KEADBY
NEXT GENERATION
POWER STATION
Hydrogen-enabled flexible power

A collaboration between SSE Thermal and Equinor

The Keadby Next Generation Power Station Project

Document Ref: 6.3

Planning Inspectorate Ref: EN0110001

The Keadby Next Generation Power Station Development Consent Order [YEAR]

Environmental Statement (ES)

Volume II – Appendix 18B In-Combination Climate Change Impact Assessment

The Planning Act 2008

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

Applicant: Keadby Next Generation Limited

Date: August 2025

Version: V0

ARUP DWD AECOM

Document History

Document Ref	6.3.26 / Appendix 18B
Issue	V0
Document Owner	AECOM

Glossary

Abbreviation/	Description
ALARP	As Low as Reasonably Practicable
BAT	Best Available Techniques
CEMP	Construction Environmental Management Plan
CCRA	Climate Change Risk Assessment
COMAH	Control of Major Accident Hazards
DCO	Development Consent Order
DEMP	Decommissioning Environmental Management Plan
DESNZ	Department for Energy Security and Net Zero
EIA	Environmental Impact Assessment
ES	Environmental Statement
ICCI	In-Combination Climate Change
IEMA	Institute of Environmental Management and Assessment
IPCC	Intergovernmental Panel on Climate Change
NPS	National Policy Statement
NPPF	National Planning Policy Framework
NSIP	Nationally Significant Infrastructure Project
RCP	Representative Concentration Pathways
UKCP	United Kingdom Climate Projections
UK Met Office	United Kingdom Meteorological Office

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18B. Introduction

18B.1. Overview

18B.1.1 This appendix presents the results of the In-combination Climate Change Risk Assessment (ICCA) for the construction, operation and maintenance, and decommissioning phases of the Proposed Development in the form of a ICCI table. It should be read in conjunction with **ES Volume I Chapter 18:** Climate Change (**Application Document Ref. 6.2**).

18B.1.2 The time-period for the initial risk rating of each phase of the Proposed Development reflects the period of the obtained climate change projection data (e.g. projections for 2020-2049 cover the estimated construction phase of 2026-2030).

18B.2. Legislation, Policy and Guidance

Legislation

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017

18B.2.1 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017: Section 5(2) and Schedule 4, paragraphs 4 and 5 sets out that an EIA should describe and assess (in an appropriate manner and in light of each individual case) the direct and indirect significant effects of the Proposed Development on the climate.

Policy

National Planning Statements

18B.2.2 National Planning Statements (NPSs) set out the UK government's key objectives, policies and considerations to inform planning decisions. Use of the NPSs for decision making ensures that development of major infrastructure projects aligns with national priorities relating to sustainability, economic growth, and environmental protection, including

the government position on the mitigation of, and adaptation to, climate change.

Overarching National Planning Statement for Energy (NPS EN-1) (DESNZ, 2023)

18B.2.3 The Overarching NPS EN-1 is of particular relevance to the Proposed Development. Specifically, it contains the following:

- Paragraphs 4.6.13 and 4.10.9 in relation to climate impacts and adaptation;
- Paragraphs 4.1.3 to 4.1.4 in relation to the presumption in favour of granting consent to applications for energy NSIPs; and
- Paragraphs 4.10.3 and 5.8.5 in relation to climate projections, flood risk and the importance of relevant mitigation.

National Policy Statement for Electricity Networks Infrastructure (NPS EN-5) (November 2023) (DESNZ, 2023d)

18B.2.4 The NPS EN-5 is of relevance to the Proposed Development. Particularly in reference to the following:

- Section 2.3 regarding NPS EN-1 (November 2023) and the importance of climate change adaptation and resilience.

The National Planning Policy Framework (Ministry of Housing, Communities and Local Government, 2023)

18B.2.5 The revised National Planning Policy Framework sets out the government's planning policies for England. While the NPPF does not set specific policies for Nationally Significant Infrastructure Projects (NSIPs), its policies may be of relevance to decision making.

18B.2.6 Those policies of relevance to the climate change assessment include those achieving sustainable development and meeting the challenge of moving to a low carbon economy, climate change, flooding and coastal change. The NPPF states that the planning system should support this transition by supporting low carbon energy and associated infrastructure.

18B.2.7 The sections of the framework particularly relevant to the Proposed Development are: Paragraphs 161 to 169 in relation to climate projections, associated flood risk and adaptation.

National Planning Policy Guidance on Climate Change

18B.2.8 Guidance published by the Ministry of Housing, Communities and Local Government (2019b) describes how to identify suitable mitigation and climate adaptation measures to incorporate into the planning process, stating that "*Effective spatial planning is an important part of a successful response to climate change as it can influence the emission of greenhouse gases… Planning can also help increase resilience to climate change impact through the location, mix and design of development.*"

Guidance

EC Non-paper Guidelines for Project Managers: Making Vulnerable Investments Climate Resilient

18B.2.9 These guidelines aim to help developers of physical assets and infrastructure incorporate resilience to current climate variability and future climate change within their projects (EU Commission, 2011). Although the UK is no longer a Member State of the EU, this guidance is still considered relevant in the context of EIAs undertaken in respect of developments in the UK.

IEMA: Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation.

18B.2.10 The IEMA Guidance for assessing climate change resilience and adaptation in EIA (2020) has also been followed. It provides guidance for consideration of the impacts of climate change within project design. The guidance sets out how to:

- define climate change concerns and environmental receptors vulnerable to climate factors;
- define the environmental baseline with changing future climate parameters; and
- determine the resilience of project design and define appropriate mitigation measures to increase resilience to climate change.

18B.2.11 This guidance is used within the ICCI methodology, as described in Section 18B.3.

18B.3. Methodology

Overview

18B.3.1 This section sets out the scope and methodology for the preliminary assessment of the In-combination climate change impacts on the Proposed Development.

Study Area

18B.3.2 The Study Area for the ICCI assessment has been defined taking into account the environmental assessments undertaken by each of the other environmental disciplines, as presented in this Environmental Statement (ES). This includes all the identified environmental receptors identified within the assessments undertaken and reported within the ES. The sensitive receptors for the ICCI assessment are those identified by each discipline in their assessment. The Study Area for the ICCI assessment is therefore as identified by each discipline for their individual assessments.

Sources of information

18B.3.3 Historical climate data obtained from the Met Office website (UK Met Office, 2024a) has been used to determine the current baseline conditions for the Doncaster region.

18B.3.4 In line with paragraphs 4.10.13 and 4.10.17 of updated NPS EN-1 (which came into force in January 2024) which require use of the latest credible scientific evidence in relation to climate change, the UK Climate Projections 2018 (UKCP18) (UK Met Office, 2024b), data was obtained to determine the future baseline conditions.

18B.3.5 The IPCC AR6 Sea Level Projection Tool (IPCC, 2021) and Thinkhazard (UN, 2023) were also used for other projected trends/impacts (per the direction in Paragraph 4.10.17 of NPS EN-1 (November 2023)) for the current state of nationwide climate change risks (DESNZ, 2023).

Methodology

In-combination Climate Change Impact Assessment

18B.3.6 The ICCI assessment considers the ways in which projected climate change will influence the significance of the impact of the Proposed

Development on receptors in the surrounding environment (as defined by other environmental disciplines within this ES).

18B.3.7 The ICCI assessment considers the existing and projected future climate conditions for the geographical location and assessment timeframe. It identifies the extent to which identified receptors in the surrounding environment are potentially vulnerable to and affected by these factors. The receptors for the ICCI assessment are those that will be impacted by the Proposed Development. These impacts have been assessed in liaison with the technical specialists responsible for preparing the applicable technical chapters of this ES, listed below:

- Chapter 8: Air Quality;
- Chapter 9: Noise and Vibration;
- Chapter 10: Traffic and Transport;
- Chapter 11: Biodiversity, Ecology and Nature Conservation;
- Chapter 12: Water Environment and Flood Risk;
- Chapter 13: Geology, Hydrology and Land Contamination;
- Chapter 14: Landscape and Visual Amenity;
- Chapter 15: Cultural Heritage;
- Chapter 16: Socio-Economics;
- Chapter 17: Population and Human Health;
- Chapter 19: Major Accidents or Disasters;
- Chapter 20: Materials and Waste;
- Chapter 21: Cumulative Effects.

18B.3.8 Following identification of potential ICCIs in relation to the Proposed Development, the likelihood of their occurrence during construction, operation and decommissioning phases have been categorised. This is the same process as is undertaken for the CCRA, as detailed in **ES Volume II Appendix 18A**: Climate Change Risk Assessment (**Application Document Ref. 6.3**).

18B.3.9 Through consideration of the likelihood of the climate impact occurring, and the sensitivity of the receptor, the likelihood of an impact occurring to

the receptor has been defined. This includes consideration of any embedded mitigation measures and good practice.

18B.3.10 Once the likelihood of an ICCI has been identified, the assessment then considered how this will affect the significance of effect on the identified receptor.

18B.3.11 The ICCI consequence criteria are defined in **Table 18B.1** and are based on the change to the significance of the impact already identified by the environmental discipline. To assess the consequence of an ICCI each discipline will assign a level of consequence to an impact based on the criteria description and their discipline assessment methodology.

Table 18B.1: Consequence criteria for ICCI assessment

Consequence	Consequence criteria
High	The climate change parameter in-combination with the effect of the Proposed Development causes the significance of the impact of the Proposed Development on the resource/receptor, as defined by the topic, to increase from negligible, low, or moderate to major.
Moderate	The climate change parameter in-combination with the effect of the Proposed Development causes the effect defined by the topic to increase from negligible or low, to moderate.
Low	The climate change parameter in-combination with the effect of the Proposed Development, causes the significance of effect defined by the topic, to increase from negligible to low.
Negligible	The climate change parameter in-combination with the effect of the Proposed Development does not alter the significance of the effect defined by the topic.

Significance Criteria

18B.3.12 The significance of potential effects has been determined using the matrix in **Table 18B.2**. If significant ICCI effects are assessed, then appropriate additional mitigation measures (secondary mitigation) have been identified.

Table 18B.2: ICCI significance criteria

	Likelihood of climate-related impact occurring

		Negligible	Low	Moderate	High
Level of consequence	Negligible	NS	NS	NS	NS
	Low	NS	NS	NS	S
	Moderate	NS	NS	S	S
	High	NS	S	S	S

Note: S = significant; and NS = not significant

Scope

18B.3.13 The scope of the ICCI assessment includes climatic variables that have the potential to increase the impact to surrounding receptors. The ICCI assessment considers the existing and projected future climate conditions for the geographical location and assessment timeframe. It identifies the extent to which identified receptors in the surrounding environment are potentially vulnerable to and affected by these factors. The receptors for the ICCI assessment are those that will be impacted by the Proposed Development. These impacts have been assessed in liaison with the technical specialists responsible for preparing other technical chapters of this ES.

18B.3.14 The scope of the ICCI assessment is detailed within **Table 18B.3**.

Table 18B.3: Scope of the ICCI Assessment

Climate Variable	Scoped In/Out	Rationale
Extreme weather event	In	An increase in the likelihood and severity of extreme weather events could lead to damage to ecosystem stability. In combination with sea level rise, the likelihood and severity of acute coastal impacts such as erosion, loss of habitats, destabilisation and damage to infrastructure. These impacts may be exacerbated by the Proposed Development. The primary topic of interest for this potential climate variable is Water Environment and Flood Risk. ICCI impacts associated with extreme weather events and flood risk is considered within **ES Volume II Appendix 12A:** Flood Risk Assessment (**Application Document Ref. 6.3**). A

Climate Variable	Scoped In/Out	Rationale
		summary of key conclusions are presented in the ES.
Precipitation change leading to flash flooding	In	Climate change may lead to an increase in substantial precipitation that may cause flooding and erosion. The combination of the Proposed Development and climate change may cause increased risk of impacts. The primary topic of interest for this potential climate variable is Water Environment and Flood Risk. ICCI impacts associated with extreme weather events and flood risk are considered within **ES Volume II Appendix 12A:** Flood Risk Assessment (**Application Document Ref. 6.3**). A summary of key conclusions are presented in the ES.
Precipitation change leading to droughts	In	Climate change may lead to drought events. The combination of the Proposed Development, its water requirements and climate change may cause increased risk of water scarcity impacts.
Temperature change	In	Fluctuating levels of temperature may lead to: • Increase in likelihood and severity of heat waves which might have a negative impact on biodiversity and health; and • Increase in likelihood and severity of freezes which might have a negative impact on biodiversity and health.
Sea level rise	In	The Proposed Development Site is located in an area that is susceptible to sea level rise. The primary topic of interest for this potential climate variable is Water Environment and Flood Risk. ICCI impacts associated with sea level rise are considered within **ES Volume II Appendix 12A:** Flood Risk Assessment (**Application Document Ref. 6.3**). A summary of key conclusions are presented in the ES.
Wind	Out	The Proposed Development is not expected to alter the wind environment and therefore not to have any

Climate Variable	Scoped In/Out	Rationale
		additional impact upon receptors identified by other environmental disciplines. According to the Met Office (Met Office, 2024), the State of the UK Climate 2023 report (M. Kendon et al, 2024) "*states that there are no compelling trends in storminess when considering maximum gust speeds over the last four decades*".

Assessment Assumptions and Limitations

18B.3.15 While modelled climate change projections represent anticipated changes to average weather conditions, they cannot predict the frequency and severity of acute events such as droughts, heatwaves and prolonged heavy rainfall. Therefore, the ICCI assessment is based upon UKCP18 predictions for general changes in climate conditions, and a high-level assessment of acute events has also been included in this assessment.

18B.4. Baseline Conditions

Current Baseline

18B.4.1 The baseline for the ICCI assessment is the climate in the location of the Proposed Development for the 30-year historical period of 1981 to 2010 (the standard baseline for the UKCP18 climate change projection data). Historical climate data recorded by the closest meteorological station to the Proposed Development (Finningley, approximately 16 miles south of the Proposed Development) for the 30-year period of 1981 to 2010 was obtained from the Met Office website (UK Met Office, 2024a) and is summarised in **Table 18B.4** below.

Future Baseline

18B.4.2 The future baseline is expected to differ from the present-day baseline described above. UKCP18 (UK Met Office, 2024b) provides probabilistic Climate change projections for pre-defined 30-year periods for annual, seasonal and monthly changes to mean climatic conditions over land areas. For the purpose of the assessments, UKCP18 probabilistic projections for pre-defined 30-year periods for the following average climate variables have been obtained:

- Mean annual temperature;

- Mean summer temperature;
- Mean winter temperature;
- Mean maximum summer temperature;
- Mean minimum winter temperature
- Mean annual precipitation;
- Mean summer precipitation;
- Mean winter precipitation;
- Sea level rise; and
- Extreme weather events e.g. heat waves, storm surges etc.

18B.4.3 Projected temperature and precipitation variables presented in UKCP18 probabilistic projections have been analysed for the 25 km^2 grid square within which the Proposed Development is located. These figures are expressed as temperature/precipitation anomalies in relation to the 1981 to 2010 baseline.

18B.4.4 UKCP18 uses a wide range of possible scenarios, classified as Representative Concentration Pathways (RCPs), to model potential future emission trends and their impact on the climate. These RCPs *"[…] specify the concentrations of greenhouse gases that will result in total radiative forcing increasing by a target amount by 2100, relative to preindustrial levels.*" For the purposes of this assessment, RCP8.5 has been used as a worst-case scenario, as it predicts a high-emissions or 'business-as-usual' future. It is important to note that this scenario is used to represent broader global emission trends and their potential impact on the future climate, rather than to compare directly with the emissions from the Proposed Development.

18B.4.5 As the operational design life of the Proposed Development is 25 years, the CCRA has considered a scenario that reflects a high level of GHG emissions at the 10%, 50%, and 90% probability levels up to 2079[1] to assess the impact of climate change over the assessed design life of the Proposed Development.

18B.4.6 Climate variables impacting the construction, operation and maintenance, phases of the Proposed Development have been assessed in **Table 18B.4** below against RCP8.5 2020-2049 and 2050-2079 projection data.

[1] 2079 is beyond the lifetime of the Proposed development. However, the two time periods selected for the assessment are the next two 30-year periods available. This represents a worst-case approach as climate impacts are expected to increase further into the future.

Table 18B.4: Climate Change Baseline and Projection Data

Climate Variable	Baseline (1981-2020)	Climate change projection RCP8.5 (2020-2049)	Climate change projection RCP8.5 (2050-2079)	Projected Trend	Climate Projection Source
Temperature					
Mean annual maximum temperature (°C)	14.1°C	+1.1 (+0.5 to +1.8)	+2.5 (+1.3 to +3.7)	↑	UKCP18 RCP8.5
Mean summer maximum daily temperature (°C)	21.0°C	+1.4 (+0.2 to +2.4)	+3.1 (+1.2 to +5.1)	↑	UKCP18 RCP8.5
Mean winter minimum daily temperature (°C)	3.3°C	+0.9 (+0.1 to +1.9)	+2.1 (+0.6 to +3.8)	↑	UKCP18 RCP8.5
Mean maximum daily temperature in warmest month (°C)	21.9°C (July)	-	-		UKCP18 RCP8.5
Mean minimum daily temperature in coldest month (°C)	1.0°C (February)	-	-		UKCP18 RCP8.5
Rainfall					

Climate Variable	Baseline (1981-2020)	Climate change projection RCP8.5 (2020-2049)	Climate change projection RCP8.5 (2050-2079)	Projected Trend	Climate Projection Source
Mean annual rainfall (mm)	574.45 mm	+0.8% (-4.9 % to +6.4%)	-1.0% (-7.9% to +5.7%)	↓	UKCP18 RCP8.5
Mean summer rainfall (mm)	54.96 mm	-10.0% (-30.3% to +11.7%)	-17.9% (-41.5% to +7.1%)	↓	UKCP18 RCP8.5
Mean winter rainfall (mm)	41.81 mm	+3.4% (-3.5% to +11.5%)	+9.1% (-2.3% to 22.6%)	↑	UKCP18 RCP8.5
Wettest month on average (mm)	June: 63.0 mm	-	-		UKCP18 RCP8.5
Driest month on average (mm)	February: 32.2 mm	-	-		UKCP18 RCP8.5
Other					
Sea Level rise (m)		0.12	0.34	↑	IPCC AR6 Sea Level Projection Tool SSP8.5

Climate Variable	Baseline (1981-2020)	Climate change projection RCP8.5 (2020-2049)	Climate change projection RCP8.5 (2050-2079)	Projected Trend	Climate Projection Source
Storm surges		The UKCP18 model suggest a small contribution from storm surges, however it is unclear if the frequency and severity of future storm surges is going to change.			UKCP18 RCP8.5
Heatwaves		Under a high emissions scenario, it is estimated that by the end of the 21st Century, all areas of the UK are projected to be warmer with hotter, drier summers and heatwaves likely to become more common and intense.		↑	UKCP18 RCP8.5
Wildfires		Think Hazard has classified the wildfire hazard in South Yorkshire as medium, according to currently available information. This means that there is between a 10% and 50% chance of experiencing weather that could support a hazardous wildfire that may pose risk to life and property loss in any given year.			Think Hazard
Drought		The Met Office has projected a trend towards drier summers on average, with the trend being stronger under a high GHG emission scenario compared to a low one. However, it			UKCP18 RCP8.5

Climate Variable	Baseline (1981-2020)	Climate change projection RCP8.5 (2020-2049)	Climate change projection RCP8.5 (2050-2079)	Projected Trend	Climate Projection Source
		is the distribution of rainfall throughout the seasons that will determine UK drought risk.			

18B.5. Development Design and Impact Avoidance

18B.5.1 Mitigation measures have been built into the early design stages of the Proposed Development and will be developed further ahead of the ES. Mitigation measures embedded within the Proposed Development include:

- The management of impacts and the application of mitigation/adaptation measures during Proposed Development construction will be enforced through the final Construction Environmental Management Plan which, in accordance with the draft Requirement, must be in general accordance with the Outline Construction Environmental Management Plan (Outline CEMP) (Application Document 7.4), which accompanies the Application. This includes, but is not limited to:
  - Storing topsoil a minimum of 20m from watercourses on flat lying land; and
  - Monitoring weather forecasts and receive Environment Agency flood alerts to allow works to be planned and carried out accordingly to manage extreme weather conditions such as storms and flooding.
- Drainage Strategy (included within Annex 3 of **ES Volume II Appendix 12A:** Flood Risk Assessment (**Application Document 6.3**), including but not limited to:
  - Attenuation of surface water runoff to minimise flood risk at the Proposed Development location; and
  - Flood defence consideration and mitigation measures.

18B.6. Likely Impacts and Effects

18B.6.1 Following discussions with technical specialists responsible for preparing the applicable technical chapters of this ES, potential ICCIs have been identified and assessed, as presented in **Table18B.5, Table 18B.6** and **Table 18B.7** below.

Construction

18B.6.2 Potential ICCIs during construction and their likelihood, consequence and significance are detailed in **Table 18B.5.**

Table 18B.5: Potential ICCIs during Construction

Discipline/ Receptor	Climate Hazard	Likely ICCIs identified	Description of ICCI considering embedded environmental measures/ good practice	Likelihood of ICCI occurring	Consequence	Significance
Population and Human Health	Increase in annual temperature	Increased dust production during construction due to extended dry spells, affecting vulnerable sub-population (including the elderly and those with pre-existing respiratory conditions)	Extended dry spells may cause an increase in dust generation during the construction phase which may increase potential exposure to dusts/contaminants. This may have effect on human health as a result of air quality impacts for the vulnerable sub-populations, particularly the elderly and those with pre-existing health conditions, who may experience more severe effects due to their reduced ability to cope with air pollution. This consequence would be minimised as far as reasonably practicable, through the measures required by CEMP.	Negligible	Negligible	Negligible (not significant)
Air Quality	Increase in annual temperatures and	Increased dust production during construction due to	Increased dust production during construction due to extended dry spells could adversely affect air quality. This would be minimised as	Negligible	Negligible	Negligible (not significant)

Discipline/ Receptor	Climate Hazard	Likely ICCIs identified	Description of ICCI considering embedded environmental measures/ good practice	Likelihood of ICCI occurring	Consequence	Significance
	heatwave frequency	extended dry spells affecting air quality.	far as reasonably practicable, through the measures required by CEMP.			
Geology Hydrogeology & Land Contamination	Increase to winter rainfall	Increase to winter rainfall mixing with contaminants from with the Proposed Development and affecting groundwater conditions	Surface flooding mixing with shallow contaminants (if present), increasing the likelihood of potential impacts on groundwater quality. Any unacceptable levels of contamination would be remediated / mitigated during construction.	Negligible	Negligible	Negligible (not significant)
Water Environment & Flood Risk	Increase to winter rainfall	Increase to winter rainfall leading to an increased impact on flooding and increased drainage requirements	Increased rainfall during the winter may increase the impact on flooding and drainage. Increased rainfall due to climate change is accounted for in the design of the drainage infrastructure, as outlined in the Drainage Strategy Annex 3 of **ES Volume II Appendix 12A:** Flood Risk Assessment (**Application Document Ref. 6.3**).	Negligible	Negligible	Negligible (not significant)

Discipline/ Receptor	Climate Hazard	Likely ICCIs identified	Description of ICCI considering embedded environmental measures/ good practice	Likelihood of ICCI occurring	Consequence	Significance
Noise & Vibration	Increased annual temperatures and frequency of heatwaves	Increased temperatures leading to increased frequency of open windows, and therefore impacts in terms of indoor noise levels are the same, but there will potentially be more/ longer periods for which people are exposed to these levels.	Increased temperatures leading to increased frequency of open windows. Whilst not increasing the noise level, there will potentially be more times/ longer periods for which people are exposed to these levels.	Negligible	Negligible	Negligible (not significant)

Operation

18B.6.3 Potential ICCIs during operation and their likelihood, consequence and significance are detailed in **Table 18B.6**.

Table 18B.6: Potential ICCIs during Operation

Discipline/ Receptor	Climate Hazard	Likely ICCIs identified	Description of ICCI considering embedded environmental measures/good practice	Likelihood of ICCI occurring	Consequence	Significance
Socio-economics	Increase in annual temperatures and heatwave frequency	Increase temperatures and heatwave frequency, leading to changes in working hours or shift patterns	During operation, increased temperatures and heatwave frequency may lead to changes in working hours or shift patterns (e.g. more frequent breaks required, or avoiding the hottest part of the day), which could affect local employment opportunities.	Negligible	Negligible	Negligible (not significant)
Geology Hydrogeology & Land Contamination	Increase to winter rainfall	Increase to winter rainfall mixing with contaminants from with the Proposed Development and affecting groundwater conditions	Surface flooding mixing with shallow contaminants (if present), increasing the likelihood of potential impacts on groundwater quality. Maintenance and operation of the Proposed Development will be in accordance with environmental legislation and good practice.	Negligible	Negligible	Negligible (not significant)
Cultural Heritage	Decrease in annual	A decrease in rainfall may affect local	While peat deposits left in situ following construction will be	Moderate	Negligible	Negligible (not significant)

Discipline/ Receptor	Climate Hazard	Likely ICCIs identified	Description of ICCI considering embedded environmental measures/good practice	Likelihood of ICCI occurring	Consequence	Significance
	rainfall/ decrease in summer rainfall/ increase in heatwaves	hydrology and could dry out waterlogged peat deposits, leading to the loss of paleo-environmental resource.	sensitive to this ICCI, information held within the peat will be appropriately sampled, investigated and recorded.			
Cultural Heritage	Sea level rise/ increased winter rainfall	Sea level rise and/or increased winter rainfall may lead to increased flooding, impacting built heritage assets.	Sea level rise and/or increased winter rainfall may lead to increased flooding, impacting built heritage assets located on or adjacent to the River Trent, the canal network and the warping drains throughout the wider landscape surrounding the site.	Low	Negligible	Negligible (not significant)
Cultural Heritage	Increase in winter rainfall	An increase in rainfall may affect local hydrology and could make buried peat deposits more waterlogged, affecting preservation of archaeological	While peat deposits left in situ following construction will be sensitive to this ICCI, information held within the peat will be appropriately sampled, investigated and recorded.	Negligible	Negligible	Negligible (not significant)

Discipline/ Receptor	Climate Hazard	Likely ICCIs identified	Description of ICCI considering embedded environmental measures/good practice	Likelihood of ICCI occurring	Consequence	Significance
		remains within this paleo-environmental resource.				
MA&Ds	Increased frequency of extreme weather events	Increased risk of MA&Ds events involving meteorological initiators	Embedded mitigation measures in the design will consider the impacts of more extreme weather events to demonstrate ALARP, as needed under COMAH regulations.	Negligible	Negligible	Negligible (not significant)
Landscape and Visual	Increased occurrence of heatwaves and droughts	Reduction in the growth rates of plant material, increasing the visual impact of the Proposed Development	Landscape species to be selected and maintained in accordance with the guidance set out within the **Outline Landscape and Biodiversity Enhancement and Management Plan (LBMEP) Report** (**Application Document Ref. 5.10**).	Low	Negligible	Negligible (not significant)
Landscape and Visual	Increased occurrence of heatwaves and droughts	Increase to the likelihood of plant failure, increasing the visual impact of the	Planting areas to be regularly monitored and maintained in accordance with the **Outline**	Low	Negligible	Negligible (not significant)

Discipline/ Receptor	Climate Hazard	Likely ICCIs identified	Description of ICCI considering embedded environmental measures/good practice	Likelihood of ICCI occurring	Consequence	Significance
		Proposed Development	**LBMEP Report** (**Application Document Ref. 5.10**).			
Water Environment & Flood Risk	Increase to winter rainfall	Increase to winter rainfall leading to an increased impact on flooding and increased drainage requirements	Increased rainfall during the winter may increase the impact on flooding and drainage. Increased rainfall due to climate change is accounted for in the design of the drainage infrastructure, as outlined in the Drainage Strategy Annex 3 of **ES Volume II Appendix 12A:** Flood Risk Assessment (**Application Document Ref. 6.3**).	Low	Negligible	Negligible (not significant)
Water Environment & Flood Risk	Decreased summer rainfall and increased occurrence of heatwaves and droughts	Decreased rainfall and increased droughts leading to reduced water levels in the local waterways, affecting abstraction	Decreased rainfall and increased droughts may lead to reduced water levels in the local waterways, increasing the impact of water abstraction activities for the Proposed Development. This will be controlled by permitting requirements and abstraction licenses, with abstraction taking	Low	Negligible	Negligible (not significant)

Discipline/ Receptor	Climate Hazard	Likely ICCIs identified	Description of ICCI considering embedded environmental measures/good practice	Likelihood of ICCI occurring	Consequence	Significance
			place within permitting limits and 'hands-off flow' requirements.			
Water Environment & Flood Risk	Sea Level Rise	Sea level rise leading to increased impact of tidal flooding	Sea level rise may increase the impact of tidal flooding on the surrounding environment as a result of the Proposed Development deflecting tidal floodwater. Sea level rise is accounted for in **ES Volume II Appendix 12A:** Flood Risk Assessment (**Application Document Ref. 6.3**).	Low	Negligible	Negligible (not significant)
Noise & Vibration	Increased annual temperatures and frequency of heatwaves	Increased temperatures leading to increased frequency of open windows, and therefore impacts in terms of indoor noise levels are the same, but there will potentially be more/	Increased temperatures leading to increased frequency of open windows. Whilst not increasing the noise level, there will potentially be more times/ longer periods for which people are exposed to these levels.	Low	Negligible	Negligible (not significant)

Discipline/ Receptor	Climate Hazard	Likely ICCIs identified	Description of ICCI considering embedded environmental measures/good practice	Likelihood of ICCI occurring	Consequence	Significance
		longer periods for which people are exposed to these levels.				

Decommissioning

18B.6.4 Potential ICCIs during decommissioning and their likelihood, consequence and significance are detailed in **Table 18B.7**.

Table 18B.7: Potential ICCIs during Decommissioning

Discipline/ Receptor	Climate Hazard	Likely ICCIs identified	Description of ICCI considering embedded environmental measures/good practice	Likelihood of ICCI occurring	Consequence	Significance
Socio-economics	Increase in annual temperatures and heatwave frequency	Increase temperatures and heatwave frequency, leading to changes in working hours or shift patterns	During decommissioning, increased temperatures and heatwave frequency may lead to changes in working hours or shift patterns (e.g. more frequent breaks required, or avoiding the hottest part of the day), which could affect local employment opportunities.	Negligible	Negligible	Negligible (not significant)
Air Quality	Increase in annual temperatures and heatwave frequency	Increased dust production during decommissioning due to extended dry spells affecting air quality.	Increased dust production during decommissioning due to extended dry spells could adversely affect air quality. This would be minimised as far as reasonably practicable, through the measures required by DEMP.	Moderate	Negligible	Negligible (not significant)
Geology Hydrogeology & Land Contamination	Increase to winter rainfall	Increase to winter rainfall mixing with contaminants from with the Proposed	Surface flooding mixing with shallow contaminants (if present), increasing the likelihood of potential impacts on groundwater	Negligible	Negligible	Negligible (not significant)

Discipline/ Receptor	Climate Hazard	Likely ICCIs identified	Description of ICCI considering embedded environmental measures/good practice	Likelihood of ICCI occurring	Consequence	Significance
		Development and affecting groundwater conditions	quality. Any unacceptable levels of contamination would be remediated / mitigated during decommissioning.			
Water Environment & Flood Risk	Increase to winter rainfall	Increase to winter rainfall leading to an increased impact on flooding and increased drainage requirements	Increased rainfall during the winter may increase the impact on flooding and drainage. Increased rainfall due to climate change is accounted for in the design of the drainage infrastructure, as outlined in the Drainage Strategy Annex 3 of **ES Volume II Appendix 12A:** Flood Risk Assessment (**Application Document Ref. 6.3**)	Low	Negligible	Negligible (not significant)
Water Environment & Flood Risk	Sea Level Rise	Sea level rise leading to increased impact of tidal flooding	Sea level rise may increase the impact of tidal flooding on the surrounding environment as a result of the Proposed Development deflecting tidal floodwater.	Low	Negligible	Negligible (not significant)

Discipline/ Receptor	Climate Hazard	Likely ICCIs identified	Description of ICCI considering embedded environmental measures/good practice	Likelihood of ICCI occurring	Consequence	Significance
Noise & Vibration	Increased annual temperatures and frequency of heatwaves	Increased temperatures leading to increased frequency of open windows, and therefore impacts in terms of indoor noise levels are the same, but there will potentially be more/ longer periods for which people are exposed to these levels.	Increased temperatures leading to increased frequency of open windows. Whilst not increasing the noise level, there will potentially be more times/ longer periods for which people are exposed to these levels.	Moderate	Negligible	Negligible (not significant)

18B.7. Mitigation, Monitoring and Enhancement Measures

18B.7.1 As there are no significant residual impacts, no mitigation, monitoring and enhancement measures have been identified.

18B.8. Limitations or Difficulties

18B.8.1 The ICCI assumes that the defined mitigation measures will be incorporated into the Proposed Development design. No additional mitigation has been identified as necessary for any stage of the Proposed Development.

18B.9. Summary of Likely Significant Residual Effects

18B.9.1 No significant adverse residual In-combination Climate Change Impacts on the Proposed Development's construction, operation or decommissioning have been identified.

18B.10. References

- HMSO (2017). Her Majesty's Stationary Office. The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (SI 2017 No. 572). Available online: http://www.legislation.gov.uk/uksi/2017/572/contents/made [Accessed 04 April 2025].
- Department of Energy and Climate Change (2011a) *Overarching National Policy Statement for Energy (EN-1). July 2011* (online). Available online: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47854/1938-overarching-nps-for-energy-en1.pdf [Accessed 04 April 2025].
- DESNZ (2023c). National Policy Statement for Electricity Networks Infrastructure. Available at: https://assets.publishing.service.gov.uk/media/65a78a5496a5ec000d731abb/nps-electricity-networks-infrastructure-en5.pdf. [Accessed 04 April 2025].
- M. Kendon, et al (2024). State of the UK Climate 2023. Available at: State of the UK Climate 2023 - Kendon - 2024 - International Journal of Climatology - Wiley Online Library [Accessed 04 April 2025].
- Met Office (2024). UK and Global extreme events – Wind storms. Available at: UK and Global extreme events – Wind storms - Met Office [Accessed 04 April 2025].
- Ministry of Housing, Communities and Local Government (2019). *National Planning Policy Guidance on Climate Change* (online). Available online: https://www.gov.uk/guidance/climate-change [Accessed 04 April 2025].
- EU Commission (2011) *Non-paper guidelines for project managers: making vulnerable investments climate resilient* (online). Available online: https://climate-adapt.eea.europa.eu/metadata/guidances/non-paper-guidelines-for-project-managers-making-vulnerable-investments-climate-resilient/guidelines-for-project-managers.pdf [Accessed 04 April 2025].
- IEMA (2020) *Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation.* November 2015. Available online: https://www.iema.net/resources/reading-room/2020/06/26/iema-eia-guide-to-climate-change-resilience-and-adaptation-2020 [Accessed 04 April 2025].