by 9.8%, the steepest decline since consistent records began in 1948³⁹. Economists differ in how quickly they expect the economy to recover, however average forecast is for GDP growth of 4.8% in 2021. When the economic shock of the pandemic does dissipate it is likely that the crisis will result in lasting damage to the economy. In March 2021, the UK government launched three new investment programmes to support communities across the country as part of the 'Levelling Up' recovery response to the pandemic. These programmes will centre on developing employment opportunities, improving transport infrastructure and supporting local facilities to reduce inter-regional inequalities.

Recreation and Tourism

The DP has the potential to affect areas with recreational value through increased abstraction from rivers and reservoirs. There are a variety of opportunities for recreation and tourism within the Yorkshire Water supply area. Many of the recreational and cultural offerings are represented in other topic areas in the baseline. For example, the WRZs include a number of water resources of recreational importance including many reservoirs for sailing or fishing and river sections of particular importance with respect to navigation (e.g. The River Ouse) and angling (e.g. The River Ure). Section 2.3.4 identifies the large number of nature reserves that are present within the Yorkshire Water supply area. Section 2.3.10 identifies the importance of the Yorkshire Water supply area with respect to heritage assets, including two internationally recognised World Heritage Sites (plus a further one when considering the Tees Swale Transfer), 131 Registered Parks and Gardens (plus a further 11 when considering the Tees Swale Transfer) and 2,934 Scheduled Monuments (plus a further 178 when considering the Tees Swale Transfer). Section 2.3.11 describes the landscape baseline, which includes three Areas of Outstanding Natural Beauty (AONB) (plus a further one when considering the Tees Swale Transfer). Public open space, Rights of Way, walking routes or cycle routes are also important with respect to recreation and tourism. The National Planning Policy Framework (NPPF) states planning policies should protect and enhance public rights of way and access.

Tourism is the fifth largest industry in the UK and supports 3.1 million jobs in England (forming England's third largest employer), contributing £126.9 billion to the economy. In 2018, there were more than 5 million visitors to the top 20 paid attractions in Yorkshire and Humberside⁴⁰. Figures for inbound tourism show a record-breaking 1.39 million international visitors to the Yorkshire and the Humber region in 2018, spending over £600 million (a 6.4% increase compared to 2017)⁴¹. In 2018, Both Yorkshire and Humber and the North East region have increased total tourism spend by 2% and 3.6%, respectively, against slight decreases in total tourist spending in England.

1.2.2 Future Baseline

Population is expected to grow at a rate between 1.9% and 3.5% across the region (see [Table C6](#)), with an increasing proportion of people at or above state pension age. Yorkshire Water's draft water resources plan states that population is projected to increase by one million by 2045. Household

³⁶ ONS (2018) Regional economic activity by gross value added (balanced) UK.

³⁷ ONS (2019) Employee earnings in the UK:2019

³⁸ ONS (2019) Regional labour market statistics in the UK: January 2019

³⁹ House of Commons Library (2021) Coronavirus: Economic Impact

⁴⁰ Visit England (2019) Visitor Attraction Trends in England 2018, Full Report.

⁴¹ Welcome to Yorkshire (2019) Tourism Data Report.

projections show potential increases of between 5.2% and 7.4% across the region, with an increasing proportion of one person households.

In response to recent studies access to the recreational resources, green spaces and the historic environment will have greater importance in future planning. The NPPF suggests a range of areas that should be taken into account, including the provision of appropriate facilities for recreation that preserve the openness of the green belt.

The National Ecosystem Assessment and the Marmot Review, Fair Society, Healthy Lives, demonstrate the positive impact that nature has on mental and physical health and as a result the Government intends to establish a Green Infrastructure Partnership with civil society to support the development of green infrastructure in England.

Improvements to the quality of the water environment and certain potential climate change impacts will present opportunities for an expanding tourist industry in the region.

1.2.3 Key Issues

The key sustainability issues arising from the baseline assessment for population and human health are:

- The need to ensure water supplies remain affordable especially for deprived or vulnerable communities.
- The need to ensure public awareness of drought conditions and importance of maintaining resilient, reliable public water supplies without the need for emergency drought measures.
- The need to ensure water quantity and quality is maintained for other users including tourists, recreational users and other users such as farmers.
- The need to ensure a balance between different aspects of the built and natural environment that will help to provide opportunities for local residents and tourists, including opportunities for access to recreation resources and the natural and historic environment.
- Sites of nature conservation importance, heritage assets, water resources, important landscapes and public rights of way contribute to recreation and tourism opportunities and subsequently health and well-being and the economy.

The implications of a changing population on material assets and resource use, including water resources, are considered in Section 2.3.6 below.

1.3 Material Assets and Resource Use

1.3.1 Baseline

Water Use

In 2018/19, Yorkshire Water abstracted and treated 1,300MI/d (million litres per day) of water for supply to customers, with leakage from the water distribution system reported as 289.8MI/d⁴². The North East EA regional charge area, which comprises the Yorkshire Water operational area, had a total of 3,076 actual abstractions (over half of which were to supply the energy industry) (**Table C7**).

⁴² Yorkshire Water Services Limited (2019) Annual Report and Financial Statements.
https://www.yorkshirewater.com/media/1819/734104_yws_arfs_2019_web-min.pdf

Table C7 Estimated actual abstractions

Estimated actual abstractions from all surface and groundwater sources by purpose (2017)	Million cubic meters North East (inc. Yorkshire)	Million cubic meters England
Public water supply	743	5,332
Agriculture (including spray irrigation)	6	109
Electricity supply industry ¹	2,158	8,131
Other industry	78	1,799
Fish farming, cress growing, amenity ponds	87	888
Private water supply	2	10
Other	1	32
Total	3,076	16,302

¹Includes hydropower licences

Source: DEFRA (2019) ENV15 - Water abstraction tables for England

Resource Use and Waste

The need for society to reduce the amount of waste it generates, by using materials more efficiently, and improving the management of waste that is produced, in order to achieve sustainable living, is realised more today than it was two decades ago. Landfill volumes in England⁴³ peaked in 2001/02 at 22.4 million metric tons, before declining in the following years. In 2018/19, this figure was 2.7 million tons attributed to increased recycling rates. Household recycling rates in England have climbed to almost 45% (from 11.2% in 2000), waste generated by businesses declined by 29% in the six years to 2009 and business recycling rates are above household recycling rates at 50%. East Riding of Yorkshire Council, within the YWSL operational area, had the highest household waste recycling rate in England 2018/19 at 65% and has featured in the top three authorities for the past three years⁴⁴. In line with the widely adopted 'waste hierarchy', best practice for waste management is to reduce, re-use, recycle and recover, and only then should disposal (or storage) in landfill be considered.

Data on waste arisings is collected in a range of categories. The activities of the water industry contribute to construction, demolition and excavation waste, through construction of new infrastructure. The water industry also contributes to several waste streams through the operation of facilities. Waste streams include commercial and industrial waste (statistics include waste arisings from the power and utilities sector, which includes water supply and sewage treatment), and also hazardous wastes from industrial wastewater treatment. In 2016, it is estimated that the commercial and industrial sectors contributed over 32 million tonnes of waste in England, meanwhile the CDE sector (Construction, demolition and excavation) generated over 120 million tonnes, showing 4.7% and 3.0% increases, respectively, when compared to 2014 data⁴⁵.

The Yorkshire and The Humber region is a major producer and consumer of energy. Total energy consumption in the region during 2017 was just over 12 million tonnes of oil (mtoe), approximately 9.6% of the total UK figure⁴⁶.

Table C8 illustrates the proportion of energy consumption in both the North East and Yorkshire regions used for industry and commercial use is above the UK average. Energy consumption by type is consistent with national trends, with the majority coming from natural gas and petroleum. The renewable

⁴³ Collected by Local Authorities

⁴⁴ Defra (2019) Statistics on waste managed by local authorities in England in 2018/19

⁴⁵ Defra (2020) UK Statistics on Waste

⁴⁶ Department for Business, Energy & Industrial Strategy (2017) Regional Energy Consumption Statistics

energy sector in both regions continues to grow with 11% of sites generating renewable energy in England located in Yorkshire and the Humber⁴⁷.

Table C8 Regional energy demand by sector (2017)

Energy demand by sector	Yorkshire and The Humber	North East	UK
Industry and Commercial	43.3%	42.3%	35.6%
Domestic	28.4%	31.1%	31.4%
Transport	26.8%	25.1%	30.2%

Source: Department for Business, Energy & Industrial Strategy. Regional Energy Consumption Statistics 2017

1.3.2 Future Baseline

The Government's National Infrastructure Plan⁴⁸ (2011) includes visions to manage natural capital sustainably; treat water and waste in ways that sustain the environment and enable the economy to prosper; ensure a supply of water that meets the needs of households, businesses and the environment now and in the future and deal with waste in accordance with the waste hierarchy moving towards a zero-waste economy. The government's resource and waste strategy⁴⁹ emphasises the importance of natural capital as one of the most valuable assets and sets out how England will preserve material resources, promote resource efficiency and a move towards a circular economy whilst minimising damage to the natural environment and reducing and managing waste carefully. Targets for England by 2035 include a 65% recycling rate for municipal solid waste and less than 10% or less of municipal solid waste to landfill.

Yorkshire Water's future baseline for leakage control is detailed in their draft WRMP, where they plan to significantly reduce leakage between 2020 and 2025 by 40% (122MI/d), an ambition set out previously in 2017. If this target was met, it would reduce leakage from 297MI/d to 175MI/d by 2024/25. In 2018/19, YWSL achieved their leakage target of less than or equal to 292.1MI/d as they reported an actual value of 289.8MI/d⁵⁰. Current and future pressures on water resources include; impacts from abstraction, climate change, population growth and future energy strategy⁵¹.

The National Planning Policy Framework⁵² (2019) emphasises the need for achieving sustainable development, through making effective use of land and existing resources, using natural resources prudently and supporting renewable and low carbon energy. In 2011, the Government set out a commitment to supply 15% of the UK's energy demand from renewable sources by 2020, however, recent figures (11% in 2018) published by Eurostat⁵³ suggest the UK will fall around 4% short of this target. In line with the Paris agreement⁵⁴, the UK has targets to reach net-zero carbon emissions by 2050 and the energy white paper is set to be published in 2020, detailing the UK's path to achieving this.

1.3.3 Key Issues

The key sustainability issues arising from the baseline assessment for material assets and resource use are:

- The need to minimise the consumption of resources, including water and energy.

⁴⁷ Department for Business, Energy & Industrial Strategy (2018) Regional Renewable Statistics 2003-2018: Number of Sites

⁴⁸ HM Treasury Infrastructure UK (2011) National Infrastructure Plan

⁴⁹ HM Government (2018) Our waste, our resources: A strategy for England

⁵⁰ Yorkshire Water (2019) Annual Performance Report 2018-2019

⁵¹ Environment Agency (2018) The state of the environment: water resources. May 2018

⁵² Ministry of Housing, Communities & Local Government (2019) National Planning Policy Framework

⁵³ Eurostat (2020) Share of renewable energy in the EU up to 18%. Renewable energy in the EU in 2018.

<https://ec.europa.eu/eurostat/documents/2995521/10335438/8-23012020-AP-EN.pdf/292cf2e5-8870-4525-7ad7-188864ba0c29>. Accessed March 2020.

⁵⁴ United Nations (2015) The Paris Agreement

- The need to reduce the total amount of waste produced in the region, from all sources, and to reduce the proportion of this waste sent to landfill.
- The need to continue to reduce leakage from the water supply system.
- Daily consumption of water is higher than the national average in the area and consequently there is a continued need to encourage more efficient water use.

1.4 Water

1.4.1 Baseline

In the context of the Water Framework Directive (WFD), the water environment includes rivers, lakes, estuaries, groundwater and coastal waters out to one nautical mile. The aquatic environment of the Humber River Basin has been characterised as part of the UK Government's reporting obligations to the EU under the WFD and this provides the most appropriate baseline reference⁵⁵.

The WFD brings together the planning processes of a range of other European Directives. These Directives establish protected areas to manage water, nutrients, chemicals, economically significant species, and wildlife – and have been brought into line with the planning timescales of the WFD.

Surface Waters: Rivers and Canals

The Yorkshire Water supply area lies within the Humber River Basin District and is comprised of the following catchments⁵⁶:

- Esk & Coast
- Swale, Ure, Nidd and Upper Ouse
- Derwent (Humber)
- Hull and East Riding
- Aire and Calder
- Don and Rother

A large canal network extends from the Southern section of Yorkshire Water's supply area as far as Ripon in the North West and Driffield in the East.

Elements of the Tees Swale Transfer option are located with the Northumbrian River Basin District and is comprised of the following relevant catchments:

- Tees
- Wear
- Tyne

Approximately 30% of Yorkshire Water's supply is derived from rivers⁵⁷. Major rivers within the Yorkshire Water supply area include the Wharfe, Ouse and Derwent.

Surface Waters: Lakes and Reservoirs

There are a total of 136 lakes and reservoirs in the Humber River Basin District, of which two are natural water bodies, 22 are artificial water bodies and 108 heavily modified water bodies. Approximately 45% of Yorkshire Water's supply is from impounding reservoirs. Many of these reservoirs are important landscape characteristics and often provide nationally/ internationally important recreational resources and wildlife habitats.

⁵⁵ Defra (2005) Water Framework Directive: Summary report of the characterisation, impacts and economics analyses required by Article 5, Humber River Basin District

⁵⁶ Environment Agency (2009) River Basin Management Plan: Humber River Basin District

⁵⁷ Yorkshire Water Services Limited (2019) Draft Water Resources Management Plan 2019 - 2024

Groundwater

Approximately 25% of Yorkshire Water's supply is from groundwaters, derived from assets within the Grid SWZ or East GWZ. There are two major aquifers in the region, the Sherwood Sandstone and the Magnesian Limestone, supporting large groundwater abstractions. The Sherwood Sandstone is a major drinking water supply.

Under the WFD, there are two separate classifications for groundwater bodies; chemical status and quantitative status. A groundwater body will be classified as having poor quantitative status where:

- low groundwater levels are responsible for an adverse impact on rivers and wetlands normally reliant on groundwater
- where abstraction of groundwater has led to saline intrusion
- where it is possible that the amount of groundwater abstracted will not be replaced each year by rainfall.

For a groundwater body to be at good status overall, both chemical status and quantitative status must be good.

Estuaries

The Humber Basin has over 165km of coastline and 33,000km² of estuarine environments. The Yorkshire coastline provides a vital tourism industry to the region and there are 23 designated bathing waters in the Humber River Basin⁵⁸. Four out of six estuarine waterbodies within the Humber Estuary Operational catchment had good chemical water quality in 2016, whilst 33% were of good ecological status⁵⁹.

Monitoring

There is an adequate coverage of hydrometric and water quality data in the study area. In order for this to remain the case, the existing monitoring regime, undertaken by Yorkshire Water and the Environment Agency, should continue as at present.

Catchment Abstraction Management Strategies (CAMS)

A national review of abstraction licences was undertaken by the Environment Agency through the CAMS process in 2004. This has been revised in subsequent years, with the latest version published in 2014⁶⁰. Where applicable and relevant, updated CAMS information will be detailed in the Environmental Report if the data are made available.

CAMS areas are based on river catchment boundaries and overlap with Yorkshire Water's supply area, as summarised in **Table C9**.

⁵⁸Environment Agency (2015) Part 1: Humber river basin district River Basin management plan

⁵⁹ <http://environment.data.gov.uk/catchment-planning/OperationalCatchment/3228/Summary>

⁶⁰ <https://www.gov.uk/government/collections/water-abstraction-licensing-strategies-cams-process>

Table C9 Catchment Abstraction Management Strategies in the Yorkshire Water Supply Area

Water Resource Zone	Relevant CAMS
Grid	Aire & Calder; Don & Rother; Hull & East Riding; Swale, Ure, Nidd & Upper Ouse; Wharfe & Lower Ouse
East SW Zone	Esk & Coast
East GW Zone	Derwent; Hull & East Riding
Kielder (Tees Swale option)	Tees, Tyne & Wear

CAMS seek to identify where additional water abstractions can be made from the environment, where no additional abstractions can be made and where action is needed to address over-abstraction (or over-licensed resource allocation). **Table C10** provides a breakdown of the resource availability status in the Yorkshire Water supply area

Table C10 Resource Availability Status in the Yorkshire Water Supply Area (listing each relevant CAMS, with relevant CAMS management units)

Resource availability status assessed by the Environment Agency in the CAMS process		
Relevant CAMS	Relevant CAMS Management Unit	Resource availability status
Aire & Calder	1. Aire Headwaters	Water available for licensing
	2. Upper Aire	Water available for licensing
	3. River Worth	Water available for licensing
	4. Upper Mid Aire	Water available for licensing
	5. Lower Mid Aire	Water available for licensing
	6. Lower Aire	Water available for licensing
	7. Upper Calder	Water available for licensing
	8. Mid Calder	Water available for licensing
	9. River Colne	Water available for licensing
	10. Lower Calder	Water available for licensing
Derwent	1. Barmby Tidal Barrage	<i>Not assessed</i>
	2. East Cottingwith	Water not available for licensing
	3. Sutton upon Derwent	Restricted water available for licensing
	4. Buttercrambe weir	Water available for licensing
	5. Kirkham Bridge	Water available for licensing
	6. Low Marishes	Restricted water available for licensing
	7. River Hertford	Water not available for licensing
	8. West Ayton	Water not available for licensing
	9. Howe Bridge	Restricted water available for licensing
	10. Ness GS	Restricted water available for licensing
Don & Rother	1. River Sheaf	Water available for licensing
	2. Upper Don	Water available for licensing
	3. Upper Rother	Water available for licensing
	4. Lower Rother	Water available for licensing
	5. Upper Dearne	Water available for licensing
	6. Lower Dearne	Water available for licensing
	7. Middle Don	Water available for licensing

Resource availability status assessed by the Environment Agency in the CAMS process		
Relevant CAMS	Relevant CAMS Management Unit	Resource availability status
	8. Went Walden Stubbs	Water available for licensing
	9. Lower Went	Water available for licensing
Esk & Coast	1. Lower Esk	Water not available for licensing
	2. Murk Esk	Restricted water available for licensing
	3. Upper Esk	Water available for licensing
	4. Slaithes	Restricted water available for licensing
	1. Kelk Beck	Restricted water available for licensing
Hull & East Riding	2. Upper West Beck	Water available for licensing
	3. Upper Hull	Water not available for licensing
	4. Driffield Canal	Water available for licensing
	5. Upper Mires Beck	Restricted water available for licensing
	6. Lower Mires Beck	Water not available for licensing
	7. Rover Foulness	Water available for licensing
	8. Back Delfin	Restricted water available for licensing
	9. Market Weighton Canal	Water available for licensing
Swale, Ure, Nidd & Upper Ouse	1. Naburn	Restricted water available for licensing
	2. Foss	Water available for licensing
	3. Skelton GS	Water available for licensing
	4. Kyle	Water available for licensing
	5. Nidd	Water available for licensing
	6. Hunsingore GS)	Water available for licensing
	7. Crimble	Water available for licensing
	8. Birstwith GS	Water not available for licensing
	9. Ure	Water not available for licensing
	10. Westwick GS	Water not available for licensing
	11. Kilgram GS	Water available for licensing
	12. Swale	Water available for licensing
	13. Bat Bridge GS	Restricted water available for licensing
	14. Crakehill GS	Water available for licensing
	15. Cod Beck	Water available for licensing
	16. Wiske	Water available for licensing
	17. Bedale Beck	Water available for licensing
	18. Swale at Morton	Restricted water available for licensing
Wharfe and Lower Ouse	1. Tadcaster	Restricted water available for licensing
	2. River Wharfe	Water available for licensing
	3. River Washburn	Water not available for licensing
	4. Addingham	Water available for licensing
	5. River Dibb	Water available for licensing (above Grimwith reservoir only)

Resource availability status assessed by the Environment Agency in the CAMS process		
Relevant CAMS	Relevant CAMS Management Unit	Resource availability status
Tees	6. Cock Beck	Water available for licensing
	1. Skerne	Restricted water available for licensing
	2. Leven	Water available for licensing
	3. Upper Tees	Water available for licensing
	4. Middle Tees	Water available for licensing
	5. Lower Tees	Water available for licensing
Tyne	1. River Team	Water available for licensing
	2. River Derwent	Water available for licensing
	3. Lower Tyne	Water available for licensing
	4. South Tyne	Water available for licensing
	5. River Allens	Water available for licensing
	6. North Tyne	Water available for licensing
	7. River Rede	Water available for licensing
Wear	1. Upper Wear	Water available
	2. Middle Wear	Water available
	3. Gaunless	Water available
	4. Browney	Water available
	5. Lower Wear	Water available

Water Quality

Historically water quality has been classified using the Environment Agency General Quality Assessment (GQA) classification. Since 2007, water quality has been monitored and classified according to WFD requirements.

For surface waterbodies there are two separate classifications, ecological and chemical. For a waterbody to be in overall 'good' status, both ecological and chemical status must be at least 'good'. The ecological measures include water quality, quantity and the habitat, including the health of river insects and plants. These are scrutinised and an assessment made of the overall status. Out of a total 987 surface water bodies in the Humber RBD (River Basin District), just 137 have good ecological status or potential, with 67% of water bodies achieving moderate status⁶¹. 73% of water bodies in the Humber RBD have an objective of maintaining or aiming to achieve good ecological status between 2015 and 2027.

⁶¹ Environment Agency Catchment Data Explorer, 2016 Cycle 2 data. Accessed at <https://environment.data.gov.uk/catchment-planning/RiverBasinDistrict/4/Summary>

Table C11 summarises the key statistics for the catchments within the Yorkshire Water supply area. Similar data are being examined for catchments affected for the Tees Swale transfer option.

Table C11 Key statistics of WFD Catchment within the Yorkshire Water Supply Area

RBD	Relevant RBMP Catchment	% at good ecological status or potential		% at good chemical status	
		RBMP 2016	Target 2027	RBMP 2016	Target 2027
Humber	Aire and Calder	5	74	98	100
	Derwent Derbyshire	27	61	86	100
	Derwent Humber	13	94	100	100
	Don and Rother	6	63	98	100
	Esk and Coast	45	91	100	100
	Hull and East Riding	10	90	98	100
	Idle and Torne	5	51	91	100
	Louth Grimsby and Ancholme	9	74	100	100
	Trent Lower and Erewash	4	61	100	100
	Swale, Ure, Nidd and Ouse Upper	13	84	93	100
	Wharfe and Ouse Lower	19	91	96	100

For groundwater, there are two separate classifications for groundwater bodies: chemical status and quantitative status. Each must be reported in addition to the overall groundwater body status. For a groundwater body to be at good status overall, both chemical status and quantitative status must be good. In addition to assessing status, there is also a requirement to identify and report where the quality of groundwater is deteriorating as a result of pollution and which may lead to a future deterioration in status. Out of 51 groundwater bodies in the Humber RBD, 38 are reported as having good quantitative status and 26 as having good chemical status⁶².

Groundwaters are an important resource in the Humber River Basin District. A significant proportion of drinking water comes from the groundwaters of the chalk and sandstone. The main pressures on groundwaters are abstraction for drinking water supply and contamination with nitrates and pesticides. Historic mining in the west of the river basin on the coal measures has had a significant impact on the groundwater quality. Unsustainable abstraction from groundwater can lower groundwater levels and affect dependent river flows or wetlands, or can induce the intrusion of poorer quality water from the sea or from deeper aquifers.

The Environment Agency's 2015 River Basin Management Plan for the Humber RBD identifies several significant water management issues (SWMIs) that are the main challenges limiting the uses and potential benefits of managing the water environment in the Humber RBD in a sustainable way. These are identified in **Table C12** below as a percentage of the water bodies affected. Physical modifications, including flood defences and weirs for example, affect the largest proportion of water bodies in the river basin district and can cause excessive sedimentation as well as loss of habitat.

Table C12 Significant water management issues preventing waters reaching good status in the Humber river basin district as % of waterbodies affected (some waterbodies are affected by more than one issue)

Significant water management issue (SWMI)	% water bodies affected in Humber RBD
Physical Modifications	42
Pollution from waste water	38
Pollution from towns, cities and transport	16
Changes to the natural flow and level of water	6
Invasive non-native species (INNS)	<1%
Pollution from rural areas	32
Pollution from abandoned mines	4

⁶² Environment Agency (2015) Part 1: Humber river basin district, River basin management plan

1.4.2 Future Baseline

Water Quality

The Water Framework Directive sets a target of aiming to achieve at least 'good status' in all waterbodies by 2015. However, provided that certain conditions are satisfied, in some cases the achievement of good status may be delayed until 2021 or 2027.

Flooding

The NPPF states that inappropriate development in areas at risk of flooding (in Flood Zone 1⁶³, Flood Zone 2⁶⁴, Flood Zone 3a⁶⁵ or Flood Zone 3b - the functional floodplain); should be avoided by directing development away from areas at highest risk (whether existing or future). The NPPF requires that where development is necessary, it should be made safe without increasing flood risk elsewhere, as defined in the Technical Guidance to the NPPF⁶⁶. The NPPF requires the application of a sequential, risk-based approach (operated through Strategic Flood Risk Assessment) to the location of development to avoid where possible flood risk to people and property and to manage any residual risk, taking account of the impacts of current and future climate change. Following application of the Sequential Test, if it is not possible, consistent with wider sustainability objectives, for the development to be located in zones with a lower probability of flooding, the Exception Test can be applied if appropriate. This includes development for water-compatible uses (e.g. water transmission infrastructure and pumping stations) and essential infrastructure (e.g. water treatment works that need to remain operational in times of flood). The Government's 25 year Environment Plan looks to strengthen the relevant protections in the NPPF and, in addition, focus on using more natural flood management solutions, increase the uptake of sustainable drainage systems and improve resilience and recovery times of at risk properties.

The Environment Agency has produced 77 Catchment Flood Risk Plans (CFMPs) for England and Wales. Through the CFMPs, inland flood risk across all of England and Wales has been assessed for the first time. The CFMP considers all types of inland flooding, from rivers, ground water, surface water and tidal flooding. The role of CFMPs is to establish flood risk management policies which will deliver sustainable flood risk management for the long term. This is essential if for effective investment decisions for the future and to help prepare ourselves effectively for the impact of drought events as a result of climate change. The CFMPs will help target the areas that are at greatest risk and provide information on the likely future flood risk, which will help establish the future baseline. For the Yorkshire Water supply region, the following CFMPs have been produced:

- River Aire
- River Calder
- River Derwent
- River Don
- Esk and Coastal Streams
- Grimsby and Ancholme
- Hull & Coastal Streams
- Louth Coastal
- River Ouse
- River Trent

⁶³ Low probability of river or sea flooding (<0.1%) which has critical drainage problems

⁶⁴ Medium probability of river (1%-0.1%) or sea flooding (0.5%-0.1%)

⁶⁵ High probability of river (>1%) or sea flooding (>0.5%)

⁶⁶ Ministry of Housing, Communities & Local Government (2014) Flood risk and coastal change. Accessed at <https://www.gov.uk/guidance/flood-risk-and-coastal-change>

The River Tyne, River Wear and River Tees CFMPs will aid the future development of the Tees Swale Transfer.

Water Availability

Yorkshire Water's 2019 Water Resource Management Plan⁶⁷ and its 2019 draft DP⁶⁸ provide details on how water resources will be managed and secured for the future, including in response to the risks presented by climate change. The Water Resources Management Plan identifies that the Yorkshire Water region is currently in surplus, and can expect to remain in surplus until the mid-2030s. This reflects the current and forecast economic climate and associated impact on new development and water use. Based on the baseline supply demand forecast in WRMP 2019, no additional investment is required to maintain the water supply/demand balance to 2034/35.

In August 2018, the regulators of water in England (Defra, DWI, EA and Ofwat) set out an expectation for greater co-ordination of water resources planning to secure future resilience through strategic solutions that water companies are unlikely to have capacity to deliver alone. Five regional groups were created to cover England and each group must produce a single Regional Plan that builds resilience to a range of uncertainties and future scenarios. The EA published the Water Resources National Framework⁶⁹ (WRNF) in March 2020 which sets out the forecast future need for water across England as well as the deliverables of the Regional Plans. The WRNF has set the ambition that, by 2050, no WRZ in England should have a risk of Level 4 drought restrictions (rota cuts) that is worse than once every 1 in 500 years on average. The Regionals Plans will inform water company WRMPs and will:

- **Reduce demand** to 110 litres of water per person, per day by 2050 and drive down water use across all sectors
- **Halve leakage rates** by 2050
- **Develop new supplies** such as reservoirs, water reuse schemes and desalination plants
- **Move water to where it is needed** through more transfers of different scales and lengths
- **Reduce the use of drought measures** that have an impact on the environment

Water Resources North (comprising Yorkshire Water, Northumbrian Water and Hartlepool (Anglian) Water) has been set up to oversee water resource planning for the wider North East region. The ambition of Water Resources North is to be a national leader for water resource management through ensuring the regional has a sustainable, long-term plan for water resources that protects the region's resilience in the face of challenges such as climate change and population growth.

Minimising and adapting to the impacts of climate change

The UK Climate Change Risk Assessment (CCRA) 2017 Evidence Report⁷⁰ draws together and interprets the evidence gathered by CCRA regarding current and future threats and opportunities for the UK posed by the impacts of climate change up until 2100. Findings of the assessment include:

- Increasing pressure on the UK's water resources due to changes in hydrological conditions, population growth and regulatory requirements to maintain good ecological status
- Major supply-demand deficits were identified for five river basins including the Humber river basin district
- Increases in water demand for irrigation of crops
- Lower summer river flows across the UK due to warming and drying conditions
- An increase in precipitation in winter months due to a combination of greater depths and more frequent heavy rainfall events suggesting runoff with potential negative impacts on flood risk and sewer overflows in urban environments

⁶⁷ Yorkshire Water (2020), Water Resources Management Plan 2019

⁶⁸ Yorkshire Water (2019) Draft Drought Plan 2019

⁶⁹ Environment Agency (2020) Meeting our Future Water Needs: a National Framework for Water Resources

⁷⁰ Defra (2016) The UK Climate Change Risk Assessment 2017 Evidence Report

- Flash-flooding associated releases from combine sewer overflows (CSO) could in turn increase associated illnesses at the coast due to the varying microbial pathogens in the marine environment.

1.4.3 Key Issues

The key issues arising from the baseline assessment for water are:

- The need to further improve the quality of the region's river, estuarine and coastal waters taking into account WFD status targets.
- The need to maintain the quantity and quality of groundwater resources taking into account WFD status targets.
- The need to improve the resilience, flexibility and sustainability of water resources in the region, particularly in light of potential climate change impacts on surface waters and groundwaters.
- The need to ensure sustainable abstraction to protect the water environment.
- The need to ensure that people understand the value of water.

Flooding is not viewed as a key issue for the SEA water topic in relation to the Drought Plan 2022, because none of the drought options involve the construction of permanent physical infrastructure within areas at risk of flooding.

1.5 Soil Geology and Land Use

1.5.1 Baseline

There is a great diversity in the composition of the geology across the region. The geology of North Yorkshire comprises a range of sedimentary rocks that slope gently to the east so that the oldest rocks are present in the west of the County and the youngest in the east. The Carboniferous Limestone and the overlying Upper Carboniferous Millstone Grit dominate the exposure in the west and give rise to the characteristic upland countryside of the Yorkshire Dales and the North Pennines. There is a distinctive difference in the two habitats that these rock types support; with limestone giving rise to calcareous soils whilst shales and sandstones of the Millstone Grit giving rise to acidic soils and large areas of upland grassland and bog. The South Yorkshire area is underlain by rocks of Carboniferous age which are tilted gently to the south-east so that the oldest part of the succession occurs in the west. The moors to the west of Sheffield are formed in the shales and hard coarse-grained sandstone beds of the Millstone Grit. The West Yorkshire area is underlain by rocks of Carboniferous age which are tilted gently to the south-east so that the oldest part of the succession occurs in the west. The moors to the west of Bradford and Calderdale are formed in the shales and hard coarse-grained sandstone beds of the Millstone Grit. The geology of the East Riding of Yorkshire represents a relatively simple arrangement with the older marine clays, limestone and sandstones of Jurassic age occurring in the west of the County and younger Cretaceous rocks in the east. The topography of the area is dominated by the Chalk Wolds which are a crescent shaped series of hills stretching from the coast north of Bridlington to the Humber Bridge.

The variety of underlying geology in the region is reflected in the region's soils, the agricultural value of which varies across the region.

Arable and horticultural land is the predominant agricultural land use type in Yorkshire Water's supply region, with the majority of this land primarily located from the centre of the region to the east, with grazing and rough grassland confined mostly to the Peak District. There are pockets of dense shrub heathland present in the North Yorkshire Moors and Peak District. The Agricultural Land Classification System developed by Defra provides a method for assessing the quality of farmland, principally for the use in planning. The system divides the quality of land into five categories as well as non-agricultural and urban; the regional data is shown in **Appendix C Figure 1.2**.

The 'best and most versatile land' is generally defined as the agricultural land which falls into Grades 1, 2 and 3a. The 'best and most versatile' quality of the agricultural land is largely found to the east of the Pennines, in the Vale of York and north of Kingston upon Hull.

1.5.2 Future Baseline

The vision of Defra's Soils Strategy for England⁷¹ is for all England's soils to be managed sustainably and degradation threats tackled successfully by 2030. This will improve the quality of England's soils and safeguard their ability to provide essential services for future generations.

The Water White Paper described the Government's intentions to take forward a catchment-based approach to water quality and diffuse pollution and work towards Common Agricultural Policy reforms that will promote the farming industry's role as custodian of the natural environment⁷². The Water White Paper also identified that the strategic policy statement for Ofwat and revised social and environmental guidance would give a strong steer on Government support for approaches that offer good value for customers and the potential to prevent and manage future risks to drinking water quality. These policy objectives were reflected in regulatory guidance from Government for the 2014 water resources management planning process and the 2014 water company price review process. The catchment-based approach has now been implemented across England, with catchment partnerships now in place across the YWSL region to take forward the approach over the coming years.

One of the core planning principles of the National Policy Planning Framework (NPPF) is to encourage the effective use of land by reusing land that has been previously developed (brownfield land), provided that it is not of high environmental value. The NPPF also places great importance with respect to Green Belt policy, the aim of which is to prevent urban sprawl by keeping land permanently open. Green Belt serves five purposes: to check the unrestricted sprawl of large built-up areas; to prevent neighbouring towns merging into one another; to assist in safeguarding the countryside from encroachment; to preserve the setting and special character of historic towns; and to assist in urban regeneration, by encouraging the recycling of derelict and other urban land. Although the NPPF promotes a presumption in favour of sustainable development, this does not apply where proposed developments may affect European or other designated sites covered by specific policies. The Yorkshire and The Humber region has 2929 ha of land identified as brownfield, comprising approximately 11% of total brownfield site in the England⁷³.

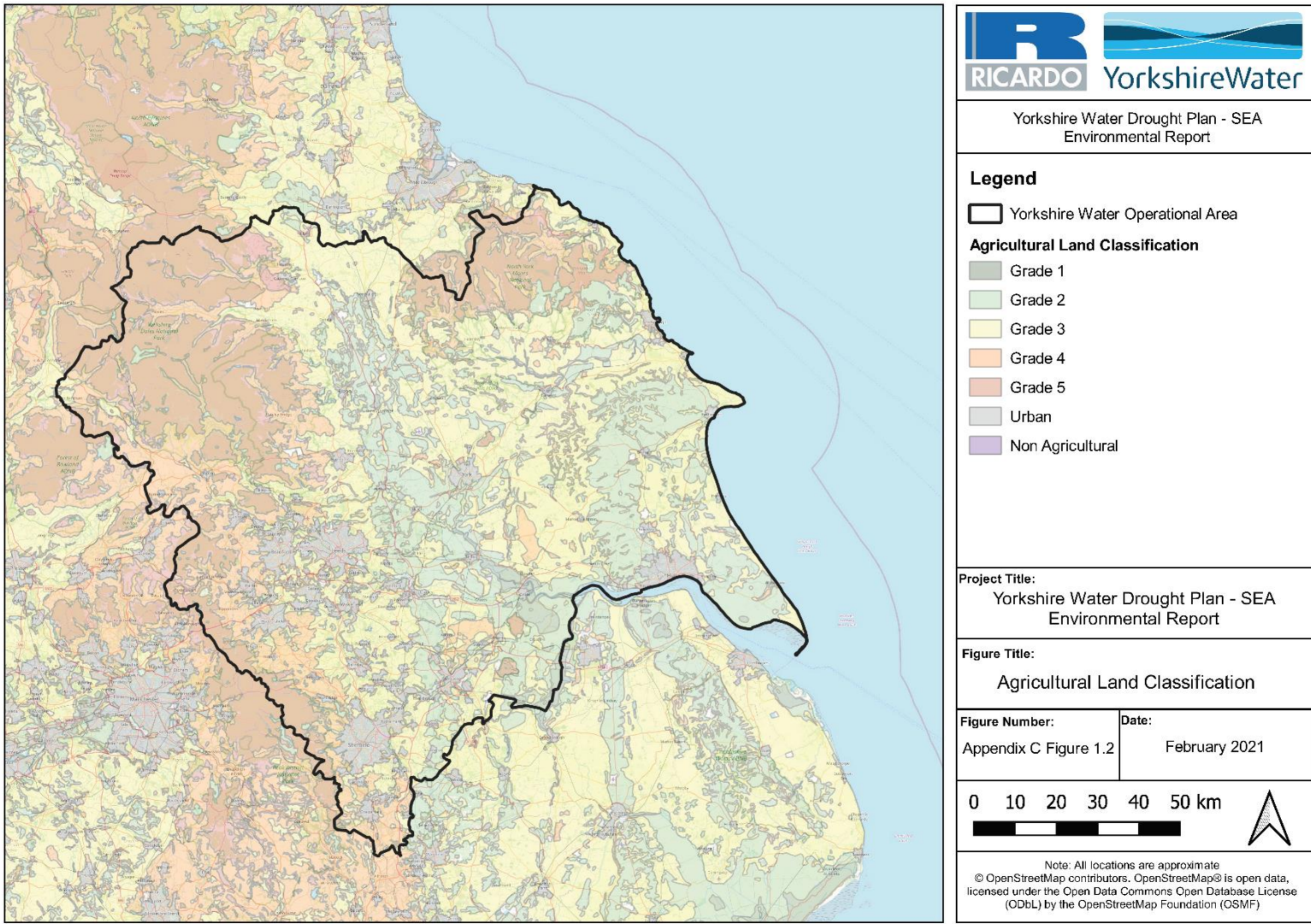
There are a number of Environmentally Sensitive Areas (ESAs) in the region including the parts of the North Peak and the Pennine Dales. The ESA Scheme was designed to protect and enhance the environment by offering payments to landowners and occupiers in these areas to adopt environmentally beneficial agricultural practices. The scheme has now been superseded by the Environmental Stewardship Scheme. Continued development of this scheme is expected to see an improvement in land use in the future.

⁷¹ Defra (2009), Safeguarding our soils – A Strategy for England

⁷² Defra (2011) Water for Life - Water White Paper

⁷³ Campaign to Protect Rural England (2019) State of Brownfield

Figure 1.2 Land Classifications in the Yorkshire Water Supply Area



1.5.3 Key Issues

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

- The need to protect geological features of importance and maintain and enhance soil function and health.
- The need to manage the land more holistically at the catchment level, benefitting landowners, other stakeholders, the environment and sustainability of natural resources (including water resources).
- The need to make use of previously developed land (brownfield land) and to reduce the prevalence of derelict land in the region.

1.6 Air and Climate

1.6.1 Baseline

Drought options could influence CO₂ emissions through additional pumping and treatment requirements. The DP is a response plan that sets out to address the supply of water during times of drought, which may become more prevalent and intense due to the effects of climate change. The DP itself functions as a form of adaptation to some of the effects of climate change.

Drought options may involve the operation of abstraction and treatment operations in locations where such operations do not normally take place, with the potential for negative effects, although generally only in the short term.

The 2018 UK Climate Projections (UKCP18) estimate that summers in the Yorkshire and Humber River Basin district are likely to become drier and winters wetter⁷⁴. In northern and upland areas, an increase in the number of extreme rainfall events is estimated, as is the frequency of dry spells (over ten consecutive days without rain). The Yorkshire Water DP includes measures and options to deal with a drought more severe than has occurred on record.

Future climate change will influence processes within the hydrological cycle such as runoff and evapotranspiration.

The UK Climate Change Risk Assessment (CCRA) 2017 Evidence Report⁷⁵ indicates an urgent need for early adaptation action (i.e. within the next 5 years) in managing water resources, particularly in areas with increasing water scarcity

The key sustainability issues arising from the baseline assessment for air and climate are presented below.

Local Air Quality

Options in the DP may require increased pumping of water (carbon emissions) and potentially provision of new temporary infrastructure construction. Therefore, there is the potential for negative effects on air quality through emissions associated with construction requirements or through the operation of the DP options.

The air quality baseline situation can be best described through reference to information produced by the local authorities in the Yorkshire Water WRZs that have declared Air Quality Management Areas (AQMA). A local authority declares an AQMA when UK National air quality objectives are unlikely to be met. The majority of the AQMAs in the UK have been declared because of emissions from road transport. Reference to AQMAs will be made when considering any adverse on air quality of the DP options.

⁷⁴ UKCP18: UK Climate Projections. Accessed at <https://www.metoffice.gov.uk/research/approach/collaboration/ukcp/index>

⁷⁵ Defra (2016) The UK Climate Change Risk Assessment 2017 Evidence Report

Climate

Climate monitoring and risk assessments have improved significantly over the last two decades but there are still limits to the understanding of future climate change impacts. Whatever happens to future 'greenhouse gas' emissions, there is already a certain amount of global warming "locked in" due to historic emissions due to the inertia and lags in the global climate system. Mitigation through reduction in greenhouse gas emissions will contribute to risk reduction over the long term (100 years). Adaptation is however needing to start now in order to reduce the costs and damages of potential impacts and to take advantage of opportunities that result from a changing climate.

The predominant greenhouse gas of interest is carbon dioxide (CO₂). National and regional CO₂ emissions estimates and how they are apportioned to their source categories are provided in [Table C13](#).

Table C13 UK CO₂ emissions (2017)

Region	Total emissions (million tonnes CO ₂)	Per capita emissions (tonnes CO ₂ per capita)	Percentage Contribution by Source Sector		
			Industry & Commercial	Domestic	Transport
Yorkshire & The Humber	35.8	6.6	46.2%	23.6%	30.2%
North East	15.3	5.8	47.2%	25.1%	27.7%
UK	351.5	5.3	37.5%	27.0%	35.5%

Source: Department for Business, Energy & Industrial Strategy, BEIS (2019)

There has been a 32% decrease in total emissions between 2005-2017 in the Yorkshire and the Humber region compared with the UK average of 33% decrease⁷⁶.

Future climate change will influence processes within the hydrological cycle such as runoff and evapotranspiration. The potential impact of climate change on Yorkshire Water's water resources in the future is summarised in [Table C14](#).

Table C14 Impact of Climate Change on Water Resources

Sector		Impact
Water Resources	(i) water supply	<ul style="list-style-type: none"> Reduction in water source yields, either in total or at certain times of the year. Increased evaporation losses from surface water stores. Increased sediment and pollution runoff into watercourses caused by changes in farm management practices adopted to adapt to climate change. Increased risk of algal blooms and pollution in reservoirs.
	(ii) water demand	<ul style="list-style-type: none"> Increase in demand in summer months leading to increase in average and peak requirements. Increased pressure on treatment and distribution system.
Flood management		<ul style="list-style-type: none"> Increased riverine flood risk and storm occurrence due to increased rainfall, leading to increased risk of flooding to water resource assets and adverse temporary effects on raw water quality
Water quality management		<ul style="list-style-type: none"> Lowered water quality in lowland rivers, with implications for in-stream ecosystems and water abstractions. Altered potential for polluting incidents

⁷⁶ UK local authority and regional carbon dioxide emissions national statistics: 2005 to 2017, Department for Business, Energy & Industrial Strategy (2019)

Sector	Impact
Navigation	<ul style="list-style-type: none"> Lower summer flows leading to reduced navigation opportunities in rivers and canals.
Aquatic ecosystems	<ul style="list-style-type: none"> Altered habitat potential, with species at their environmental margins most affected.
Water-based recreation	<ul style="list-style-type: none"> Impacts through changes in river flows and water quality.

Adaption to Climate Change

The UK Climate Change Risk Assessment (CCRA) 2017 Evidence Report⁷⁷ draws together and interprets the evidence gathered by CCRA regarding current and future threats and opportunities for the UK posed by the impacts of climate change up until 2100. Overall, the findings of the CCRA indicate that the greatest need for early adaptation action (i.e. within the next 5 years) is in the following areas:

- Flood and coastal erosion risk management
- Specific aspects of natural ecosystems, including managing productivity and biodiversity (the management of forest pests and diseases, low summer river flows and the movement of plants and animal species are all highlighted as high priorities for action)
- Managing water resources, particularly in areas with increasing water scarcity
- Overheating of buildings and infrastructure in the urban environment
- Health risks associated with heatwaves and other risks that may affect the NHS
- Opportunities for the UK economy, particularly to develop climate adaptation products and services.

1.6.2 Future Baseline

Government and international targets indicate significant cuts in greenhouse gas emissions will take place by 2027. The UK met the first and second of its legislated carbon budgets (2008-2017) with headroom of 36 and 384 MtCO₂e, respectively and is projected to meet the third carbon budget (until 2022) with headroom of 88 MtCO₂e⁷⁸. However, there are projected shortfalls against the fourth and fifth carbon budgets. In 2019, the UK set a new target to reduce greenhouse gas emissions by at least 100% (compared to 1990 levels) by 2050⁷⁹, an update from the previous target of an 80% reduction as set out in the Climate Change Act 2008. To achieve this ambition, emissions from buildings must reduce to almost zero and industrial processes will need to adapt, both significant to YWSL's operations.

The UK is currently meeting all statutory air quality limits, except for NO₂⁸⁰, where roadside NO₂ concentrations in particular have been identified as being above legal limits. In response, the government has created an air quality plan for NO₂⁸¹, setting out how it aims to meet the ambitious and legally-binding targets set out for NO_x and four other damaging air pollutants in the wider clean air strategy⁸². This strategy concludes that with the commitments and policies set out in the clean air strategy, the UK should meet all emissions ceilings in 2020 and 2030.

⁷⁷ Defra (2016) The UK Climate Change Risk Assessment 2017 Evidence Report

⁷⁸ Department for Business, Energy & Industrial Strategy (2019) Updated energy and emissions projections 2018. Accessed at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/794590/updated-energy-and-emissions-projections-2018.pdf

⁷⁹ The Climate Change Act 2008 (2050 Target Amendment) Order 2019

⁸⁰ Nitrogen Dioxide

⁸¹ Defra and DfT (2017) Air quality plan for nitrogen dioxide (NO₂) in UK (2017)

⁸² Defra (2019) Clean Air Strategy 2019

Climate change is a key theme with regards to biodiversity⁸³, climate change is likely to have an impact on biodiversity in the future by exacerbating pressures such as changes to the timing of seasonal activity and water scarcity. The CCRA considered more than 700 risks and selected 100 risks for detailed review. A selection of threats and opportunities identified under the 'medium scenario' are summarised in **Appendix C Figure 1.3**.

As well as reducing the carbon footprint, Yorkshire Water are investing in flood resilience measures such as building flood protection walls around treatment works and raising control panels for electrical equipment above flood levels. They are working in partnership with the government to make sure that critical national infrastructure is able to cope with future weather events. This includes working with local authorities, emergency services and others to test and improve joint emergency response plans.

Together with leading academics and experts, Yorkshire Water is also working on research studies and innovative solutions like Sustainable Urban Drainage Systems (SUDs) and real time models of our river networks. These projects will help the company understand and manage the water cycle better so that it can maintain high levels of customer service in a way that is cost effective and which delivers multiple benefits for people, wildlife and the environment.

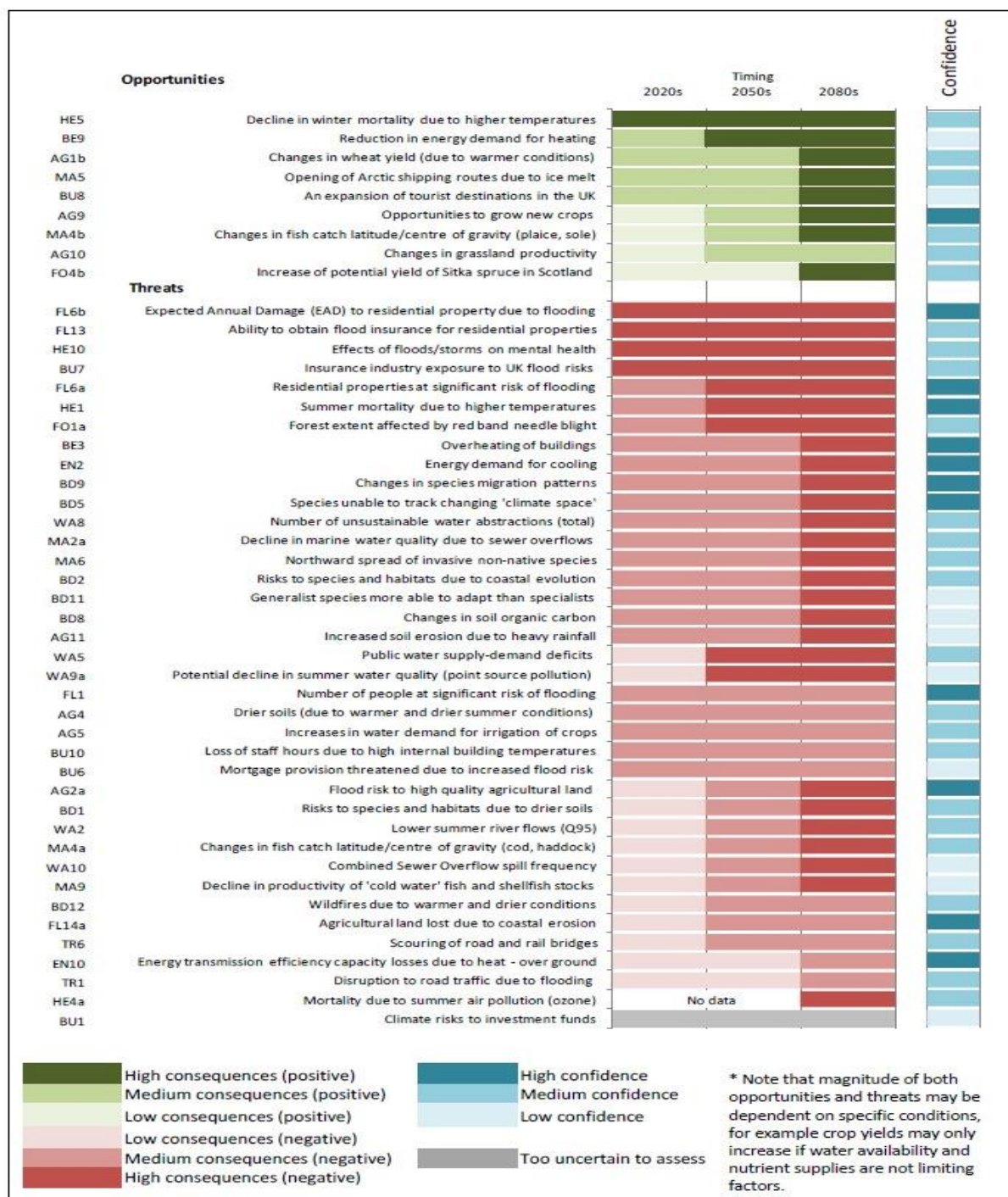
1.6.3 Key Issues

The key sustainability issue arising from the baseline assessment for air and climate is:

- The need to reduce air pollutant and greenhouse emissions and limit air emissions to comply with air quality standards.
- The need to mitigate against climate change through the reduction in greenhouse gas emissions in order to contribute to risk reduction over the long term.
- The need to adapt to the impacts of climate change for example through, sustainable water resource management, water use efficiencies, specific aspects of natural ecosystems (e.g. connectivity) as well as accommodating potential opportunities of climate change.

⁸³ Natural Environment White Paper The Natural Choice: Securing the Value of Nature (2011); DEFRA Biodiversity 2020: A strategy of wildlife and ecosystem services (2011).

Figure 1.3 Summary of natural environment impacts with an indication of direction, magnitude and confidence (CCRA, 2012)



1.7 Archaeology and Cultural Heritage

1.7.1 Baseline

The Yorkshire Water supply area and Tyne-Tees corridor includes three internationally recognised World Heritage Sites⁸⁴: Saltaire; Sudley Royal Park including the ruins of Fountains Abbey; the Frontiers of the Roman Empire (Hadrian's Wall).

There are approximately 2,934 Scheduled Monuments (SMs) located within Yorkshire Water supply area and 178 within 5km of impacted reaches of the Tyne-Tees corridor.

The key sustainability issues arising from the baseline assessment for archaeology and cultural heritage are presented below.

Options in the DP could affect historic landscape character and historic structures associated with the water environment, or the historical context of their setting. Archaeological remains are also sensitive to changes in water quality, water levels (for example waterlogged deposits), pollution and land use practices.

Registered Parks and Gardens also make up part of the UK's cultural heritage of national importance. There are approximately 131 sites designated as such in the WRZs. Nationally important archaeological sites are statutorily protected as designated heritage assets. **Table C15** shows the designated heritage asset count nationally, regionally and within the Yorkshire Water supply area (and the Tees Swale Transfer area).

Table C15 Designated Heritage Assets

Asset	England	Yorkshire and The Humber	North East	Yorkshire Water Supply Area	Tees-Swale Transfer (within 5km of impacted reaches)
World Heritage Site	19	2	2	2	1
Scheduled Monuments	19,861	2,640	1,400	2,934	178
Listed Buildings	378,526	31,503	12,404	unknown	Unknown
Registered Historic Parks & Gardens	1,669	126	55	30,809	3,301
Registered Historic Battlefields	47	7	6	131	11
Protected Wrecks	53	2	1	7	0

Source: Historic England: Heritage Indicators 2019 (*designated assets were identified from GIS datasets available from Historic England at <https://services.historicengland.org.uk/NMRDataDownload/SecurePages/Download.aspx>)

Historic England has been collecting data on buildings at risk for more than a decade. The National Heritage at Risk Register systematically checks the condition of problem buildings, initially focused on buildings at risk, but now adapted to serve other types of heritage asset. The number of Grade I and II* buildings at risk fell by 17% between 1999 and 2007. However, there has been a significant slow-down in the annual rate of decrease since then⁸⁵. In the North East and Yorkshire area, 69.4% of buildings or structures on the baseline 1999 Register have been removed due to their futures being

⁸⁴ World Heritage Sites are places of international importance for the conservation of mankind's cultural and natural heritage. The World Heritage List was set up by the World Heritage Convention, established by UNESCO in 1972. www.english-heritage.org.uk

⁸⁵ English Heritage, now known as Historic England (2011) Heritage at Risk Registers (Yorkshire and the Humber; North East).

secured, this is comparable with the national figure of 65.3%. For other types of heritage assets, the long-term trends are not yet firmly established but there has been notable reductions between 2009 and 2019 including 60.3% of archaeological entries (scheduled monuments) on the North East and Yorkshire register have been removed for positive reasons, this is above the national figure of 50.2%⁸⁶. Overall there are 555 historic sites at risk across the Yorkshire and The Humber region and, in 2019, 13 new sites were added to the list whilst 52 sites were saved and removed from the list⁸⁷.

Nationally, 1.71% of Scheduled Monuments are at risk of from water abstraction or dewatering. However, other assets such as those composed of organic material and preserved in waterlogged or anaerobic conditions are proportionately more at risk (e.g. palaeo- environmental deposits).

There are a number of floodplains within the Yorkshire Water supply area which are either known or suspected to be of high importance for waterlogged archaeology. Such evidence includes both material (wooden artefacts and structures such as trackways) and evidence of past environmental change from the deposits themselves.

The waterlogged conditions that preserve these remains may be rain-fed or groundwater fed. If the latter, then clearly abstraction levels can be a critical factor in maintaining conditions in which preservation of the remains is viable. In addition, there are waterlogged deposits that are specifically associated with chalk, such as springs and their intimately associated wetlands which again can contain important archaeological information, especially palaeo-environmental evidence.

1.7.2 Future Baseline

The NPPF was introduced in 2012 to replace the Planning Policy Statements. The NPPF aimed to make the planning system less complex and more accessible, and changed the emphasis on planning to have a presumption in favour of development. However, core planning principles include those aiming to protect heritage assets, including “*conserve heritage assets in a manner appropriate to their significance, so that they can be enjoyed for their contribution to the quality of life of this and future generations*”⁸⁸. The NPPF was revised in 2019 but the policy on historic environment was broadly unchanged.

Recent and ongoing national economic difficulties may have a negative effect on removing heritage assets from the heritage at risk register. Climate change could have variable impacts on heritage assets in the future. Some types of assets and landscapes have already experienced and survived significant climatic changes in the past and may demonstrate considerable resilience in the face of future climate change. However, many more historic assets are potentially at risk from the direct impacts of future climate change⁸⁹.

1.7.3 Key Issues

The key sustainability issue arising from the baseline assessment for archaeology and cultural heritage is:

- The need to conserve or enhance sites of archaeological importance and cultural heritage interest, particularly those which are sensitive to the water environment.

1.8 Landscape and Visual Amenity

1.8.1 Baseline

The landscape character network⁹⁰ defines landscape character as 'a distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another, rather than better or worse'. Some landscapes are special because they have a particular amenity value,

⁸⁶ Historic England (2019): Heritage at Risk (North East & Yorkshire)

⁸⁷ <https://historicengland.org.uk/whats-new/in-your-area/yorkshire/heritage-at-risk-2019/>

⁸⁸ MHCLG (2019) National Planning Policy Framework

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

⁹⁰ www.landscapecharacter.org.uk, accessed 22nd July 2016

such as those designated as Areas of Outstanding Natural Beauty (AONB). Others may have an intrinsic value as good examples or be the only remaining examples of a particular landscape type. Some landscapes are more sensitive to development whereas others have a greater capacity to accommodate development. Assessments of landscape character and landscape sensitivity enable decisions to be made about the most suitable location of development to minimise impacts on landscapes.

Nationally Designated Sites

There are three National Parks (**Appendix C Figure 1.4**) in the Yorkshire Water area which are protected by national legislation and water companies also have a statutory duty to have regard to the protection and conservation of national parks in carrying out their functions as a water undertaker. National Character Areas (**Appendix C Figure 1.4**) have also been considered. There are 27 within the Yorkshire and Humber Region and include the North Pennines, Yorkshire Dales, Southern Pennines and Holderness. There are also four national trails in the area including the Pennine Way, Wolds Way, Cleveland Way and Pennine Bridleway.

AONBs are areas of land designated for conservation due its significant landscape value. They are designated by Natural England through the Countryside and Rights of Way Act, 2000. The primary purpose of the AONB is 'to conserve and enhance the natural beauty of the landscape'. As outlined in **Table C16**, there are three AONB within the Yorkshire Water supply area (Howardian Hills, Nidderdale and Forest of Bowland) and a further AONB within a 5km corridor of the Tees Swale Transfer option (The North Pennines AONB). The North Pennines AONB has been awarded the UNESCO-backed status of 'European Geopark' (the first in Britain) in recognition of the area's world class earth heritage and the efforts being made to conserve and interpret it. Each of these AONBs has a Management Plan describing the special qualities of the area which contribute to the national significance of the landscape, identifies major trends and opportunities in the area and presents a 5-year programme of actions from 2019-2024. Natural England Natural Areas also take account of landscape value and amenity.

Figure 1.4 Landscape Character Designations in the Yorkshire Water Supply Area

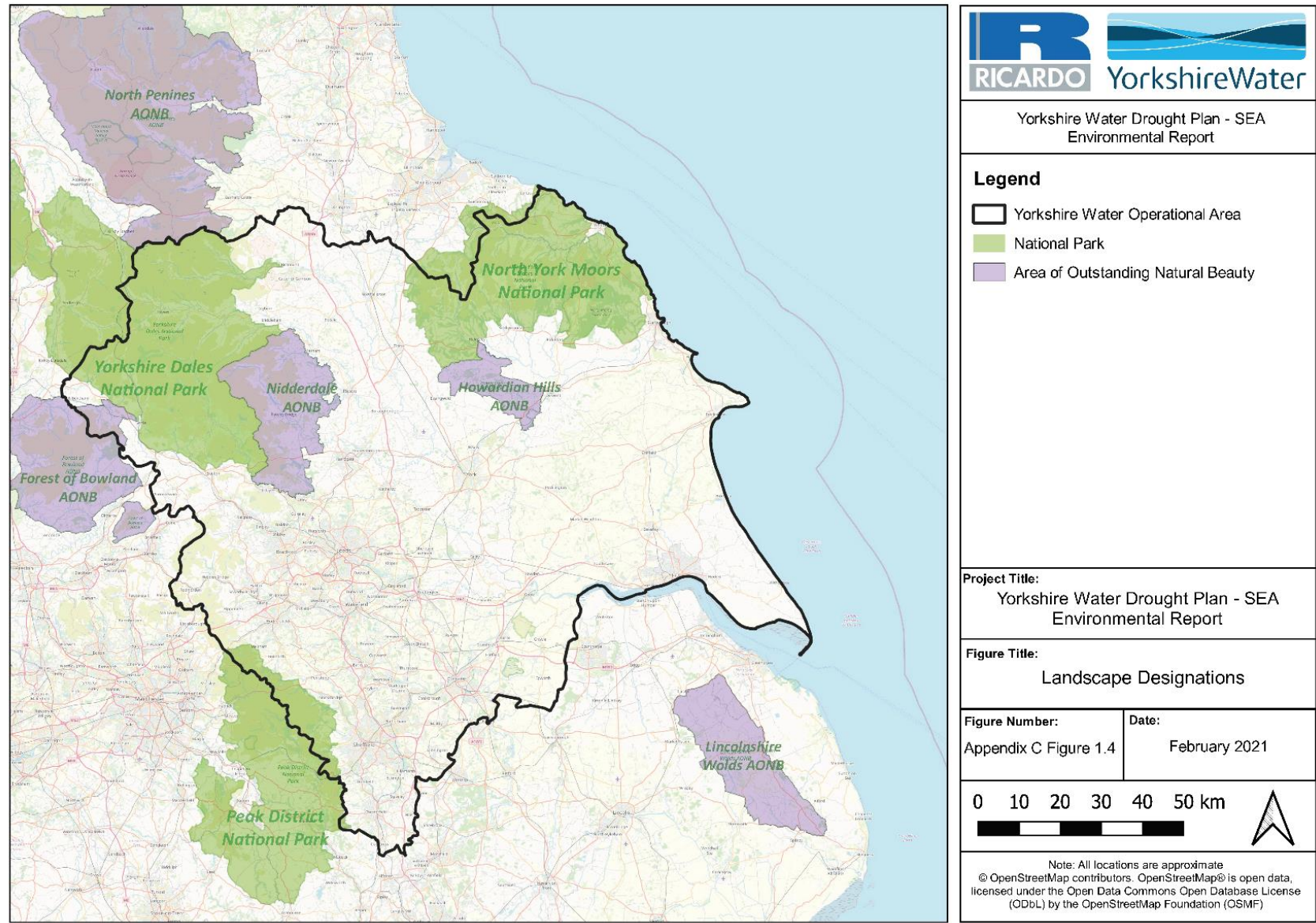


Table C16 AONBs within the Yorkshire Water Supply Area

Name of site	Water Resource Zone	Key Characteristics
Howardian Hills	Grid SW; East GW	<p>Jurassic limestone creating distinctive character.</p> <p>In effect, the irregular 180m ridges of the Howardian Hills are a southern extension of the rocks of the North York Moors.</p> <p>Notably famous for a number of fine country houses, whose parklands are an intrinsic part of the landscape value</p>
Nidderdale	Grid SW.	<p>Includes the wooded dales of the Washburn, Laver, Burn and dale of Nidd itself.</p> <p>Landscape is dominated by its millstone grit geology.</p> <p>Glaciation and differential resistance to weathering of the sand, shale and gritstones produce distinctive features</p>
The North Pennines	Tees-Swale DP option.	<p>Landscape contains many habitats of exceptional conservation value, including blanket bog, upland heath, species-rich hay meadows, oak and ash woodlands, juniper scrub, flushes and springs and unimproved and heavy- metal rich grasslands. It contains flowering plants on the calcareous grasslands of Teesdale which are unique in the UK.</p> <p>Internationally important numbers of birds, including 10,000 pairs of breeding waders and 80% of England's black grouse, breed and feed on the open moors and adjacent grasslands.</p> <p>The AONB includes parts of the Pennine Dales Environmentally Sensitive Area</p>
Forest of Bowland	Grid SW	<p>Internationally important landscape of heather moorland and blanket bog; Area host to rare bird species and important grouse/sheep populations; Majority of land is privately owned and used for agricultural purposes</p>

The DP has the potential to influence the landscape and visual amenity through the change in water levels of rivers and reservoirs (either positively or negatively).

1.8.2 Future Baseline

It is envisaged that landscape and designated sites will be maintained and enhanced for the enjoyment of the public.

The NPPF highlights the different roles and character of different areas, promoting the vitality of our main urban areas, protecting the Green Belts around them, recognising the intrinsic character and beauty of the countryside and supporting thriving rural communities within it. The NPPF states that great weight should be given to conserving landscape and scenic beauty in National Parks and AONBs, which have the highest status of protection. It identifies that planning permission should be refused for major developments in these designated areas except in exceptional circumstances and where it can be demonstrated they are in the public interest.

1.8.3 Key Issues

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

- The need to protect and improve the natural beauty of the region's National Parks, AONBs, and other areas of natural beauty.

1.9 Inter-relationships

It is noted that there are inter-relationships between SEA topics, for example, the potential impacts of changes to flow regime and water quality on ecology. Inter-relationships that result in changes to individual effect are considered through the assessment of synergistic effects.

1.9.1 Key Issues

The key sustainability issue arising is:

- The need to consider the inter-relationships between topics.

1.10 Summary of Key Issues

A summary of the key issues identified by the policies, plans and programmes review (Section 2.2) and the baseline data review (Section 2.3) is presented in the Main Report. These key issues have been used to develop draft SEA objectives in Section 3.

Appendix D: Assessment Matrices

[See *separate file*]



T: +44 (0) 1235 753000

E: enquiry@ricardo.com

W: ee.ricardo.com