The Great Grid Upgrade

nationalgrid

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Abbreviations

Abbreviation	Full Term
AA	Appropriate Assessment
AAI	Area of Archaeological Importance
AC	Alternating Current
ADS	Archaeological Data Service
AIL	Abnormal Indivisible Load
AIS	Air Insulated Switchgear
ALC	Agricultural Land Classification
ALO	Agricultural Liaison Officer
AOD	Above Ordnance Datum
AONB	Area of Outstanding Natural Beauty
AQMA	Air Quality Management Area
AQO	Air Quality Objective
AQS	Air Quality Standard
ATC	Air Traffic Control
BAP	Biodiversity Action Plan
BCT	Bat Conservation Trust
BGS	British Geological Survey
BHS	British Horse Society
BMV	Best and Most Versatile
BNG	Biodiversity Net Gain
CAA	Civil Aviation Authority
CAMS	Catchment Abstraction Management Strategy
CBA	Cost Benefit Analysis/Council for British Archaeology (note context)
CEMP	Construction Environmental Management Plan
CIRIA	Construction Industry Research and Information Association.
CLA	Country Land and Business Association
CoCP	Code of Construction Practice
CRCE	Centre for Radiation, Chemical and Environmental Hazards
CROW (Act)	Countryside and Rights of Way Act, 2000

Abbreviation	Full Term
CS	Core Strategy
CSEC	Cable Sealing End Compound
CSS	Countryside Stewardship Scheme
CWS	County Wildlife Site
dB	Decibel
DBA	Desk Based Assessment
DC	Direct Current
DCLG	Department for Communities and Local Government
DCMS	Department of Culture, Media and Sport
DCO	Development Consent Order
DECC	Department of Energy and Climate Change
DEFRA	Department for Environment, Food and Rural Affairs
DNO	Distribution Network Operator
DSOR	Distribution System Options Report
DTM	Digital Terrain Model
EA	Environment Agency
EC	European Commission
EcIA	Ecological Impact Assessment
EG	Environmental Gain
EHO	Environmental Health Officer
EIA	Environmental Impact Assessment
ELF	Extremely Low Frequency
EMC	Electromagnetic Compatibility
EMFs	Electric and Magnetic Fields
EMS	Environmental Management System
EN-1	Overarching National Policy Statement for Energy
EN-5	National Policy Statement for Electricity Networks Infrastructure
ENSG	Electricity Networks Strategy Group
EPA	Environmental Protection Act
EPAQS	Expert Panel on Air Quality Standards
EPO	Environmental Protection Officer
EqIA	Equalities Impact Assessment
ERP	Emergency Response Plan

Abbreviation	Full Term
ES	Environmental Statement
ESA	Environmentally Sensitive Area
EU	European Union
FES	Future Energy Scenario
FRA	Flood Risk Assessment
FTE	Full Time Equivalents
GDP	Gross Domestic Product
GIL	Gas-Insulated Line
GIS	Geographic Information System
GPS	Geographic Positioning System
GVA	Gross Value Added
GVLIA	Guidelines for Landscape and Visual Impact Assessment
GW	Gigawatt. One billion (10^9) watts
GWhr	Gigawatt hours
ha	Hectare
HER	Historic Environment Record
HGV	Heavy Goods Vehicle
HSI	Habitat Suitability Index
HLA	Historic Landscape Assessment
HLC	Historic Landscape Characterisation
HLCA	Historic Landscape Character Area
HM	His Majesty's
HND	Holistic Network Design
HPA	Health Protection Agency (Centre for Radiation)
HPI	Habitat of Principal Importance
HRA	Habitats Regulations Assessment
HVDC	High Voltage Direct Current
Hz	Hertz
ICNIRP	International Commission on Non-Ionizing Radiation Protection
IDB	Internal Drainage Board
IEMA	Institute of Environmental Assessment and Management
IET	Institution of Engineering and Technology
IfA	Institute for Archaeologists

Abbreviation	Full Term
ILA	Important Landscape Area
ILE	Institute of Lighting Engineers
IMD	Index of Multiple Deprivation
ISO	International Standards Organisation
km	Kilometre
kV	Kilovolt
kV/m	kilovolts per metre
LB	Listed Building
LBAP	Local Biodiversity Action Plan
LCA	Landscape Character Assessment
LCT	Landscape Character Type
LDF	Local Development Framework
LDP	Local Development Plan
LDV	Light Duty Vehicle
LEN	Local Electricity Network
LI	Landscape Institute
LNR	Local Nature Reserve
LHA	Local Highway Authority
LOAEL	Lowest Observed Adverse Effect Level
LPA	Local Planning Authority
LS	Listed Structure
LSOA	Lower Super Output Areas
LVIA	Landscape and Visual Impact Assessment
LWS	Local Wildlife Site
m	metre/million
MCA	Minerals Consultation Area
MGW	Maximum Gross Weight
MoD/MOD	Ministry of Defence
MPGs	Mineral Planning Guidance Notes
MPS	Minerals Policy Statement
MW	Megawatt. One million (10^6/1,000,000) watts
NAQS	National Air Quality Strategy
NBN	National Biodiversity Network

Abbreviation	Full Term
NC	Natural Capital
NCN	National Cycle Network
NERC	Natural Environment and Rural Communities Act
NETS	National Electricity Transmission System
NFU	National Farmers Union
NGET	National Grid Electricity Transmission
NGR	National Grid Reference
NMR	National Monuments Record
NNR	National Nature Reserve
NO_2	Nitrogen Dioxide
NO_x	Nitrous Oxide
NPPF	National Planning Policy Framework
NPS	National Policy Statement
NSIP	Nationally Significant Infrastructure Project
NVC	National Vegetation Classification
NVZ	Nitrate Vulnerable Zones
OD	Ordnance Datum
ONS	Office of National Statistics
OS	Ordnance Survey
PD	Permitted Development
PHE	Public Health England
PINS	Planning Inspectorate
PM_{10} and $PM_{2.5}$	Particulate matter
PPG	Planning Policy Guidance Note
PPG	Pollution Prevention Guideline (Environment Agency publication)
PRoW	Public Right of Way
RF	Radio Frequency
RPA	Root Protection Area
RSPB	Royal Society for the Protection of Birds
RSS	Regional Spatial Strategy
SAC	Special Area of Conservation
SAGE	Stakeholder Advisory Group on ELF EMFs
SFRA	Strategic Flood Risk Assessment

Abbreviation	Full Term
SINC	Site of Importance for Nature Conservation
SLA	Special Landscape Area
SMR	Sites and Monuments Record
SNIC	Site of Nature Conservation Importance
SOCC	Statement of Community Consultation
SOAEL	Significant Observed Adverse Effect Level
SOR	Strategic Optioneering Report
SOS	Secretary of State
SPA	Special Protection Area
SPG	Supplementary Planning Guidance
SPI	Species of Principal Importance
SPZ	Source Protection Zone
SQSS	Security and Quality of Supply Standard
SRN	Strategic Road Network
SSA	Strategic Search Area
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Drainage System
TA	Transport Assessment
TAN	Technical Advice Note
TMP	Traffic Management Plan
TPO	Tree Preservation Order
TWh	Terawatt hour (10^{12} watt hours)
UDP	Unitary Development Plan
UK	United Kingdom
UKBAP	United Kingdom Biodiversity Action Plan
UKHAP	United Kingdom Habitat Action Plan
VP	Vantage Point
ZTV	Zone of Theoretical Visibility

1. Introduction

1.1 Overview

1.1.1 The North Humber to High Marnham Project (the 'Project') is a proposal by National Grid Electricity Transmission (NGET) (National Grid) to reinforce the transmission network between a new substation close to the existing Creyke Beck Substation, in Yorkshire and a new substation close to the existing High Marham Substation in Nottinghamshire. This would be achieved by reinforcing the transmission network with a new 400 kilovolt (kV) electricity transmission line over a distance of approximately 90 kilometres (km).

1.1.2 National Grid owns, builds and maintains the electricity transmission network in England and Wales, and operates the high voltage electricity network throughout Great Britain, transporting electricity from generators (such as wind farms, solar farms and power stations) to local distribution network operators (DNO's). Under the Electricity Act 1989, National Grid holds a transmission licence, under which it is required to develop and maintain an efficient, coordinated and economical electricity system.

1.1.3 National Grid is also required, under Section 38 of the Electricity Act 1989, to comply with the provisions of Schedule 9 of the Act. Schedule 9 requires licence holders, in the formulation of proposals to transmit electricity, to:

Schedule 9(1)(a) "…have regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest"; and

Schedule 9(1)(b) "…do what [it] reasonably can to mitigate any effect which the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings or objects".

1.1.4 The Project is likely to comprise of the following components:

- works to facilitate the connection of a new overhead line (OHL) into a proposed new substation, close to the existing Creyke Beck Substation in the East Riding of Yorkshire;
- a new 400 kV OHL route, approximately 90 km in length between a proposed new substation close to the existing Creyke Beck Substation and a proposed new substation close to the existing High Marnham Substation;
- reconfiguration of a section of the existing 400 kV ZDA[1] OHL to the east of Crowle and west of Keadby Power Station, potentially including cable sealing end compounds (CSEC's), to facilitate the crossing of the new OHL;
- works to facilitate the connection of a new OHL into a proposed new substation close to the existing High Marnham Substation, in Bassetlaw District in Nottinghamshire;

[1] ZDA route running between Drax, Keadby and Thorpe Marsh substations

- potential cable sealing end compounds and/or tunnel head houses for any underground cable sections of the Project;
- potential alterations to sections of existing transmission OHLs (such as 4ZQ, 2KN, 4KG, 4TM, ZDA, 4VE, 4VK, and/or 4ZM); and
- potential for removal/reconfiguration/diversion of utility assets.

1.1.5 The Project is a Nationally Significant Infrastructure Project (NSIP), as defined under Part 3(16) of the Planning Act 2008 (as amended) (Ref 1.1) because it comprises new overhead electricity transmission connections of more than 2 km, with an operating voltage of above 132 kV.

1.1.6 This Scoping Report supports a request by National Grid, under Regulation 10 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (hereafter referred to as 'the EIA Regulations') (Ref 1.2), for a written Scoping Opinion from the Secretary of State (SoS) for Energy Security and Net Zero, administered by the Planning Inspectorate on behalf of the SoS, to inform the EIA for the Project.

1.2 The Need for the Project

1.2.1 The Government's recent British Energy Security Strategy (Ref 1.3) outlines the ambition to increase energy from offshore wind to 50 GW by 2030 – more than enough to power every home in the UK. This has led to a shift towards offshore renewable generation of power (60% of which is expected to come ashore along the East Coast) away from coal powered generation in the north and the Midlands. The UK is also transporting more power between countries across the North Sea, using interconnectors. These factors have driven a change in the energy landscape across the UK and in particular, the Humber and East Midlands where reinforcement of the network (overhead lines, pylons, underground cables and other infrastructure that transports electricity around the country) is required to deliver this change. This Project is part of The Great Grid Upgrade – the largest overhaul of the grid in generations.

1.2.2 The existing electricity transmission network in the Humber and East Midlands region was developed in the 1960s and has historically been able to meet demand. However, due to the changes noted above in terms of delivering net zero emissions, the existing network in the Humber and East Midlands region does not have the capability to reliably and securely transport all the energy that will be connected by 2030, whilst operating to the standards it is required to. The North Humber to High Marnham Project will support the UK's net zero target by reinforcing the electricity transmission network between the north of England and the Midlands and facilitate the connection of planned offshore wind generation and interconnectors with other countries, allowing clean green energy to be carried on the network. The North Humber to High Marnham Project, together with other reinforcements along the East Coast, will help meet future energy requirements.

1.2.3 National Grid has considered alternative strategic options to reinforce the network and alternative route corridors, as part of the options appraisal process (see **Chapter 3, Main Alternatives Considered**). The reinforcements are necessary to support the connection of new generation projects in Scotland and the north-east of England in the next decade and beyond. National Grid identified that the existing transmission system would not be sufficient to meet connection demand going forward. Without additional network capability, offshore wind and interconnectors will be constrained off at times of high wind generations and high imports. The operation of the network would become sub-optimal

in the long term, less efficient, and more carbon intensive sources of generation would potentially be used at those times, hindering progress towards net zero.

1.2.4 The network reinforcement would provide greater security to the network in the region and reduce the risk of outages (a period of interruption to electricity supply) from limited network availability. If the network is not reinforced, outages could result in a greater risk of widespread supply interruptions. The transmission network needs to be able to maintain a minimum level of security of supply, as defined within the National Electricity Transmission System Security and Quality of Supply Standards (NETS SQSS).

1.3 The requirement for Environmental Impact Assessment

1.3.1 Environmental Impact Assessment (EIA) is a process required by UK law which brings together information about the likely significant effects of a development. The legal basis for EIA lies in European Community Directive 85/337/EEC2 (the 'EIA Directive'). The EIA Directive is transposed into UK law through several pieces of legislation.

1.3.2 In relation to NSIPs, EIA is required for certain developments under the EIA Regulations. Under the EIA Regulations, EIA is mandatory for development projects defined under Schedule 1. Those development projects defined in Schedule 2 only require EIA if they are likely to have significant effects on the environment by virtue of their nature, size or location. As the proposed length of the overhead lines is greater than 15 km, the Project falls within the provisions of Schedule 1. Considering the nature and size of the Project, an EIA will be prepared in line with Regulation 8(1)(b) of the EIA Regulations, National Grid hereby provides notice that the application for a DCO will be accompanied by an Environmental Statement (ES).

1.4 Geographical Context

1.4.1 The Project is located in the east of England across the Humber and East Midland regions, as illustrated on **Figure 1.1 Scoping Boundary**. The Scoping Boundary lies within three local planning authority areas: the northern part of the Project lies within the East Riding of Yorkshire; the central part of the project lies in North Lincolnshire and the southern part of Bassetlaw District.

1.4.2 The Project is located in an area that is predominantly rural, with large parts of the land under arable use. The city of Kingston-upon-Hull, towns of Beverley, Crowle, Scunthorpe, Epworth, Gainsborough and Retford are located within 5 km of the Scoping Boundary. There are multiple villages and individual properties within or near to the Project.

1.4.3 The Scoping Boundary was designed to exclude the Humber Estuary itself, taking into account ecological concerns regarding designated sites and the technical challenges associated with crossing it. Instead, the area extends to the west of the confluence with the River Ouse, allowing for a crossing in closer proximity to the existing 400 kV OHL. There may still be some interaction with one or more of the Humber Estuary designations; the Humber Estuary Ramsar Site, Special Area of Conservation (SAC), Special Area of Protection (SPA) and Special Site of Scientific Interest (SSSI).

1.5 Purpose and Structure of the Scoping Report

1.5.1 Scoping forms a key stage of the EIA process; providing a framework for identifying potential significant effects arising from the Project and distinguishing the environmental topics to be addressed within the ES.

1.5.2 This Scoping Report sets out the proposed content, methodologies to be adopted and the potential likely significant environmental effects that are proposed to be considered in the EIA.

1.5.3 The opinion of the SoS is being sought specifically on:

- the environmental topics that should be included in the EIA;
- the relevant components of the Project and the resultant likely significant effects;
- those effects not likely to be significant that do not need to be considered further;
- the approach to setting the study areas for each topic;
- the data that has been gathered (and will be gathered);
- the assessment methods that will be used to determine likely significant effects; and
- the approach to determining the environmental measures that could be incorporated into the Project to avoid, prevent, reduce or, if necessary, offset significant effects.

1.5.4 This Scoping Report has been prepared in accordance with the EIA Regulations, as well as having due regard to Planning Inspectorate Advice Note Seven (Ref 1.4).

1.5.5 Regulation 10(3) of the EIA Regulations defines the information that must be provided when requesting a scoping opinion, namely:

"(a) a plan to sufficiently identify the land;

(b) a description of the proposed development including its location and technical capacity;

(c) an explanation of the likely significant effects of the development on the environment; and

(d) such other information or representations as the person making the request may wish to provide or make".

1.5.6 **Table 1.1** identifies where the information set out in Regulation 10(3) and Planning Inspectorate Advice Note Seven can be found within this Scoping Report.

Table 1.1: Compliance with regulation 10(3) and Planning Inspectorate Advice Note Seven

Suggested information to be included within the Scoping Report	Location within this Scoping Report
The Proposed Development	
Referenced plans presented at an appropriate scale to cover clearly all	The Scoping Boundary is shown on **Figure 1.1 Scoping Boundary**.

Suggested information to be included within the Scoping Report	Location within this Scoping Report
known features associated with the proposed development	
An explanation of the approach to addressing uncertainly which remains in relation to the elements of the proposed development	**Chapter 4, Description of the Project**.
EIA Approach and Topic Areas	
An outline of the reasonable alternatives considered and the reasons for selecting the preferred option	**Chapter 3, Main Alternatives Considered**.
A summary table describing each of the aspects and matters that are requested to be scoped out allowing for quick identification of issues	Each of the technical chapters (Chapter 6 to Chapter 19) include a summary table identifying those sources, impact and receptors proposed to be scoped in and out of the ES.
A detailed description of the aspects and matters proposed to be scoped out of further assessment with justification provided	This is presented within section 6 of each of the technical chapters (**Chapter 6** to **Chapter 19**).
Results of desktop and baseline studies where available and where relevant to the decision to scope in or out aspects or matters	Information on the baseline characteristics is included in section 4 of each of the technical chapters (**Chapter 6** to **Chapter 19**).
Aspects and matters to be scoped in, the report should include details or the methods to be used to assess the impacts and to the determine the significance of effect e.g., the criteria for determining sensitivity and magnitude	Sources, impacts and receptors proposed to be 'scoped in' for the purpose of the ES are identified within section 6 of each of the technical chapters (**Chapter 6** to **Chapter 19**). The proposed EIA approach and methods are described in **Chapter 5, EIA Approach and Methodology** and in section 7 of each of the technical chapters (**Chapter 6** to **Chapter 19)** which describe how they will apply that methodology to their assessments or where it differs due to specific topic guidance, set out their proposed methodologies.
Any avoidance or mitigation measures proposed, how they may be secured and the anticipated residual effects	These are set out within section 5 of each of the technical chapters (**Chapter 6** to **Chapter 19**). An Outline Code of Construction Practice (CoCP) is provided in **Appendix 4.1 Outline CoCP**.
Information Sources	
Reference to any practice and best guidance to be relied upon	This is presented within section 7 of each of the technical chapters (**Chapter 6** to **Chapter 19**).

Suggested information to be included within the Scoping Report	Location within this Scoping Report
Evidence or agreements reached with consultation bodies	Feedback from stakeholders is described as appropriate throughout the technical chapters (**Chapter 6** to **Chapter 19**).
Transboundary Effects	
The Applicant may also wish to provide a completed transboundary screening matrix dealing with the potential effects of the proposed development on other European Economic Area (EEA) States	**Appendix 1.A** presents this matrix which follows the suggested format for the transboundary screening matrix which is provided in the PINS Advice Note 12 (Ref 1.5).

1.6 Structure of this Scoping Report

1.6.1 The structure of this Scoping Report is outlined in **Table 1.2**. For ease of presentation, **Volume 1** presents the main text of this Scoping Report; **Volume 2** Appendices and **Volume 3** Figures.

Table 1.2: Scoping report structure

Chapter/Appendix	Content
Volume 1 – Main Text	
Chapter 1 Introduction	An introduction to the Project and the purpose and structure of the Scoping Report.
Chapter 2 Regulatory and Planning Policy Context	A review of the legislation and policy relevant to the Project.
Chapter 3 Main Alternatives Considered	This chapter outlines the evolution of the Project, reasonable alternatives considered and the reasons for selecting the preferred Project.
Chapter 4 Description of the Project	The chapter goes on to describe the Project including permanent features and associated temporary works. It describes the general characteristics of the Project, outlines areas of flexibility in relation to design parameters, and how the Project would be constructed, operated and maintained.
Chapter 5 EIA Approach and Methodology	A description of the overall EIA methodology (including cumulative effects assessment methodology) that is proposed on the Project including temporal durations and approach to mitigation.
Chapter 6 Landscape Chapter 7 Visual Chapter 8 Ecology and Biodiversity	There is a chapter for each environmental topic scoped into the EIA. The technical chapters are structured as follows:

Chapter/Appendix	Content
Chapter 9 Cultural Heritage Chapter 10 Water Environment Chapter 11 Geology and Hydrogeology Chapter 12 Agriculture and Soils Chapter 13 Traffic and Transport Chapter 14 Air Quality Chapter 15 Noise and Vibration Chapter 16 Socio-economics, recreation and Tourism Chapter 17 Health and Wellbeing Chapter 18 Climate Change Chapter 19 Major Accidents and Disasters Chapter 20 References	• the regulatory and planning policy context specific to the topic area; • the proposed topic study area; • a description of the relevant baseline including data sources used; • any embedded or good practice measures take into consideration when proposing the scope; • potential for significant effects; • proposed assessment methodology; and • concluding statements explaining the matters proposed to be scoped into and out of the ES.
Volume 2 Appendices	Provides the appendices which support Volume 1.
Volume 3 Figures	Provides the Figures which support Volume 1.

Other Assessments

1.6.2 In addition to the EIA, the preparation of the DCO application for the Project requires other standalone assessments to be carried out to meet the requirements of other policy and legislation, such as The Conservation of Habitat and Species Regulations 2017. Whilst the outcomes of these assessments may be drawn upon when carrying out the EIA (and vice versa), the scope of these other assessments will be discussed and agreed with appropriate regulatory authorities in line with their own regulatory requirements and relevant policy and legislation, rather than within this Scoping Report.

1.6.3 Where appropriate, however, the individual topic chapters in this Scoping Report outline where the findings of one of the additional assessments are to be drawn upon when carrying out the EIA, and any proposed scope of the relevant additional assessment is set out to facilitate consultation with relevant consultees in relation to this Scoping Report.

Net Gain Commitments

1.6.4 National Grid has committed to 10% Net Gain in Environmental value including as a minimum 10% Biodiversity Net Gain (BNG) across all its construction projects, including this Project, in line with the Environment Act 2021.

1.6.5 This commitment is underpinned by the delivery of quantifiable enhancements for biodiversity measures from a baseline using the DEFRA Biodiversity Calculator (Ref 1.6) with actions formalised and secured by long term management arrangements with external organisations and partners.

1.6.6 Wider environmental benefits such as carbon capture and storage, air quality and recreation and associated financial values are also considered and quantified using a variety of tools and emerging methodologies.

1.6.7 These commitments ensure that National Grid can deliver long term environmental improvements as part of our works. The commitments will align and make a positive contribution to regional and national strategies and facilitate collaboration and partnerships with our communities and stakeholders.

Competence

1.6.8 Regulation 14(4) of the EIA Regulations requires that an ES is prepared by 'competent experts' and that the ES is accompanied by a statement outlining the relevant expertise or qualifications of such experts.

1.6.9 This Scoping Report has been prepared and coordinated by environmental consultants who are members of the Institute of Environmental Management and Assessment (IEMA) EIA Quality Mark Scheme (Ref 1.7). The scheme allows organisations that lead the co-ordination of EIAs in the UK to make a commitment to excellence in their EIA activities and have this commitment independently reviewed.

2. Regulatory and Planning Policy Context

2.1 Introduction

2.1.1 This chapter sets out an overview of the regulatory and planning policy framework that applies to the Project, which has been taken into account across all technical chapters in the preparation of this Environmental Impact Assessment (EIA) Scoping Report. Additional legislation, policy and guidance are applicable to some topics. Any such topic specific legislation is set out in the relevant technical chapters (**Chapter 6** to **19**).

2.2 Key Legislation

The Planning Act 2008

2.2.1 The Planning Act 2008 ("PA 2008") provides the legislative basis for applications for a Development Consent Order (DCO). It also defines the application process under which a DCO is sought. The PA 2008 sets out that the projects meeting certain defined criteria, are classified as Nationally Significant Infrastructure Projects (NSIPs). It requires that developers wishing to construct, operate and maintain NSIPs must obtain a DCO from the relevant Secretary of State (SoS) to authorise the project.

2.2.2 As the Project consists of the installation of an electric line above ground of more than 132 kV and more than 2 km in length, it is classified as an NSIP under Section 14(1)(b) of the PA 2008.

The Infrastructure Planning (EIA) Regulations 2017

2.2.3 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) govern the EIA process relevant to NSIPs. Schedule 1 of the EIA Regulations lists those projects for which an EIA is required and Schedule 2 lists projects which may be considered an EIA development, based on the selection criteria provided in Schedule 3 on characteristics of the development, its location and the types and characteristics of the potential impacts.

2.2.4 Under these Regulations (paragraph 20 of Schedule), a project is Schedule 1 if it fulfils the following criteria *"Construction of overhead electrical power lines with a voltage of 220 kV or more, and a length of more than 15 km"*. The Project comprises a 400 kV electricity transmission line over a distance of approximately 90 km of which more than 15 km is proposed to be overhead, therefore the Project falls under Schedule 1 and requires a statutory EIA.

2.2.5 Regulation 5(2) states that the EIA must

"*identify, describe and assess in an appropriate manner, in light of each individual case, the direct and indirect significant effects of the proposed development on the following factors-*

a) Population and human health;

b) *Biodiversity, with particular reference to species and habitats protected under Directive 92/43/EEC and 2009/147/EC;*

c) *Land, soil, water, air and climate;*

d) *Material assets, cultural heritage and landscape; and,*

e) *The interaction between the factors referred to in sub-paragraphs (a) to (d)".*

These factors are considered within the topic-specific chapters (**Chapters 6** to **18**).

2.2.6 In addition, Regulation 5(4) states that the EIA should include, where relevant,

"*the expected significant effects arising from the vulnerability of the proposed development to major accidents or disasters that are relevant to that developmen*t".

2.2.7 This is considered within **Chapter 19, Major Accidents and Disasters**.

2.2.8 Schedule 4(5) states that a description should be included, of the significant effects arising from

"the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources".

2.2.9 This is addressed within **Chapter 5, EIA Approach and Methodology**.

Electricity Act 1989

2.2.10 Section 9(2) of the Electricity Act 1989 places general duties on National Grid as a license holder:

"to develop and maintain an efficient, co-ordinated and economical system of electricity transmission…"

2.2.11 In addition, Section 38 and Schedule 9 of the Electricity Act 1989 requires National Grid, when formulating proposals for new lines and other works, to:

"have regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest; and shall do what it reasonably can to mitigate any effect which the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings or objects."

2.2.12 National Grid's Stakeholder, Community and Amenity Policy (Ref 2.1), published December 2016, sets out how the company will meet the Schedule 9 duty placed upon it by the aforementioned legislation.

Related Assessments

2.2.13 In addition to the EIA, the Project will be assessed in accordance with the other regulatory regimes, where they apply. Information on these is included in the environmental topic chapters of this Scoping Report where applicable. These include the Conservation of Habitats and Species Regulations 2017, as amended by the Conservation of Habitats and Species (Amended) (EU Exit) Regulations 2019 (hereafter "the Habitats Regulations").

Habitat Regulations

2.2.14 The Habitats Regulations transposed the requirements of European Council Directive 92/43/EEC ('the Habitats Directive') into English law. The Habitats Regulations apply to plans and projects that may have significant effects on the Natura 2000 ecological network (sites designated under the Habitats Directive and the Wild Birds Directive (Council Directive 2009/147/EC, which codified 79/409/EEC)). Sites designated in England under the Habitats Regulations include Special Protection Areas (SPAs) and Special Areas of Conservation (SACs).

2.2.15 Following changes made to the Habitats Regulations (as amended) by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, SACs and SPAs in the UK no longer form part of the EU's Natura 2000 ecological network and now form part of the 'UK National Site Network'. The term 'European sites' is used to refer collectively to such sites throughout this Scoping Report. It is also government policy that Ramsar sites, potential SPAs, possible SACs and sites used to compensate for adverse effects on European sites are considered in the HRA process. This is described in paragraph 181 of the National Planning Policy Framework.

2.2.16 The Habitats Regulations require an Appropriate Assessment if a project is likely to have a significant effect on a European site.

2.3 National Planning Policy

2.3.1 The Project is an NSIP which requires development consent under the PA 2008. Section 104 of the PA 2008 outlines the importance of National Policy Statements (NPS) to the decision-making process which applications for development consent are considered. Section 104(2) states, inter alia:

"In deciding the application, the SoS must have regard to -

a) any additional policy statement which has effect in relation to development of the description to which the application relates (a 'relevant national policy statement')…

d) any other matters which the SoS thinks are both important and relevant to the SoS decision"

2.3.2 The two relevant NPS are:

- Overarching National Policy Statement for Energy (EN-1) (NPS EN-1) (Adopted 2011) (Ref 2.2); and
- National Policy Statement for Electricity Networks Infrastructure (EN-5) (NPS EN-5) (Adopted 2011) (Ref 2.3).

Overarching National Policy Statement for Energy (EN-1)

2.3.3 National Policy Statement EN-1 sets out the Government's overarching policy with regard to the development of NSIPs in the energy sector. It outlines high-level objectives, policy and the regulatory framework. EN-1 emphasises the need for new energy projects to contribute to a secure, diverse and affordable energy supply. This is to support the Government's policies on sustainable development, in particular by mitigating and adapting to climate change.

2.3.4 Section 3.7 of EN-1 states that current scenarios show significant potential increases in generation and changes in direction of net electricity flows from north to south and from

eastern England to centres of demand in the Midlands and south-east England. Paragraph 3.7.7 of EN-1 states that

"these kinds of flows of power cannot be accommodated by the existing network. Accordingly, new lines will have to be built".

2.3.5 It also acknowledges in paragraph 3.7.10 that

"*in most cases, there will be more than one technological approach by which it is possible to make such a connection or reinforce the network (for example, by overhead line or underground cable) and the costs and benefits of these alternatives should be properly considered as set out in EN-5… before any overhead line proposal is consented"*.

2.3.6 Section 4.5 of EN-1 sets out the principles for good design that should be applied to all energy infrastructure and notes the importance which the Planning Act 2008 places on good design and sustainability. Part 5 of NPS EN-1 sets out generic impacts in respect of matters such as air quality and emissions, biodiversity, dust and odour, flood risk, historic environment, landscape and visual, land use, noise and vibration, socio-economics, traffic and transport and waste management. These generic impacts have been considered in the preparation of the Scoping Report.

Overarching National Policy Statement for Energy (EN-5)

2.3.7 NPS EN-5 relates to electricity networks, and Part 2 includes specific policies including consideration of good design, biodiversity and geological conservation, landscape and visual, and noise and vibration. These policies have also been considered in the preparation of the Scoping Report.

2.3.8 Paragraph 2.2.6 of EN-5 reiterates the duties under Section 9 of the Electricity Act 1989, both in relation to developing and maintaining an economical and efficient network and, in formulating proposals for new electricity network infrastructure, to:

"have regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiological features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest; and…do what [they] reasonably can to mitigate any effect which the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings or objects."

2.3.9 These policies have been considered in the relevant technical chapters.

Draft Energy National Policy Statements

2.3.10 The Government is currently reviewing and updated the Energy NPS. It is doing this to reflect its policies and strategic approach for the energy system that is set out in the Energy White Paper (December 2020), and to ensure that the planning policy framework enables the delivery of the infrastructure required for the country's transition to net zero carbon emissions. As part of the Energy NPS review process, the Government published a suite of Draft Energy NPS for consultation on 6 September 2021 and revised Drafts on 30 March 2023.

2.3.11 The following Draft Energy NPS have also been considered in the scoping of this EIA:

- Draft Overarching NPS for EN-1 (Ref 2.4); and
- Draft Overarching NPS for EN-5 (Ref 2.5).

2.3.12 Draft NPS EN-1 sets out general principles and impacts to be considered for all types of energy NSIP covered by the draft Energy NPS. Once designated it will form the primary basis for determining if development consent should be granted and is underpinned by the principle that there will be a need for significant amounts of new large-scale energy infrastructure to meet the Governments energy objectives. It states at paragraph 2.1.1 and 2.3.6 that the energy system needs to be transferred by

"…tackling emissions while continuing to ensure secure and reliable supply, and affordable bills for households and businesses".

2.3.13 Paragraph 3.3.58 states that the need for the electricity generating technologies covered within the scope of the NPS is urgent and that there is a critical national priority (CNP) for the provision of nationally significant new offshore wind infrastructure (and supporting onshore and offshore network infrastructure). Paragraph 3.3.60 states

"…subject to any legal requirements, the urgent need for CNP Infrastructure to achieving our energy objectives, together with the national security, economic objectives, together with the national security, economic, commercial, and net zero benefits, will in general outweigh any other residual impacts not capable of being addressed by application of the mitigation hierarchy. Government strongly supports the delivery of CNP Infrastructure, and it should be progressed as quickly as possible".

2.3.14 Paragraph 3.3.36 – 3.3.37 states

"*there is an urgent need for new electrical network infrastructure to meet our energy objectives. The security and reliability of the UK's current and future energy supply is very highly dependent on having an electricity network which will enable new renewable electricity generation, storage, and interconnection infrastructure that our country needs to meet the rapid increase in electricity demand required to transition to net zero while maintaining energy security. The delivery of this important infrastructure also needs to balance cost to consumers, accelerated timelines for delivery and the minimisation of community and environmental impacts".*

2.3.15 Like its predecessor, Draft NPS EN-5 covers electricity networks and focuses on policies and considerations that are specific to this type of energy infrastructure. It sets out how the SoS should consider EN-5 and EN-1 in tandem when evaluating applications relating to electricity networks infrastructure. It also lays out the general principles against which electricity network schemes should be assessed.

2.3.16 Paragraph 2.12.7 of EN-5 acknowledges the definition of offshore wind development, and the supporting onshore and offshore transmission infrastructure and related network reinforcements required as CNP and *"should be progressed as quickly as possible".*

National Planning Policy Framework

2.3.17 The revised National Planning Policy Framework (NPPF) was most recently updated in July 2021 (Ref 2.6). Paragraph 5 of the NPPF sets out that it does not contain specific policies for NSIPs and states that:

"These are determined in accordance with the decision-making framework in the Planning Act 2008 (as amended) and relevant national policy statements for major infrastructure, as well as any other matters that are relevant (which may include the National Planning Policy Framework)".

2.3.18 While EN-1 and EN-5 remain the prime decision-making documents, where they do not provide guidance, each technical chapter will consider whether there is important and

relevant policy in the NPPF that may require consideration by the decision-making authority. At this stage, it is not possible to confirm if such secondary guidance will be considered important or relevant by the SoS, and it is therefore included for completeness to allow the SoS to make such a determination.

2.3.19 Paragraph 154 states

"New Development should be planned for in ways that:

a) avoid increased vulnerability to the range of impacts arising from climate change. When new development is brought forward in areas which are vulnerable, care should be taken to ensure that risks can be managed through suitable adaptation measures, including through the planning of green infrastructure; and

b) can help to reduce greenhouse gas emissions, such as through its location, orientation and design. Any local requirements for the sustainability of buildings should reflect the Government's policy for national technical standards".

2.3.20 The NPPF is supported by the National Planning Practice Guidance (NPPG), a web-based resource.

2.4 Local Planning Policy

2.4.1 Regional and local planning policies have also been considered in the development of the Scoping Report. The main local planning policy documents that could be relevant to the Project comprises of the following (a summary of the relevant planning policies to be considered throughout the environmental assessment is included in the appropriate technical chapters):

- East Riding of Yorkshire Council
  - East Riding Local Plan 2012-2029, Adopted 2016 (Ref 2.7) (noting that a Local Plan Update was submitted to the Planning Inspectorate on 31 March 2023) (Ref 2.8);
  - East Riding of Yorkshire and Kingston Upon Hull Joint Minerals Local Plan 2016-2033, Adopted 2019 (Ref 2.9); and
  - East Riding of Yorkshire and Kingston Upon Hull Joint Waste Local Plan, Adopted 2004 (Ref 2.10).
- North Lincolnshire Council
  - North Lincolnshire Local Development Framework Core Strategy, Adopted June 2011 (Ref 2.11) (noting a new single Local Plan for North Lincolnshire is currently submitted for consultation and will replace the Core Strategy and the Housing and Employment Land Allocation Development Plan Documents) (Ref 2.12);
  - Housing and Employment Land Allocation Development Plan Document (DPD), Adopted March 2016 (Ref 2.13); and
  - North Lincolnshire Local Plan, Adopted May 2003, Saved Policies (Ref 2.14).
- Bassetlaw District Council
  - Bassetlaw District Local Development Framework Core Strategy and Development Management Policies, Adopted December 2011 (Ref 2.15).

- Nottinghamshire County Council
  - Nottinghamshire and Nottingham Waste Local Plan, Adopted January 2002 (Ref 2.16);
  - Nottinghamshire and Nottingham Waste Core Strategy, Adopted December 2013 (Ref 2.17) and
  - Nottinghamshire Minerals Local Plan, Adopted March 2021 (Ref 2.18).

2.4.2 Bassetlaw Local Plan 2020-2037 (Ref 2.19) is currently at Local Plan Examination and is anticipated to be adopted in Summer 2023. Although not formally adopted, this local plan will be considered within this Scoping Report as it anticipated the plan would be adopted when the ES is submitted.

2.5 Guidance

Holford Rules

2.5.1 Guidelines on overhead line routeing were first formulated in 1959 by Sir William (later Lord) Holford, as advisor to the Central Electricity Generation Board. Holford developed a series of planning guidelines in relation to amenity issues, that have subsequently become known as the "Holford Rules" (Ref 2.20) and remain a valuable tool in selecting and assessing potential route options as part of the options appraisal process. A summary of the Holford Rules can be found in Box 1. These have been an important consideration during the development of the Project. The Holford Rules are also expressly considered as part of EN-5.

Box 1: The Holford Rules

1. Avoid altogether, if possible, the major areas of highest amenity value, for example designations including Areas of Outstanding Natural Beauty (AONB).

2. Avoid smaller areas of high amenity value or scientific interest by deviation where this can be done without using too many angle towers, for example Sites of Special Scientific Interest (SSSI). An explanatory note states that where possible routes should be chosen which minimise effects on the settings of areas of architectural, historic and archaeological interest including Conservation Areas, Listed Buildings, Listed Parks and Gardens and Scheduled Monuments.

3. Other things being equal, choose the most direct line, with no sharp changes of direction to minimise use of angle towers.

4. Choose tree and hill backgrounds in preference to sky backgrounds, wherever possible; and where the line has to cross a ridge, secure this opaque background as long as possible and cross obliquely when a dip in the ridge provides an opportunity. Where there is no dip in the ridge, cross directly, preferably between belts of trees.

5. Prefer moderately open valleys with woods where the apparent height of towers will be reduced and views of the line will be broken by trees.

6. Where land is flat and sparsely planted, keep high voltage lines as far as possible independent of smaller lines, converging routes, distribution poles and other masts, wires and cables, to avoid 'wirescape'.

7. Approach urban areas through industrial zones, where they exist. When pleasant residential and recreational land intervenes between the approach line and the substation, consider carefully the comparative costs of undergrounding, for lines other than those of the highest voltage.

Horlock Rules

2.5.2 National Grid devised the Horlock Rules (Ref 2.21) in 2003, and these were subsequently updated in 2006. The Horlock Rules provide guidelines for the siting and design of new substations, or substation extensions, to avoid or reduce the environmental effects of such developments. In summary, like the Holford Rules, they facilitate consideration of environmental and amenity considerations within the design and siting of new substation infrastructure. These will be considered as the Project evolves during for any above ground infrastructure relating to sections of undergrounding where required.

2.6 National Grid Policy and Guidance

2.6.1 National Grid has its own policies and processes that are followed when developing projects. The key policies that are applicable to this project include Our Stakeholder, Community and Amenity Policy (Ref 2.1). This document describes the 10 commitments that National Grid has made to the way that electricity and gas works are carried out in the UK. This includes setting out how National Grid will meet its amenity responsibilities and how stakeholders and communities are involved on projects.

2.6.2 National Grid's approach to appraisal of design options is underpinned by a set of overarching principles which reflect out statutory duties, which assist in decision-making and which help achieve an appropriate balance between competing interests that must be taken into account during options appraisal (section 3.2).

2.6.3 National Grid also has an extensive range of process and guidance documents that govern how projects are designed and implemented. Specific documents are referenced later in the Scoping Report chapters where relevant.

3. Main Alternatives Considered

3.1 Introduction

3.1.1 Regulation 14(d) in conjunction with Schedule 4, paragraph 2 of the Environmental Impact Assessment (EIA) Regulations states that an Environmental Statement (ES) should include a description of reasonable alternatives studied by the promotor and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects. While there is no statutory requirement to include an assessment of alternatives in support of a request for a Scoping Opinion, the Planning Inspectorate's Advice Note Seven Environmental Impact Assessment: Preliminary Environmental Information, Screening and Scoping (Ref 1.4) recommends that a Scoping Report includes *"an outline of the reasonable alternatives considered and the reasons for selecting the preferred option".*

3.1.2 The current stage of the Project design is the result of an iterative process that commenced at Project inception when the initial need to reinforce the network was identified in Network Options Assessment 2020/2021 (NOA 2020/2021). National Grid has been through an iterative options appraisal process to determine the preferred option for the Project which comprises the Scoping Boundary (**Figure 1.1 Project Scoping Boundary**). A preliminary design exercise has also identified where it might be more appropriate to site the Project within the Scoping Boundary, the outcome of which is referred to as the graduate swathe – comprising coloured shading of varying intensity to indicate areas more likely (darker colour) and less likely (lighter colour) to be the location of the proposed infrastructure. The design process will continue up to the application for development consent in parallel with, and informed by, the EIA process and statutory consultation.

3.2 National Grid Approach to Options Appraisal

3.2.1 National Grid undertakes an options appraisal for their individual projects. There are often a number of different ways that a project can be developed, involving different locations, technologies or designs. Each project requires judgements and decisions about the most appropriate way to achieve the required outcome. The options appraisal process provides information to help inform those judgements.

3.2.2 Options appraisal is a robust and transparent process that is used to compare options and to assess the positive and negative effects they may have, across a wide range of criteria including environmental, socio-economic, technical, and cost factors. The aim is to find the most appropriate design solution that accords with relevant National Planning Policy, taking into account National Grid's statutory duties and having regard to established policy and principles (e.g. Holford Rules (Ref 2.20) and Horlock Rules (Ref 2.21). Further details can be found in Our Approach to Consenting (Ref 3.1).

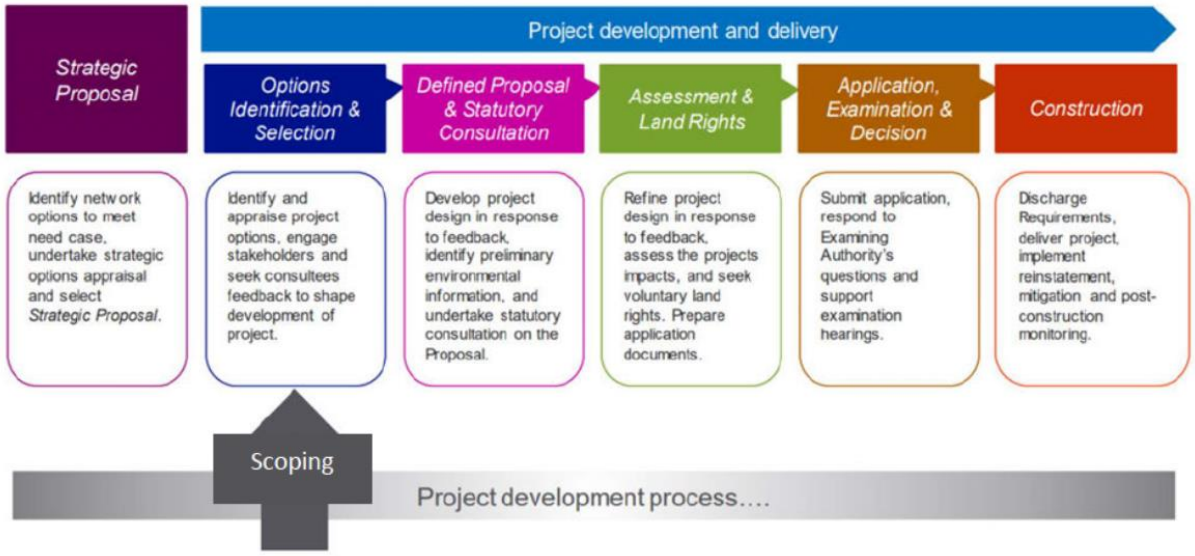
3.2.3 At each stage in the options appraisal process for the Project, transparent methods are used to inform the iterative decision-making and design development processes, including inputs from engineers and environmental consultants. Interim decision making takes into (and continues to take) account of feedback from both prescribed bodies, as defined in the Planning Act 2008, other stakeholders and the local community through an

extensive programme of engagement and consultation. In addition, projects are subject to continuous challenge and review to ensure the robustness of the decisions made in the light of changing environments (including technical, environmental, socio-economic and cost).

3.2.4 National Grid's Approach to Consenting (Ref 3.1) outlines the development process for major infrastructure projects, from initial inception to consent and construction. The approach is divided into the following six stages, as detailed on **Image 3.1**:

- Stage 1: Strategic Proposal;
- Stage 2: Options Identification and Selection;
- Stage 3: Defined Proposal and Statutory Consultation;
- Stage 4: Assessment and Land Rights;
- Stage 5: Application, Examination and Decision; and
- Stage 6: Construction.

Image 3.1 National Grid's Consenting Process (Our Approach to Consenting, National Grid, 2022)



3.2.5 Project decisions have considered National Grid's statutory obligations set out in Sections 9 and 38 of the Electricity Act 1989, its licence requirements and all other relevant considerations including the relevant existing and draft National Planning Statements (NPSs). The options appraisal has also considered other policy and guidance when making judgements and decisions on the Project including the Holford and Horlock Rules (Ref 2.20 and Ref 2.21).

3.2.6 The following sections provide a summary of the alternatives that have been considered at each stage to date.

3.3 Background to the Project

3.3.1 The strategic options considered for the Project were defined and appraised having regard to the needs case that requires the provision of increased network capacity whilst ensuring compliance with National Grid's statutory duties.

3.3.2 The need to reinforce the transmission system is reviewed on an annual basis by the Electricity System Operator (ESO) in response to predicted changes, such as new renewable and low-carbon energy generation forecasted to connect to the network. This review, which sets out the parts of the network that require reinforcing, is reported within the Electricity Ten Year Statement (Ref 3.2). Proposals that provide those reinforcements are then assessed through the Network Options Assessment (NOA) (Ref 3.3) which is published annually.

3.3.3 The need for the Project was first identified by the National Grid Electricity System Operator (ESO) in 2019. The subsequent NOA published in January 2020 recommended that NGET proceed to develop projects to help address the projected shortfall in boundary capability across network transmission boundaries B7a and B8 in order to improve transfer capability facilitating north to south power flows and reduce generation constraints.

3.4 Strategic Options Considered for the Project

3.4.1 National Grid Electricity Transmission (NGET) undertook a Strategic Options Appraisal at the Strategic Proposal Stage (Stage 1) which identified the most appropriate strategic solution to bring forward, considering a wide range of options for providing the necessary north-south power flows. The Strategic Options Appraisal is reported in the Strategic Options Report (Ref 3.4), which describes the future network requirements and the options appraised to meet these requirements. This report addressed two projects in particular, the North Humber to High Marnham and Grimsby to Walpole projects. The consideration of strategic options was part of an iterative process in response to interaction of a range of emerging energy projects and customer requirements. This report also considered how the projects interact with other proposals, which would connect power flows from the north of England and Scotland, with strategic options for the projects.

3.4.2 The strategic options appraisal process initially identified the need case for the works and identified a list of strategic options which could be further refined through evaluation processes. A chronological history of the projects that were evaluated is included in section 4 of the Strategic Options Report (Ref 3.4) The process identified a range of different options (paragraph 4.2.9, Ref 3.4), a combination of which satisfied the need as it was defined in 2019/20. These options were then appraised for environmental and socio-economic impact, considering a 20 km study area around the strategic option identified, in order to identify the likely significant effects and make comparisons between the options, with the objective of identifying an initial preferred option. The options were developed further to meet changes in the need case which were identified in 2023.

3.4.3 This initial list of potential strategic options was then reduced by removing those that would not deliver the required outcomes, with four onshore and one offshore option being taken forward for appraisal (section 6.2, Ref 3.4). The environmental and socio-economic appraisal of the options is detailed in Appendix G of the Strategic Options Report (Ref 3.4). Each of the shortlisted strategic options were appraised in accordance with National Grid's Approach to Consenting. Environmental and socio-economic issues were informed by desk study information and constraints mapping. For each strategic option, a study area was established within which the strategic option could reasonably be expected to be developed. The high-level options appraisal had particular regard for internationally or nationally important sites and other features that are of a sufficient scale and importance to inform decision-making at a regional level. A technical appraisal was also undertaken to ensure the option would satisfy the National Electricity Transmission System (NETS)

Security and Quality of Supply Standards (SQSS) and resolve the requirements set out in the need case, along with a cost evaluation of the option transmission works.

3.4.4 The Strategic Options report concluded that the establishment of a new primarily overhead line connection between a new Creyke Beck Substation and a new High Marnham Substation was the preferred option recommended to take forward.

3.5 Options Identification and Selection

3.5.1 Having identified the preferred strategic option, National Grid undertook a Corridor and Preliminary Routeing and Siting Study (CPRSS) (Ref 3.5).

Approach to Routeing and Siting

3.5.2 The routeing and siting approach is a phased process which enables National Grid to make informed and proportionate decisions on the selection of corridors and possible route alignments to be further refined. This process allows for options to be appraised on a comparable basis, so that a preferred corridor/option can be identified and progressed.

3.5.3 A brief summary of the process that was undertaken for this Project is provided below.

3.5.4 The first step in the routeing and siting process was defining the study area and identifying corridors within the study area, this was undertaken in six steps.

- **Step 1: Defining the Study Area** – this step sought to identify the extent of the study area within which route corridor options could be developed.
- **Step 2: Data Gathering** – this step identified constraints data and appropriate buffers from sites or features.
- **Step 3: Weight, Agree and Heat Map Features** – this step attributed a sensitivity rating to the constraints identified in Step 2 and a heat map produced. This was then reviewed to ensure the sensitivity weighting applied was appropriate.
- **Steps 4-6: Identifying and Defining Corridors** – the heat map, professional judgement, knowledge of routeing considerations including the Holford Rules were then used to identify early corridors.

3.5.5 Once the corridors had been identified an options appraisal process was undertaken which considered the following four main themes:

- environmental constraints;
- socio-economic factors;
- technical considerations; and
- cost.

Study Area

The routeing and siting Study Area was defined through a five-phase process which is detailed in the CPRSS (Ref 3.5) and illustrated on **Figure 3.1 Routeing and Siting Study Area**. The approach to developing the study area for the Project balanced National Grid's duty to develop an economical system of transmission (Section 9 of the Electricity Act 1989), with Holford Rule 1 which is to *"avoid altogether, if possible, the major areas of highest amenity value, by so planning the general route of the first line in the first place,*

even if the total mileage is somewhat increased in consequence" and Holford Rule 3; "other things being equal, choose the most direct line, with no sharp changes of direction and thus with fewer angle towers', whilst also considering possible opportunities to follow existing transmission line corridors.

3.5.6 The northern extent of the Study Area is located between Hull in the east, and Drax in the west, partially bounded to the north by the routes of two existing overhead transmission lines and by the River Ouse to the south. This section is located within East Riding of Yorkshire and primarily comprises the open flat landscape of the Humberhead Levels National Character Area (NCA) in the west and the elevated landscape of the Yorkshire Wolds NCA in the east. The primary land use comprises arable farmland bounded by field drains, and scattered settlements including South Cave, Gilberdyke and Howden.

3.5.7 The Study Area was designed to exclude the River Humber itself, taking into account the technical challenges associated with crossing it. Instead, the area extends to the west of the confluence with the River Ouse. The River Ouse runs through the study area from Drax in the west to the southwest of Blacktoft in the east where it joins with the River Trent to form the Humber. The Humber Estuary Special Area of Conservation (SAC), Special Protection Area (SPA) and Ramsar sites extend from east to west across the Study Area along the River Ouse to the north of Airmyn, bounded by the A614. The sites also extend south along the River Trent, where the Humber Estuary SPA ends to the east of Adlingfleet, and the Humber Estuary SAC and Ramsar sites continue south to Althorpe, bounded by Keadby Bridge. This area is within the Humberhead Levels NCA and is an open flat landscape comprising arable farmland in the east to the increasingly industrial landscape around Goole and Drax in the west.

3.5.8 To the south of the River Ouse in the central section of the routeing and siting Study Area, the Humberhead Levels NCA dominates the routeing and siting Study Area to Retford in the south and Laughton in the east. The landform is flat and open in this area, and the eastern section of the routeing and siting study area is covered by the Isle of Axholme which comprises settlements including Westwoodside, Haxey and Epworth. The land use within this area is predominantly arable farmland with infrastructure including Keadby Power Station, Keadby Windfarm, and the existing electricity transmission network. The road network comprises major routes including the M62, M18 and M180 which connect the large settlements of Goole, Thorne, Stainforth and Hatfield. The Thorne and Hatfield Moors SPA, SAC, SSSI and National Nature Reserve are located within the central section of the Study Area. To the south of these sites lies Doncaster Sheffield Airport in the western extent of the routeing and siting Study Area.

3.5.9 To the south of the Humberhead Levels lies the Trent and Belvoir Vales NCA which begins in the Gainsborough area and covers the southeastern extent of the routeing and siting Study Area. The landform in this area is undulating with a broad gently rolling ridge running north south, separating the Trent and Idle valleys. Retford (Gamston) Airport lies within the western extent of the routeing and siting Study Area. The land use within this area is predominantly arable farmland which is intersected by the River Trent.

Route Corridor Options

3.5.10 Four preliminary route corridor options were identified in the CPRSS (Ref 3.5) between the start and end points for the Project, as illustrated on **Figure 3.2 Route Corridor Options**. The four preliminary corridors were divided into sections, links and loops for appraisal, and this combined assessment process then led to the identification of an emerging preferred corridor for non-statutory consultation purposes.

Corridor 1

3.5.11 Corridor 1 begins to the north of Cottingham in the area around the existing Creyke Beck Substation and then routes in a north-westerly direction to the south of Market Weighton. From here, it routes in a south-easterly direction towards Barmby on the Marsh where it crosses the River Ouse. From the River Ouse, the corridor continues south passing the towns of Thorne, Bawtry and Retford before ending at the area around the existing High Marnham Power Station. Corridor 1 is located furthest west and was the longest corridor of the options appraised.

3.5.12 Constraints to note for this corridor include the Yorkshire Wolds Important Landscape Area (ILA); River Ouse crossing; Thorne and Hatfield Moors designated sites; local plan allocations and proximity to Doncaster Sheffield Airport and Retford (Gamston) Airport. The corridor provided an opportunity to avoid crossing the sections of the River Ouse that are internationally designated for their bird interest (Humber Estuary designated sites). It was also recognised as potentially providing opportunities to close parallel existing overhead lines; between Creyke Beck and Market Weighton alongside the existing 4ZR 400kV overhead line for approximately 17.5 km; between Spaldington and Barmby on the Marsh alongside the existing 4VC 400kV overhead line for approximately 8.5 km; and between Blyth and Retford alongside the existing XE 275 kV overhead line for approximately 8 km.

Corridor 2

3.5.13 Corridor 2 begins with a northern and southern option. Both the northern and southern options merge at Bellasize and the corridor then routes south-west towards the River Ouse. Corridor 2 provides three separate crossing opportunities for the River Ouse to the east and west of Swinefleet and Saltmarshe. South of the River Ouse, Corridor 2 continues south passing settlements such as Crowle, Epworth and Sturton le Steeple before ending at the area around the existing High Marnham Power Station.

3.5.14 Key constraints to note for this corridor include the Yorkshire Wolds ILA; River Ouse crossing; River Ouse and Thorne and Hatfield Moors designated sites; Isle of Axholme Area of Special Historic Landscape Interest; and proximity to several wind farms.

Corridor 3

3.5.15 Corridor 3 begins to the north of Cottingham in the area around the existing Creyke Beck Substation and then routes in a south-westerly direction to Ellerker, passing to the north of Skidby and Brantingham. From Ellerker, the corridor continues in a south-westerly direction to the north of Yokefleet and Blacktoft, crossing the River Ouse in between these settlements. From the River Ouse, the corridor continues south passing the settlements of Garthorpe, Althorpe, Epworth, Misterton and Gainsborough before ending at the area around the existing High Marnham Power Station.

3.5.16 Key constraints to note for this corridor include the Yorkshire Wolds ILA; River Ouse crossing and Humber Estuary designated sites and Blacktoft Sands RSPB Nature Reserve; Keadby Windfarm and existing transmission infrastructure. The corridor provided opportunity to close parallel existing electricity transmission infrastructure, including the existing 4ZQ 400 kV overhead line between Creyke Beck and Keadby and the several existing 400 kV routes south of Keadby to High Marnham.

Corridor 4

3.5.17 Corridor 4, which branches from Corridor 3, begins with a crossing of the River Trent to the south-west of Scunthorpe and south of Burringham. The corridor then routes south-east through agricultural fields crossing the M180, M181 and A159 to the west and south of Scunthorpe before routeing south-east to avoid Scotter and Laughton Forest. From Scotter, the corridor continues south past Scotton, Kirton in Lindsey and Northorpe before crossing the A631 at Corringham, and continuing south passing settlements including Upton, Willingham by Stow and Stow. The corridor then routes south crossing the A1500, A156, A57 and A1133 before routeing in a south-west direction ending at the area around the existing High Marnham Power Station.

3.5.18 Corridor 4 was the furthest east corridor option appraised and was the shortest as it does not connect to Creyke Beck, instead connecting to the northern section of Corridors 2 or 3 at a point south-west of Scunthorpe to complete the route. Key constraints to note for this corridor include five existing 400 kV overhead lines, which would need to be crossed, in addition to the River Trent and the road and rail network. The corridor provided an opportunity to avoid the Trent Valley and route away from the existing electricity transmission infrastructure in this area through a relatively open and unconstrained landscape within west Lincolnshire. Corridor 4 was the only corridor to predominantly route to the east of the River Trent and the only corridor to route into High Marnham from the north-east.

Option Selection

3.5.19 Following the options appraisal (Chapter 6 to Chapter 9 in the CPRSS (Ref 3.5)), the appraisal findings were considered by the Project team considering environmental, engineering, cost and technical aspects. The environmental, social and technical constraints and opportunities identified in the preliminary corridors were discussed and considered alongside the likely cost performance, and the performance of the different corridor options (including loops and links between the corridors) were carefully compared and assessed. A preferred preliminary option was identified in each section of the study area having regard to relevant National Planning Policy, National Grid's statutory duties and all relevant policies and principles. On balance, the preliminary option was considered to provide the most appropriate overall solution.

3.5.20 The preferred preliminary corridors were not considered as whole end-to-end corridors for the purposes of the comparative evaluation of options because each preliminary corridor has localised constraints which could be avoided through alternative routeing opportunities (i.e., use of links and loops between sections of preliminary corridors). Therefore, it was likely that a combination of sections of preliminary corridors, links and loops, rather than a single corridor would be used to route between Creyke Beck and High Marnham. As a result, the comparative evaluation was undertaken on the basis of defined components of any given preliminary corridor, link or loop and comparison of these more locally defined evaluation components rather than the end-to-end preliminary corridor. The defined components considered under each step are set out below. The defined components were considered in isolation and broadly approached in a sequential manner routeing north to south:

- Step 1 – consider the preliminary corridors across the Yorkshire Wolds;
- Step 2 – consider how to link the optimum preliminary corridor from Step 1 between the Yorkshire Wolds and the River Ouse;
- Step 3 – consider the best performing preliminary corridor across the River Ouse;

- Step 4 – consider options from the River Ouse crossing point to High Marnham; and
- Step 5 – consider all evaluation components as end-to-end solutions to ensure that there were no circumstances where an accumulation of smaller constraints in a 'discarded' option might justify reconsidering decisions in identification of the components.

3.5.21 The emerging preferred corridor identified in the CPRSS consisted of:

- a new overhead line closely parallel to the existing 4ZQ 400 kV overhead line from the edge of the Yorkshire Wolds to near Luddington (Lincolnshire) including crossing the River Ouse alongside the existing overhead line river crossing;
- a new overhead line from Luddington to near Beltoft, looping west around Keadby Windfarm to pass east of Ealand and then parallel or close parallel to the two existing 400 kV overhead lines south to near the crossing of the Warping Drain, south-east of Haxey; and
- a new overhead line from there looping west to pass west of Misterton, then south, passing west of the line of villages along the edge of the Trent valley (Wallingham, Beckingham, Sturton le Steeple, North and South Leverton, Tresswell and Woodbeck) to pass west of East Drayton then approach High Marnham from the north-east.

3.5.22 Overall, the conclusion was drawn that routeing the new overhead line closely parallel to the existing 400 kV network would minimise the overall environmental impacts – concentrating impacts in areas already impacted rather than spreading them more widely. The main exceptions to this are at Keadby with the technical constraints around the Keadby Windfarm and south of Haxey, identifying a new corridor three to four kilometres west of the existing 400 kV overhead lines in the Trent Valley where the increasing numbers of existing lines form a broad and complex network.

3.6 Development of the Scoping Boundary

3.6.1 A final preferred alignment of the Project has not yet been confirmed. To retain flexibility, a Scoping Boundary (**Figure 1.1 Project Scoping Boundary**) has been defined to represent the maximum extent of the Project, which closely aligns with the route of the emerging preferred corridor identified by the CPRSS (Ref 3.5). It has taken into account further technical, physical, and environmental constraints, leading to adjustments in certain areas. These modifications have occasionally resulted in a narrower boundary, while in other cases, it has been expanded to allow for alternative routing options that circumvent the identified sites and features.

3.6.2 A preliminary design exercise was conducted to determine the most suitable location within the corridor for the Project. This assessment considered the Holford Rules and took into account local sites and features, such as residential properties, extensive woodlands, and existing infrastructure. The outcome of this exercise is represented by a 'graduated swathe', which employs varying shades of colour to indicate areas with higher (darker colour) or lower (lighter colour) likelihood of accommodating the proposed infrastructure. It is important to note that while the graduated swathe provides guidance for potential routes, adjustments may occur during the pre-application stage of the Project. To ensure the EIA encompasses this flexibility, the study areas outlined in this report are based on the Scoping Boundary depicted in **Figure 1.1**.

4. Description of the Project

4.1 Introduction

4.1.1 The Project will provide reinforcement of the electricity transmission network between a proposed new substation near Creyke Beck, in Yorkshire and a proposed new substation near High Marnham in Nottinghamshire. The proposed new substations do not currently form part of the Project.

4.1.2 This chapter sets out the evolving description of the Project and has been split into the following sections, which describe:

- a description of the infrastructure proposed as part of the Project;
- the construction methods that are outlined for installing the infrastructure associated with the Project;
- operation and maintenance requirements; and
- how the Project is proposed to be decommissioned if required.

4.2 Project Description

4.2.1 The Scoping Boundary is illustrated in **Figure 1.1 Scoping Boundary**. The Project is at an early stage of development, however indicative scope is set out below:

- works to facilitate the connection of a new overhead line (OHL) into a proposed new substation, close to the existing Creyke Beck Substation in the East Riding of Yorkshire;
- a new 400 kV OHL route, approximately 90 km in length between a proposed new substation close to the existing Creyke Beck Substation and a proposed new substation close to the existing High Marnham Substation;
- reconfiguration of a section of the existing 400 kV ZDA[2] OHL to the east of Crowle and west of Keadby Power Station, potentially including cable sealing end compounds (CSEC's), to facilitate the crossing of the new OHL;
- works to facilitate the connection of a new OHL into a proposed new substation close to the existing High Marnham Substation, in Bassetlaw District in Nottinghamshire;
- potential cable sealing end compounds and/or tunnel head houses for any underground cable sections of the Project
- potential alterations to sections of existing transmission OHLs (such as 4ZQ, 2KN, 4KG, 4TM, ZDA, 4VE, 4VK, and/or 4ZM); and
- potential for removal/reconfiguration/diversion of utility assets.

[2] ZDA route running between Drax, Keadby and Thorpe Marsh substations

Scoping Boundary

4.2.2 The precise location of the components of the Project including temporary working areas are not known at this stage. This will be refined through the development of the Project and will take account of:

- ongoing technical studies and design development;
- environmental surveys and assessment; and
- feedback received through stakeholder engagement and non-statutory and statutory consultation.

4.2.3 The Scoping Boundary has therefore been designed to represent the area within which the proposed Project would be located.

Good Design Principles

4.2.4 The Project will be designed, constructed, maintained, and operated in accordance with applicable health and safety legislation and regulations. The Project will comply with relevant design safety standards including the National Electricity Transmission System Security and Quality of Supply Standards (NETS SQSS) which sets out the criteria and methodology for planning and operating the National Electricity Transmission System. National Grid policies and processes, which contain details on design standards required to be met when designing, constructing, maintaining, and operating assets such as those proposed on the project, will be adhered to.

4.2.5 **Chapter 2, Regulatory and Planning Context** sets out the overarching policy relevant to the Project including NPS EN-1 (Ref 2.2) and EN-5 (Ref 2.3). Paragraph 4.5.1 of EN-1 states:

"The visual appearance of a building is something considered to be the most important factor in good design. But high quality and inclusive design goes far beyond aesthetic considerations. The functionality of an object — be it a building or other type of infrastructure — including fitness for purpose and sustainability, is equally important. Applying "good design" to energy projects should produce sustainable infrastructure sensitive to place, efficient in the use of natural resources and energy used in their construction and operation, matched by an appearance that demonstrates good aesthetic as far as possible".

4.2.6 National Grid's options appraisal allows good design to be considered as part of the design process. This includes locating project features away from sensitive receptors, where practicable, and considering measures that can be embedded into the design regarding the final features.

4.2.7 **Table 4.1** outlines the principle embedded measures that have been included to date. As the Project moves forward more embedded measures will be identified and included within the Project design. The Project will also be designed to comply with existing National Grid standards and relevant external guidance and processes, such as the International Commission on Non-Ionizing Radiation Protection (ICNIRP) guidelines for reducing effects in relation to electric and magnetic fields (EMFs). These measures will mean that the designs will meet the functions required.

4.2.8 BREEAM Infrastructure Projects v6 (formerly known as CEEQUAL) Technical Manual (Ref 4.1) (or an equivalent sustainability assessment scheme) guidance will be used to help integrate positive environmental and social design into the Project.

Table 4.1: Embedded Measures

Embedded Measure	Benefits
Sensitive routeing and siting	Avoids and reduces, as far as practicable, impacts on identified receptors, in line with NPS and Holford Rules.
Selection of the most appropriate pylon type.	Possible benefits of using low height pylons and alternative pylon design would, in the appropriate circumstances, have the ability to better integrate the transmission lines into the immediate and wider landscape setting over traditional lattice pylons.
The Project would be designed in accordance with National Grid design standards and would be compliant with the guidelines and policies relating to EMF stated in NPS EN-5 (Ref 2.3), including the ICNIRP guidelines (1998).	Compliance with these guidelines and policies mean that the Project would already have designed out potential effects from EMF to a level to meet health and safety standards.
The Project would be designed to comply with design safety standards including NETS SQSS and the suite of National Grid policies and processes which contains details on design standards required to be met when designing, constructing, and operating its projects.	Existing National Grid processes are designed to identify potential safety risks during construction and operation and to design these out at each stage of Project development.

Approach to materials and waste

4.2.9 The Project would require the use of new materials during construction such as galvanised steel for the pylons, reinforced concrete for the foundations, insulator sets (typically glass, porcelain or polymeric) and aluminium/copper conductors. Further information regarding materials will be provided within the project description within the ES.

4.2.10 The material sources are unlikely to be identified until the detailed design stage of the Project, which would happen post-consent. The nature of the Project means that it is difficult to use secondary sources during construction of the Project, as this can affect the operation and the design life of the Project. However, National Grid has existing processes in place to source materials from sustainable sources and to use recycled materials where these do not compromise the required design standards and operational life of the Project.

4.2.11 Temporary materials, such as aggregate for access routes and site compounds, works cabins and security fencing would be required during construction. Where practicable temporary materials would be sourced from other construction projects within the region and reused at other construction projects after completion of the Project.

4.2.12 Waste materials would be produced by the Project. The contractor would be required to produce a Site Waste Management Plan (SWMP) prior to construction (commitment

GG22 in **Appendix 4.A Outline Code of Construction Practice**). This would set out the measures to reduce the generation of waste in the first place and appropriate measures to reuse and recycle materials where practicable. It would also identify appropriate waste facilities to dispose of materials.

4.2.13 Soil may need to be removed from site in certain circumstances, such as where the soil was found to be contaminated, in which case, the soils would be managed in an appropriate manner, as set out in the good practice measures within the **Appendix 4.A Outline Code of Construction Practice** and the future SWMP.

Approach to energy consumption

4.2.14 The Project aims to support the UK's transition to Net Zero emissions by 2050. As outlined in **Chapter 3, Main Alternatives**, National Grid has a statutory duty to develop and maintain an efficient, coordinated, and economical electricity transmission system. Therefore, the Project would contribute to supporting the UK's Net Zero transition.

4.2.15 The Project would consume energy during manufacture and construction. The Project will consider a range of measures to reduce energy consumption during construction, such as the use of energy efficient plant and tools. The Project will aim to use a local grid connection for temporary site power, where viable. Where not viable an alternative sustainable option should be used, such as appropriately sized alternatively fuelled or hybrid generators, where practicable.

4.2.16 A Construction Traffic Management Plan (CTMP) will set out measures to reduce journeys, such as car sharing and using public transport where practicable. It will also set out commitments regarding using electric vehicles or vehicles conforming with emission standards ratings (see commitment TT01 and TT02 in **Appendix 4.1 Outline Code of Construction Practice**).

4.2.17 Energy consumption during maintenance and operation would be limited to the energy required to operate the Project. National Grid also has existing processes in place to monitor its energy consumption across the network. If consented, the operational energy requirements would be managed as part of the wider network operation.

4.2.18 The measures outlined above would reduce the energy consumption of the Project during both construction and operation in line with the good design principles.

Overhead Line

4.2.19 The OHL would comprise of conductors supported by pylons. A typical pylon operating at 400 kV is approximately 50 m in height[3]. A typical span distance between pylons is approximately 350 m. In broad terms there are typically three pylons for every kilometre of overhead line.

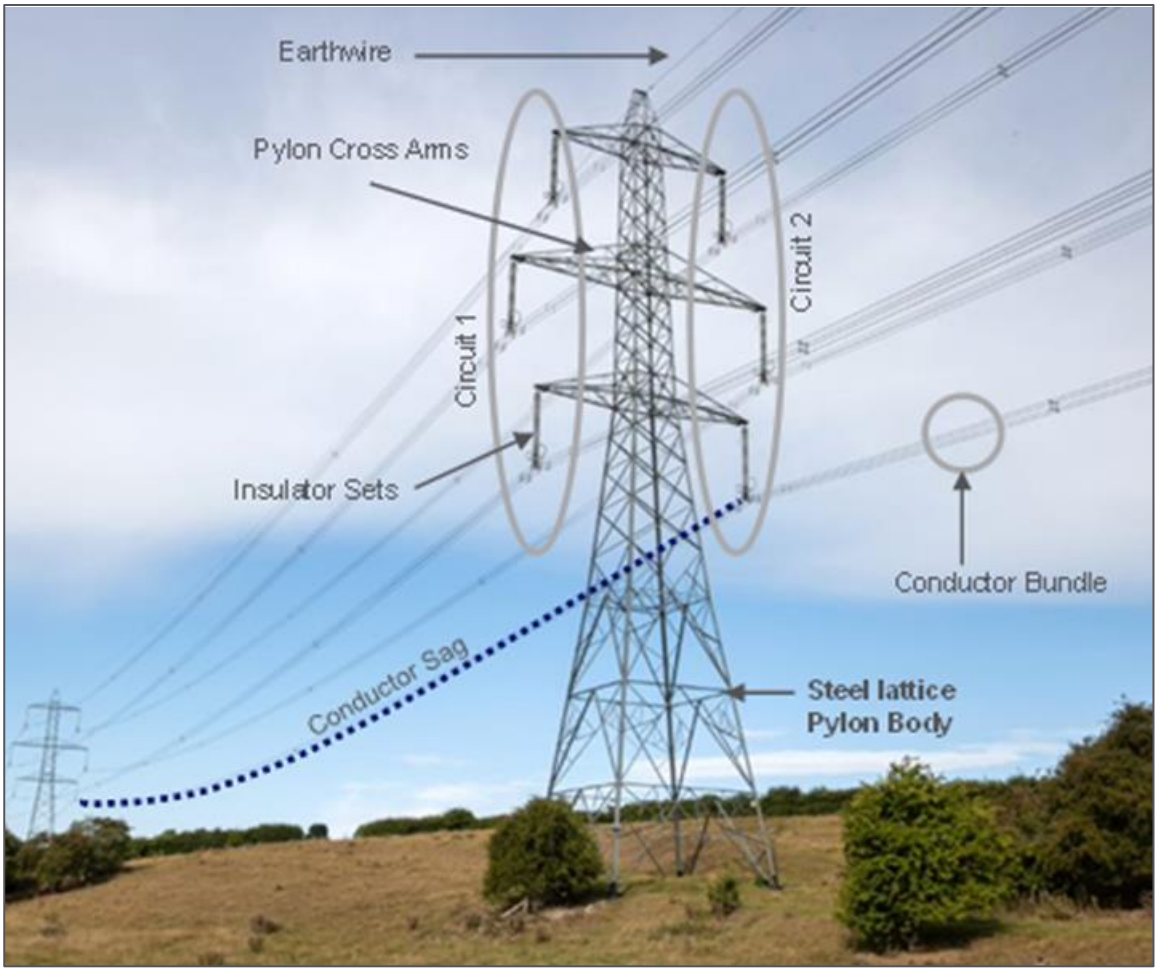
4.2.20 Pylons are either suspension pylons, from which the conductor is simply suspended, or tension pylons, which are more robust structures that hold conductors in tension where the alignment of an OHL changes direction or to maintain tenson in long straight sections of the route. The conductors are connected to the pylon by an insulator assembly consisting of a set of insulators (components made from a material with a high resistance to the flow of electric current such as glass or porcelain) and steel fittings and conductor clamps. Additional fittings, such as spacers and vibration dampers, would be fitted to the

[3] Localised requirements may prompt the need for taller pylons. For example, the existing pylons either side of the crossing of the River Ouse at Ousefleet, are some 110 m in height.

conductors. Spacers prevent the conductors from touching each other and vibration dampers prevent oscillations from the conductors from reaching the insulator fittings and minimise effects of fatigue loading. Arcing horns will also be required, which are required to protect insulators from damage due to dangerous electrical conditions, such as overvoltages due to electrical faults or lightning strikes.

4.2.21 The main components of an overhead line are shown in **Image 4.1**, which shows a typical steel lattice suspension pylon.

Image 4.1: Components of a Typical Transmission Connection



4.2.22 Where the route of the overhead line changes, angle pylons are required to accommodate the additional sideways strains with the insulators tensioning the conductors horizontally to keep conductors aligned (**Image 4.2**).

Image 4.2: Suspension Pylon (left) and Angle Pylon (right)

Pylons

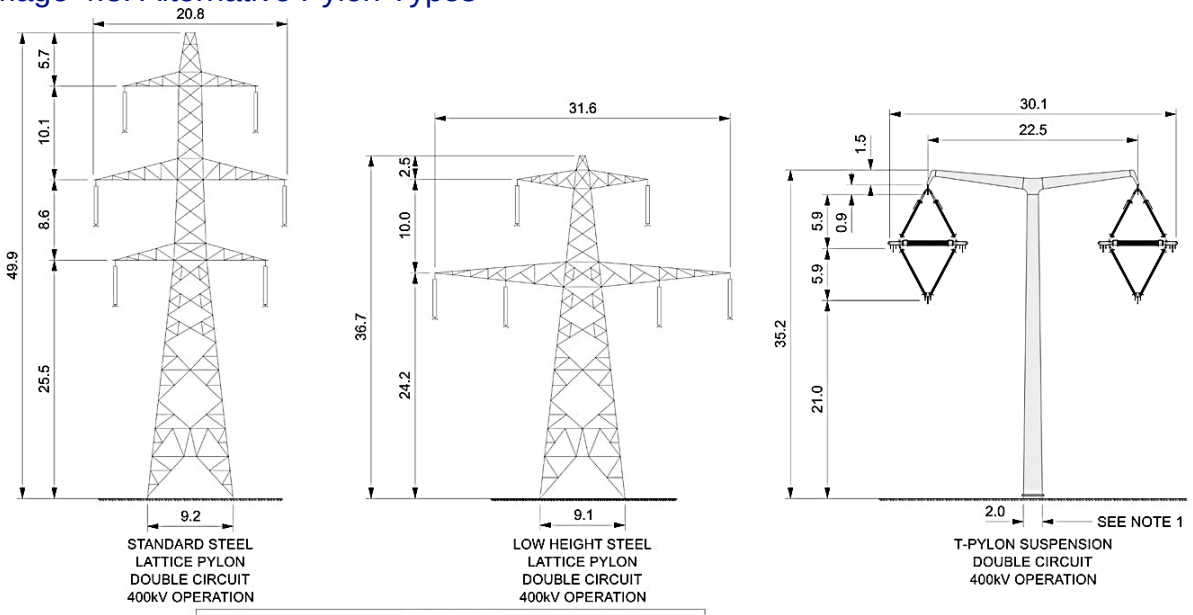
4.2.23 It is likely that the proposed pylons for the Project would comprise of steel lattice with three arms on either side of a central body. Typical heights for steel lattice pylons are around 50 m, however the proposed height of each pylon would depend on the specifics of each location such as topography, land use and crossings. For example, the existing pylons either side of the River Ouse near Ousefleet are approximately 110 m in height, due to the requirement to maintain clearances. Indicative pylon heights will be provided within the ES which will be limited by a vertical Limit of Deviation (LoD) to be defined through the development of the Project.

4.2.24 Alternative pylon designs may also be considered, where mitigation (e.g. for landscape and visual effects) is required. Alternative designs which may be considered are:

- Low height steel lattice; and
- T pylon.

4.2.25 Alternative pylon designs are illustrated in **Image 4.3**.

Image 4.3: Alternative Pylon Types



CHARACTERISTIC	PYLON TYPE: STANDARD LATTICE PYLON	LOW HEIGHT LATTICE PYLON	T-PYLON	
STANDARD HEIGHT	49.9m	36.7m	35.2m	
STANDARD PYLON DESIGN WIDTH	20.8m	31.6m	30.1m	
STANDARD BASE DIMENSIONS	9.2m SQUARE	9.1m SQUARE	2m DIAMETER	SEE NOTE 1
MIN & MAX PYLON HEIGHTS	43.9m - 67.9m	32.23m - 45.73m	32.2m - 38.2m	
MIN & MAX PYLON BASE WIDTHS	7.96m - 13.32 SQUARE	7.93m - 11.26m SQUARE	APPROX 2m MIN to MAX	SEE NOTE 1

NOTE 1

1. FOR T-PYLON SUSPENSION, 2m IS MEASURED ABOVE BASEPLATE. EXACT DIMENSION AT GROUND LEVEL MAY VARY.

Conductors and insulators

4.2.26 Conductor type has not been selected at this stage, however a maximum of four conductors per phase would be required. This would result in a total of 24 phase conductors in addition to an earth wire conductor.

4.2.27 Insulators can be made of different types of material, but the most common industry standard is either glass, porcelain, or polymeric.

4.2.28 Suspension pylons would typically have a single insulator string hanging vertically downwards from each crossarm end to carry the conductor bundle. A tension pylon would typically have one insulator string per conductor (i.e. two insulator strings for a conductor bundle consisting of two conductors) and these are orientated horizontally outwards from the crossarm ends and take the tension of the conductors.

Line swap overs

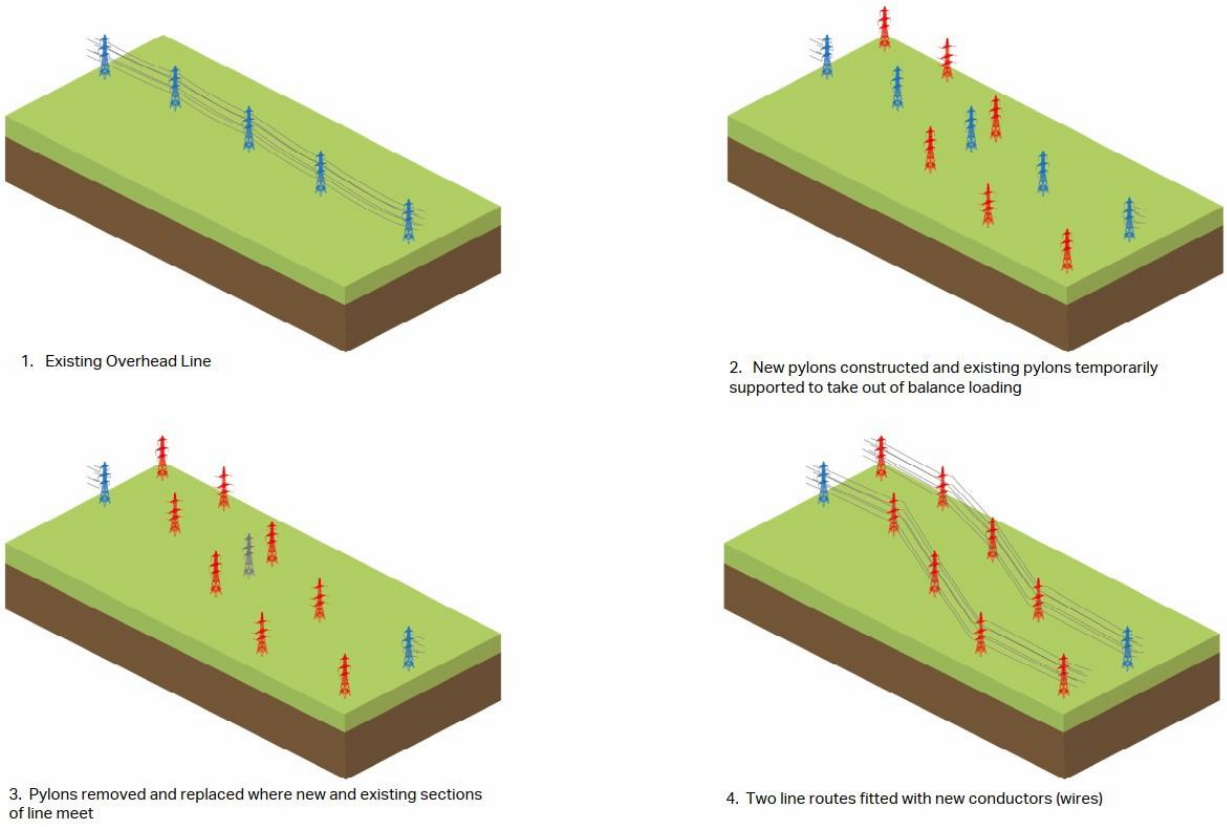
4.2.29 The emerging preferred route corridor selected for the Project and subsequently the Project Scoping Boundary includes sections where a parallel design with the existing 400 kV OHLs could be developed. The exact alignments will be developed through ongoing technical and environmental studies and surveys alongside stakeholder and consultation feedback. Where parallel designs are taken forward, there may be a need for line swap overs.

4.2.30 Line swap overs comprise reconfiguration of an existing OHL to allow the OHL routes to remain parallel without the need for a line ‘duck-under’ or cross over. Line swap overs allow for the continuation of a route from a section of new pylons to a section of existing pylons, whilst the parallel route is a continuation of a route from a section of existing pylons to a section of new pylons.

4.2.31 Line swap overs are achieved by removing a section of existing line and forming two unconnected ends, which are then each connected to a new line approaching from either side. A line swap over is illustrated schematically on **Image 4.4**.

4.2.32 Temporary diversions of localised sections of the existing route may also be required to ensure continuity of supply on the affected routes

Image 4.4: Schematic of a Line Swap Over



Limits of Deviation

4.2.33 As recognised by the Planning Inspectorate's Advice Note Nine, a necessary and proportionate degree of flexibility needs to be incorporated into the design of a development so that unforeseen issues encountered after a development has been consented can be addressed. In this instance, for example, previously unidentified poor ground conditions, or the identification of significant unrecorded archaeological remains, may require a pylon to be re-sited. Therefore, to allow for this necessary and proportionate degree of flexibility, limits of deviation (LoD) would be developed for the Project components which would then be subject to a Requirement of the DCO. The LoD's would provide a maximum distance or measurement of variation within which every component of the Project would be located.

4.2.34 In respect of a 400 kV OHL or UGC, LoD would be applied horizontally and vertically.

Substation Connections

4.2.35 The Project would connect into proposed new substations near Creyke Beck, in Yorkshire and near High Marnham in Nottinghamshire. The proposed new substations do not form part of this Project and would be subject to separate consent applications.

4.2.36 At this stage the exact locations of both proposed substations are unknown.

Undergrounding

4.2.37 The Project includes for the potential undergrounding of a section of the existing ZDA OHL where the new overhead would cross this asset to the east of Crowle and west of Keadby Power Station.

4.2.38 Further sections of undergrounding may be required as the Project is developed. This could include:

- installing a section of the proposed 400 kV OHL underground in order to mitigate an environmental effect that can't be avoided or reduced to an appropriate level through other measures;
- as a means of avoiding a routeing constraint; and
- undergrounding other third-party assets which are impacted by the Project, where these are included for within the DCO for this Project.

Underground cables

4.2.39 The typical characteristics of 400 kV underground cables is set out in **Table 4.2**.

Table 4.2: Typical characteristics of 400 kV underground cables

Characteristic	Description
Working width	Typically[4] up to 120 m
Number of cables	Up to 18
Number of trenches	Up to 6
Trench width	Typically 1.5 m
Trench depth	Typically 1.2 m
Minimum depth of cover	Typically[5] 900 m
Backfill material	Soil and cement bound sand (CBS) or other thermally suitable material
Cable section length	Typical cable section length: Up to 1000 m
Above ground infrastructure	At each cable joint there may be an above ground kiosk, which will be used to monitor and occasionally test the underground cables.

Cable Sealing End Compounds

4.2.40 Cable Sealing End Compounds (CSEC) are required where a section of OHL transitions to a section of underground cable and vice versa. These are likely to occupy a footprint

[4] Some sections such as trenchless crossings may require greater working widths
[5] This depth will vary based on land use, constraints and installation techniques

of approximately 90 m x 50 m, subject to design requirements. Each CSEC would comprise an adjacent pylon with down leads connecting to one or more gantries which then connect to CSECs and other electrical equipment. In addition, a small control building may be required in each compound. Each compound would have a permanent access, be surrounded by a security fence to protect the equipment and incorporate landscape planting where appropriate. Examples of sealing end compounds are shown in **Image 4.5**.

Image 4.5: Example 400 kV sealing end compound

Tunnel Head Houses

4.2.41 In some instances, there may be a need to cross a feature such as a watercourse or road using a trenchless crossing technique either for technical reasons or to avoid an environmental effect. Where the feature is significant, or the ground conditions require the trenchless crossing technique may need to be a tunnel. Should a tunnel be required Tunnel head houses (THHs) would likely be required at either end of the tunnel to provide maintenance access to the tunnel and tunnel shafts. They may also need to contain ventilation equipment in order to regulate the temperature in the tunnel and shafts. The specific location, size and equipment required at each THH would be determined on a site-by-site basis should a tunnel be required on the Project.

Limits of Deviation and Parameters

4.2.42 The location of any section of underground cable, inclusive of any trenchless crossing (if required) would require a LoD to allow for a necessary and proportionate degree of flexibility.

4.2.43 Where CSECs or THHs are required, these will also require a degree of flexibility to be incorporated into the design so that unforeseen issues encountered after a development has been consented can be addressed. This flexibility will be limited by LoD such as the height of buildings or structures and zones in within which certain elements of the above ground installation could be installed. These parameters would be subject to a Requirement of the DCO.

4.3 Construction

4.3.1 This section describes how the infrastructure described above would typically be constructed and installed. An Outline CoCP has been produced and is included in **Appendix 4.1 Outline Code of Construction Practice**. The topic chapters (6-19) have

taken account of the control and management measures which are set out in the Outline CoCP when determining the proposed scope of assessment.

Construction Programme

4.3.2 Subject to gaining development consent, construction works would be expected to start in 2027 and be completed by 2031. Certain advance works (such as archaeological trial trenching or protected species mitigation) may take place in advance of the main construction period.

4.3.3 Reinstatement would be required following the construction period

4.3.4 The construction programme will be developed as the Project progresses and will take account of seasonal constraints such as protected species breeding or hibernation seasons.

4.3.5 Due to the linear nature of the Project, construction activities are expected to be transient, moving along the length of the working area over time. Therefore, the works in any given area would be shorter duration than the overall construction programme. Further details on the phasing of the project will be set out within the ES.

Construction Compounds

4.3.6 Construction activities would begin with the preparation and installation of construction compounds. The location of the construction compounds will be determined through the development of the Project presented in the ES.

4.3.7 A generic layout for a construction compound typically includes the following:

- security gate house;
- plant and construction vehicle parking;
- site office parking area;
- site offices and welfare facilities;
- fencing;
- lighting;
- laydown area;
- storage area;
- wheel wash;
- collection, storage and disposal of surface water, in addition to water from within the compound including grey and foul water;
- soil bund;
- spoil storage area;
- power supplies (where feasible to do so alternatively fuelled generators will be used and/or a local grid connection); and
- fuel storage.

4.3.8 Smaller satellite compounds may be required at specific working areas along the route to ensure provision of welfare, storage, and mess room facilities for site operatives.

Overhead Line Construction

4.3.9 The construction of the 400 kV OHL would generally follow the sequence outlined below as work progresses along the length of the OHL:

- survey;
- ground Investigation;
- installation of bellmouths and creation of visibility splays;
- installation of stock proof fencing and gates or equivalent;
- topsoil stripping, temporary drainage installation where required;
- installation of access tracks (including culverts and bridges) and demarcated pylon working areas;
- installation of pylon foundations (pad and column, mini pile, tube pile or bespoke);
- working area and layout of steelwork in preparation for erection;
- assembly (painting if required) and erection of steelwork;
- installation of protection prior to stringing of conductors, including scaffolding;
- installation of insulator assemblies on suspension pylons;
- establishment of machine sites for conductor stringing;
- conductor stringing;
- temporary earthing;
- installation of insulator assemblies on tension and terminal pylons;
- installation of tower signage including safety notice plate and anti-climbing devices;
- removal of construction equipment and reinstatement of ground and restoration of soils;
- removal of access tracks and bellmouths; and
- removal of construction compounds and reinstatement of ground.

4.3.10 Activities such as surveys, archaeological investigation, ground investigation, construction of bellmouths and access tracks could commence without the full construction compounds in place. Nominal office and welfare facilities would suffice for an initial period until the full construction compounds were available.

4.3.11 Vegetation clearance may be undertaken prior to or during any of the activities identified above, this would be in accordance with any ecological requirements identified through the EIA and secured through a DCO requirement.

4.3.12 Dependant on local conditions, access roads may be required to be established from suitable access points from the existing road network in the area.

Installation of bellmouths and the creation of visibility splays

4.3.13 Where new accesses or widening of existing accesses from the public highway are required, bellmouths would be installed. The installation of bellmouths may require realignment of existing underground services and the creation of visibility splays to create a line of sight for the safe use of the bellmouth. Within the visibility splay, vegetation would need to be cut to a specified height or visual obstacles removed depending on local conditions, the speed rating of the road and whether traffic management was in place.

Topsoil stripping

4.3.14 The topsoil may be required to be stripped from the access tracks, site compounds and pylon working areas. The topsoil would be stored carefully to one side; typically, topsoil would be stored in bunds. Temporary drainage would be installed as required, with necessary environmental protection measures (such as silt fences) installed where required.

Drainage

4.3.15 Temporary drainage would be required during construction, to deal with rainfall and water encountered during excavation where appropriate. The drainage design will include a variety of potential measures to address silt runoff. Construction sustainable drainage systems (SuDS) would be used if necessary and where appropriate to do so.

Installation of access tracks (including culverts and bridges) and pylon working areas

4.3.16 A single way access tracks/haul roads would typically be 4.5 m wide, and typically up to 9m wide at passing places, which, coupled with the area for soil storage and drainage between the track and the fence line, would give a typical swathe of 12 m. A two-way stone access track/haul roads would typically be 9m, which, coupled with the area for soil storage and drainage between the track and the fence line, would, give a typical swathe of 20 m. They would be stone laid on geotextile membrane. Other accesses may also be used comprising of interlocking panels, depending on ground conditions and the duration and type of use. Soil stabilisation techniques could be considered subject to local conditions.

4.3.17 The stone access tracks would be constructed using secondary or primary aggregates. The total amount of aggregate material that would be needed for the construction of the stone access tracks (including bellmouths) and pylon working areas will be determined through the development of the Project and reported in the ES. On completion of construction, the access tracks would be removed, and aggregates taken to an appropriate facility which could include recycling, or onward use, for example as secondary aggregate in the construction industry.

4.3.18 Culvert installations would be required for temporary access tracks to cross ditches and watercourses. The size and depth of a culvert is dependent upon the dimensions of the crossing, sensitivity, and importance of the watercourse. To maintain the flow of a watercourse during installation of the culvert a pump would be used on site.

4.3.19 Should culverts not be suitable for a particular crossing, due to either the sensitivity of the watercourse or engineering requirements, a temporary bridge would be installed.

4.3.20 Temporary bridges may need to accommodate a mobile crane (approximately 250 t capacity, subject to detailed design) and the temporary bridge support requirements

would be assessed on a site-by-site basis. Most bridge crossings would be of a short span and flat deck construction; however, Bailey style bridges may also be used. All bridges would be clear span and the foundations would be placed clear of the main channel of the watercourse, where feasible.

4.3.21 Once the foundations are in place the temporary bridge would be fitted. Although the installation method is dependent on the type of bridge being installed, a typical bridge would be delivered in sections. Each bridge component would be assembled on site and lifted into position by crane. With the bridge in position, decking panels would be lifted and fixed into position.

4.3.22 Pylon working areas would typically be 75 m x 75 m. They would either be stone laid on a geotextile, or formed of interlocking panels, depending on ground conditions and the duration and type of use. Soil stabilisation techniques could be considered subject to local conditions.

Installation of pylon foundations (pad and column, mini pile or tube pile)

4.3.23 The foundations for the pylons would either be pad and column, mini pile or tube pile (or bespoke if required). The selection of foundation type would depend upon the ground conditions encountered.

Assembly and erection of steelwork

4.3.24 The steelwork components would be brought to each pylon working area. The steelwork components would be bolted together on the ground. The pylon would be assembled in sections beginning from ground upwards, using a mobile crane.

4.3.25 To lift the topmost sections of the pylons, a crane with a capacity of up to 250 t may be required for the reach and weight of the sections to be positioned into place. A smaller capacity crane could be used to lift pylon sections up to the limit of reach of the crane considering load to be lifted. Though in this instance the larger capacity crane would still be required to complete the pylon.

Crossing protection prior to stringing of conductors

4.3.26 Temporary scaffolding and nets would be installed during construction where required as a safety measure to protect assets such as roads, railways, and distribution network OHLs (where not already moved underground) and could include hedgerows which would be crossed by the proposed 400 kV OHL. This is required to protect these features during conductor stringing from the accidental dropping of conductors and any of the associated equipment. Temporary closures of some affected asset, such as roads, may be required during these works to install the protective netting, or indeed may be used instead of installing scaffolding.

4.3.27 The scaffolding would be transported to site using a lorry or tractor and trailer and assembled either side of the feature being protected. Alternative methods may be utilised dependant on local site conditions/restrictions, such as aerial catenary support systems, where feasible.

Installation of insulators

4.3.28 The insulators would be fastened to the cross arms of the pylons, with running wheels hung from the end of the insulators to carry the pilot wires in preparation for installing the conductors.

Establishment of machine sites for conductor stringing

4.3.29 The conductors are usually installed from tension pylon to tension pylon, often termed a ‘section’, with machine sites required at either end of the section.

4.3.30 The machine sites for conductor stringing would normally be located within the pylon conductor pulling positions, sited on interlocking panels laid directly onto the ground surface reducing disturbance to the underlying soils.

4.3.31 A conductor pulling position would be established at each end of the section with a winching machine (‘winch’) and empty steel reels to accept pilot wires. At the other end of the section the full conductor drums would be arranged in close proximity to the tensioning machine (‘tensioner’).

Conductor stringing

4.3.32 The conductors would be delivered to pulling positions on large cable drums and, depending on the conductor type, each completed drum could weigh up to 8 t, although larger and heavier drums are possible depending on the supplier and the length of conductor. The drums containing the conductors would typically be delivered to the construction compound, or satellite compound, first, and would be distributed from there.

4.3.33 Light pilot wires would be laid at ground level (and over temporary scaffolding protecting assets such as roads and railway lines) along the length of the section between the pulling positions. Some vegetation management could be required. The pilot wires would be lifted and fed through running wheels on the cross arms of all the pylons in the section, and then fed around the winch at the pulling position. The light pilot wires are used to pull through heavier, stronger pilot wires which are in turn used to pull conductors through from their drums. The tensioning machine would keep the wires off the ground and prevent the conductors running freely when the winch pulls the pilot wire. When the conductor is fully ‘run out’, it would be fastened at its finished tension and height above ground by a linesman working from platforms on the pylons which are suspended beneath the conductors. Additional fittings, such as spacers, vibration dampers and arcing horns would be fitted.

4.3.34 To counterbalance the out of balance loading at the tension pylons at the end of a conductor stringing section, it is normal to install temporary backstays or concrete blocks for safety of installation. The temporary backstays or concrete blocks would be removed as the conductor stringing process starts on the next section. Temporary backstays might also be required at other locations such as connecting new conductor to existing conductor, temporary diversions, and temporary spans.

4.3.35 A drone/helicopter may be utilised in the construction of the overhead line, and/or transportation of equipment to the Project site.

Removal of construction equipment, reinstatement of ground and restoration of soils

4.3.36 Once the 400 kV OHL is constructed, the access tracks and working areas at the pylon site would be removed and the ground reinstated to their previous condition. Other surfaces would be reinstated, and accesses would be restored to the condition they were in at the commencement of the works, unless agreed otherwise.

Underground Cable Construction

4.3.37 Installation of underground 400 kV cables will typically be undertaken within a 120 m wide working width. The exception to this is where environmental or engineering constraints mean additional land is required such as where the cable would cross features such as roads or watercourses using a non-open cut technique. In these locations, the working width may be required to be larger to accommodate the larger construction equipment required to undertake installation works.

4.3.38 There are several cable installation methods which are summarised below:

- Open cut methods: These would typically be utilised in open agricultural land. This involves the excavation of a trench into which the cables could either be directly laid, or a duct could be laid through which cables will then be pulled through. This is usually followed by land reinstatement.
- Trenchless methods: These would typically be utilised where features (watercourses, roads, railway lines, flood defences or other utilities) require to be crossed. This would involve the installation of ducts or a tunnel below the feature. The cables would then be pulled through the ducts or the tunnel.

4.3.39 Jointing is required where two adjacent sections of cable meet. This requires clean and dry conditions, so covers or cabins would be temporarily erected at joint bay locations. Due to the precise nature of engineering works undertaken, joint bays could remain open for several weeks to allow for trench and joint bay excavation, cable pulling, jointing and reinstatement.

4.3.40 Underground cable installation would typically be undertaken in the following sequence:

- survey and ground investigations;
- installation of bellmouths and creation of visibility splays;
- installation of stock proof fencing and gates or equivalent;
- topsoil stripping, temporary drainage installation where required;
- installation of access tracks (including culverts and bridges);
- trench dug utilising excavators (or by hand in areas of known buried utilities). Excavated sub-soil will be stockpiled separately from the top soil;
- installation of a base layer of cement bound sand (CBS), or suitable alternative material, into the cable trench;
- cables laid in trench by ‘pulling’ from cable drum, with the aid of rollers placed within the trench.
- cables are bedded in with CBS;
- protective tiles are placed along the width of the trench;
- warning tapes will be placed above the protective tiles;
- trench is back filled with excavated sub-soil or thermally suitable material where required (to avoid the alteration of local environmental temperatures around the cables); and
- topsoil will be reinstated to original soil profile and land re-seeded or released to the farmer for cultivation as it was found.

4.3.41 To install sections of underground cable there would be a requirement to establish temporary construction facilities, including suitable locations for cable drum storage and areas for dewatering, temporary and permanent land drainage and temporary access roads which are described above under overhead line construction. The following section provides a typical description of the works required to construct and install underground cables.

4.3.42 Where ducting is proposed as an alternative to direct lay, the ducts would need bedding in with the CBS and the trench backfilled. Joint bays would be excavated along the route (typically 800 m – 1000 m, dependant on detailed design) which would act as pulling locations for the cables and then the cables would be installed in the ducts by pulling from the cable drum between joint bays.

General trenching

4.3.43 Soft, collapsible soils such as sand-based soils would require either temporary trench boarding (direct buried) or trench boxing (ducted) to facilitate the containment construction. In firmer soils, 'battered' excavations become more acceptable for both configurations.

Cable installation

4.3.44 The two main installation methods for cable laying are direct buried or ducted. Durations between can vary significantly depending on the installation method used. With an open trench, direct buried configuration, a significant amount of time is required to set up the system to install – these include flat rollers for straight runs, box rollers for corners and careful calculation of pull forces on the cable.

4.3.45 For a ducted system, which may not always be viable due to system constraints, provided that any moves away from the horizontal and vertical planes (bends) are within acceptable parameters, installation can often be achieved in faster timescales, provided the infrastructure is in place (drum laydown and pulling points).

4.3.46 Where a feature is required to be crossed using a trenchless method, there are a number of methods that can be employed depending on the ground conditions and design requirements. A description of trenchless techniques that may be used to facilitate installation of underground HV cables is provided below.

Horizontal directional drilling

4.3.47 A Horizontal Directional Drilling (HDD) rig and associated equipment would be set up at the launch site, following construction of accesses and site set up. This includes electricity supply (likely a portable generator), drill mud filter, control unit and welfare facilities. Drilling utilises a drill bit, drill head and drilling fluid. Drilling fluid (typically bentonite slurry) assists the drilling process, as well as lubricating and cooling the drill head. A pilot hole is typically drilled first, followed by a series of increasing size bores until the final drill diameter that is required is achieved. Location and direction of drilling can be monitored using the HDD locating system to ensure drilling follows the pre-planned path. Ducting is then pulled back through the drilled hole towards the HDD rig. One cable duct is required for each cable It is likely that spare ducts will be installed to allow for ease of replacement should any faults be identified in future. Ducts can be capped to ensure no attenuation of water or sediment or prevent use by animals if left prior to cable pulling. HV cable would be delivered to site on drums and the cable pulled through the ducts. Reinstatement

would be carried out, following completion. Topsoil will be reinstated to original soil profile and land re-seeded or released to the farmer for cultivation as it was found.

Tunnelling

4.3.48 Various tunnel construction methods exist, with the most appropriate subject to various factors such as ground conditions and other design considerations. One method often used for HV cable tunnels utilises a steerable tunnel boring machine (TBM) to create a tunnel between two shafts (additional shafts can be required dependant on the length of tunnel to ensure adequate ventilation and emergency access/egress). Access and site set up, including provision of utilities such as power and water, is followed by construction of shafts (typically between 10 – 60 m deep). The TBM is transported to site and lowered into the launch shaft using a crane. Different types (such as earth pressure balance or slurry) and sizes of TBM can be used, subject to ground conditions and design factors, and could be in excess of 4 m diameter. During tunnelling the construction would involve use of concrete, steel and/or other materials to line and create the tunnel structure, ensuring appropriate ground stabilisation and reducing water ingress to acceptable levels. Excavated material from the tunnelling process would likely be transported to surface level for processing, re-use (where possible) and/or disposal. Excavated material may be mixed with other substances, such as bentonite or water, which may require processing or separation. This may require use of a temporary separation facility at surface level. Dewatering and drainage systems would be in use during construction and operation.

4.3.49 Once the tunnel has been constructed the support structures and ancillary services such as fire detection, drainage and control systems are installed. HV cable would be delivered to site on drums and the cable lowered into the shafts and tunnel for installation. Jointing of cables may be required within the tunnel, dependant on tunnel length.

4.3.50 At least one ‘active’ headhouse would be required (located at a shaft), which would contain systems including electrical, mechanical, and forced ventilation. This would require permanent access during both construction and operation/maintenance. Additional headhouses may be required, subject to design requirements The high-level sequence of events to construct the THHs would include access and accommodation works, construction of the building envelope, fit out and finish, installation of services and creation of hard and soft landscaping.

Cable Sealing End Compound Construction

4.3.51 CSEC installation would typically include:

- survey and ground investigations;
- installation of bellmouths and creation of visibility splays;
- installation of temporary construction compound;
- installation of stock proof fencing and gates or equivalent;
- topsoil stripping, temporary drainage installation where required;
- installation of temporary and permanent access tracks (including culverts and bridges);
- earthing installation;
- permanent drainage installation;

- foundations, troughs, ducts and fencing installation;
- structures and HV equipment including cable sealing ends, gantries (If required);
- installation of HV cable, ancillary cable equipment and testing of cable;
- installation of OHL connections; and
- topsoil will be reinstated to original soil profile and land re-seeded or released to the farmer for cultivation as it was found.

4.3.52 The CSECs require a clean and controlled environment whilst being installed. Therefore, a weatherproof covered scaffold structure would be erected over the CSECs during installation. Once constructed, the cables would be tested using a high voltage cable testing lorry.

4.3.53 Percussive piling may be required at the CSEC. This would be confirmed through a programme of ground investigations which would in turn inform the foundation designs.

4.4 Operation

4.4.1 During operation the Project would transmit electricity between the proposed new Creyke Beck substation and the proposed new High Marham substation and onto the remainder of the national transmission system.

4.4.2 The Project would be operated remotely in the same way as National Grid operates the rest of the network.

4.5 Maintenance

Overhead Line

4.5.1 The OHL would be subject to annual inspection from the ground by foot patrol, small van, or by air using drone/helicopter to check for visible faults or signs of wear. The inspections would also indicate if plant/tree growth or third-party developments were at risk of affecting safety clearances. Inspections would provide input as to when refurbishment was required.

4.5.2 The overhead line could support telecommunication equipment such as small mobile telephone antennae and would contain optical fibres within the earthwire. If this were to be the case, independent companies would require access for maintenance purposes using pickup trucks and vans. Access for the optical fibres will usually be at the joint box positions located just above the anticlimbing devices on certain pylons. Position and frequency of joint boxes is subject to design by the successful contractor.

4.5.3 Access for vegetation management, telecommunications and fibre optic maintenance would be along routes agreed with the landowners and may require interlocking track mat panels.

4.5.4 The overhead line would be made up of a variety of materials, including concrete and steel for the foundations, steelwork for the pylon and aluminium for the conductors. All these materials have an expected lifespan, which would vary depending on how the overhead line was used and where it is located. Typically, pylon steelwork and foundations have a life expectancy of approximately 80 years, the conductors have a life expectancy of approximately 40 to 60 years and the insulators and fittings have a life

expectancy of approximately 25 to 40 years. The lifespan of the overhead line may be longer than the anticipated 80 years, depending on its condition, the environment to which it is exposed, refurbishments and transmission network requirements.

4.5.5 Minor repairs or modifications may be required from time to time for local earthwire damage, addition of jumper weights, local conductor damage, broken insulator units, damaged or broken spacers, broken or damaged vibration dampers, damaged or broken anti climbing guards. Minor repairs would be programmed locally by a maintenance team using pickup trucks and vans to access site along routes agreed with landowners. Access may require interlocking track mat panels.

4.5.6 Refurbishment work would be undertaken typically on one side of the pylon at a time, so that the other side could be kept 'live' or in use.

4.5.7 Refurbishment work could involve:

- the replacement of conductors and earth wires;
- the replacement of insulators and steelwork that holds the conductors and insulators in place, insulator fittings, conductor fittings, tower signage;
- painting or replacement of the pylon steelwork;
- replacement of telecommunication equipment (by separate companies); and
- foundation repairs/upgrades.

4.5.8 Refurbishment would usually be carried out in two stages because the OHL has two circuits, one on each side of the pylon. This means that work can be undertaken on one side only, so that the other side can be kept 'live'. Once all the work has been completed on the first side, the circuit would be re-energised, and the opposite side switched off, so that the work could be carried out on the other side.

4.5.9 The refurbishment works would require temporary access tracks, a small compound and potentially scaffolding to protect roads and other features during the work.

4.5.10 Vans are used to carry workers in and out of site and trucks are used to bring new materials and equipment to site and remove old equipment. Temporary works including installation of access routes and installation of scaffolding to protect roads, railways and footpaths would be required as necessary for the OHL refurbishment (similar to the initial construction requirements).

Underground Cables

4.5.11 Maintenance activity along sections of cable would generally be limited to non-intrusive inspections and cable repairs. The latter would only be required in the unlikely event of a cable fault. Where a fault does occur the location of the fault would be identified, and the faulty section of cable replaced. The activities involved in cable repair would be similar to those outlined above for construction albeit over a much smaller area and scale.

Cable Sealing End Compounds

4.5.12 Maintenance activities would include infrequent visits to the CSECs to monitor the outdoor sealing end terminations and carry out periodic maintenance and checks on electrical equipment within the compound.

4.5.13 When the CSEC require refurbishment and/or replacement works, vans would be used to carry workers in and out of the site and larger vehicles (possibly HGVs and small mobile cranes) would be used to bring new materials and equipment to site and remove old equipment. Temporary scaffolding may be required to protect any infrastructure around the compound.

Tunnel Head Houses

4.5.14 Maintenance checks would be undertaken at regular intervals and would cover elements including the fans, lighting, pumps, and gas detection. Where access to the shaft or tunnel was not required, the THH building would be inspected and maintained as per any National Grid Electricity Transmission System building.

4.6 Decommissioning

4.6.1 The design life of the Project is at least 80 years but with regular maintenance is likely to extend further. At the time that decommissioning would take place, the regulatory framework, good industry practices and the future baseline could have altered. At the point where the Project requires decommissioning, National Grid would consider and implement an appropriate decommissioning strategy taking account of good industry practice, its obligations to landowners under the relevant agreements and all relevant statutory requirements. As such, decommissioning is excluded from the environmental assessment.

Overhead Line

4.6.2 If the Project is required to be decommissioned the section of overhead line between the proposed new Creyke Beck substation and proposed new High Marnham substation would be removed. Fittings such as dampers and spacers would be removed from the conductors. The conductors would be cut into manageable lengths or would be winched onto drums in a reverse process to that described for construction the conductor, fittings and insulator assemblies would be removed from the pylons and lowered to the ground.

4.6.3 Each pylon would most likely be dismantled by crane, with sections cut and lowered to the ground for further dismantling and removal from site. Depending on the access and space available, it may be possible to cut the pylon legs and then pull the pylon to the ground using a tractor. The pylon could be cut into sections on the ground. Unless there was a compelling need for removal of all the foundations, these would be removed to approximately 1.5 m deep, sufficient for safe agricultural use of the land and subsoil and topsoil reinstated. All waste removed from site and recycled in line with waste disposal regulations at the time.

Underground Cables

4.6.4 If the Project is required to be decommissioned, any section of underground cable that formed part of the operational Project would be decommissioned. Dependent on specific requirements the redundant cables could either be left in-situ, or all or parts of the cable could be removed for recycling. Where this is not possible, removed cables would be disposed of in accordance with the relevant waste disposal regulations at the time of decommissioning.

Cable Sealing End Compounds

4.6.5 If the Project is required to be decommissioned any materials would be removed and taken for recycling. Should the site no longer be required for operational purposes the land would be reinstated to an appropriate end use.

4.6.6 Similar methods and equipment would be required for dismantling as outlined for construction above.

Tunnel Head Houses

4.6.7 If the Project is required to be decommissioned the underground cable would be decommissioned. Cables would be removed from the tunnel and the shafts either capped or backfilled. The THH and associated equipment could be removed, and materials would be taken for recycling. It is likely that any tunnel if required) would remain in-situ. Should the site no longer be required for operational purposes the land would be reinstated to an appropriate end use.

5. EIA Approach and Methodology

5.1 Introduction

5.1.1 Environmental Impact Assessment (EIA) is a process of compiling, evaluating and presenting information about the likely significant environmental effects, both adverse and beneficial, that could occur as a result of a project. The assessment is designed to help produce an environmentally sympathetic project and to provide decision makers and statutory consultees with the environmental information they require during determination of an application for consent. The early detection of likely significant adverse environmental effects enables appropriate mitigation (i.e. measures to avoid, reduce or offset likely significant adverse effects) to be identified and incorporated into the design of a project, or commitments to be made, for example to environmentally sensitive construction methods and practices. The approach is iterative and involves close working between the undertaker, the EIA team and the designers.

5.1.2 Three main EIA documents are produced as part the Development Consent Order (DCO) pre-application process:

- **Scoping Report**: The Scoping Report sets out the likely significant effects from a project (scope). It also presents the data collected and the proposed assessment methodology and approach that would be used during the EIA. The Scoping Report is issued by the Planning Inspectorate (PINS) to consultees for comment on the scope and methodology proposed informing the scoping opinion;
- **Preliminary Environmental Information Report (PEIR)**: The PEIR sets out the information that 'is reasonably required for the consultation bodies to develop an informed view of the likely significant environmental effects of the development' (Planning Inspectorate, 2020). The PEIR is used by consultees to inform their consultation responses during the Statutory Consultation; and
- **Environmental Statement (ES)**: The ES presents the results of the EIA undertaken for the project. It identifies the likely significant effects that would result if the project was implemented, and any proposed mitigation to reduce those significant effects. The ES is submitted as part of the application for development consent and is taken into account during the decision-making process.

5.2 General Approach

5.2.1 This chapter describes the methodology which will be used to assess the potential effects on the natural, human and built environment as a result of the Project. In accordance with the EIA Regulations, the assessments undertaken will evaluate and identify the likely significant environmental effects arising from the proposed construction and operational phases of the Project. This information will be presented in an ES.

5.2.2 Each topic chapter within this Scoping Report includes a description of the methodology that is proposed for determining significant effects for that relevant topic. The Scoping Report, and ultimately the ES, would also be supported by professional judgement and discussion from the technical specialist author to justify the final judgements on significance.

5.2.3 In general, the assessment within the ES would follow a receptor-based assessment approach. Receptors are those aspects of the environment which are sensitive to change as a result of sources such as dust, noise, and construction activities. When deciding on which receptors to include within the Scoping Report, consideration has been given to Regulation 5(2) and Schedule 4 paragraph 4 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) (Ref 1.2) and the Planning Inspectorate Advice Note Seven: Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements (Ref 1.4). The EIA will identify environmental effects and, if any, propose project specific mitigation measures to avoid, reduce or offset adverse environmental effects or maximise environmental benefits.

5.2.4 The EIA process involves the main steps on **Image 5.1**.

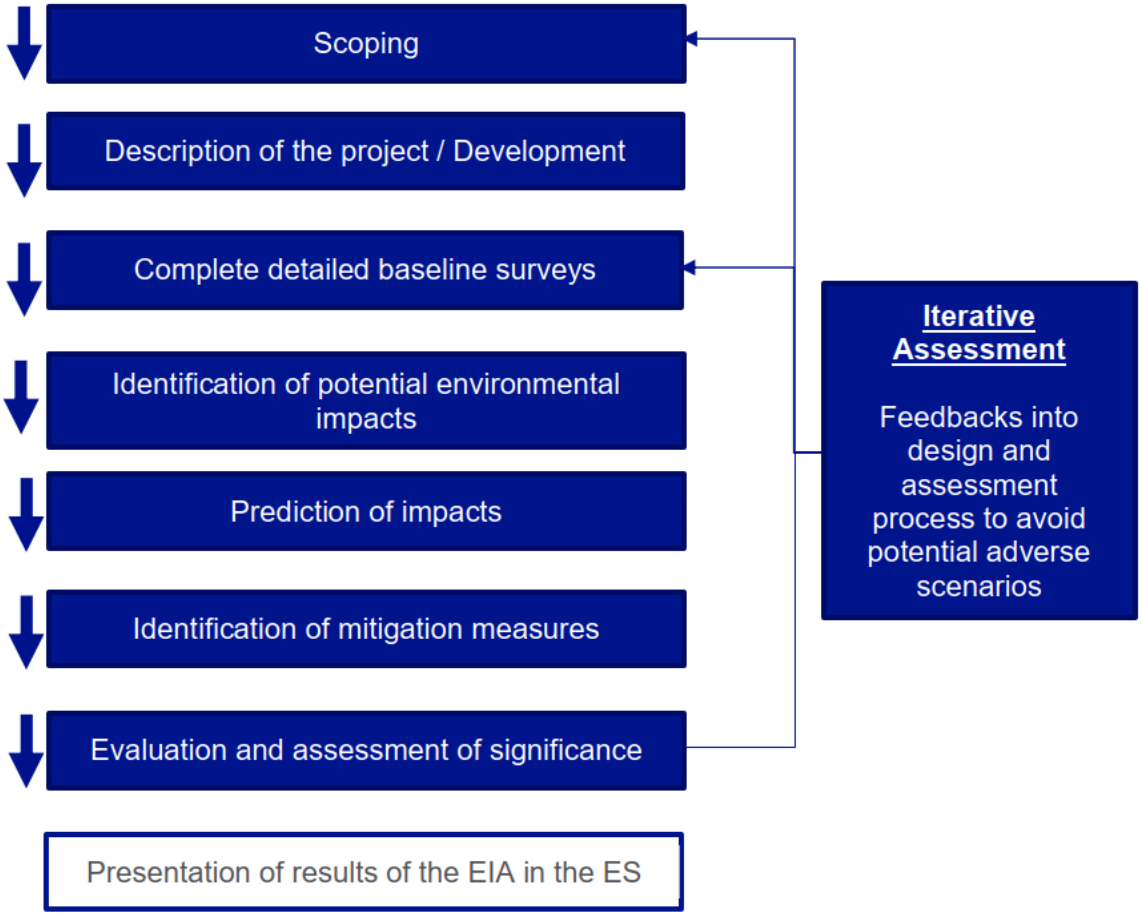


Image 5.1: EIA process

The 'Rochdale Envelope' Approach

5.2.5 Major infrastructure projects such as linear infrastructure projects for, overhead lines, above ground installations and underground cables, typically need some flexibility to be maintained for detailed design and construction, if conditions are found that would otherwise prevent or delay construction. Examples can include previously unknown archaeological assets on the location of proposed pylons. To mitigate such issues a flexible approach to design parameters is used within the EIA process, and this typically

referred to as the ‘Rochdale Envelope’; and it allows for a realistic worst-case assessment to be undertaken.

5.2.6 By developing a realistic worst-case scenario in response to critical technical and engineering parameters, as well as the emerging findings of the EIA and feedback from stakeholders, it is possible to strike a balance between the level of design information needed for the purpose of EIA and the application for consent and while still retaining the level of design flexibility needed as the Project moves into detailed design and construction.

5.2.7 The EIA process will aid and inform the design process and support the identification of a design freeze that is flexible enough to accommodate change in future stages but not so flexible that it could over-state or unnecessarily amplify the potential environmental impacts of the Project.

5.3 Approach to Scoping

5.3.1 Scoping sets the proposed scope for the EIA process and, when done right, it makes the subsequent phases more straightforward. A robust scope, focussed on the potential for likely significant environmental effects is required in order to ensure the EIA is focused and proportionate. The process of scoping helps to ensure that the topics covered, the baseline information used, and the methods of assessment are appropriate, and have considered the views of decision makers, and consultees where appropriate.

5.3.2 The EIA scoping process establishes which aspects of the environment are likely to be significantly affected by a project and involves identifying:

- the people and environmental resources (collectively known as “receptors”) that could be significantly affected by the Project, and
- the work required to take forward the assessment of these potential likely significant effects.

5.3.3 The approach taken in preparation of this Scoping Report has also been informed by the Planning Inspectorate’s Advice Note Seven (Ref 1.4) and reflects that the EIA Regulations require an ES to focus on aspects of the environment likely to be subject to significant effects. In line with guidance and legislation this Scoping Report seeks to, where appropriate, scope out aspects/matters from further assessment with suitable justification provided. This will streamline the assessment to focus on key likely significant effects and ensure the EIA for the Project is proportionate in accordance with the Institute of Environmental Management and Assessment (IEMA) (2017) Delivering Proportionate EIA guidance document (Ref 5.1).

5.3.4 The approach taken to identifying the proposed scope of the EIA has used a staged approach that considers the likelihood of significant impacts using a source, pathway, receptor-based approach. This is to ensure transparency and provide a clear justification as to why particular receptors and aspect/matters are either proposed to be scoped in or scoped out of the EIA, with the aim of ensuring that the ES is proportionate. The approach taken to the identification of the proposed scope is presented in **Image 5.2**.

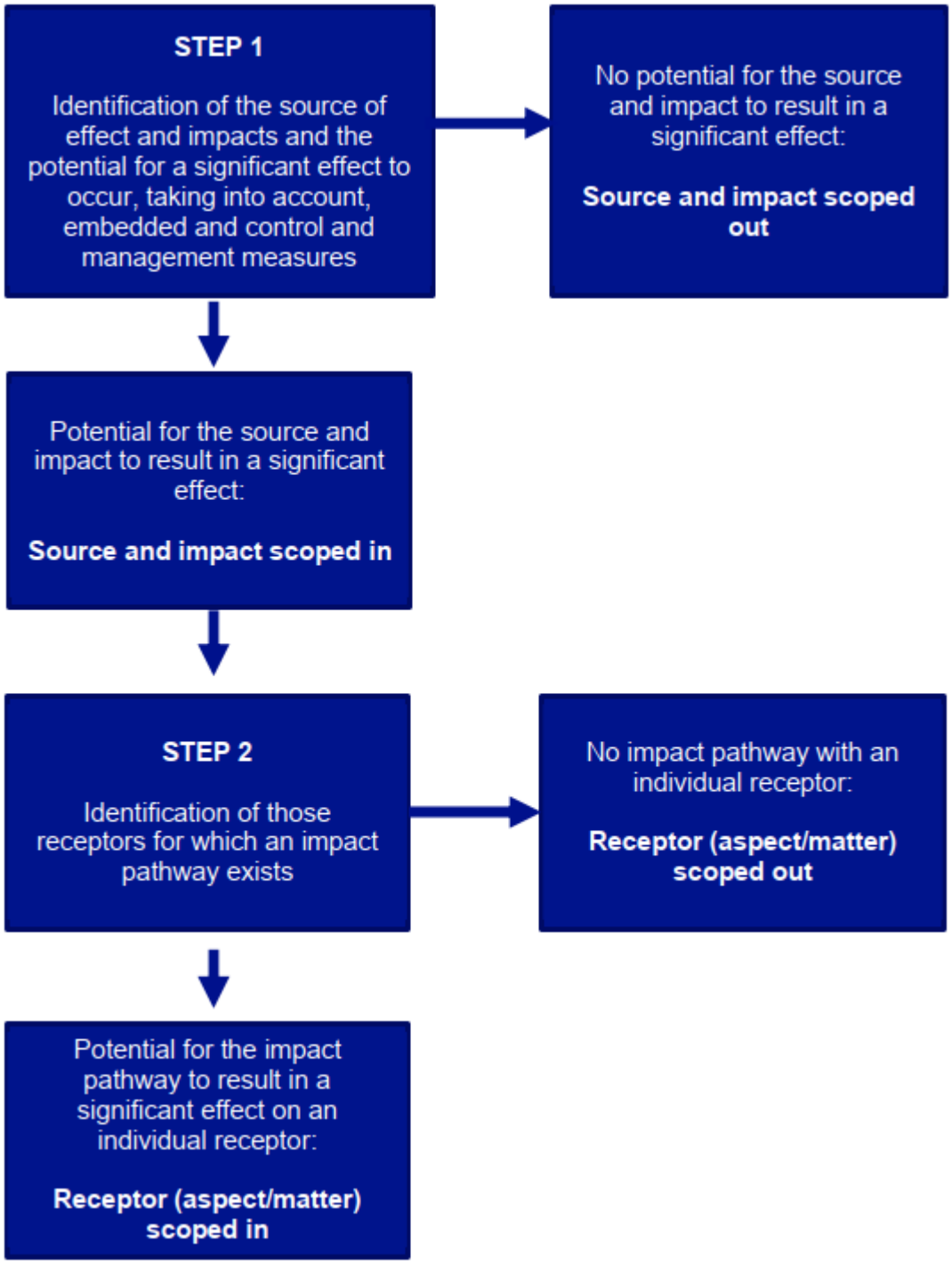


Image 5.2: Approach to the identification of the proposed scope of assessment

Technical Scope

5.3.5 The technical scope of assessment for each environmental aspect is detailed in technical **Chapters 6-21** and this includes proposals for scoping matters in or out of the EIA. The technical scope also details the approach to baseline data collection and assessment methodologies.

Spatial Scope

5.3.6 The spatial scope for each environmental aspect, the area over which changes to the environment are predicted to occur as a consequence of the Project, will depend on the nature of the potential effects and the location of receptors that could be affected. It takes account of:

- the physical area of the Project;
- the nature of the baseline environment; and
- the manner and extent to which environmental effects may occur.

5.3.7 The proposed Order Limits would encompass the land required permanently and temporarily to build and operate the Project. The proposed Order Limits would include Limits of Deviation (LoD), covering the maximum parameters within which the OHL or any underground cable sections would be installed. The LoD are often applied to the horizontal alignment of the Project but may also include the maximum height above ground and maximum depth below ground. The assessment within the ES would be based on the maximum LoD as defined in the DCO. This would provide flexibility regarding any deviations in the alignment.

5.3.8 The study areas to be presented in the ES are based on the distance over which an impact is likely to occur. Study areas are defined in each of the topic chapters and vary between topics. Each technical chapter describes the study area to be considered, providing a clear explanation as to why the study area has been adopted. The spatial scope of each assessment may be refined for both the PEIR and the ES in response to comments from consultees or further assessment work.

Temporal Scope

5.3.9 Subject to gaining development consent, construction works would be expected to start in 2027 and be completed by 2031.

5.3.10 The EIA will predict the changes (effects) to the current and future baseline during the construction and operation phases of the Project. The general approach is summarised below and any variations from this are discussed in the relevant technical chapters:

- Baseline year: the baseline is the reference level of the environmental conditions without implementation of the Project, against which the potential effects of the project are assessed. The baseline year is 2024, when the majority of baseline surveys are to take place. For certain topics the baseline environment is expected to change over time, and for these topics this change has been predicted to enable robust identification of the effects of the project against a future baseline;
- Construction Phase: these are effects that are likely to occur during the construction phase of the Project. This will include effects resulting from the activities associated with installation of the overhead line, any underground cables, cable sealing end compounds, substations and works to facilitate the connection of the OHL into the substations at Creyke Beck and High Marnham. It also includes effects associated with the temporary works such as access tracks, haul roads, construction compound areas and work activities; and
- Operation Phase: these are effects that will potentially occur as a result of the presence, operation and maintenance of the Project.

5.3.11 The design life of the Project is at least 80 years but with regular maintenance is likely to extend further. At the time that decommissioning would take place, the regulatory framework, good industry practices and the future baseline could have altered. At the point where the project requires decommissioning, National Grid would consider and implement an appropriate decommissioning strategy taking account of good industry practice, its obligations to landowners under the relevant agreements and all relevant statutory requirements. The environmental effects associated with decommissioning are likely to be similar to those associated with construction, subject to any changes to the baseline environment in the intervening period.

5.3.12 At the time that decommissioning would take place, the regulatory framework, good working practices, and the future baseline are all likely to have altered. Therefore, it is not possible to assess the probable future effects at the present time. National Grid therefore proposes to scope decommissioning out of the assessment.

5.3.13 The environmental assessment uses defined temporal scales to characterise the duration of potential effects. For the purposes of assessment, the following definitions are applied unless otherwise defined in the specific topic chapter:

- Permanent – these are effects that will remain even when the Project is complete, although these effects may be caused by environmental changes that are permanent or temporary.
- Temporary – these are effects that are related to environmental changes associated with a particular activity and that will cease when that activity finishes.

5.3.14 The temporal nature of effects could be different to the phase in which the effects occur. For example, effects as a result of vegetation clearance during construction may be felt for a number of years after construction has been completed, before any replanted habitats have matured. For the purposes of the EIA, the effects are described under the phase within which the impact arises (i.e. in the above example, vegetation loss assessed for the construction phase).

5.3.15 The future baseline is the theoretical situation that would exist in the absence of the Project. This is based upon extrapolating the current baseline using technical knowledge of likely changes to predict this (e.g. predictable changes such as climate change, changes that can be predicted based on reasonable assumptions and modelling calculations, information about other relevant developments etc.).

5.3.16 Each technical chapter of the ES will define the baseline (current or future or both) against which the environmental effects of the Project will be assessed. The baseline conditions to be assessed for each environmental topic are outlined in technical chapters of this Scoping Report. Where relevant, aspect chapters provide further information on the time elements within the Project programme that will be considered for their assessment.

Mitigation measures adopted as part of the Project

5.3.17 A number of measures would be adopted in the Project to avoid and reduce the likely significant effects that would be experienced during implementation of the Project, which fall into one of three categories: embedded measures, control and management measures and mitigation measures, and that may be required to avoid or reduce the potential for significant adverse effects of the Project.

5.3.18 **Embedded mitigation measures** are those that are intrinsic to and built into the design. Embedded measures may include, for example, working within the existing topography to reduce pylon intrusion, and reducing habitat loss by minimising land take. They can

also include the avoidance of designated sites through sensitive routeing, siting and design. Initial embedded measures are described within **Chapter 3, Main Alternatives Considered** and **Chapter 4, Description of the Project**.

5.3.19 The embedded mitigation measures which form an intrinsic part of the Project design would be described within the ES.

5.3.20 **Control and management measures** comprise management activities, control measures and techniques, that would be implemented during construction of the Project to limit impacts. They include adherence to good site practices and achieving legal compliance. These measures may include, for example, applying construction site dust suppression techniques within working areas, which the Main Works Contractor would be required to implement as part of their working practices under the terms of their contract. Control and management measures to address construction-related impacts are described in each of the technical chapters and are detailed **Appendix 4.A Outline Code of Construction Practice** . As the Project evolves these will be added to as appropriate and will be supplemented by other control and management documents such as the Construction Traffic Management Plan (CTMP).

5.3.21 In addition, licenses through separate regimes may also be required. For example, ecological licences and assents granted by Natural England and various permits relating to water and waste granted by the Environment Agency. On the presumption that the regulatory authorities would not permit the works unless the potential impacts have been appropriately managed, it is assumed that these licensable activities are considered measures adopted as part of the Project.

5.3.22 **Mitigation Measures** comprise measures over and above any embedded and standard mitigation measures, for which the EIA has identified a requirement to further reduce significant environmental effects such as landscape planting.

5.3.23 All mitigation measures will be described within the ES and secured through the DCO or through other statutory agreements.

5.3.24 Environmental compensation is considered where mitigation at an affected location is not possible to avoid or reduce a significant effect. Where identified, compensation measures forming part of the Project would be described within the ES.

5.3.25 Embedded, control and management and mitigation measures are assumed to be in place or at least achievable prior to undertaking the scoping of likely significant effects, in accordance with guidance from the IEMA Guide to Shaping Quality Development (Ref 5.2).

5.4 Assessment of Effects and Determination of Significance

5.4.1 Regulation 5(2) of the EIA Regulations states that *“the EIA must identify, describe and assess in an appropriate manner, in light of each individual case, the direct and indirect significant effects of the proposed development on the following factors: (a) population and human health, (b) biodiversity…, (c) land, soil, water, air and climate, (d) material assets, cultural heritage and the landscape; e) the interaction between the factors referred to in sub-paragraphs (a) to (d)”.*

5.4.2 Schedule 4 paragraph 5 of the EIA Regulations requires a description of the likely significant effects of the development on the environment. The assessment of the significance of effects for the majority of topics will be based on the steps set out in the following paragraphs.

Identification of Potential Effects

5.4.3 The likely significant effects (beneficial and adverse) of the Project will be predicted and evaluated using appropriate evaluative techniques, many of which follow specific best practice guidelines for a particular topic. Potential effects will be identified first, usually in summary, as an indication of what effects could theoretically occur in the absence of mitigation (other than mitigation inherent in the design of the Project).

Assessing Effects and Determining Residual Significance

5.4.4 There is no statutory definition of what constitutes a "significant" effect within the EIA Regulations and whilst the determination of the significance of effects is important to informing the decision-making process, defining what is significant is not a simple task. The process typically involves consideration of two aspects of a potential effect, namely the sensitivity and/or value of the receptor or resource, and the magnitude of the impact on the receptor/resource.

5.4.5 The significance of the residual effects (those that are predicted to remain after the environmental mitigation measures have been implemented) will be determined by reference to criteria for each assessment topic. Specific significance criteria for each technical discipline will give due regard to the following:

- scale of the impact;
- impact duration, and whether effects are temporary, revisable, or permanent;
- effect nature (whether direct or indirect, reversible or irreversible, beneficial or adverse);
- where the effect occurs in isolation, is cumulative, or will interact with other effects;
- performance against any relevant environmental quality standards;
- sensitivity of the receptor; and
- compatibility with environmental policies.

5.4.6 Each technical chapter of this Scoping Report includes a description of the proposed approach to determining the significance of effects, including how professional judgement may be applied. The technical chapters use the terminology for magnitude, sensitivity and significance described in the following sections unless there is a need to deviate due to specific topic guidance. Where there is a requirement to deviate this justification is provided within the technical topic chapter.

Magnitude of impact

5.4.7 General criteria for defining the magnitude of an impact, or change, are set out in **Table 5.1**. Key factors that influence this include:

- scale of change – the scale of change refers to the degree of change to or from the baseline environment caused by the impact being described;
- spatial extent – the extent of an impact is the full area over which the impact occurs; and
- duration and frequency – the duration is a measure of how long the impact is expected to last. Frequency refers to how often the impact would occur; it may be continuous or periodic.

Table 5.1: Impact magnitude criteria

Magnitude	General criteria
Large	Adverse: Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features, or elements. Beneficial: Large scale or major improvement of resource = quality; extensive restoration; major improvement of attribute quality.
Medium	Adverse: Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements. Beneficial: benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality.
Small	Adverse: Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements. Beneficial: Minor benefit to, or in addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk or negative impact occurring.
Negligible	Adverse: Very minor loss of detrimental alteration to one or more characteristics, features or elements. Beneficial: Very minor benefit to or positive addition of one or more characteristics, features or elements.

Sensitivity and value of the receptor

5.4.8 The sensitivity of a receptor or feature is characterised by its vulnerability to change and its ability to recover. The value of a receptor or feature reflects its overall importance and the value placed on it by society; this may be reflected by its level of statutory or policy protection or else a value may be attributed through consultation and the application of professional judgement. Criteria for defining the sensitivity and/or value of a receptor are set out in **Table 5.2**. Characterisation of the receptor is achieved by balancing out these considerations to determine the receptors sensitivity:

- vulnerability – the vulnerability of the receptor relates to its capacity to accommodate change i.e. the tolerance/intolerance of the receptor to change;
- recoverability – the ability of the receptor to return to the baseline state; and
- importance – the importance of the receptor or feature is a measure of the value assigned to that receptor based on biodiversity and ecosystem services, social value and economic value. Importance of the receptor is also defined within a geographical context, whether it is important internationally, nationally or locally.

Table 5.2: Sensitivity criteria

Value	General criteria
Very High	Very high importance and rarity, value at an international level and limited potential for recovery or substitution.
High	High importance and rarity, value at an international level and limited potential for recovery or substitution.
Medium	Medium importance and rarity, value at an international level and limited potential for recovery or substitution.
Small	Low or medium importance and rarity, value at an international level and limited potential for recovery or substitution.
Negligible	Very low importance and rarity, valued at a local level, easy to replace.

Evaluating the significance of effects

5.4.9 Having established the magnitude of change and sensitivity of the receptor, the significance of an effect can be assessed. To aid transparency in the assessment process, the matrix shown on **Image 5.3** will be used as the basis for assigning significance to an effect; however, the identification of significance typically requires the application of professional judgement. As an illustration, a high sensitivity receptor subject to a large magnitude of change would experience a major or moderate significance effect, and a low sensitivity receptor subject to a small magnitude of change would experience a minor or negligible significance effect.

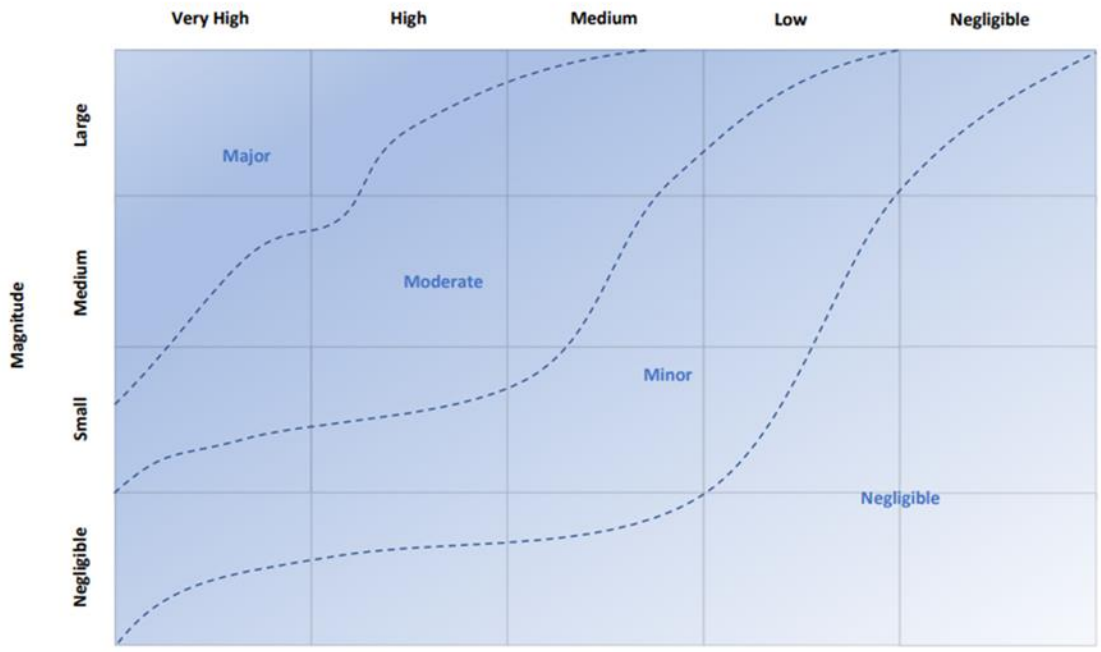


Image 5.3: Basis of assigning significance

5.4.11 Each of the specialist disciplines will apply magnitude and sensitivity criteria that best suit the topic area, and for some topics these may be defined in industry guidelines.

5.4.12 Following the classification of an effect using the methodology, a clear statement will then be made in the ES as to whether that effect is significant or not significant. Major and moderate effects are typically considered to be significant, whilst minor and negligible effects are considered to be not significant. However, professional judgement will also be applied in reaching conclusions as to the significance of effects. Typical definitions for the classification of effects are shown in **Table 5.3**.

Table 5.3: Sensitivity criteria

Significance	General criteria	Significant effect
Major	A large and detrimental change to a valuable/sensitive receptor; likely exceeding an accepted (often legal) threshold. A large and beneficial change, resulting in improvements to the baseline result in previously poor compliance or a major contribution being made to national targets. These effects may represent key factors in the decision-making process. Potentially associated with sites and features of national importance or likely to be important considerations at a regional or district scale. Major effects may relate to resources or features that are unique and which, if lost, cannot be replaced, or relocated.	**Yes**
Moderate	A medium scale change that, although not beyond an accepted threshold, is still considered to be generally unacceptable, unless balanced out by other significant positive benefits of a project. Likely to be in breach of planning policy, rather than legal statute. These effects, if adverse, are likely to be important at a regional or local scale and on their own could have a material influence on decision making. A positive moderate effect is a medium scale change that is significant in that the baseline conditions are improved to the extent that guideline targets (e.g. UK BAP targets) are contributed to.	**Yes (typically)**
Minor	A small change that, whilst adverse, does not exceed legal or planning policy thresholds. A small positive change, but not one that is likely to be a key factor in the overall balance of issues. These effects may be raised as local issues and may be of relevance in the detailed design of a project but are unlikely to be critical in the decision-making process.	No

Negligible	A very small change that is so small and unimportant that it is considered acceptable to disregard. Effects which are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error, these effects are unlikely to influence decision making, irrespective of other effects.	No

Residual Effects

5.4.13 Residual effects are those that are predicted to remain after the proposed mitigation measures have been implemented. These will be described at the end of each topic chapter within the ES.

5.5 Cumulative Effects

Introduction

5.5.1 When undertaking an assessment of the environmental effects of a project, it is necessary to consider how various effects may interact, and also how the effects of the project could accumulate with the effects of other developments proposed within the same zone of influence. The cumulative effects assessment for the Project will include the following effects:

- inter-project effects: effects resulting from the Project combined with the same aspect-related effects generated by other developments to affect a common receptor; and
- intra-project effects: individual environmental aspect effects resulting from the Project, which are not significant in their own right, but could combine with other environmental aspect effects from the Project to create effects that are significant.

Legislation, Planning Policy and Technical Guidance

5.5.2 Schedule 4 of the Infrastructure Planning (EIA) Regulations 2017 (the EIA Regulations) states that an ES is to include a description of the likely significant effects of a development on the environment, which should cover, amongst others, cumulative effects. Paragraph 5(e) describes cumulative as: *"the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources".* In addition, Regulation 5(2)(e) of the EIA Regulations requires that the EIA considers the interaction of environmental effects associated with the Project. The inter-related effects assessment considers likely significant effects from multiple impacts and activities from the construction and operation of the Project on the same receptor, or group of receptors.

5.5.3 National Policy Statement EN-1 states at paragraph 4.2.5 that *"When considering cumulative effects, the ES should provide information on how the effects of the applicant's proposal would combine and interact with the effects of other development (including projects for which consent has been sought or granted, as well as those already in existence)".* Paragraph 4.2.6, goes on to state that the Secretary of State should *"...consider how the accumulation of, and interrelationship between effects might affect*

the environment, economy or community as a whole, even though they may be acceptable when considered on an individual basis with mitigation measures in place."

5.5.4 National Policy Statement EN-5 provides topic-specific guidance for electrical infrastructure including overhead lines but makes only limited reference to cumulative considerations: paragraph 2.8.2 refers to overhead lines and the potential for landscape and visual cumulative impacts to arise in relation to substations, wind farms and other sources of power generation. EN-5 also refers briefly to NPS EN-1 and to landscape and visual considerations. There are no substantive changes proposed with regard to cumulative effects assessment within those draft energy NPS which are considered to be relevant to the Project.

5.5.5 Paragraph 111 of the NPPF states that *"Development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe".* Paragraph 185 states that *"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development"*. Paragraph 186 states that *"Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas".*

5.5.6 Planning Inspectorate Advice Note 17, Cumulative Effects Assessment, sets out a staged approach to cumulative effects assessment for Nationally Significant Infrastructure Projects and provides template formats for documenting the assessment within an applicant's ES.

Intra-Project Effects

5.5.7 Intra-project cumulative effects (sometimes referred to as combined or interactive effects) occurs where a single receptor is affected by more than one source of effect or aspect of the Project. An example of an intra-project effect would be where a local community is affected by dust, noise, and traffic disruption during the construction of the Project, with the result being a greater level of nuisance than each individual effect alone.

5.5.8 A useful summary of the principle of cumulative intra-project effects is provided by the Planning Inspectorate in Advice Note Nine: Rochdale Envelope (Ref 5.3).

"The ES should not be a series of separate unrelated topic reports. The interrelationship between aspects of the proposed development should be assessed and careful consideration should be given by the developer to explain how interrelationships have been assessed in order to address the environmental impacts of the proposal as a whole. It need not necessarily follow that the maximum adverse impact in terms of any one topic impact would automatically result in the maximum potential impact when a number of topic impacts are considered collectively. In addition, individual impacts may not be significant but could become significant when their interrelationship is assessed. It will be for the developer to demonstrate that the likely significant impacts of the project have been properly assessed".

5.5.9 In line with this requirement, a description of the likely significant intra-project cumulative effects will be provided within the ES.

20.1.1 There is no standard approach to the assessment of intra-project effects although it should be carried out with reference to guidance and to professional judgement. Some environmental topics consider receptors that are not considered by any other topics and so intra-project cumulative assessment is unlikely to be necessary. Other receptors may be considered by multiple topics, and as such intra-project cumulative effects are more likely to occur. Receptors considered in multiple chapters are likely to include local residents, communities, and businesses. It should be noted that some elements of the assessment inherently consider intra-related effects. For example, the terrestrial ecology and nature conservation assessment of effects considers the potential for multiple impacts affecting particular features such as disturbance effects on faunal receptors resulting from noise and vibration, visual disturbance and lighting. Where this is the case, this is described within the individual aspect chapter.

20.1.2 It is proposed to undertake the assessment of intra-project cumulative effects using a three-stage approach (**Image 5.4**). The first stage consists of a pre-screening exercise to determine whether a receptor is exposed to more than one type of effect. Those receptors identified as experiencing more than one type of effect will be taken through to the second stage. The second stage will consist of a screening exercise to identify the significance each type of effect has on each receptor. Those receptors exposed to two or more types of effect, with a significance of effect greater than negligible, will be taken forward to the third stage. The third stage is the main intra-project assessment, which will consider if the combination of effects is likely to lead to overall effects of greater significance.

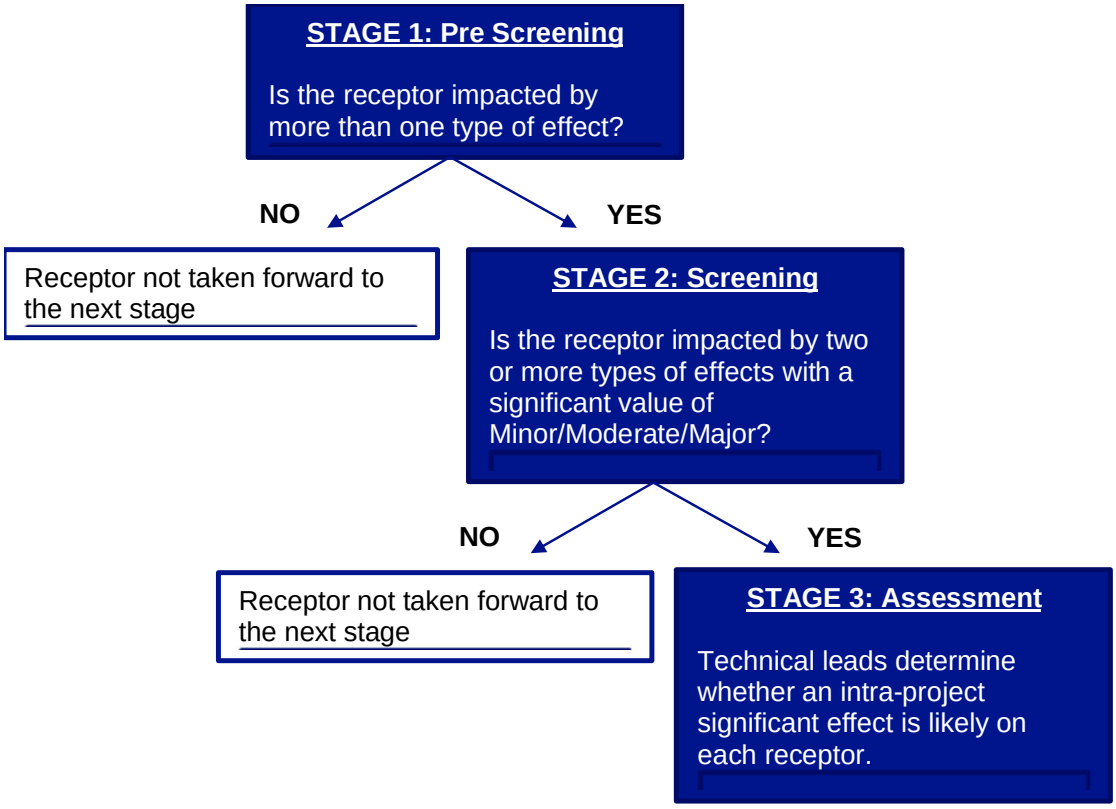


Image 5.4: Methodological approach to identifying intra-project cumulative effects

20.1.3 An initial pre-screening assessment is presented in **Table 5.4** showing how the receptor groups are likely to interact between chapters. This will be revisited as part of the ES to ensure all receptors considered within the ES are taken through this pre-screening assessment.

Table 5.4: Pre-screening stage

Receptors	Technical chapters+												
	6	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**
Landscape character and designations	✓	✓	✓	✓									
Visual receptors	✓	✓		✓					✓	✓	✓		
Commercial receptors										✓	✓		
Ecological receptors	✓		✓						✓				
Notable habitats (terrestrial and aquatic)	✓		✓		✓				✓				
Designated heritage assets	✓	✓		✓									
Non-designated heritage assets				✓									
Water resources (existing abstractions and discharges)					✓	✓							
Watercourses and waterbodies					✓	✓							
Flood risk receptors					✓								
BMV agricultural land							✓						
Agricultural holdings							✓						
Soil							✓				✓		
Public rights of way		✓						✓			✓		
Cycle routes		✓						✓					
Roads								✓					
Communities		✓				✓				✓	✓		
Geology						✓							
Mineral reserves						✓					✓		
Groundwater						✓							
Human health												✓	
Climate			✓		✓								✓

+ Chapter numbers refer to the scoping technical chapters: Chapter 6 Landscape; Chapter 7 Visual; Chapter 8 Ecology and Biodiversity; Chapter 9 Cultural Heritage; Chapter 10 Water Environment; Chapter 11 Geology and Hydrogeology; Chapter 12 Agriculture and Soils; Chapter 13 Traffic and Transport; Chapter 14 Air Quality; Chapter 15 Noise and Vibration; Chapter 16 Socioeconomic Recreation and Tourism; Chapter 17 Human Health; and Chapter 18 Climate Change.

Inter-project effects

5.5.10 As detailed in paragraph 5.5.1, inter-project cumulative effects occur where a receptor is affected by two or more projects at the same time, potentially amplifying the overall effect. Individually the effects may not be significant, but when considered together could create a significant cumulative effect.

5.5.11 The Planning Inspectorate Advice Note 17 (Ref 5.4) provides a methodology for assessing inter-project cumulative effects. It provides guidance about the type and scale of other developments that should be considered in the assessment of cumulative effects with other projects. It is acknowledged that the availability of information necessary to conduct the inter-project effects assessment will depend on the current status of the other existing development and/or approved development. Any assumptions or limitations in relation to the 'other existing development and/or approved development' data collected will be stated. A level of certainty, reflecting the availability of detail and information necessary for the assessment, will be assigned to each development and recorded.

5.5.12 The approach outlined in Advice Note 17 is split into four stages:

Stage 1 – the two main tasks in this stage are to establish what the 'zone of influence (ZOI)' is for each topic and to then identify a 'long list' of other developments, by reviewing planning applications, development plans.

Stage 2 – criteria are set for the inclusion or exclusion of developments on the long list. These will be based on overlaps in construction programmes, shared receptors, or shared effect pathways.

Stage 3 – information is gathered about the shortlisted projects, including design, location, programme, operation, and decommissioning information, and reported environmental effects.

Stage 4 – Cumulative Effects Assessment is undertaken in relation to the shortlisted developments and the findings are reported in the matrix format. The focus is on Tier 1 and 2 projects, with Tier 3 included if possible. These three tiers are described below in **Table 5.6**.

Stage 1: Establishing the long list

5.5.13 The first step of Stage 1 is to identify a ZOI within which the long list of projects can be identified. It is considered that doubling the maximum study area is sufficient to identify the long list of 'other developments' whose study areas may overlap with the area within which the Project could result in a potential effect, therefore the area within which inter-project cumulative effects could feasibly occur. This is illustrated on Image **5.5**. Professional judgement will also be applied so as to not use this as hard cut off when identifying the long list.

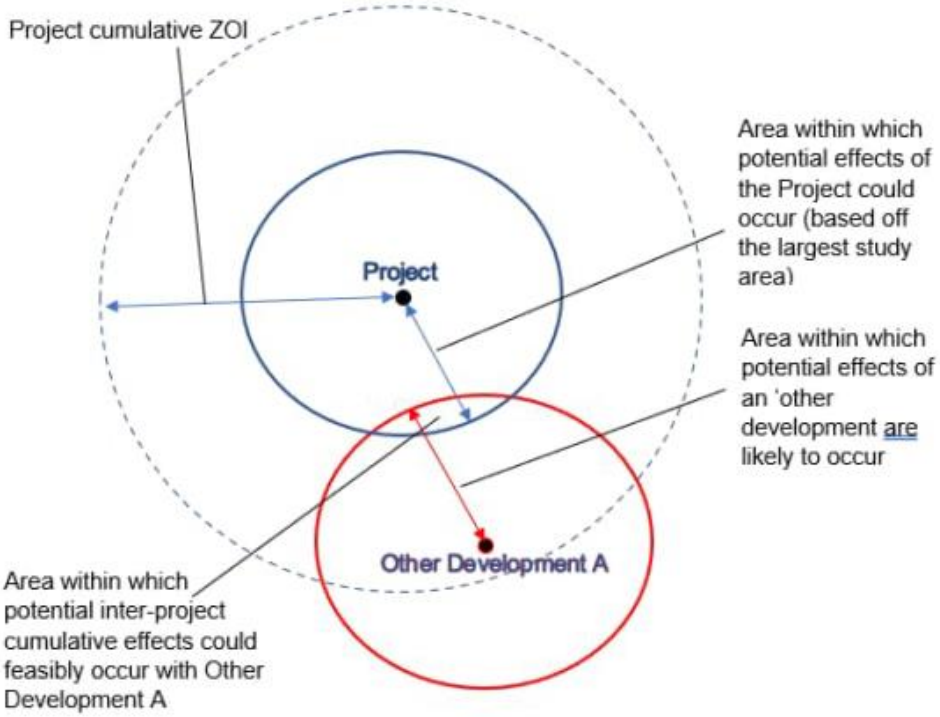


Image 5.5: Defining the ZOI

5.5.14 The largest study areas proposed for technical chapters 6-19 are summarised in **Table 5.5**. The rationale for these study areas is explained in section 3 of the relevant technical topic chapters 6-19.

Table 5.5: Largest study areas for environmental topics

Environmental topic	Study areas
Landscape and Visual	5 km
Ecology and Biodiversity	10 km*
Historic Environment	3 km
Water Environment, Geology and Hydrogeology, Agriculture and Soils, Traffic and Transport, Air Quality, Noise and Vibration, Socio-economics	≤0.5 km

*the 10 km study area encompasses statutory designated sites of international, national and local nature conservation value, and non-designated sites. A wider 30 km study area is identified in Chapter 08 Ecology and Biodiversity for the identification of any Special Areas of Conservation or Special Protection Areas where (respectively) bats or bird species with large foraging ranges are noted as, or one of, the qualifying features.

5.5.15 The largest topic study area has been identified as 10 km from the Project Scoping Boundary, therefore a ZOI of 20 km from the Project Scoping Boundary has been set to establish the long list of developments present within the ZOI. This is illustrated on **Figure 5.1**. This will be kept under review as the Project develops and the long list updated as required.

5.5.16 The long list will be categorised into three tiers (**Table 5.6**). Minor planning applications will be excluded from the assessment, as these relate to projects of small scale and local significance. These projects are highly unlikely to give rise to significant cumulative environmental effects over and above the Project in isolation. All reasons for excluding any development from further consideration will be clearly recorded and presented in the ES to present a clear audit trail.

Table 5.6: 'Other development' for inclusion in the inter-project cumulative effects assessment

Tier	Development
Tier 1	Under construction
	Permitted application(s), where the project is classified as 'major development,' whether under the Act or other consent regimes, but not yet implemented.
	Submitted application(s), where the project is classified as 'major development,' whether under the Act or other consent regimes, but not yet determined.
Tier 2	Projects on the Planning Inspectorate's Programme of Projects, and/or the relevant local planning authorities planning portal where the project is classified as 'major development' and a scoping or screening report has been submitted.
Tier 3	Projects on the Planning Inspectorate's Programme of Projects, and/or the subject of pre-application discussion with a relevant local planning authority, where a scoping or screening report has not been submitted. Projects registered on the local planning authority's portal classed as major development but do not require EIA.
	Identified in the relevant Development Plan (and emerging Development Plans - with appropriate weight being given as they move closer to adoption) recognising that much information on any relevant proposals will be limited.
	Identified in other plans and programmes (as appropriate) which set the framework for future development consents/approvals, where such development is reasonably likely to come forward.

[+] Scoping at the scoping stage under the Town and Country Planning Act have also been included within this tier.

Stage 2: Establishing the Short List

5.5.17 Following Stage 1, the projects included on the long list will be screened as to the temporal scope, scale and nature of the development to identify whether they would be likely to result in a potential for a significant cumulative effect with the Project. Professional judgement would be used during the application of threshold criteria to determine whether developments should be scoped in or out of the assessment. This would include developments that were below the threshold criteria but with characteristics that were likely to give rise to a significant effect or could give rise to cumulative effects by virtue of its proximity to the proposed Project.

5.5.18 The following inclusion/exclusion criteria will be used for the assessment:

- **Temporal Scope**: other projects with an overlapping construction phase (currently expected to be 2027-2031) and in some cases operational effects would be scoped into the assessment. Planning applications submitted up to five years prior to the planned commencement year of construction (2027) would be included in the assessment. Five years is selected as planning permissions typically expire after a period of three to five years (unless an application for extension is permitted). Applications submitted outside this temporal scope would be excluded.
- **Scale and nature of development**: development identified as Schedule 1 and 2 developments in the EIA Regulations would be considered further. Development not identified as Schedule 1 or 2 developments would be scoped out of the assessment, except where professional judgement identifies specific scenarios where there is a high likelihood of significant environmental effects arising in combination with the Project.
- **Sensitivity of the receiving environment**: where there are potential source-pathway-receptor linkages between the Project and other development, cumulative effects would be considered further. Other development with no clear source-pathway-receptor linkage would be scoped out of the assessment.
- **Consultation**: requests from relevant stakeholders for the inclusion of specific projects and/or plans within the cumulative effects assessment.

Stage 3: Information gathering

5.5.19 Further information on the short-listed developments will be gathered to inform the final cumulative effects assessment, where this is available. This will include:

- proposed design and location information;
- construction and operational timescales; and
- results of any environmental assessments completed for the other developments.

5.5.20 Project data will be gathered from a variety of sources including the website of the relevant local planning authority(ies), the Planning Inspectorate's website and potentially through direct liaison with stakeholders including local authorities, statutory bodies and relevant applicants/developers.

Stage 4: Assessment

5.5.21 The cumulative effects assessment will be commensurate with information available at the time of assessment. Information on some proposals may be limited and such gaps are acknowledged within the assessment. The assessment for Tier 3 other development may be high level in comparison to Tier 1 and 2, reflective of the level of information available. Any measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant cumulative effects and, where appropriate, any proposed monitoring arrangements will be identified.

5.6 Monitoring

5.6.1 Schedule 4, Paragraph 7 of the EIA Regulations states that, where appropriate, the ES should include a description of any proposed monitoring arrangements where likely significant residual effects have been identified. The monitoring requirements will be detailed within the ES topic chapters to include clear and proportionate objectives for

monitoring, the parameters to be monitored, the methodology for the monitoring, a timescale for implementation, identification of the party who will be responsible for the monitoring, and an outline of the remedial actions to be undertaken should results be adverse.

5.7 Approach to the Environmental Statement

5.7.1 The Planning Inspectorate Advice Note Seven (Ref 1.4) requires that applicants provide an outline structure of what the ES will contain. The structure of the ES for the Project will broadly follow the same order of chapters that are presented in this Scoping Report, acknowledging that changes may need to be made within the ES to address the advice from the Scoping Opinion, both in terms of presentation of the Project to aid understanding and address the design requirements as they evolve.

5.7.2 An indicative outline structure of the ES is set out in **Table 5.7**.

Table 5.7: Indicative structure of the ES

ES Volume	Title	Likely content
Volume 1	Non-Technical Summary (NTS)	A concise and standalone document which will provide a description of the Project, EIA process and its findings in a manner that is easily understood by the general public
Volume 1 Main Document	Chapter 1 Introduction	Setting out an overview of the Project including the Project need. The purpose and structure of the ES and a brief summary of the other relevant assessments and documents.
	Chapter 2 Regulatory and Planning Context	This chapter will set out the legislative, national, and local planning context, other relevant guidance and policies and any applicable consents and permits.
	Chapter 3 Main Alternatives Considered	This chapter will set out the main alternatives considered and the reasons for the selection of the preferred options.
	Chapter 4 Proposed Description	This chapter will provide a description of the Proposed Development and how the Proposed Development would be constructed, operated maintained and decommissioned.
	Chapter 5 EIA Approach and Methodology	This chapter will provide a description of the overall EIA methodology that is proposed on the Project including temporal durations and approach to mitigation.
	Chapter 6 Landscape Chapter 7 Visual Chapter 8 Ecology and Biodiversity Chapter 9 Cultural Heritage Chapter 10 Water	There is a chapter for each environmental topic scoped into the EIA. The topic chapters are structured as follows: • the regulatory and planning policy context specific to the topic area; • the proposed topic study area;

ES Volume	Title	Likely content
	Chapter 11 Geology and Hydrogeology Chapter 12 Agriculture and Soils Chapter 13 Traffic and Transport Chapter 14 Air Quality Chapter 15 Noise and Vibration Chapter 16 Socio-economics Chapter 17 Health and Wellbeing Chapter 18 Climate Change Chapter 19 Major Accidents and Disasters	• a description of the relevant baseline including data sources used; • any embedded or good practice measures take into consideration when proposing the scope; • potential for significant effects; • proposed assessment methodology; and • concluding statements explaining the matters proposed to be scoped into and out of the ES.
	Chapter 20 References	Reference list.
Volume 2	Appendices	Provides the appendices which support Volume 1.
Volume 3	Figures	Provides the Figures which support Volume 1.

6. Landscape

6.1 Introduction

6.1.1 This chapter presents how the landscape assessment will consider the potentially significant effects on landscape receptors that may arise from the construction, operation and maintenance of the Project (as described in **Chapter 4, Description of the Project**). It describes the methodology and datasets to be used within the landscape assessment, presents an overview of the baseline conditions, and identifies the potential likely significant effects to be considered within the assessment, and how these will be assessed for the purpose of an Environmental Impact Assessment (EIA). As detailed in **Chapter 4, Description of the Project**, the decommissioning has been scoped out of the environmental assessment.

6.1.2 The Scoping Boundary is illustrated on **Figure 1.1 Project Scoping Boundary**.

6.1.3 This chapter should be read in conjunction with:

- **Chapter 2, Regulatory and Planning Policy Context**;
- **Chapter 4, Description of the Project**;
- **Chapter 5, EIA Approach and Methodology**;
- **Chapter 7, Visual**;
- **Chapter 8, Ecology and Biodiversity**; and
- **Chapter 9, Cultural Heritage**.

6.1.4 This chapter is supported by the following figures and appendices:

- **Figure 6.1, Proposed Landscape Study Area**;
- **Figure 6.2, Landscape Constraints**;
- **Figure 6.3, National and Local Landscape Character Areas**; and
- **Appendix 6.A, Landscape Assessment Methodology.**

6.2 Regulatory and Planning Context

6.2.1 **Chapter 2, Regulatory and Planning Context** describes the overall regulatory and planning policy context for the Project. Key legislation, policy, and planning guidance relevant to the assessment of potential effects on landscape associated with the construction, operation, and maintenance of the Project is presented below.

Legislation

European Landscape Convention

6.2.2 The European Landscape Convention (Ref 6.1) was ratified in the UK in 2006. It defines landscape as: *"an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors"*. The European Landscape Convention promotes an *"all-landscapes approach"*, founded on the recognition of value in all landscapes. It recognises that the landscape is important as a component of the environment and of people's surroundings in both town and country and whether it is ordinary landscape or outstanding.

Electricity Act 1989

6.2.3 The Electricity Act 1989 – Section 38 and Schedule 9 of the Electricity Act 1989 places a duty on all electricity transmission and distribution licence holders, in formulating proposals for new electricity networks infrastructure to *"have regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest; and … do what [they] reasonably can to mitigate any effect which the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings or objects".*

Tree Preservation Orders

6.2.4 The law on Tree Preservation Orders (TPO) is in the Town and Country Planning Act 1990 (particularly sections 197-214 as amended) and in the Town and Country Planning (Trees) Regulations 1999 (Statutory Instrument number 1892). This is relevant as it informs the development of mitigation proposals should any TPO tree have to be removed.

Planning Policy

National planning policy

National Policy Statements

6.2.5 As detailed in **Chapter 2, Regulatory and Planning Policy Context**, National Policy Statements (NPSs) set out the primary policy tests against which the application for a Development Consent Order (DCO) for the Project would be considered. The two relevant NPSs are Overarching National Policy Statement for Energy (EN-1) (Ref 2.2) and National Policy Statement for Electricity Networks Infrastructure (EN-5) (Ref 2.3). **Table 6.1** sets out how both the current and draft NPSs relevant to electricity networks infrastructure are relevant to the landscape assessment.

Table 6.1: Relevant sections of the relevant National Policy Statements

National Policy Statement	NPS section	How it will be considered
EN-1	4.5.3 (part) *"...Whilst the applicant may not have any or very limited choice in the physical appearance of some energy infrastructure, there may be opportunities for the applicant to demonstrate good design in terms of siting relative to existing landscape character, landform, and vegetation".*	The design of the route of the 400 kV OHL and the siting of associated infrastructure is being developed within the underlying principle of good design through the application of the Holford Rules (Ref 2.20) and Horlock Rules (Ref 2.21).
EN-1	4.5.4 (part) *"…For the IPC to consider the proposal for a project, applicants should be able to demonstrate in their application documents how the design process was conducted and how the proposed design evolved. Where a number of different designs were considered, applicants should set out the reasons why the favoured choice has been selected. In considering applications the IPC should take into account the ultimate purpose of the infrastructure and bear in mind the operational, safety and security requirements which the design has to satisfy".*	The Scoping Boundary has been developed through a detailed routeing and siting process. The strategic options and alternatives considered for the Project are summarised in **Chapter 3, Main Alternatives Considered**. The evolution of the design will continue to be informed by both environmental and technical desk studies and site surveys as well as consultation and stakeholder feedback. This evolution will be documented in the alternatives chapter within the Environmental Statement (ES).
EN-1	*4.6.3 (part) "In the light of the above and given the importance which the Planning Act 2008 places on good design and sustainability, the IPC needs to be satisfied that energy infrastructure developments are sustainable and, having regard to regulatory and other constraints, are as attractive, durable, and adaptable (including taking account of natural hazards such as flooding) as they can be. In so doing, the IPC should satisfy itself that the applicant has taken into account both functionality (including fitness for purpose and sustainability) and aesthetics (including its contribution to the quality of the area in which it would be located) as far as possible. Whilst the applicant may not have any or very limited choice in the physical appearance of some energy infrastructure, there may be opportunities for the applicant to demonstrate good design in terms of siting*	The Scoping Boundary has been developed through a detailed routeing and siting process. The strategic options and alternatives considered for the Project are summarised in **Chapter 3, Main Alternatives Considered**. The evolution of the design will continue to be informed by both environmental and technical desk studies and site surveys as well as consultation and stakeholder feedback. This evolution will be documented in the alternatives chapter within the ES.

National Policy Statement	NPS section	How it will be considered
	relative to existing landscape character, landform, and vegetation".	
EN-1	5.9.5 (part) *"…The landscape and visual assessment should include reference to any landscape character assessment and associated studies as a means of assessing landscape impacts relevant to the proposed project. The applicant's assessment should also take account of any relevant policies based on these assessments in local development plan documents in England and local development plans in Wales".*	The assessment will be based on the national, regional, and local landscape character assessments listed in section 6.5 of this chapter. The assessment will take account of the local planning policies listed in **Table 6.2**.
EN-1	5.9.6 *"The applicant's assessment should include the effects during construction of the project and the effects of the completed development and its operation on landscape components and landscape character".*	The proposed approach to assessing the Project at different stages in its lifecycle is detailed at **Appendix 6.A Landscape Assessment Methodology**. The proposed scope of the assessment is provided in section 6.7.
EN-1	5.9.8 *"Landscape effects depend on the existing character of the local landscape, its current quality, how highly it is valued and its capacity to accommodate change. All of these factors need to be considered in judging the impact of a project on landscape. Virtually all nationally significant energy infrastructure projects will have effects on the landscape. Projects need to be designed carefully, taking account of the potential impact on the landscape. Having regard to siting, operational and other relevant constraints the aim should be to minimise harm to the landscape, providing reasonable mitigation where possible and appropriate".*	**Chapter 4, Description of the Project** describes the evolution of the Project to date and demonstrates that minimising adverse effects on the landscape through sensitive routeing, siting and design in accordance with the Holford Rules and Horlock Rules was a major consideration during its development and will continue in the future design evolution of the Project. The proposed approach to assessing the existing character, quality, value and the susceptibility and sensitivity to change of the landscape is detailed at **Appendix 6.A Landscape Assessment Methodology**.
EN-1	5.9.9 *"National Parks, the Broads and AONBs have been confirmed by the Government as having the highest status of protection in relation to landscape and scenic beauty. Each of these designated areas has specific statutory purposes which help ensure their*	No above ground construction or operational part of the Project would fall within the boundaries of a National Park or AONB, or within the provisional Candidate Area for the Yorkshire Wolds

National Policy Statement	NPS section	How it will be considered
	continued protection and which the IPC should have regard to in its decisions. The conservation of the natural beauty of the landscape and countryside should be given substantial weight by the IPC in deciding on applications for development consent in these areas".	which is described in section 6.5.
EN-1	*5.9.10 "Nevertheless, the IPC may grant development consent in these areas in exceptional circumstances. The development should be demonstrated to be in the public interest and consideration of such applications should include an assessment of:* • *the need for the development, including in terms of national considerations, and the impact of consenting or not consenting it upon the local economy;* • *the cost of, and scope for, developing elsewhere outside the designated area or meeting the need for it in some other way, taking account of the policy on alternatives set out in section 4.4; and* • *any detrimental effect on the environment, the landscape and recreational opportunities, and the extent to which that could be moderated".*	No above ground construction or operational part of the Project would fall within the boundaries of a National Park or AONB, or within the provisional Candidate Area for the Yorkshire Wolds.
EN-1	5.9.11 *"The IPC should ensure that any projects consented in these designated areas should be carried out to high environmental standards, including through the application of appropriate requirements where necessary".*	No above ground construction or operational part of the Project would fall within the boundaries of a National Park or AONB, or within the provisional Candidate Area for the Yorkshire Wolds.
EN-1	5.9.12 *(part) "The duty to have regard to the purposes of nationally designated areas also applies when considering applications for projects outside the boundaries of these areas which may have impacts within them. The aim should be to avoid compromising the purposes of designation and such projects should be designed sensitively given the various siting, operational, and other relevant constraint".*	No above ground construction or operational part of the Project would compromise the purposes of a National Park or AONB, including the provisional Candidate Area for the Yorkshire Wolds.

National Policy Statement	NPS section	How it will be considered
EN-1	5.9.13 *"The fact that a proposed project will be visible from within a designated area should not in itself be a reason for refusing consent".*	No part of the Project would be visible from within the boundaries of a National Park or AONB, or within the provisional Candidate Area for the Yorkshire Wolds.
EN-1	5.9.14 *"Outside designated landscapes, there are local landscapes that may be highly valued locally and protected by local designation. Where a local development document in England or a local development plan in Wales has policies based on landscape character assessment, these should be paid particular attention. However local landscape designations should not be used in themselves to refuse consent as this may unduly restrict acceptable development".*	The assessment will consider the effects of the Project on the locally designated landscapes listed in section 6.5.
EN-1	5.9.15 *"The scale of such projects means that they will often be visible within many miles of the site of the proposed infrastructure. The IPC [Secretary of State] should judge whether any adverse impact on the landscape would be so damaging that it is not offset by the benefits (including need) of the project".*	The proposed approach to assessing the Project is described in **Appendix 6.A Landscape Assessment Methodology**. The proposed scope of the assessment is provided in section 6.7. The scope will include an assessment of effects on views out from individual landscape character areas and how this could indirectly affect the perceived character of the landscape character area.
EN-1	5.9.16 *"In reaching a judgement, the IPC should consider whether the adverse impact on the landscape is temporary, such as during construction, and/ or whether any adverse impact on the landscape will be capable of being reversed in a timescale that the IPC considers reasonable".*	The proposed approach to assessing the Project at different stages in its lifecycle is detailed in **Appendix 6.A Landscape Assessment Methodology**. The proposed scope of the assessment is provided in section 6.7.
EN-1	5.9.17 *"The IPC should consider whether the project has been designed carefully, taking account of environmental effects on the landscape and siting, operational and other relevant constraints, to minimise harm to the*	**Chapter 4, Description of the Project** describes the evolution of the Project to date and demonstrates that minimising adverse effects on the landscape through sensitive

National Policy Statement	NPS section	How it will be considered
	landscape, including by reasonable mitigation".	routeing, siting and design in accordance with the Holford Rules and Horlock Rules was a major consideration during its development and will continue in the future design evolution of the Project. The proposed approach to mitigation is discussed in **Chapter 4, Description of the Project**.
EN-1	5.9.21 *"Reducing the scale of a project can help to mitigate the visual and landscape effects of a proposed project. However, reducing the scale or otherwise amending the design of a proposed energy infrastructure project may result in a significant operational constraint and reduction in function – for example, the electricity generation output. There may, however, be exceptional circumstances, where mitigation could have a very significant benefit and warrant a small reduction in function. In these circumstances, the IPC may decide that the benefits of the mitigation to reduce the landscape and/or visual effects outweigh the marginal loss of function".*	**Chapter 4, Description of the Project** describes the evolution of the Project to date and demonstrates that minimising adverse effects on the landscape through sensitive routeing, siting and design in accordance with the Holford Rules and Horlock Rules was a major consideration during its development and will continue in the future design evolution of the Project.
EN-1	5.9.22 *"Within a defined site, adverse landscape and visual effects may be minimised through appropriate siting of infrastructure within that site, design including colours and materials, and landscaping schemes, depending on the size and type of the proposed project. Materials and design of buildings should always be given careful consideration".*	**Chapter 4, Description of the Project** describes the evolution of the Project to date and demonstrates that minimising adverse effects on the landscape through sensitive routeing, siting and design in accordance with the Holford Rules and Horlock Rules was a major consideration during its development and will continue in the future design evolution of the Project.
EN-1	5.9.23 *"Depending on the topography of the surrounding terrain and areas of population it may be appropriate to undertake landscaping off site. For example, when filling in gaps in existing tree and hedge lines would mitigate the impact when viewed from a more distant vista".*	The proposed approach to mitigation is discussed in **Chapter 4, Description of the Project**. The landscape effects will be assessed at year 1 and year 15

National Policy Statement	NPS section	How it will be considered
		to allow for the maturing of mitigation planting.
EN-1 (Draft)	4.6.2 (part) *"Applying 'good design' to energy projects should produce sustainable infrastructure sensitive to place, efficient in the use of natural resources and energy used in their construction and operation, matched by an appearance that demonstrates good aesthetic as far as possible. It is acknowledged, however that the nature of much energy infrastructure development will often limit the extent to which it can contribute to the enhancement of the quality of the area".*	The design of the route of the 400 kV OHL and the siting of associated infrastructure is being developed within the underlying principle of good design through the application of the Holford Rules and Horlock Rules.
EN-1 (Draft)	4.6.2 (part) *"Given the benefits of "good design" in mitigating the adverse impacts of a project, applicants should consider how "good design" can be applied to a project during the early stages of the project lifecycle. Design principles should be established from the outset of the project to guide the development from conception to operation".*	The design of the route of the 400 kV OHL and the siting of associated infrastructure is being developed within the underlying principle of good design through the application of the Holford Rules and Horlock Rules.
EN-1 (Draft)	4.6.3 (part) *"…the Secretary of State needs to be satisfied that energy infrastructure developments are sustainable and, having regard to regulatory and other constraints, are as attractive, durable, and adaptable (including taking account of natural hazards such as flooding) as they can be. In doing so, the Secretary of State should be satisfied that the applicant has taken into account both functionality (including fitness for purpose and sustainability) and aesthetics (including its contribution to the quality of the area in which it would be located, any potential amenity benefits, and visual impacts on the landscape or seascape) as far as possible".*	The design of the Project has sought to avoid such features through the application of the Holford Rules and Horlock Rules.
EN-1 (Draft)	4.6.4 (part) *"Many of the wider impacts of a development, such as landscape and environmental impacts, will be important factors in the design process. The Secretary of State will consider such impacts under the relevant policies in this NPS. Assessment of impacts must be for the stated design life of the scheme rather than a shorter time period".*	The proposed approach to assessing the Project at different stages in its lifecycle is described in **Appendix 6.A Landscape Assessment Methodology**. The design life of the Project is at least 80 years but with regular maintenance is likely to extend further.

National Policy Statement	NPS section	How it will be considered
		The proposed scope of the assessment is provided in section 6.7.
EN-1 (Draft)	5.10.8 *"The assessment should also demonstrate how noise and light pollution from construction and operational activities on residential amenity and on sensitive locations, receptors, and views, will be minimised".*	**Chapter 4, Description of the Project** describes the evolution of the Project to date and demonstrates that minimising adverse effects on sensitive locations through routeing, siting and design in accordance with the Holford Rules and Horlock Rules was a major consideration during its development and will continue in the future design evolution of the Project. **Chapter 7, Visual Assessment** sets out the proposed scope and approach to assessing the effects of the Project on residential visual amenity. Other effects, including noise and vibration, and assessed in **Chapter 15, Noise and Vibration**, and **Chapter 16, Socio-economic, Recreation and Tourism**.
EN-5	2.2.6 *"...As well as having duties under section 9 of the Electricity Act 1989, (in relation to developing and maintaining an economical and efficient network), developers will be influenced by Schedule 9 to the Electricity Act 1989 , which places a duty on all transmission and distribution licence holders, in formulating proposals for new electricity networks infrastructure, to "have regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest; and … do what [they] reasonably can to mitigate any effect which the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings or objects." Depending on the location of the*	The design of the Project has sought to avoid such features through the application of the Holford Rules and Horlock Rules. **Chapter 4, Description of the Project** describes the evolution of the Project to date and how it demonstrates good design in its development to date. The proposed approach to assessing likely significant landscape effects is described in **Appendix 6.A Landscape Assessment Methodology**.

National Policy Statement	NPS section	How it will be considered
	proposed development, statutory duties under section 85 of the Countryside and Rights of Way Act 2000 and section 11A of the National Parks and Access to the Countryside Act 1949 may be relevant".	
EN-5	2.8.2 (part) *"Government does not believe that development of overhead lines is generally incompatible in principle with developers' statutory duty under section 9 of the Planning Act to have regard to amenity and to mitigate impacts…In practice new above ground electricity lines, whether supported by lattice steel towers/pylons or wooden poles, can give rise to adverse landscape and visual impacts, dependent upon their scale, siting, degree of screening and the nature of the landscape and local environment through which they are routed. For the most part these impacts can be mitigated, however at particularly sensitive locations the potential adverse landscape and visual impacts of an overhead line proposal may make it unacceptable in planning terms, taking account of the specific local environment and context".*	**Chapter 4, Description of the Project** describes the evolution of the Project to date and demonstrates that minimising adverse effects on the landscape through sensitive routeing, siting and design in accordance with the Holford Rules and Horlock Rules was a major consideration during its development and will continue in the future design evolution of the Project. The main approach to mitigating the landscape effects of tall vertical infrastructure such as pylons, is through careful design and routeing.
EN-5	2.8.2 (part) *"…New substations, sealing end compounds and other above ground installations that form connection, switching and voltage transformation points on the electricity networks can also give rise to landscape and visual impacts. Cumulative landscape and visual impacts can arise where new overhead lines are required along with other related developments such as substations, wind farms and/or other new sources of power generation".*	The proposed approach to assessing likely significant cumulative landscape effects is described in **Appendix 6.A Landscape Assessment Methodology**. The proposed approach to mitigation is discussed in **Chapter 4, Description of the Project**.
EN-5	2.8.3 *"Sometimes positive landscape and visual benefits can arise through the reconfiguration or rationalisation of existing electricity network infrastructure".*	The strategic options and alternatives considered for the Project are summarised in **Chapter 3, Main Alternatives Considered**.
EN-5	2.8.4 *"Where possible, applicants should follow the principles below [Holford Rules] in designing the route of their overhead line proposals and it will be for applicants to offer constructive proposals for additional*	The strategic options and alternatives considered for the Project are summarised in

National Policy Statement	NPS section	How it will be considered
	mitigation of the proposed overhead line. While proposed underground lines do not require development consent under the Planning Act 2008, wherever the nature or proposed route of an overhead line proposals makes it likely that its visual impact will be particularly significant, the applicant should have given appropriate consideration to the potential costs and benefits of other feasible means of connection or reinforcement, including underground and sub-sea cables where appropriate. The ES should set out details of how consideration has been given to undergrounding or sub-sea cables as a way of mitigating such impacts, including, where these have not been adopted on grounds of additional cost, how the costs of mitigation have been calculated".	**Chapter 3, Main Alternatives Considered**.
EN-5	2.8.5 *"Guidelines for the routeing of new overhead lines, the Holford Rules, were originally set out in 1959 by Lord Holford, and are intended as a common sense approach to the routeing of new overhead lines. These guidelines were reviewed and updated by the industry in the 1990s and should be followed by developers when designing their proposals".*	**Chapter 4, Description of the Project** describes the evolution of the Project to date and demonstrates that minimising adverse effects on the landscape through sensitive routeing, siting and design in accordance with the Holford Rules and Horlock Rules was a major consideration during its development and will continue in the future design evolution of the Project.
EN-5	2.8.8 *"Paragraph 3.7.10 of EN-1 sets out the need for new electricity lines of 132 kV and above, including overhead lines. Although Government expects that fulfilling this need through the development of overhead lines will often be appropriate, it recognises that there will be cases where this is not so. Where there are serious concerns about the likely adverse effects of a proposed overhead line, the IPC will have to balance these against the relevant factors, including the need for the proposed infrastructure, the availability and cost of alternative sites and routes and methods of installation (including undergrounding)".*	The strategic options and alternatives considered for the Project are summarised in **Chapter 3, Main Alternatives Considered**. The proposed approach to assessing likely significant landscape effects is described in **Appendix 6.A Landscape Assessment Methodology**.
EN-5	2.8.9 *"The impacts and costs of both overhead and underground options vary*	The strategic options and alternatives considered for the

National Policy Statement	NPS section	How it will be considered
	considerably between individual projects (both in absolute and relative terms). Therefore, each project should be assessed individually on the basis of its specific circumstances and taking account of the fact that Government has not laid down any general rule about when an overhead line should be considered unacceptable. The IPC should, however, only refuse consent for overhead line proposals in favour of an underground or sub-sea line if it is satisfied that the benefits from the non-overhead line alternative will clearly outweigh any extra economic, social, and environmental impacts and the technical difficulties are surmountable. In this context it should consider: • *The landscape in which the proposed line will be set, (in particular, the impact on residential areas, and those of natural beauty or historic importance such as National Parks, AONBs and the Broads);* • *the additional cost of any undergrounding or sub-sea cabling (which experience shows is generally significantly more expensive than overhead lines but varies considerably from project to project depending on a range of factors, including whether the line is buried directly in open agricultural land or whether more complex tunnelling and civil engineering through conurbations and major cities is required. Repair impacts are also significantly higher than for overhead lines as are the costs associated with any later uprating.); and* • *the environmental and archaeological consequences (undergrounding a 400 kV line may mean disturbing a swathe of ground up to 40 m across, which can disturb sensitive habitats, have an impact on soils and geology, and damage heritage assets, in many*	Project are summarised in **Chapter 3, Main Alternatives Considered**. **Chapter 4, Description of the Project** describes the evolution of the Project to date and demonstrates that minimising adverse effects on the landscape through sensitive routeing, siting and design in accordance with the Holford Rules and Horlock Rules was a major consideration during its development and will continue in the future design evolution of the Project. The proposed approach to assessing the existing character, quality, value, and the susceptibility/ sensitivity to change of the landscape is described in **Appendix 6.A Landscape Assessment Methodology**. An overview of the landscape is provided in section 6.5.

National Policy Statement	NPS section	How it will be considered
	cases more than an overhead line would)".	
EN-5	2.8.10 *"In addition to following the principles set out in the Holford Rules and considering undergrounding, the main opportunities for mitigating likely adverse landscape and visual impacts of electricity networks infrastructure are:* • *consideration of network reinforcement options (where alternatives exist) which may allow improvements to an existing line rather than the building of an entirely new line; and* • *selection of the most suitable type and design of support structure (i.e. different lattice tower types, use of wooden poles etc.) in order to minimise the overall visual impact on the landscape".*	The strategic options and alternatives considered for the Project are summarised in **Chapter 3, Main Alternatives Considered**. The design evolution of the Project to date and how it demonstrates good design is reported in **Chapter 4, Description of the Project** which also explains how the presence of an existing 400 kV OHL offers opportunities to lessen the likely effects of the proposed 400 kV OHL.
EN-5	2.8.11 (*part) "There are some more specific measures that might be taken, and which the IPC could require through requirements if appropriate, as follows: Landscape Schemes comprising off-site tree and hedgerow planting are sometimes used for larger overhead line projects to mitigate likely landscape and visual impacts, softening the effect of a new above ground line whilst providing some screening from important visual receptors. These can only be implemented with the agreement of the relevant landowner(s) and advice from the relevant statutory advisor may also be needed".*	The proposed approach to mitigation is discussed in **Chapter 4, Description of the Project**.
EN-5 (Draft)	2.2.2 *"However, Applicants retain substantial control over routing and site selection within the identified macro-level location or development zone. Moreover, the locational constraints identified above do not, of course, exempt Applicants from their duty to consider and balance the site-selection considerations set out below, much less the policies on good design and impact mitigation detailed in Sections 2.7-2.14".*	The design evolution of the Project to date and how it demonstrates good design is reported in **Chapter 4, Description of the Project**.

National Policy Statement	NPS section	How it will be considered
EN-5 (Draft)	2.2.3 *"Applicants should bear in mind that the connection between the initiating and terminating points of a proposed new electricity line need not go via the most direct route. Indeed, engineering, environmental, and community constraints may make this infeasible or unsuitable".*	The design evolution of the Project to date and how it demonstrates good design is reported in **Chapter 4, Description of the Project**.
EN-5 (Draft)	2.11.2 *"While government does not believe that the development of overhead lines is incompatible in principle with developers' statutory duty under Schedule 9 of the Electricity Act 1989 to have regard to visual and landscape amenity and to mitigate to the fullest extent reasonably possible any impacts thereon, in practice new overhead lines – whether supported by lattice steel towers or monopole structures – can give rise to adverse landscape and visual impacts. These impacts depend on the type, scale, siting, and degree of screening of the lines, as well as the characteristics of the landscape and local environment through which they are routed".*	**Chapter 4, Description of the Project** describes the evolution of the Project to date and demonstrates that minimising adverse effects on the landscape through sensitive routeing, siting and design in accordance with the Holford Rules and Horlock Rules was a major consideration during its development and will continue in the future design evolution of the Project. The proposed approach to assessing likely significant landscape effects is described in **Appendix 6.A Landscape Assessment Methodology**.
EN-5 (Draft)	2.11.4 *"Cumulative adverse landscape and visual impacts may arise where new overhead lines are required along with other related developments such as substations, wind farms, and/or other new sources of generation".*	The proposed approach to assessing likely significant cumulative landscape effects is described in **Appendix 6.A Landscape Assessment Methodology**.
EN-5 (Draft)	2.11.5 *"Landscape and visual benefits may arise through the reconfiguration, rationalisation, or undergrounding of existing electricity network infrastructure".*	The strategic options and alternatives considered for the Project are summarised in **Chapter 3, Main Alternatives Considered**.
EN-5 (Draft)	2.11.8 *"Where the nature or proposed route of an overhead line will likely result in particularly significant landscape and/or visual impacts, the Applicant should demonstrate that they have given due consideration to the costs and benefits of feasible alternatives to the line, including – where appropriate – underground or subsea cables. The ES should set out details of this consideration,*	The strategic options and alternatives considered for the Project are summarised in **Chapter 3, Main Alternatives Considered**.

National Policy Statement	NPS section	How it will be considered
	including the Applicant's rationale for eschewing feasible alternatives to the overhead line, and the mitigation cost calculation methodology that this rationale may rely upon".	
EN-5 (Draft)	2.11.13 *"Although it is the government's position that overhead lines should be the strong starting presumption for electricity networks developments in general, this presumption is reversed when proposed developments will cross part of a nationally designated landscape (i.e. National Park, Broads, or Area of Outstanding Natural Beauty). In these areas, and where harm to the landscape cannot feasibly be avoided by mitigation or re-routing, the strong starting presumption will be that the developer should underground the relevant Section of the line. Note however that undergrounding will not be required where it is infeasible in engineering terms, or where the harm that it causes is not outweighed by its corresponding landscape and/or visual benefits".*	The strategic options and alternatives considered for the Project are summarised in **Chapter 3, Main Alternatives Considered**.
EN-5 (Draft)	2.11.14 *"Additionally, cases will arise where – though no part of the proposed development crosses a designated landscape – a high potential for widespread and significant adverse landscape and/or visual impacts along certain Sections of its route may nonetheless recommend undergrounding the relevant segments of the line. In these cases, and taking account of the fact that the government has not laid down any further rule on the circumstances requiring undergrounding, the Secretary of State must weigh the feasibility, cost, and any harm of the undergrounding option against i) the adverse implications of the overhead line proposal; ii) the cost and feasibility of rerouting the relevant line Section; and iii) the cost and feasibility of the reconfiguration, rationalisation, and/or undergrounding of proximate existing or proposed electricity National Policy Statement for Electricity Networks Infrastructure (EN-5) networks infrastructure. In such cases the Secretary of State should only grant development consent for underground (or subsea) Sections of a*	The strategic options and alternatives considered for the Project are summarised in **Chapter 3, Main Alternatives Considered**. **Chapter 4, Description of the Project** describes the evolution of the Project to date and demonstrates that minimising adverse effects on the landscape through sensitive routeing, siting and design in accordance with the Holford Rules and Horlock Rules was a major consideration during its development and will continue in the future design evolution of the Project. The proposed approach to assessing the existing character, quality, value, and the susceptibility/ sensitivity to change of the landscape receptors is described in

National Policy Statement	NPS section	How it will be considered
	proposed line over an overhead alternative if it is satisfied that the benefits accruing from the former proposal clearly outweigh any extra economic, social, or environmental impacts that it presents, and that any technical obstacles associated with it are surmountable. In this context it should consider: • *the landscape and visual baseline characteristics of the setting of the proposed route (in particular, the impact on high sensitivity visual receptors as defined in the current edition of the Landscape Institute's Guidelines for Landscape and Visual Impact Assessment, residential areas, and areas of natural beauty or historic importance, including those in proximity to nationally designated landscapes);* • *the additional cost of the proposed underground or sub-sea alternatives, including their significantly higher lifetime cost of repair and later uprating;* • *the potentially very disruptive effects of undergrounding on local communities, habitats, archaeological and heritage sites, soil, geology, and, for a substantial time after construction, landscape, and visual amenity. (Undergrounding a 400 kV line may mean digging a deep trench 40-110 m wide along the length of the route, and so such works will often be considerably more disruptive – albeit temporarily – to the receptors listed above than would an overhead line of equivalent rating); and* • *the developer's commitment, as set out in their ES, to mitigate the potential detrimental effects of undergrounding works on any relevant agricultural land and soils, particularly regarding Best and Most Versatile land. Such a commitment must guarantee appropriate handling of soil, backfilling,*	**Appendix 6.A Landscape Assessment Methodology**. The proposed approach to assessing likely significant landscape effects is described in **Appendix 6.A Landscape Assessment Methodology**. An overview of the landscape is provided in section 6.5. The proposed approach to assessing likely significant effects on agriculture and soils is described in **Chapter 12, Agriculture and Soils**.

National Policy Statement	NPS section	How it will be considered
	and return of the land to the baseline Agricultural Land Classification (ALC), thus ensuring no loss or degradation of agricultural land. Such a commitment should be based on soil and ALC surveys in line with the 1988 ALC criteria and due consideration of the Defra Construction Code".	
EN-5 (Draft)	2.11.15 *"In addition to good design in accordance with the Holford and Horlock rules, and the consideration of undergrounding or rerouting the line, the principal opportunities for mitigating adverse landscape and visual impacts of electricity networks infrastructure are:* • *consideration of network reinforcement options (where alternatives exist) which may allow improvements and/or extensions to an existing line rather than the building of an entirely new line;* • *selection of the most suitable type and design of support structure in order to minimise the overall visual impact on the landscape. In particular, ensuring that lattice steel towers are of the smallest possible footprint and internal volume; and* • *the rationalisation, reconfiguration, and/or undergrounding of existing electricity networks infrastructure in the vicinity of the proposed development.*	The strategic options and alternatives considered for the Project are summarised in **Chapter 3, Main Alternatives Considered**.
EN-5 (Draft)	2.11.16 *"Additionally, there are more specific measures that might be taken, and which the Secretary of State could mandate through DCO requirements if appropriate, as follows:* • *landscape schemes, comprising off-site tree and hedgerow planting, are sometimes used for larger new overhead line projects to mitigate potential landscape and visual impacts, softening the effect of a new above ground line whilst providing some screening from important visual*	The proposed approach to mitigation on the Project is discussed in **Chapter 4, Description of the Project**.

National Policy Statement	NPS section	How it will be considered
	receptors. These may be implemented with the agreement of the relevant landowner(s), or the developer may compulsorily acquire the land in question. Advice from the relevant statutory authority may also be needed; • *screening, comprising localised planting in the immediate vicinity of residential properties and principal viewpoints can also help to screen or soften the effect of the line, reducing the visual impact from a particular receptor".*	
EN-5 (Draft)	2.11.17 *"Note that, as set out in Section 2.3 above, where landscape schemes and/or screening mitigation of the kind described above is required, rights over the land necessary for such measures may be compulsorily acquired as part of the DCO".*	The proposed approach to mitigation is discussed in **Chapter 4, Description of the Project**.
EN-5 (Draft)	2.11.18 *"Also note that since long-term management of the selected mitigation schemes is essential to their mitigating function, a management plan, developed at least in outline at the conclusion of the examination, should secure the integrity and benefit of these schemes and uphold the landscape commitments made to achieve consent, alongside any pertinent commitments to environmental and biodiversity net gain".*	National Grid plc's environmental and Biodiversity Net Gain commitments are explained in **Chapter 08, Ecology and Biodiversity**. An outline management plan will be included with the application.
EN-5 (Draft)	2.11.19 *"The Secretary of State should be satisfied that the development, so far as is reasonably possible, complies with the Holford and Horlock Rules or any updates to them. The Secretary of State should also be satisfied that all pertinent options for mitigation – including the rationalisation, reconfiguration, or undergrounding of existing electricity networks infrastructure, have been considered and evaluated appropriately".*	The strategic options and alternatives considered for the Project are summarised in **Chapter 3, Main Alternatives Considered**. **Chapter 4, Description of the Project** describes the evolution of the Project to date and demonstrates that minimising adverse effects on the landscape through sensitive routeing, siting and design in accordance with the Holford Rules and Horlock Rules was a major consideration during its

National Policy Statement	NPS section	How it will be considered
		development and will continue in the future design evolution of the Project. .

National Planning Policy Framework

6.2.6 The National Planning Policy Framework (NPPF) (Ref 2.6) does not set specific policies for NSIPs and is not applicable to NSIP where the requirements of the NPS apply. Its policies may however be material to decision making. The NPPF includes policies that ensure developments are "*sympathetic to local character and history, including the surrounding built environment and landscape setting, while not preventing or discouraging appropriate innovation or change*". The NPPF includes several policies relating to conserving and enhancing the natural environment relevant to landscape.

6.2.7 NPPF Chapter 15 Conserving and enhancing the natural environment recognises that the environment should be enhanced by:

- *"protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);*
- *recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;*
- *maintaining the character of the undeveloped coast, while improving public access to it where appropriate;*
- *minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;*
- *preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and*
- *remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate".*

6.2.8 NPPF Chapter 15 Conserving and enhancing the natural environment states that:

"great weight should be given to conserving and enhancing landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural Beauty which have the highest status of protection in relation to these issues……The scale and extent of development within all these designated areas should be limited, while development

within their setting should be sensitively located and designed to avoid or minimise adverse impacts on the designated areas".

6.2.9 NPPF is clear that plans should recognise the intrinsic character and beauty of the countryside, and that strategic policies should provide for the conservation and enhancement of landscapes. This can include nationally and locally designated landscapes but also the wider countryside. The accompanying Natural Planning Practice guidance sets out the key issues in implementing policy to protect and enhance the natural environment, including local requirements.

6.2.10 Paragraph 036 (Reference ID: 8-036-20190721) of the National Planning Practice Guidance (Ref 6.2) notes that, where landscapes have a particular local value, policies may set out criteria against which proposals for development affecting these areas can be assessed. Plans may also include policies to avoid adverse impacts on landscapes and to set out necessary mitigation measures, such as appropriate design principles and visual screening, where necessary. The cumulative impacts of development on the landscape need to be considered carefully.

Local planning policy

6.2.11 As detailed in **Chapter 2, Regulatory and Planning Policy Context**, section 2.4 Local Planning Policy, the Project lies within the jurisdiction of East Riding of Yorkshire Council, North Lincolnshire Council, Nottinghamshire County Council, and Bassetlaw District Council. The City of Doncaster Council, West Lindsey District Council, and Newark and Sherwood District Council are located within 10 km of the Project.

6.2.12 A summary of the relevant local planning policy which is relevant to a study of landscape matters and will inform the landscape assessment in the ES is provided in **Table 6.2**.

Table 6.2: Relevant Local Planning Policies

Local Plan	Policy ref	Policy context
East Riding Local Plan 2012-2029 Strategy Document, Adopted 2016 (Ref 2.7); and Local Plan Update 2020 – 2039 (Ref 2.8)	Policy ENV2 – Promoting a high-quality landscape.	Development should be designed so that it is sensitively integrated into the landscape and responds to the intrinsic qualities of the landscape. Where possible, it should seek to make the most of the opportunities to protect and enhance landscape characteristics and features, such as woodland and wetland. Where important hedgerows and trees are lost, replacements will be required, which may be provided off-site in some instances. Proposals are expected to consider and take forward the conclusions of the Landscape Character Assessment Update (Ref 6.3) and Important Landscape Areas Boundary Refinement (Ref 6.4) which

Local Plan	Policy ref	Policy context
		identified several important landscapes in the East Riding. These Important Landscape Areas (ILA) are locally valued and include the Yorkshire Wolds and Thorne, Crowle and Goole Moors[1].
North Lincolnshire Local Development Framework – Core Strategy (2011) (Ref 2.11)	Policy A1: Beverley and Central sub area	The distinctive character and landscape setting of the Wolds villages should be retained.
	CS4 – A Spatial Vision for North Lincolnshire: Spatial Objective 10	North Lincolnshire's image should be transformed by ensuring that all new development exhibits a high standard of design and architectural quality that respects and enhances the distinctive landscapes and townscapes of North Lincolnshire's towns and villages.
	CS5 – Delivering Quality Design in North Lincolnshire	All new development in North Lincolnshire should be well designed and appropriate for their context. It should contribute to creating a sense of place. The council will encourage contemporary design, provided that it is appropriate for its location and is informed by its surrounding context. Design which is inappropriate to the local area or fails to maximise opportunities for improving the character and quality of the area will not be acceptable.
	CS16 – North Lincolnshire's Landscape, Greenscape and Waterscape	Strategic landscape, greenspace, estuary and water environments, and archaeology should be protected and enhanced.
	Saved Policy LC7 – Landscape Protection	The scenic quality and distinctive local character of the landscape should be protected. Habitats of landscape importance and valuable existing natural or built heritage landscape elements should be protected and enhanced.

[1] Policies taken from the Local Plan Update

Local Plan	Policy ref	Policy context
	Policy LC12 – Protection of Trees, Woodland, and Hedgerows	Proposals for all new development should, wherever possible ensure the retention of trees, woodland, and hedgerows.
	LC13 Parks, Gardens and Landscapes of Special Historic Interest	Historic parks, gardens and landscapes are an important part of the heritage and environment of North Lincolnshire and development should not affect their special historic character and appearance or setting.
	Saved Policy LC14 – Area of Special Historic Landscape Interest	The Isle of Axholme is designated as an area of Special Historic Landscape as it displays significant areas of medieval open strip fields and Turbaries, both of which are of considerable national importance. These attributes together with enclosed land and the overall settlement pattern of the area make it nationally unique. Within this area, development will not be permitted which would destroy, damage or adversely affect the character, appearance or setting of the historic landscape, or any of its features.
	Saved Policy RD2 – Development in the Open Countryside	Policy RD2 aims to balance the needs and benefits of economic activity with maintaining and/or enhancing the quality of the countryside. Where development is permitted it should be of the highest quality and make a positive contribution to the environment as well as the social and economic prospects of the area. PPG7 states “New building in rural areas should... be of an appropriate design and scale for its location. Modern designs should have proper regard to the context for development in relation to both the immediate setting and the defining characteristics of the wider local area, including local or

Local Plan	Policy ref	Policy context
		regional building traditions or materials".
Emerging Bassetlaw Local Plan 2020-2037 (2021) (Ref 2.19)	Policy ST37 – Landscape Character	Protect and where possible enhance the distinctive qualities of the relevant landscape character Policy Zone.
	Policy ST39 – Green and Blue Infrastructure	Protect and enhance the character and distinctiveness of the green and blue infrastructure network, including ancient and mature woodland and hedgerows and the landscape along defined main and minor green corridors.
	Policy 41 – Trees, Woodlands, and Hedgerows	Consideration should be given to trees and hedgerows both on individual merit as well as their contribution to amenity and interaction as part of a group within the broader landscape setting.
Central Lincolnshire Local Plan (Ref 6.5)	Policy S62 Areas of Outstanding Natural Beauty and Areas of Great Landscape Value	Where a proposal may result in adverse impacts, it may exceptionally be supported if the overriding benefits of the development demonstrably outweigh the harm – in such circumstances the harm should be minimised and mitigated through design and landscaping.
Doncaster Local Plan 2015 – 2035 (Ref 6.6)	Policy 32 – Woodlands, Trees, and Hedgerows	Woodlands, trees, and hedgerows must be adequately considered during the design process, so that a significant adverse impact upon public amenity or ecological interest has been avoided. There is a presumption against development that results in the loss or deterioration of ancient woodland and/or veteran trees.
	Policy 33 – Landscape	Protect, maintain, and enhance the quality, local distinctiveness and the sensitivity to change of distinctive landscape character areas and individual landscape features, in particular Thorne and Hatfield Moors.

Consultation and Engagement

6.2.13 The environmental assessment will be informed by consultation and engagement with stakeholders, including East Riding of Yorkshire Council, North Lincolnshire Council, Bassetlaw District Council, Nottinghamshire County Council, and Natural England, which has been ongoing throughout the early development stages of the Project. A summary of the proposed survey and assessment methodology for ecology and biodiversity was shared with Natural England, East Riding of Yorkshire Council, North Lincolnshire Council, Bassetlaw District Council and Nottinghamshire County Council. The feedback received from this pre-scoping consultation is included in **Table 6.3,** along with a response on how the comments has been considered in this Scoping Report, where applicable.

Table 6.3 Pre-scoping engagement

Local Planning Authority	Summary of Response	Consideration in the Scoping Report
North Lincolnshire Council	Landscape and visual impacts will need to be considered in terms of the adopted Landscape Assessment and Guidelines and the Countryside Design Summary. I would also recommend the use of the Guidelines for Landscape and Visual Impact Assessment 3rd Edition (GLVIA3, 2013), produced by the Landscape Institute and the Institute of Environmental Management and Assessment. Core Strategy Spatial Objective 10, policies CS5 and CS16 and Saved Local Plan Policies LC7, LC14 and RD2 should also be considered. In the relatively open landscape of the Isle of Axholme, both new structures and any trees planted to screen them can dramatically alter the landscape character. The proposed approach to landscape impacts closely matches this advice.	The assessment will be undertaken in accordance with GLVIA3. The 1999 North Lincolnshire Landscape Assessment and Guidelines and the Countryside Design Summary will inform the description of the baseline environment and subsequent assessment. Due consideration will also be given to the North Lincolnshire Landscape Character Assessment review which forms part of the evidence base for the emerging Local Plan. This recommends designation of some LCTs including the Isle of Axholme Historic Landscape Character Area as 'Areas of High Landscape Value' The Strategic Objective 10, Policy CS 5 and saved policies LC14 and RD have been included in **Table 6.2**. The effects of the Project on the landscape of the Isle of

Local Planning Authority	Summary of Response	Consideration in the Scoping Report
		Axholme will be considered in the assessment.
Nottinghamshire County Council	6.A.1 (**Appendix 6.A**): Guidance confirmed as agreed 6.A.2 (**Appendix 6.A**): <u>6.A.2.1 Assessing Landscape Effects</u> LPA to provide support in identification of all relevant Landscape Character Area (LCA) studies from national to district level plus any other supporting studies relevant to the development area. While project is of a national scale, consideration of effects at the finer grain local Landscape Character level must also be assessed. <u>6.A.2.2 Study Area</u> The proposed 5 km study area from the Limits of Deviation boundary is accepted. This is assumed to relate to the emerging preferred corridor. Any change to the alignment of preferred corridor and resultant Limits of Deviation boundary will need to be reflected in a modification of the 5 km study area. The statement that the study area will continue to be reviewed is welcomed. It is anticipated that the proposed ZTV plan will assist in identification of any potential sensitive receptors outside the study area. Early review of the ZTV plan by the LPA would be welcomed ahead of viewpoint selection. <u>6.A.2.3 Baseline Data Gathering</u> Confirmed as agreed <u>6.A.2.4 Establishing Landscape Sensitivity</u> • 2.4.5 Landcover pattern – while the statement, 'The presence of modern (particularly vertical) structures such as existing high voltage electricity infrastructure, wind turbines, transport, utility or communication infrastructure or industrial development may reduce landscape susceptibility to a new 400 kV overhead line', is likely to be true in many cases, the study should ensure this is not just applied without proper consideration of the local scale LCA	6.A.1 – no response required. 6.A.2.1 – it is proposed to base the assessment on the regional landscape character types identified in the East Midlands Landscape Character Assessment. These are considered an appropriate level of detail for the assessment. The need for a further breakdown into smaller local landscape character areas will be reviewed as the assessment progresses. 6.A.2.2 – as noted in 6.A.2.2.1, the 5 km study area will continue to be reviewed and modified as necessary. The ZTV will be circulated to the LPA for review and comment ahead of the viewpoint selection, but this will be based on indicative pylons locations and will not necessary be a true reflection of the potential visibility of the Project. 6.A.2.3 – no response required. 6.A.2.4 – the effect of existing infrastructure on the susceptibility of the landscape will consider the local scale LCA and susceptibility in specific policy zones.

Local Planning Authority	Summary of Response	Consideration in the Scoping Report
	and susceptibility in specific policy zones. All other sections confirmed as agreed <u>6.A.2.5 Predicting Magnitude of change</u> • 2.5.4 Geographical Extent of Effect – clarification required of LCA scales (national/regional/local) that will be considered in relation to geographical extent evaluation. • 2.5.8 Making Judgements – clarification given that size/scale of effect will form the primary focus for making judgements with minor adjustments up and down for duration and reversibility is welcomed and agreed. All other sections confirmed as agreed <u>6.A.2.6 Judging Levels of Landscape Effect</u> • 2.6.3 Clarification is required on how the various identified levels of significance will be applied. Will this be strictly one category or another (major or moderate or minor), or will there be a blending of the categories (major, major/moderate, moderate, moderate/minor, etc)? All other sections confirmed as agreed <u>6.A.2.7 Mitigation and Residual Effects</u> • 2.7.3 Clarification is required on what level of residual effect will be classed as significant at Year 15. Will it just be major residual effects, or will it include lower ratings or sub-categories, e.g. major/moderate, moderate, etc? All other sections confirmed as agreed <u>6.A.3 (Appendix 6.A):</u> • 6.A.3.1 Zone of Theoretical Visibility Confirmed as agreed • 6.A.3.2 Assumptions and Limitations Confirmed as agreed	6.A.2.5 – as noted in 6A.2.5.4, the geographical extent over which the landscape effect would arise will be described as follows based on the definitions set out on page 91 of GLVIA3 and the published landscape character areas/types: Small – at the site level or its immediate setting; Medium – at the scale of the landscape; type/character area within which the Project lies; and Large – influencing several landscape character types/areas. 6.A.2.6 – as stated in 6.A.2.6.4, the categories will be major, moderate minor etc., but where an effect falls at the upper or lower end of the category, this will be noted. 6.A.2.7 – as stated in 6.A.2.7.4, residual effects will be identified as major, moderate, minor or negligible. 6.A.3 – no response required.
Natural England	With regard to the methodologies for Landscape and Visual assessment, Natural	The provisional Candidate Area is shown on **Figure 6.2**

Local Planning Authority	Summary of Response	Consideration in the Scoping Report
	England raise no issues and consider the methodology to be appropriate and agreed. With regard to NE's designation programme, in June 2021, Natural England announced an ambitious programme for landscape, including four new designation projects. These will help deliver on the Government's commitment to safeguard more of England's beautiful and iconic landscapes for future generations as outlined in its 10 Point Plan for a Green Industrial Revolution. We are currently considering the designation of four new areas: • A new Yorkshire Wolds AONB; • A new Cheshire Sandstone Ridge AONB; • An extension to the Surrey Hills AONB; and • An extension to the Chilterns AONB. NE is fully resourced and committed to the above four cases and is therefore not taking on any new designation projects at the current time. It is therefore suggested that the Yorkshire Wolds designation project is considered during the scoping phase. Appendix 6.A Proposed Landscape Assessment (the Baseline Data Gathering section at paragraphs 2.3.3) makes reference to Natural England's reports identifying a candidate area for the Yorkshire Wolds designation as AONB as part of that baseline gathering process. We would suggest that this is also repeated in the corresponding section at paragraph 2.3.2 in Chapter 7 (Visual Assessment). The Candidate Area is currently being revised (a revision which is unlikely to materially affect the Project) and this area can be shared with NG once appropriate to do so.	**Landscape Constraints**. At its closest the provisional Candidate Area lies some 14 km from the nearest point on the Scoping Boundary. The tallest elements of the Project are the two pylons at the crossing of the River Ouse. These could be approximately 110 m high which is similar to the existing pylons at Blacktoft. At 14 km distance, 110 m high pylons would appear to be 48 mm tall in the landscape (refer to section 6.3). This means that even if they were visible alongside the existing pylons in views out from the provisional Candidate Area, they would not fundamentally alter the character of those views or indirectly influence the character of the landscape. Therefore, it is proposed to exclude the provisional Candidate Area from the assessment.

6.3 Study Area

6.3.1 The extent of the study area is determined by the potential visibility of the Project in the surrounding landscape and is proportionate to the size and scale of the Project and nature of the surrounding landscape. GLVIA3 (Ref 6.7) states that the study area should include

"*the full extent of the wider landscape around it which the Proposed Development may influence in a significant manner".*

6.3.2 Based on the type of OHL infrastructure and experience of assessments of 400 kV OHL (the tallest element of the Project), the visibility of individual pylons approximately 50 m tall is assumed to be a maximum distance of 10 km. Beyond this distance the perceptibility of pylons approximately 50 m tall diminishes considerably in most instances, and in all but the clearest of viewing conditions.

6.3.3 At distances greater than 5 km, effects on landscape character and visual amenity are unlikely to be significant. This is because at 5 km distance, when viewed at arm's length, a 50 m tall pylon will appear to be approximately 0.61 cm high in the landscape. If a pylon is seen on the skyline in very clear conditions, or a pair of pylons are seen close together at this distance, perceptibility may increase slightly but this is still unlikely to trigger significant effects.

6.3.4 Initial field survey for the Project has also determined that, where visible at distances between 1 km and 3 km, existing pylons are typically noticeable but not prominent. This is because in the rolling well-treed landscapes found north of the Humber Estuary, pylons are often obscured by trees, landform and vegetation, whilst in the flat open landscapes south of the Humber Estuary, the visually permeable nature of the pylon's lattice structure means that they rapidly recede and visually assimilate into the wider landscape.

6.3.5 Where visible within 1 km it is typically seen in a greater proportion of the view, depending on filtering, screening, or backgrounding which may reduce the extent visible.

6.3.6 Based on these observations, the proposed study area for the landscape assessment is defined as a 5 km distance from the Project (the 'wider landscape'). This is considered to cover landscape receptors which could be affected to a significant degree. The emphasis of the assessment will, however, be based on receptors lying within 3 km as this is where significant effects are most likely to occur.

6.3.7 To support the assessment, Zone of Theoretical Visibility (ZTV) maps will be produced up to a 10 km distance surrounding the project (see **Appendix 6.A Landscape Assessment Methodology** for more details). These will help to determine the area over which the proposed 400 kV OHL could theoretically be visible. The reason the ZTV maps will be prepared over a 10 km distance is to inform the assessment of cumulative landscape impacts with other proposed developments and to ensure that the effects of taller elements such as the pylons at the River Ouse crossing are fully assessed.

6.3.8 These distances will continue to be reviewed and, if necessary, amended as the design of the Project progresses.

6.4 Baseline Conditions

Data Sources

6.4.1 The known or predicated current and future baseline environment described in this section has been informed by the following data sources:

- Natural England National Character Area Profiles (Ref 6.8);
- East Riding of Yorkshire Landscape Character Assessment;
- North Lincolnshire Landscape Character Assessment and Guidelines (Ref 6.9);
- North Lincolnshire Countryside Design Summary (Ref 6.10)
- North Lincolnshire Landscape Character Assessment (Ref 6.11)
- Doncaster Landscape Character Assessment and Capacity Study (Ref 6.12);
- East Midlands Regional Landscape Character Assessment (Ref 6.13);
- Doncaster Landscape Character Assessment Update – Sensitivity to Wind Energy Development (Ref 6.14); and
- East Riding of Yorkshire Important Landscape Areas Boundary Refinement.

Baseline

6.4.2 The study area for the landscape assessment is shown in **Figure 6.1 Proposed Landscape Study Area** and an explanation of how it was defined is provided in section 6.3.

Overview of current landscape character

6.4.3 The landscape through which the Project traverses can be divided into the following three geographical areas, all of which are strongly influenced by the estuarine landscape of the Humber Estuary to the north and the River Trent to the south. A broad overview of the three areas based on Natural England's National Character Area (NCA) Profiles is provided below.

The Yorkshire Wolds

6.4.4 The northern extent of the study area includes the southern end of the Yorkshire Wolds which rise in an easterly direction from the Vale of York to create a broad sinuous escarpment above North Newbold, South Cave and Welton. The escarpment is incised by small dry valleys which creates a complex landform. When combined with the high woodland cover this gives a strong sense of enclosure.

6.4.5 East of the escarpment is a large-scale rolling plateau landscape with medium to large, often rectilinear arable fields punctuated by occasional woodland blocks and shelterbelts. Hedgerows are generally well-maintained but insubstantial which, combined with the limited tree and woodland cover, adds to the sense of openness and big skies. The plateau is lightly settled with large farmsteads and occasional villages. The strong rural character and dispersed settlement pattern, gives it a sense of remoteness. The scale and openness of the Wolds has been captured in recent times by the artist David Hockney in his popular large-scale landscape paintings such as 'Bigger Trees Near Water'.

6.4.6 At the base of the Wolds and along the north side of the Humber Estuary, the landscape is much more developed, and the farmland degraded by proximity to the urban area. The small towns of Hessle, North Ferriby and Brough merge eastwards along the northern coast of the Humber Estuary into the City of Hull and are connected by a network of main roads and railway lines. There are many discordant landscape elements and features including the commercial development along the A63 corridor and several overhead lines. This includes the existing 400 kV OHL (4ZQ) which crosses the A63 between South Cave

and Brantingham at the very southern end of the Wolds between Creyke Beck Substation and the River Ouse.

Humberhead Levels

6.4.7 This area (from the M62/A63 in the north, to the Chesterfield Canal in the south, and the River Idle to the west) comprises the Humberhead Levels, a flat, low-lying and large-scale agricultural landscape bounded to the west by the low ridge of the Southern Magnesian Limestone and to the east by the North Lincolnshire Edge, an escarpment of Jurassic Limestone combined with an escarpment of Lower Jurassic mudstones, which runs north from Lincoln to the Humber Estuary.

6.4.8 The River Trent flows slowly across the Levels at the foot of the North Lincolnshire Edge joining the River Ouse to form the Humber Estuary near Alkborough. Much of the Humberhead Levels comprises highly productive farmland and displays a pattern of large geometric fields defined by ditches. The human influence of drainage channels and canalised main rivers is almost always present and although the watercourses themselves are often not visually prominent, their presence is often marked by reedswamp which has developed along their margins.

6.4.9 Around Scunthorpe are the Coversands, post-glacial wind-blown sands which have given rise to landscape mosaic of heathland, acid grassland and oak/birch wood.

6.4.10 The Isle of Axholme is of international historic significance for its extensive strip field system, while other areas reveal distinct field and drainage patterns linked to past uses and drainage of the area. The still extensive tract of Hatfield, Thorne, Goole and Crowle Moors is a remnant of the vast complex of moor, bog and fen that once surrounded the head of the Humber estuary and included much of Lincolnshire's Isle of Axholme. Although extensively drained and improved for agriculture or cut for horticultural peat, several relic pockets of mire vegetation persist and represent the largest area of raised bog in lowland Britain. The presence of several windfarms south of Goole has lowered the remote quality of the area but its distinctiveness remains largely unchanged.

6.4.11 Woodland represents a small percentage of the landcover of North Lincolnshire. Although there are extensive areas of woodland east of Scunthorpe, the relative openness of most of North Lincolnshire’s landscape is very apparent. Trees and woodland are consequently particularly important in contributing to the character of the countryside. Similarly, hedgerows are markedly absent or in a state of decline.

6.4.12 Outside the main towns of Scunthorpe, Goole and Thorne settlement is limited, with villages and large dispersed and relatively isolated farmsteads generally concentrated on the slightly higher, drier ground or along the scarp foot springline. Views to distant horizons are often long and unbroken, with expansive skies, and vertical elements such as water towers, power stations, pylons and wind turbines being very noticeable features in the landscape. Further settlement concentrations and industrial development are found on the southern shores of the Humber Estuary.

6.4.13 Parts of the Humberhead Levels have been affected by development and the presence of discordant elements and features. These areas are typically located on the edge of settlements but may also be in rural locations where industrial development has taken place, for example along the M62/A63 corridor at Goole and along the River Trent at Gunness. The M180/A180/A160 is the principal east-west route passing south of Scunthorpe and linking the ports and industrial areas of Grimsby and Immingham to their hinterland.

6.4.14 Power stations at Killingholme and Keadby in North Lincolnshire are connected by several OHL, which also connect to West Burton Power Station further south along the Trent in Nottinghamshire. These OHL include the parallel 400 kV OHLs (2KN and 4KG) which run between Killingholme and Keadby, the 400 kV OHL (ZDA) running west from Keadby, the 400 kV OHL (4ZQ) running south from the River Ouse and a parallel 400 kV OHL (ZDA and 4TM) running south from Keadby to West Burton.

Trent and Belvoir Dales

6.4.15 The remaining study area comprise undulating, strongly rural and predominantly arable farmland, centred on the meandering River Trent and its floodplain. The eastern edge of the Vale is defined by the escarpment of the Lincolnshire Edge and to the west, the escarpment of a broad ridge of rolling landscape defines the boundary with the neighbouring Sherwood and Humberhead Levels NCA.

6.4.16 The River Trent supports a variety of wetland habitats which contributes to a more diverse landscape, but the surrounding landscape is mainly arable farmland with medium to large fields bordered by hawthorn hedges and ditches. Traditionally a mixed farming area, its intrinsic landscape character has been weakened by modern agricultural practices and development. Pasture has been converted to arable use and hedgerows removed to create larger fields. The farmland is only lightly wooded, which together with the sparse hedgerow network creates an open landscape. Wetland habitat created after the extraction of sand and gravel provide important sites for wildlife as well as being important recreational assets.

6.4.17 The settlement pattern is characterised by compact villages and dispersed farmsteads linked by a network of small, quiet country lanes, contrasting with the busy towns and main roads that connect them.

6.4.18 Detractors along the Trent floodplain, include power stations and several overhead power lines, industrial estates, sewage treatment works and active sand and gravel extraction sites. An existing set of parallel 400 kV OHL's (ZDA and 4TM) broadly follows the River Trent as it heads south to West Burton. The landscape south of West Burton contains several overhead lines including the 400 kV OHL (4ZM) which head south-east towards Lincoln, a set of parallel 400 kV OHL's (ZDA and 4VE) between Keadby and High Marnham via Cottom Power Station and a 400 kV OHL (4VK) which heads south from Cottom follows the River Trent. Four 400 kV OHLs (4ZV, ZDF and ZDA) head south-west from High Marnham with a 275 kV (XE) heading west.

Designated landscapes

Nationally designated landscapes

6.4.19 The Lincolnshire Wolds AONB lies to the south-east outside of the study area as shown on **Figure 6.2 Landscape Constraints**. At its closest point it lies approximately 30 km from the nearest point on the Scoping Boundary. Given the distance to the Project, it is proposed to exclude the Lincolnshire Wolds AONB from the assessment.

Proposed extensions to designated areas

6.4.20 The Yorkshire Wolds lie north of the River Humber and are described in Natural England's National Character Area (NCA) profiles as follows:

"*The Yorkshire Wolds National Character Area (NCA) forms an arc of high, gently rolling ground extending from the Humber Estuary west of Hull, to the North Sea coast at Flamborough Head, north of Bridlington. It comprises a prominent chalk escarpment and foothills rising from the Vale of York to the west and the Vale of Pickering to the north and falling to the plain of Holderness to the east. A very low proportion of the area is urban and woodland, and the vast majority of the land is agricultural. Woodland planting is restricted to small, scattered woodland blocks on higher land and steeper slopes"*.

6.4.21 Following the announcement in 2021 by Natural England that the Yorkshire Wolds was being considered for AONB status, assessments were undertaken to define the area that satisfies the natural beauty criterion capable of being included in an AONB. In June 2022, a provisional Candidate Area for designation was published on the Yorkshire Wolds Designation Project website and feedback invited. Feedback on the provisional Candidate Area is currently being considered and any appropriate refinements to the provisional Candidate Area made. The outcome of this process will be a proposed Candidate Area and a supporting report, which will be submitted to Natural England to decide whether it is of such national significance that it should be designated as an AONB and managed to achieve the statutory purpose.

6.4.22 At its closest the provisional Candidate Area lies some 14 km from the nearest point on the Scoping Boundary. The tallest elements of the Project are the two pylons at the crossing of the River Ouse. These would be approximately 110 m high which is similar to the existing pylons at Blacktoft. At 14 km distance, 110 m high pylons would appear to be 48 mm tall in the landscape (refer to section 6.3). This means that even if they were visible alongside the existing pylons in views out from the provisional Candidate Area, they would not fundamentally alter the character of those views or indirectly influence the character of the landscape. Therefore, it is proposed to exclude the provisional Candidate Area from the assessment.

6.4.23 In 2020 North Lincolnshire Council made a formal request to Natural England to consider making a Variation Order to the existing Lincolnshire Wolds AONB. The request covers an area to the north of the AONB. As shown on **Figure 6.1 Proposed Landscape Study Area**, it is not contiguous with the current AONB boundary.

6.4.24 In June 2021, Natural England announced proposals for new protected areas across England, alongside a new programme to examine how more areas could benefit from landscape improvements and deliver more for people and nature. Under these proposals, Natural England announced that extensions are being considered to two existing AONB (Surrey Hills AONB and the Chilterns AONB) as well as two new AONB (Yorkshire Wolds AONB and Cheshire Sandstone Ridge AONB). There is no current programme available regarding consideration of the proposed extension to the Lincolnshire Wolds AONB.

6.4.25 It is therefore proposed to exclude the proposed extension of the Lincolnshire Wolds AONB from the assessment as it has no formal status. The area covered by the proposed extension will be covered in the assessment of effects on the relevant regional character areas.

Locally designated

6.4.26 The study area includes the following two Important Landscape Areas (ILA), which are a local landscape designation defined by the East Riding of Yorkshire Council:

- The Yorkshire Wolds; and
- Thorne, Crowle and Goole Moors.

6.4.27 The ILA are based on the East Riding of Yorkshire Landscape Character Assessment, and their boundaries generally coincided with the high quality LCA identified at the time. Following a review in 2013 the boundaries were amended to only encompass areas displaying the valued attributes of the ILA, which are shown on **Figure 6.2 Landscape Constraints**.

6.4.28 There are several heritage assets within the study area including conservation areas, areas of historic interest and registered parks and gardens. These designations will not be assessed as part of the landscape assessment but are relevant because they contribute to the value and susceptibility of the landscape. The effects of the Project on these receptors are considered in **Chapter 9, Cultural Heritage**. Where these assets are open to the public, they will be included in the visual assessment as described in **Chapter 7, Visual**.

6.4.29 The study area includes two Areas of Great Landscape Value (AGLV) near Gainsborough, which is a local landscape designation defined in the Central Lincolnshire Local Plan.

6.4.30 The boundaries of the AGLV are shown on **Figure 6.2 Landscape Constraints**.

6.4.31 The study area includes 27 conservation areas as shown on **Figure 6.2 Landscape Constraints**. The nearest, Elleker Conservation Area, lies within the Scoping Boundary.

6.4.32 The study area includes the following Registered Parks and Gardens as shown on **Figure 6.2 Landscape Constraints**:

- Risby Hall (Grade II); and
- Thwaite Hall (Grade II).

6.4.33 The nearest, Risby Hall Registered Park and Garden, is located to the north of Skidby and lies 130 m to the north of the Scoping Boundary.

6.4.34 The study area encompasses part of the Isle of Axholme, an area of raised ground in an otherwise flat landscape in North Lincolnshire. The area has one of the largest areas of preserved medieval strip fields in the UK (Miller, 1997). These attributes together with enclosed land and the overall settlement pattern of the area make it unique in the country and it is locally designated by North Lincolnshire Council as an Area of Historic Landscape Interest (AHLI). An assessment of effects on the AHLI will be included in **Chapter 9, Cultural Heritage**. North Lincolnshire Council has stated their intention to submit a bid for the Isle of Axholme to be designated as an AONB. At the time of scoping submission Natural England has not undertaken any consultation on this matter. It is therefore not proposed to include the Isle of Axholme as a potential nationally designated landscape.

6.4.35 The North Lincolnshire Landscape Character Assessment review, which forms part of the evidence base for the emerging Local Plan recommends designation of the Isle of Axholme Historic Landscape Character Area (and other LCTs) as ‘Areas of High Landscape Value’. This recommendation will continue to be reviewed as the Project develops alongside the emerging Local Plan.

6.4.36 The Isle of Axholme will be covered in the assessment of effects on the relevant character types and due consideration given to its acknowledged landscape value.

National character

6.4.37 At a national scale, Natural England provide 159 NCA profiles. Each profile includes a description of the natural and cultural features that shape the landscape. Eight of these NCA profiles lie within or close to the scoping boundary. It is not proposed to assess the effects of the Project on these NCA as the assessment of effects on regional and local character areas will provide a more detailed prediction of the likely effects. They will however be included in the baseline assessment to provide relevant background information.

6.4.38 The study area is covered by seven NCA profiles:

- NCA Profile 27: Yorkshire Wolds;
- NCA Profile 28: Vale of York;
- NCA Profile 39: Humberhead Levels;
- NCA Profile 40: Holderness;
- NCA Profile 41: Humber Estuary;
- NCA Profile 45: Northern Lincolnshire Edge with Coversands;
- NCA Profile 48: Trent and Belvoir Dales; and
- NCA Profile 49: Sherwood.

6.4.39 The boundaries of the NCA are shown on **Figure 6.3 National Landscape Character Areas**.

Regional character

6.4.40 At a regional scale, the study area is covered by the following assessments:

- East Riding of Yorkshire Landscape Character Assessment;
- North Lincolnshire Landscape Character Assessment[2]; and
- East Midlands Region Landscape Character Assessment.

East Riding of Yorkshire Landscape Character Assessment

6.4.41 The East Riding of Yorkshire Landscape Character Assessment divides the landscape into 23 landscape character types (LCT) which were then subdivided into more detailed LCA. The assessment was carried out in the context of the NCA Profiles.

6.4.42 The study area contains the following LCT:

- LCT 4: River Corridors;
- LCT 6: Open Farmland;
- LCT 7: Wooded Open Farmland;
- LCT 8: Foulness Open Farmland;

[2] The boundaries defined in this report were digitised by AECOM in 2020 as part of the landscape and visual impact assessment for the Keadby 3 (Carbon Capture equipped Gas Fired Generating Station) Order. It is proposed to use these digitised boundaries for the landscape assessment.

- LCT 9: Drained Open Farmland;
- LCT 11: Jurassic Hills Farmland;
- LCT 12: Sloping Wooded Farmland;
- LCT 13: Open High Rolling Farmland;
- LCT 16 Sloping Farmland;
- LCT 17: Farmed Urban Fringe;
- LCT 22: Farmed Urban Fringe; and
- LCT 23: Humber Banks.

6.4.43 The Project lies within LCT 4: River Corridors, LCT 9: Drained Open Farmland, LCT 11: Jurassic Hills Farmland, LCT 12: Sloping Wooded Farmland, LCT 13: Open High Rolling Farmland, and LCT 16: Sloping Farmland. These LCT have the potential to be both directly and indirectly affected by the Project and will therefore be included in the assessment.

6.4.44 LCT 8: Foulness Open Farmland, LCT 17: Farmed Urban Fringe, LCT 22: Farmed Urban Fringe, and LCT 23: Humber Banks lie close to the Project. They therefore have the potential to be indirectly affected and will be included in the assessment.

6.4.45 LCT 6: Open Farmland and LCT 7: Wooded Open Farmland would be highly unlikely to experience significant landscape effects from the Project. Notwithstanding the potential for intervisibility, the 400 kV pylons would be distant, and their presence would not fundamentally alter the composition or character of the views out from the LCT or indirectly influence the character of the landscape within the LCT. It is therefore proposed to exclude these LCT from the assessment.

North Lincolnshire Landscape Character Assessment and Guidelines

6.4.46 The North Lincolnshire Landscape Character Assessment and Guidelines divides the landscape into six LCA which are further subdivided into LCT.

6.4.47 The study area contains the following LCA and LCT:

- Trent Levels LCA
  - LCT 1: Flat Drained Farmland;
  - LCT 2: Flat Drained Treed Farmland;
  - LCT 3: Flat Open Remote Farmland;
  - LCT 4: Flat Wooded Farmland;
  - LCT 5: Industrial Landscape;
  - LCT 6: Open Island Farmland; and
  - LCT 7: Wooded Springline Farmland.
- Lincolnshire Edge LCA
  - LCT 8: Despoiled Landscape;
  - LCT 9: Steep Wooded Scarp Slope;

- LCT 10: Elevated Wooded Farmland; and
- LCT 11: Urban Areas.

- Humber Estuary LCA
  - LCT 12: Flat Drained Farmland.

6.4.48 The Project lies within LCT 1: Flat Drained Farmland, LCT 4: Flat Wooded Farmland, LCT 5: Industrial Landscape and LCT 12: Flat Drained Farmland, which therefore have the potential to be both directly and indirectly affected and will be included in the assessment.

6.4.49 LCT 2: Flat Drained Treed Farmland, LCT 3: Flat Open Remote Farmland, LCT 6: Open Island Farmland, LCT 7: Wooded Springline Farmland, LCT 9: Steep Wooded Scarp Slope, and LCT 10: Elevated Wooded Farmland. They therefore have the potential to be indirectly affected and will be included in the assessment.

6.4.50 LCT 8: Despoiled Landscape and LCT 11: Urban Areas would be highly unlikely to experience significant landscape effects from the Project. Notwithstanding the potential for intervisibility, the presence of additional 400 kV pylons would not fundamentally alter the composition or character of the views out from the LCT or indirectly influence the character of the landscape within the LCT which are already affected by infrastructure and industrial development. It is therefore proposed to exclude these LCT from the assessment.

East Midlands Region Landscape Character Assessment

6.4.51 The East Midlands Region Landscape Character Assessment divides the landscape into 31 regional landscape character types (RLCT). The assessment was carried out in the context of the Natural England NCA.

6.4.52 The study area contains the following LCT:

- RLCT 2b: Planned and Drained Fenns and Carrlands;
- RLCT 3a: Floodplain Valleys;
- RLCT 3b: Sandland Farmlands;
- RLCT 4a: Unwooded Vales;
- RLCT 4b: Wooded Vales;
- RLCT 5b: Wooded Village Farmlands;
- RLCT 6a: Limestone Scarps and Dip Slopes; and
- RLCT 10b: Sandstone Forests and Heaths.

6.4.53 The Project lies within RLCT 2b: Planned and Drained Fenns and Carrlands, RLCT 3a: Floodplain Valleys; RLCT 4a: Unwooded Vales and RLCT 5b: Wooded Village Farmlands. These RLCT have the potential to be both directly and indirectly affected and will be included in the assessment.

6.4.54 RLCT 3b: Sandland Farmlands and RLCT 4b: Wooded Vales lie close to the Project. They therefore have the potential to be indirectly affected and will be included in the assessment.

6.4.55 RLCT 6a: Limestone Scarps and Dip Slopes and RLCT 10b: Sandstone Forests and Heaths would be highly unlikely to experience significant landscape effects from the Project. Notwithstanding the potential for intervisibility, the 400 kV pylons would be distant, and their presence would not fundamentally alter the composition or character of the views out from the RLCT or indirectly influence the character of the landscape within the RLCT. As such, it is proposed to exclude these RLCT from the assessment.

Local character

6.4.56 The study area is covered by the Doncaster Landscape Character Assessment and Capacity Study which was updated to include an assessment of the sensitivity of the landscape to wind energy development.

Doncaster Landscape Character Assessment and Capacity Study

6.4.57 A landscape character and capacity assessment of Doncaster was carried out in 2006/2007. The study describes Doncaster's landscape character and assesses the overall landscape capacity of landscape character areas to accommodate different types of development including housing, strategic employment, minerals and waste, large-scale forestry, biomass planting, and wind energy. Additional Areas of Special Landscape Value (ASLV) were identified but ASLV do not form part of the current development plan.

6.4.58 Further landscape assessment was carried out in 2010 to examine in greater detail localised areas where there is pressure for housing and/or strategic employment development.

6.4.59 The Doncaster Landscape Character Assessment and Capacity Study divides the landscape into eight LCT and 20 LCA of which the following are in the study area:

- LCT G2: Thorne and Hatfield Peat Moorlands; and
- LCT H2: Blaxton to Stainforth Sandland Heaths and Farmland.

6.4.60 It is considered highly unlikely that either of these LCT would experience significant landscape effects from the Project. Notwithstanding the potential for intervisibility, the 400 kV pylons would be distant, and their presence would not fundamentally alter the composition or character of the views out from the LCT or indirectly influence the character of the landscape within the LCT. As such, it is proposed to exclude these LCT from the assessment.

Future Baseline

6.4.61 Landscape change is an ongoing and inevitable process and will continue across the study area irrespective of whether the Project goes ahead. Change can arise through natural processes (e.g., the maturity of woodlands) and natural systems (e.g., river erosion) or, as is often the case, occurs due to human activity, land use, management, or neglect.

6.4.62 There are continued pressures on the landscape brought about loss of existing features such as hedgerows, introduction of new features such as new housing, wind turbines, overhead lines, quarries, roads etc and decline in quality or state of repair of features such as dereliction of the urban fringe; neglect of hedgerows; scrub invasion leading to loss of a smooth rolling topography; introduction of standardised suburban housing styles to a previously architecturally diverse settlement.

6.4.63 Climate change is increasingly acknowledged as a key driver of future landscape change. The low-lying landscapes around the Humber Estuary are particularly vulnerable to sea level change. Changing weather patterns and increased storms also pose risks to agriculture, tourism, and local infrastructure.

6.4.64 Future baseline is also related to consented proposals which are not yet present in the landscape but are expected to be constructed. These will be considered in **Chapter 20, Cumulative Effects**.

6.4.65 Ash (Fraxinus excelsior) trees within the study area may be affected by ash dieback. This is a disease of ash trees caused by a fungus of Asian origin called *Hymenoscyphus fraxineus* (*H. fraxineus*; formerly called *Chalara fraxinea*). The disease causes leaf loss and crown dieback in affected trees and is usually fatal. The future baseline therefore assumes that there would be loss of ash trees in the long term across the study area, but that other tree species would occupy gaps created in the short term, and overall levels of vegetation would remain similar to existing. An Arboricultural Impact Assessment (AIA) will record incidents of ash dieback during site surveys (see **Appendix 8.C Arboricultural Survey Strategy**).

6.5 Embedded and Control and Management Measures

Embedded Measures

6.5.1 The Project has been routed to avoid designated sites and sensitive receptors as far as possible. This is in accordance with the Holford Rules and Horlock Rules, which will continue to be used to inform the routeing, siting, and design process in order to minimise potential landscape effects.

6.5.2 Design decisions which are relevant to the landscape assessment are the choice of pylon type, for example to keep a consistent appearance with the existing 400 kV OHL infrastructure along the route and the decision to closely parallel the existing OHL wherever possible to reduce the spread of infrastructure within the landscape. The northern section of the Project proposes to be closely parallel to the existing OHL to reduce the effects on the Yorkshire Wolds.

6.5.3 The landscape assessment will inform modifications and refinements to the detailed design of the Project, including consideration of individual pylon locations during the design and assessment process, and the identification of any further appropriate mitigation measures to reduce potential residual effects.

6.5.4 Notwithstanding the application of the principles outlined in the Holford Rules and Horlock Rules, given the intrinsic characteristics of overhead line infrastructure, some significant adverse landscape effects are likely to be unavoidable.

Control and Management Measures

6.5.5 An Outline Code of Construction (CoCP) is provided in **Appendix 4.A, Outline Code of Construction Practice**. Measures relevant to the control and management of impacts that could affect the landscape assessment are:

- LV01: The contractor(s) will retain vegetation where practicable. Where vegetation is lost and trees cannot be replaced in situ due to the restrictions associated with land rights required for operational safety, native shrub planting approved by National Grid will be used as a replacement, in accordance with the outline vegetation

reinstatement plans included within the outline Landscape Environmental Management Plan (LEMP).

- LV02: The contractor(s) will apply the relevant protective principles set out in British Standard (BS) 5837:2012: Trees in relation to Design, Demolition and Construction – Recommendations (Ref 6.15). This will be applied to trees within the Order Limits which will be preserved through the construction phase, and to trees outside of the Order Limits where such measures do not hinder or prevent the use of the relevant working width for construction. All works to high grade trees, including trees under Tree Preservation Orders and veteran trees, will be undertaken or supervised by a suitably qualified arboriculturist.
- LV03: A five-year aftercare period will be established for all reinstatement and mitigation planting.
- LV04: Construction lighting will be directional and minimised where possible.
- B07: Where the works require the crossing or removal of hedgerows, the gap will be reduced to a width required for safe working …New hedgerow planting will contain native, woody species of local provenance.

6.5.6 Additional measures of potential relevance to the avoidance or reduction of effects on landscape character include the following:

- NV01: Construction working will be undertaken within the agreed working hours set out within the DCO. Best practicable means to reduce construction noise will be set out within the CEMP.

6.5.7 The project has also committed to producing an Outline LEMP (commitment GG03), which will set out the measures to protect existing vegetation and details regarding the reinstatement and additional planting. This will also account for biodiversity net gain targets (see **Chapter 8, Ecology and Biodiversity**).

6.6 Potential for Significant Effects

6.6.1 The landscape assessment will consider the construction, operation and maintenance of the Project. Details of each of these stages are set out in **Chapter 4, Description of the Project**.

6.6.2 The proposed scope of the landscape assessment is set out in **Table 6.4** and has been determined using the approach described in **Chapter 5, EIA Approach and Methodology.**

6.6.3 The potential for the Project to result in the likely significant effects identified in **Table 6.3** takes into account the embedded and control and management measures described in section 6.6.

Sources and Impacts (Step 1)

6.6.4 This section identifies the sources and impacts that would occur as a result of the construction, operation and maintenance of the Project.

6.6.5 The potential impacts of the Project on landscape receptors comprise in brief:

- physical impacts and consequential perceptible effects on designated landscapes and their setting through removal and addition of landscape features and infrastructure elements; and
- physical impacts and consequential perceptible effects on landscape character through removal and addition of landscape features and infrastructure elements.

Potential sources of impacts

Sources of construction impacts

- Construction activities as detailed in **Chapter 4, Description of the Project**, section 4.3.
  - Site clearance, tree felling and boundary/hedgerow removal.
  - Topsoil stripping and earthworks particularly associated with construction compounds and site accesses.
  - Undergrounding of third-party services.
  - Movement of construction related traffic including delivery and removal of material to and from site, off-site road traffic including workers travelling to and from site.
  - Movement of vehicles along temporary access tracks.
  - Construction, presence and removal of temporary site accesses and access routes, including bellmouths.
  - Construction, presence and removal of temporary bailey bridges and culverts.
  - Erection, presence and removal of temporary scaffolding.
  - Presence of temporary hoardings and/or security fencing or signage.
  - Construction and removal of temporary pylons and overhead line required for construction.
  - Construction site lighting particularly during the winter months.

Sources of operational impacts

- The introduction of the operational 400 kV OHL into the landscape.
- Introductions of cable sealing ends compounds (CSECs) into the landscape.
- Effects of mitigation measures proposed by other topics, particularly re-contoured landform and new planting in relation to the mitigation of ecological and/or visual effects.
- Localised widening of public highways.
- Operations lighting at potential cable sealing end compounds and/or tunnel head houses.

Sources of maintenance impacts

- Periodic vehicle access for routine maintenance and emergency repairs.

- General maintenance activities including cutting back of vegetation along wayleave corridor to ensure safety clearances.
- Annual inspection by drone/helicopter.

Potential impacts

6.6.6 **Table 6.4** identifies the potential impacts that could result from the sources identified above.

6.6.7 Where **Table 6.4** identifies the potential for an impact to result in a significant effect the impact is taken through to Step 2. Where **Table 6.4** identifies no potential for an impact to result in a significant effect, that impact is proposed to be scoped out.

Table 6.4: Impacts and the potential for significant effects

Project phase	Source	Impact	Potential for significant effects
Construction	Activities associated with construction as listed in Step 1 including site preparation, assembly and erection of steelwork and conductor stringing.	Physical and perceptible effects on landscape character and/or setting from construction including vegetation removal and presence of construction compounds, storage areas access tracks, plant (including mobile cranes), vehicles and personnel.	**Yes** – potential for direct effects on landscape elements and features and indirect effects on overall composition and character.
Operation	The introduction of the operational 400 kV OHL and/or CSECs into the landscape.	Physical and perceptible effects on landscape character and/or setting from long-term loss of landscape elements and features, and introduction of new infrastructure.	**Yes** – potential for direct effects on landscape elements and features and indirect effects on overall composition and character. This may include effects from night-time lighting of CSECs.
	Effects of mitigation measures proposed by other topics, particularly re-contoured landform, and new planting in relation to the mitigation of ecological and/or visual effects.	Physical and perceptible effects on landscape character and/or setting from changes to landform and introduction of landscape elements such as trees and hedgerows.	**Yes** – potential for direct effects on landscape elements and features and indirect effects on overall composition and character.

Project phase	Source	Impact	Potential for significant effects
	Localised widening of public highways	Physical and perceptible effects on landscape character and/or setting from permanent loss of roadside vegetation.	No – Any roadside vegetation lost during widening works would be reinstated like for like and therefore unlikely to result in significant effects.
Maintenance	Periodic vehicle/helicopter/drone access for routine maintenance and emergency repairs.	Physical and/or perceptible effects on landscape character and/or setting from routine maintenance activities including temporary access tracks, storage compounds, vehicle and personnel movements.	No – Maintenance activities would be temporary, short term and unlikely to result in significant effects.
	General maintenance activities including cutting back of vegetation along wayleave corridor to ensure safety clearances.	Physical and/or perceptible effects on landscape character and/or setting from general maintenance activities including cutting back of vegetation.	No – Vegetation management is unlikely to have ongoing significant effects, the main effect would be from the initial loss during construction.

Impact Pathways with Receptors (Step 2)

6.6.8 This section identifies whether there are any impact pathways from the impacts identified above that could give rise to potentially significant effects on receptors identified within the study area.

6.6.9 **Table 6.5** provides a summary of the impact pathways identified and those proposed to be scoped in or out of the landscape assessment for the Project.

Table 6.5: Impact pathways with receptors

Project Phase	Impact	Receptor	Potential for significant effects	Proposed to be scoped in/out
Nationally Designated Landscapes				
Construction	Physical and/or perceptible effects on landscape	Yorkshire Wolds provisional Candidate Area	No – at its closest the provisional Candidate Area lies some 14 km from the	Scoped out

Project Phase	Impact	Receptor	Potential for significant effects	Proposed to be scoped in/out
	character and/or setting from construction including vegetation removal and presence of construction compounds, storage areas access tracks, plant (including mobile cranes), vehicles and personnel.		nearest point on the Scoping Boundary. Given the distance to the Project and lack of potential intervisibility, it is proposed to exclude the provisional Candidate Area from the assessment.	
		Lincolnshire Wolds AONB and proposed extension area	No – at its closest the Lincolnshire Wolds lies some 30 km from the nearest point on the Scoping Boundary. Given the distance to the Project and lack of potential intervisibility, it is proposed to exclude the Lincolnshire Wolds. Proposed extension excluded as has no formal status at this time.	Scoped out
Locally Designated Landscapes				
Construction	Physical and/or perceptible effects on landscape character and/or setting from construction including vegetation removal and presence of construction compounds, storage areas access tracks, plant (including mobile cranes), vehicles and personnel.	Yorkshire Wolds ILA	**Yes** – potential for direct and indirect effects on the valued attributes of the ILA (East Riding of Yorkshire Landscape Character Assessment, 2005).	**Scoped in**
		Thorne, Crowle and Goole Moors ILA	No – the construction activities would be distant and only present at each pylon location for a short period of time. The works would not fundamentally alter the composition or character of the	Scoped out

Project Phase	Impact	Receptor	Potential for significant effects	Proposed to be scoped in/out
			views out from the ILA or indirectly influence the character of the landscape within the ILA.	
		AGLV around Gainsborough	No – the construction activities would be distant and only present at each pylon location for a short period of time. The works would not fundamentally alter the composition or character of the views out from the AGLV or indirectly influence the character of the landscape within the AGLV.	Scoped out
East Riding of Yorkshire Landscape Character Assessment				
Construction	Physical and/or effects on landscape character and/ or setting from construction including vegetation removal and presence of construction compounds, storage areas access tracks, plant (including mobile cranes), vehicles and personnel.	LCT 4, 9, 11, 12, 13, and 16	**Yes** – potential for direct effects on landscape elements and features and indirect effects on overall composition and character.	**Scoped in**
		LCT 6, 7, 8, 17, 22 and 23	No – the construction activities would not be seen at close range and would only be present at each pylon location for a short period of time. The works would not fundamentally alter the composition or character of the views out from the LCT or indirectly	Scoped out

Project Phase	Impact	Receptor	Potential for significant effects	Proposed to be scoped in/out
			influence the character of the landscape within the LCT.	
North Lincolnshire Landscape Character Assessment and Guidelines				
Construction	Physical and/or perceptible effects on landscape character and/or setting from construction including vegetation removal and presence of construction compounds, storage areas access tracks, plant (including mobile cranes), vehicles and personnel.	LCT 1, 4, and 12	**Yes** – potential for direct effects on landscape elements and features and indirect effects on overall composition and character.	**Scoped in**
		LCT 2, 3, 6, 7, 9 and 10	**Yes** – potential for indirect effects on views out from LCT with consequent effects on landscape character.	**Scoped in**
		LCT 2, 3, 5, 6, 7, 8, 9,11 and 10	No – the construction activities would not be seen at close range and would only present at each pylon location for a short period of time. The works would not fundamentally alter the composition or character of the views out from the LCT or indirectly influence the character of the landscape within the LCT.	Scoped out
East Midlands Region Landscape Character Assessment				
Construction	Physical and/or perceptible effects on landscape character and/or setting from construction	RLCT 2b, 3a, 4a and 5b	**Yes** – potential for direct effects on landscape elements and features and indirect effects on overall composition and character.	**Scoped in**

Project Phase	Impact	Receptor	Potential for significant effects	Proposed to be scoped in/out
	including vegetation removal and presence of construction compounds, storage areas access tracks, plant (including mobile cranes), vehicles and personnel.	RLCT 3b, 4b, 6a and 10b	No – the works would not fundamentally alter the composition or character of the views out from the RLCT or indirectly influence the character of the landscape within the RLCT.	Scoped out
Doncaster Landscape Character Assessment and Capacity Study				
Construction	Physical and/or perceptible effects on landscape character and/or setting from construction including vegetation removal and presence of construction compounds, storage areas access tracks, plant (including mobile cranes), vehicles and personnel.	LCT G2 and H2	No – the works would not fundamentally alter the composition or character of the views out from the RLCT or indirectly influence the character of the landscape within the RLCT.	Scoped out
Construction	Perceptible effects on landscape character and/ or setting from night-time lighting of construction activities.	All landscape receptors	No – no overnight working is anticipated.	Scoped out
Nationally Designated Landscapes				
Operation	Physical and/or perceptible effects on landscape	Yorkshire Wolds provisional Candidate Area	No – at its closest the provisional Candidate Area lies some 14 km from the	Scoped out

Project Phase	Impact	Receptor	Potential for significant effects	Proposed to be scoped in/out
	character and/or setting from long-term loss of landscape elements and features, and introduction of new infrastructure. Potential changes to landform and introduction of landscape elements such as trees and hedgerows.		nearest point on the Order Limits. Given the distance to the Project and lack of potential intervisibility, it is proposed to exclude the provisional Candidate Area from the assessment.	
		Lincolnshire Wolds AONB and proposed extension area.	No – at its closest the Lincolnshire Wolds lies some 30 km from the nearest point on the Scoping Boundary. Given the distance to the Project and lack of potential intervisibility, it is proposed to exclude the Lincolnshire Wolds. Proposed extension excluded as has no formal status at this time.	Scoped out
Locally Designated Landscapes				
Operation	Physical and/or perceptible effects on landscape character and/or setting from long-term loss of landscape elements and features, and introduction of new infrastructure. Potential changes to landform and introduction of landscape elements such as	Yorkshire Wolds ILA	**Yes** – potential for direct and indirect effects on the valued attributes of the ILA (East Riding of Yorkshire Landscape Character Assessment, 2005).	**Scoped in**
		Thorne, Crowle and Goole Moors ILA	**Yes** – potential for indirect effects on the valued attributes of the ILA (East Riding of Yorkshire Landscape Character Assessment, 2018).	**Scoped in**

Project Phase	Impact	Receptor	Potential for significant effects	Proposed to be scoped in/out
	trees and hedgerows.			
		Areas of Great Landscape Value around Gainsborough	No – the 400 kV pylons would be distant, and their presence would not fundamentally alter the composition or character of the views out from the Areas of Great Landscape Value or indirectly influence the character of the landscape.	Scoped out
East Riding of Yorkshire Landscape Character Assessment				
Operation	Physical and/or perceptible effects on landscape character and/or setting from long-term loss of landscape elements and features, and introduction of new infrastructure.	LCT 4, 9, 11, 12, 13, and 16	**Yes** – potential for direct effects on landscape elements and features and indirect effects on overall composition and character	**Scoped in**
		LCT 8, 17, 22, and 23	**Yes** – potential for indirect effects on views out from LCT with consequent effects on landscape character	**Scoped in**
	Potential changes to landform and introduction of landscape elements such as trees and hedgerows.	LCT 6 and 7	No – the 400 kV pylons would be distant, and their presence would not fundamentally alter the composition or character of the views out from the LCT or indirectly influence the character of the landscape within the LCT.	Scoped out
North Lincolnshire Landscape Character Assessment and Guidelines				

Project Phase	Impact	Receptor	Potential for significant effects	Proposed to be scoped in/out
Operation	Physical and/or perceptible effects on landscape character and/or setting from long-term loss of landscape elements and features, and introduction of new infrastructure. Potential changes to landform and introduction of landscape elements such as trees and hedgerows.	LCT 1, 4 and 12	**Yes** – potential for direct effects on landscape elements and features and indirect effects on overall composition and character.	**Scoped in**
		LCT 2, 3, 6, 7, 9 and 10	**Yes** – potential for indirect effects on views out from LCT with consequent effects on landscape character.	**Scoped in**
		LCT 5, 8 and 11	No – the 400 kV pylons would be distant, and their presence would not fundamentally alter the composition or character of the views out from the LCT or indirectly influence the character of the landscape within the LCT. It is therefore proposed to exclude these LCT from the assessment.	Scoped out
East Midlands Region Landscape Character Assessment				
Operation	Physical and/or perceptible effects on landscape character and/or setting from long-term loss of landscape elements and features, and introduction of new infrastructure.	RLCT 2b, 3a, 4a and 5b.	**Yes** – potential for direct effects on landscape elements and features and indirect effects on overall composition and character.	**Scoped in**
		RLCT 3b and 4b	**Yes** – potential for indirect effects on views out from RLCT with consequent effects on landscape character.	**Scoped in**

Project Phase	Impact	Receptor	Potential for significant effects	Proposed to be scoped in/out
	Potential changes to landform and introduction of landscape elements such as trees and hedgerows.	RLCT 6a and 10b	No – the 400 kV pylons would be distant, and their presence would not fundamentally alter the composition or character of the views out from the LCT or indirectly influence the character of the landscape within the RLCT. It is therefore proposed to exclude these LCT from the assessment.	Scoped out
Doncaster Landscape Character Assessment and Capacity Study				
Operation	Physical and/or perceptible effects on landscape character and/or setting from long-term loss of landscape elements and features, and introduction of new infrastructure. Potential changes to landform and introduction of landscape elements such as trees and hedgerows.	LCT G2 and H2	No – the 400 kV pylons would be distant, and their presence would not fundamentally alter the composition or character of the views out from the LCT or indirectly influence the character of the landscape within the LCT. It is therefore proposed to exclude these LCT from the assessment.	Scoped out
Operation	Perceptible effects on landscape character and/or setting from night-time lighting.	All landscape receptor groups	**Yes** – there may be a requirement for night-time lighting of the CSECs	**Scoped in**

6.7 Proposed Assessment Methodology

Proposed Data Sources

6.7.1 In addition to the published landscape character assessments listed at section 6.5.1, it is proposed to use the following data sources to inform the landscape assessment:

- Ordnance Survey (OS) 1:10,000, 1:25,000, 1:50,000 and 1:250,000 base mapping;
- OS Terrain® 50 mid-resolution and LIDAR Composite 2017 – 50 cm (DTM);
- Google Earth Pro aerial photography, and Google Maps Street View;
- base mapping from ArcGIS Map Service;
- open source GIS data; and
- national, regional, and local landscape character assessments listed in section 6.5.

6.7.2 The desk-based scoping exercise was supported by an initial site familiarisation visit. The site visit was undertaken on 4 October 2022 by car. Weather conditions were varied. The purpose of the visit was to gain a high-level overview of the general landscape character in proximity to the Project.

Technical Guidance

6.7.3 The landscape assessment will be carried out in accordance with the following good practice and guidance documents:

- The Holford Rules – Guideline for the Routeing of New High Voltage Overhead Transmission Lines;
- The Horlock Rules – Guidelines on the Siting and Design of National Grid Substations;
- Landscape Institute and Institute for Environmental Management and Assessment (IEMA) (2013) Guidelines for Landscape and Visual Impact Assessment – 3rd Edition (GLVIA3);
- Landscape Institute (2021) Technical Guidance Note 02/21 Assessing Landscape Value Outside National Designations (Ref 6.16);
- Natural England (2014) An Approach to Landscape Character Assessment (Ref 6.17);
- Planning Inspectorate (2019); Advice Note 17: Cumulative Effects Assessment Relevant to Nationally Significant Infrastructure Projects (AN17) (Ref 5.4).

Proposed Assessment Methodology

6.7.4 The following section summarises the methodology proposed to be used for the landscape assessment. This builds on the general assessment methodology presented in **Chapter 5, EIA Approach and Methodology** and is described more fully in **Appendix 6.A Landscape Assessment Methodology**.

6.7.5 The methodology for undertaking the visual assessment is based on principles set out in GLVIA3. GLVIA3 is the established good practice guidance for landscape and visual impact assessment and complies with the requirements of EN-1 and EN-5. GLVIA3 advocates that the assessment should reflect the scale and complexity of the development which is being assessed and should focus on the 'likely' significant effects, rather than every conceivable effect. This approach provides greater opportunity to scope out receptors where it can be justified that significant effects would be unlikely to arise, which should result in more concise and meaningful assessments.

6.7.6 As explained in section 6.5, the assessment will be based on existing published landscape character assessments.

6.7.7 Where relevant, the LVIA will consider any inter-relationship of baseline information and impacts from the project between different aspects of the environment. For example, the outputs of **Chapter 8, Ecology and Biodiversity** will provide information on existing vegetation and species including ancient woodland and veteran trees, **Chapter 9, Cultural Heritage** will be cross-referenced in relation to historic assets including historic landscapes and registered parks and gardens which may contribute to value of the landscape.

6.7.8 Information contained within the future Arboriculture Impact Assessment will be referenced to inform the visual assessment and in relation to mitigation proposals (**Appendix 8.C Arboricultural Survey Strategy**).

Site-Based Assessment

6.7.9 The findings of the desk-based study will be supplemented with a programme of seasonal site surveys. This will include surveys during both summer and winter months to fully understand the landscape baseline.

Sensitivity

6.7.10 As explained in **Appendix 6.A Landscape Assessment Methodology**, the sensitivity of landscape receptors will be determined through consideration of the value attached to the landscape (which is established and reported as part of the baseline) and its susceptibility to change arising from the Project, which will be determined through informed professional judgement guided by the indicative criteria set out in **Table 2.2**, and **Table 2.3** of **Appendix 6.A Landscape Assessment Methodology**.

6.7.11 Judgements on the value attached to the landscape are unrelated to the nature of the development being proposed, whilst judgements on susceptibility may vary depending on the key characteristics of the landscape.

6.7.12 Judgements on value and susceptibility will be recorded as either **very high**, **high**, **medium** or **low**.

Magnitude

6.7.13 As explained in **Appendix 6.A Landscape Assessment Methodology**, the magnitude of change will be determined through consideration of the likely size and scale of the change and its duration and reversibility, which will be determined through informed professional judgement guided by the indicative criteria set out in **Table 2.4** of **Appendix 6.A**. Judgements will be recorded as either **large**, **medium**, **small** or **negligible**.

6.7.14 As explained in paragraph 2.5.8 of **Appendix 6.A Landscape Assessment Methodology**, once the magnitude of change likely to be experienced by each landscape

receptor has been assessed, a separate description of the geographical distribution of effects across the study area will be provided in the landscape assessment summary.

Significance of effects

6.7.15 As explained in **Appendix 6.A Landscape Assessment Methodology**, an "overall profile" approach will be adopted whereby, *"all the judgements against the individual criteria are arranged in a table to provide an overall profile of each identified effect"*. GLVIA3 Page 92, para 5.55. This determination requires the application of professional judgement and experience to balance the different variables.

6.7.16 In accordance with GLVIA3, the use of an overly mechanistic approach through reliance upon a matrix will be avoided. Instead, judgements will be supported by clear and accessible narrative explanations of the rationale underlying the assessment made for each landscape receptor. Reference will be made to the relevant viewpoints to support and explain the rationale.

6.7.17 Significance will be recorded as **major**, **moderate**, **minor** or **negligible** and the direction of change will be categorised as **adverse** or **beneficial**.

Limitations of assessment

6.7.18 The assessment will be undertaken based upon the design which will indicate the maximum extent and indicative locations of temporary construction and storage areas, access tracks, the location, number and heights of pylons and any other temporary or permanent infrastructure required to facilitate the Project.

6.7.19 To take account of the flexibility allowed for in the draft DCO, consideration will be given to the potential for effects to be of greater significance should any of the permanent or temporary infrastructure elements be moved within the Limits of Deviation (LOD) or Order Limits. The assumptions made regarding the use of flexibility for the main assessment, and any alternative assumptions, are set out in **Chapter 4, Description of the Project**.

6.7.20 The operational assessment will assume that the works to underground or relocate existing distribution infrastructure as part of the Project has been undertaken.

6.7.21 Assessment, site work, and photography will be undertaken from publicly accessible locations, such as the public highway and PRoW.

6.7.22 It is not proposed to prepare a ZTV for the construction phase of the Proposed Development as there is a great degree of variability in the extent and timeframes of visibility of construction activity. Also, tall construction plant (for example tower cranes and piling rigs) rarely gives rise to significant landscape effects as it is present at each pylon location for a short period of time.

6.7.23 The visibility of the Project will not remain constant throughout the year, and as such the assessment will be based on the worst-case scenario of winter views, with reference made to summer views where relevant.

6.8 Conclusion

Summary

6.8.1 The proposed scope, as set out in this chapter, is intended to focus the attention of the landscape assessment on likely significant effects and to avoid assessing the same impact twice.

Designated Landscapes

6.8.2 No National Parks or AONB (or their setting) would be affected, and the Project would not affect the proposed extension area to the Yorkshire Wolds AONB. There is however the potential for significant direct and indirect effects on the Yorkshire Wolds ILA and Thorne, Crowle and Goole Moors ILA.

Landscape Character Areas

6.8.3 There is potential for significant direct and indirect effects on the landscape character of some RLCA and LCA.

6.8.4 During construction, the only significant effects are likely to arise where the Scoping Boundary passes through an LCA.

6.8.5 During operation the only significant effects are likely to arise where an LCA lies close to the Project (typically within 1 km), and these will diminish with distance.

6.8.6 No significant landscape effects are anticipated during maintenance operations.

Proposed Scope of the Assessment

6.8.7 A summary of the proposed scope of the assessment is provided in **Table 6.6**.

Table 6.6: Proposed scope of the assessment

Receptor	Potential for significant effect	Project phase(s)	Proposed to be scoped in/out
Nationally Designated Landscapes			
Yorkshire Wolds provisional Candidate Area	No	Construction, Operation and Maintenance	Scoped out
Lincolnshire Wolds AONB and proposed extension area	No	Construction, Operation and Maintenance	Scoped out
Locally Designated Landscapes			

Receptor	Potential for significant effect	Project phase(s)	Proposed to be scoped in/out
Yorkshire Wolds Important Landscape Area	Yes	Construction and Operation	**Scoped in**
	No	Maintenance	Scoped out
Thorne, Crowle and Goole Moors Important Landscape Area	Yes	Operation	**Scoped in**
	No	Construction, and Maintenance	Scoped out
East Riding of Yorkshire Landscape Character Assessment			
LCT 4: River Corridors	Yes	Construction and Operation	**Scoped in**
	No	Maintenance	Scoped out
LCT 6: Open Farmland	No	Construction, Operation and Maintenance	Scoped out
LCT 7: Wooded Open Farmland	No	Construction, Operation, and Maintenance	Scoped out
LCT 8: Foulness Open Farmland	Yes	Operation	**Scoped in**
	No	Construction and Maintenance	Scoped out
LCT 9: Drained Open Farmland	Yes	Construction and Operation	**Scoped in**
	No	Maintenance	Scoped out
LCT 11: Jurassic Hills Farmland	Yes	Construction and Operation	**Scoped in**
	No	Maintenance	Scoped out
LCT 12: Sloping Wooded Farmland	Yes	Construction and Operation	**Scoped in**
	No	Maintenance	Scoped out
LCT 13: Open High Rolling Farmland	Yes	Construction and Operation	**Scoped in**
	No	Maintenance	Scoped out

Receptor	Potential for significant effect	Project phase(s)	Proposed to be scoped in/out
LCT 16: Sloping Farmland	Yes	Construction and Operation	**Scoped in**
	No	Maintenance	Scoped out
LCT 17: Farmed Urban Fringe	Yes	Operation	**Scoped in**
	No	Construction and Maintenance	Scoped out
LCT 22: Farmed Urban Fringe	Yes	Operation	**Scoped in**
	No	Construction and Maintenance	Scoped out
LCT 23: Humber Banks	Yes	Operation	**Scoped in**
	No	Construction and Maintenance	Scoped out
North Lincolnshire Landscape Character Assessment and Guidelines			
LCT 1: Flat Drained Farmland	Yes	Construction and Operation	**Scoped in**
	No	Maintenance	Scoped out
LCT 2: Flat Drained Treed Farmland	Yes	Operation	**Scoped in**
	No	Construction and Maintenance	Scoped out
LCT 3: Flat Open Remote Farmland	Yes	Operation	**Scoped in**
	No	Construction and Maintenance	Scoped out
LCT 4: Flat Wooded Farmland	Yes	Construction, Operation and Maintenance	**Scoped in**
LCT 5: Industrial Landscapes	No	Construction, Operation and Maintenance	Scoped out
LCT 6: Open Island Farmland	Yes	Operation	**Scoped in**
	No	Construction and Maintenance	Scoped out
LCT 7: Wooded Springline Farmland	Yes	Operation	**Scoped in**
	No	Construction and Maintenance	Scoped out
LCT 8: Despoiled Landscape	No	Construction, Operation and Maintenance	Scoped out

Receptor	Potential for significant effect	Project phase(s)	Proposed to be scoped in/out
LCT 9: Steep Wooded Scarp Slope	Yes	Operation	**Scoped in**
	No	Construction and Maintenance	Scoped out
LCT 10: Elevated Wooded Farmland	Yes	Operation	**Scoped in**
	No	Construction and Maintenance	Scoped out
LCT 11: Urban Areas	No	Construction, Operation and Maintenance	Scoped out
LCT 12: Flat Drained Farmland	Yes	Construction and Operation	**Scoped in**
	No	Maintenance	Scoped out
East Midlands Region Landscape Character Assessment			
RLCT 2b: Planned and Drained Fens and Carrlands	Yes	Construction and Operation	**Scoped in**
	No	Maintenance	Scoped out
RLCT 3a: Floodplain Valleys	Yes	Construction and Operation	**Scoped in**
	No	Maintenance	Scoped out
RLCT 3b: Sandland Farmlands	Yes	Operation	**Scoped in**
	No	Construction and Maintenance	Scoped out
RLCT 4a: Unwooded Vales	Yes	Construction and Operation	**Scoped in**
	No	Maintenance	Scoped out
RLCT 4b: Wooded Vales	Yes	Operation	**Scoped in**
	No	Construction and Maintenance	Scoped out
RLCT 5b: Wooded Village Farmlands	Yes	Construction and Operation	**Scoped in**
	No	Maintenance	Scoped out
RLCT 6a: Limestone Scarps and Dip Slopes	No	Construction, Operation and Maintenance	Scoped out
RLCT 10b: Sandstone	No	Construction, Operation and Maintenance	Scoped out

Receptor	Potential for significant effect	Project phase(s)	Proposed to be scoped in/out
Forests and Heaths			
Doncaster Landscape Character Assessment and Capacity Study			
LCT G2: Thorne and Hatfield Peat Moorlands	No	Construction, Operation and Maintenance	Scoped out
LCT H2: Blaxton to Stainforth Sandland Heaths and Farmland	No	Construction, Operation and Maintenance	Scoped out
Landscape receptors			
Effects on landscape receptors from night-time lighting	Yes	Construction, Operation and Maintenance	Scoped in

7. Visual

7.1 Introduction

7.1.1 This chapter presents how the visual assessment will consider the potentially significant effects on visual receptors that may arise from the construction, operation and maintenance of the Project (as described in **Chapter 4, Description of the Project**). This chapter of the Scoping Report describes the methodology to be used within the visual assessment, the datasets to be used to inform the assessment, an overview of the baseline conditions, the potential likely significant effects to be considered within the assessment, and how potential likely significant effects will be assessed for the purpose of an Environmental Impact Assessment (EIA). As detailed in **Chapter 4, Description of the Project**, the decommissioning has been scoped out of the environmental assessment.

7.1.2 The Scoping Boundary is illustrated on **Figure 1.1 Project Scoping Boundary**.

7.1.3 This chapter should be read in conjunction with:

- **Chapter 2, Regulatory and Planning Policy Context;**
- **Chapter 3, Main Alternatives Considered;**
- **Chapter 4, Description of the Project;**
- **Chapter 5, EIA Approach and Methodology;**
- **Chapter 6, Landscape;**
- **Chapter 8, Ecology and Biodiversity; and**
- **Chapter 9, Cultural Heritage.**

7.1.4 This chapter is supported by the following figures and appendices:

- **Figure 7.1 Proposed Visual Study Area;**
- **Figure 7.2 Visual Constraints Overview; and**
- **Appendix 7.A Visual Assessment Methodology.**

7.2 Regulatory and Planning Context

7.2.1 **Chapter 2, Regulatory and Planning Context** describes the overall regulatory and planning policy context for the Project. Key legislation, policy and planning guidance relevant to the assessment of potential effects on visual associated with the construction, operation, and maintenance of the Project is presented below.

Legislation

European Landscape Convention

7.2.2 The European Landscape Convention (Ref 6.1) treaty was ratified in the UK in 2006. It defines landscape as: "*an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors*'. The European Landscape Convention promotes an 'all-landscapes approach", founded on the recognition of value in all landscapes. It recognises that the landscape is important as a component of the environment and of people's surroundings in both town and country and whether it is ordinary landscape or outstanding.

Electricity Act 1989

7.2.3 The Electricity Act 1989 – Section 38 and Schedule 9 of the Electricity Act 1989 places a duty on all electricity transmission and distribution licence holders, in formulating proposals for new electricity networks infrastructure to *"have regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest; and … do what [they] reasonably can to mitigate any effect which the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings or objects"*.

Tree Preservation Orders

7.2.4 The law on Tree Preservation Orders is in the Town and Country Planning Act 1990 (particularly sections 197-214 as amended) and in the Town and Country Planning (Trees) Regulations 1999 (Statutory Instrument number 1892). This is relevant because it informs the mitigation proposals should a TPO tree have to be removed.

Planning Policy

National Planning Policy

National Policy Statements

7.2.5 As detailed in **Chapter 2, Regulatory and Planning Policy Context**, National Policy Statements (NPSs) set out the primary policy tests against which the application for a Development Consent Order (DCO) for the Project would be considered. The two relevant NPSs are Overarching National Policy Statement for Energy (EN-1) (Ref 2.2) and National Policy Statement for Electricity Networks Infrastructure (EN-5) (Ref 2.3). **Table 7.1** sets out how both the current and draft NPSs relevant to electricity networks infrastructure are relevant to the visual assessment.

Table 7.1: Relevant sections of the National Policy Statements

National Policy Statement	NPS section	How it will be considered
EN-1	4.5.3 (part) *"...Whilst the applicant may not have any or very limited choice in the physical appearance of some*	The design of the route of the 400 kV

National Policy Statement	NPS section	How it will be considered
	energy infrastructure, there may be opportunities for the applicant to demonstrate good design in terms of siting relative to existing landscape character, landform and vegetation".	OHL and the siting of associated infrastructure is being developed within the underlying principle of good design through the application of the Holford Rules (Ref 2.20) and Horlock Rules (Ref 2.21).
EN-1	4.5.4 (part) *"…For the IPC to consider the proposal for a project, applicants should be able to demonstrate in their application documents how the design process was conducted and how the proposed design evolved. Where a number of different designs were considered, applicants should set out the reasons why the favoured choice has been selected. In considering applications the IPC should take into account the ultimate purpose of the infrastructure and bear in mind the operational, safety and security requirements which the design has to satisfy".*	The Scoping Boundary has been developed through a detailed routeing and siting process. The strategic options and alternatives considered for the Project are summarised in **Chapter 3, Main Alternatives Considered.** The evolution of the design will be informed by both environmental and technical desk studies and site surveys as well as consultation and stakeholder feedback. This evolution will be documented in the alternatives chapter within the Environmental Statement (ES).
EN-1	5.9.7 *"The assessment should include the visibility and conspicuousness of the project during construction and of the presence and operation of the project and potential impacts on views and visual amenity. This should include light pollution effects, including on local amenity, and nature conservation".*	The proposed approach to assessing the Project at different stages in its lifecycle is detailed in **Appendix 7.A Visual Assessment Methodology**. The design life of the Project is at least 80

National Policy Statement	NPS section	How it will be considered
		years but with regular maintenance is likely to extend further. The proposed scope of the assessment is provided in section 7.7. The proposed approach to assessing the effects of light pollution on nature conservation interests is provided in **Chapter 8, Ecology and Biodiversity**.
EN-1	5.9.13 *"The fact that a proposed project will be visible from within a designated area should not in itself be a reason for refusing consent".*	No part of the Project would be visible from within the boundaries of a National Park or AONB, or within the provisional Candidate Area for the Yorkshire Wolds.
EN-1	5.9.15 *"The scale of such projects means that they will often be visible within many miles of the site of the proposed infrastructure. The IPC [Secretary of State] should judge whether any adverse impact on the landscape would be so damaging that it is not offset by the benefits (including need) of the project".*	The proposed approach to assessing the Project is set out in **Appendix 7.A Visual Assessment Methodology**. The proposed scope of the assessment is provided in section 7.7.
EN-1	5.9.18 *"All proposed energy infrastructure is likely to have visual effects for many receptors around proposed sites. The IPC will have to judge whether the visual effects on sensitive receptors, such as local residents, and other receptors, such as visitors to the local area, outweigh the benefits of the project".*	**Chapter 4, Description of the Project** describes the evolution of the Project to date and demonstrates that minimising adverse effects on visual amenity through sensitive routeing, siting and design in accordance with the Holford Rules and Horlock Rules was a

National Policy Statement	NPS section	How it will be considered
		major consideration during its development and will continue in the future design evolution of the Project.
EN-1	5.9.19 "*It may be helpful for applicants to draw attention, in the supporting evidence to their applications, to any examples of existing permitted infrastructure they are aware of with a similar magnitude of impact on sensitive receptors. This may assist the IPC [Secretary of State] in judging the weight it should give to the assessed visual impacts of the proposed development".*	Where there are relevant examples, the visual assessment will make reference to other 400 kV OHL projects.
EN-1	5.9.21 *"Reducing the scale of a project can help to mitigate the visual and landscape effects of a proposed project. However, reducing the scale or otherwise amending the design of a proposed energy infrastructure project may result in a significant operational constraint and reduction in function – for example, the electricity generation output. There may, however, be exceptional circumstances, where mitigation could have a very significant benefit and warrant a small reduction in function. In these circumstances, the IPC may decide that the benefits of the mitigation to reduce the landscape and/or visual effects outweigh the marginal loss of function".*	**Chapter 4, Description of the Project** describes the evolution of the Project to date and demonstrates that minimising adverse effects on visual amenity through application of the Holford Rules and Horlock Rules was a major consideration during its development and will continue in the future design evolution of the Project.
EN-1	5.9.22 *"Within a defined site, adverse landscape and visual effects may be minimised through appropriate siting of infrastructure within that site, design including colours and materials, and landscaping schemes, depending on the size and type of the proposed project. Materials and design of buildings should always be given careful consideration".*	**Chapter 4, Description of the Project** describes the evolution of the Project to date and demonstrates that minimising adverse effects on visual amenity through sensitive routeing, siting and design in accordance with the Holford Rules and Horlock Rules was a major consideration during its development

National Policy Statement	NPS section	How it will be considered
		and will continue in the future design evolution of the Project.
EN-1	5.9.23 *"Depending on the topography of the surrounding terrain and areas of population it may be appropriate to undertake landscaping off-site. For example, when filling in gaps in existing tree and hedge lines would mitigate the impact when viewed from a more distant vista".*	The proposed approach to mitigation is discussed in **Chapter 4, Description of the Project**. The visual effects will be assessed at year 1 and year 15 to allow for the maturing of any mitigation planting.
EN-1 (Draft)	4.6.2 (part) *"Given the benefits of 'good design' in mitigating the adverse impacts of a project, applicants should consider how 'good design' can be applied to a project during the early stages of the project lifecycle. Design principles should be established from the outset of the project to guide the development from conception to operation".*	The design of the route of the 400 kV OHL and the siting of associated infrastructure is being developed within the underlying principle of good design through the application of the Holford Rules and Horlock Rules.
EN-1 (Draft)	4.6.3 (part) *"….the Secretary of State needs to be satisfied that energy infrastructure developments are sustainable and, having regard to regulatory and other constraints, are as attractive, durable, and adaptable (including taking account of natural hazards such as flooding) as they can be. In doing so, the Secretary of State should be satisfied that the applicant has taken into account both functionality (including fitness for purpose and sustainability) and aesthetics (including its contribution to the quality of the area in which it would be located, any potential amenity benefits, and visual impacts on the landscape or seascape) as far as possible".*	The design of the Project has sought to avoid impacts on visual receptors through the application of the Holford Rules and Horlock Rules.
EN-1 (Draft)	4.6.4 (part) *"Many of the wider impacts of a development, such as landscape and environmental impacts, will be important factors in the design process. The Secretary of State will consider such impacts under the relevant policies in this NPS. Assessment of impacts must be for the stated design life of the scheme rather than a shorter time".*	The proposed approach to assessing the Project at different stages in its lifecycle is detailed in **Appendix 7.A Visual Assessment Methodology**. The design life of the

National Policy Statement	NPS section	How it will be considered
		Project is at least 80 years but with regular maintenance is likely to extend further. The proposed scope of the assessment is provided in section 7.7.
EN-1 (Draft)	5.10.8 *"The assessment should also demonstrate how noise and light pollution from construction and operational activities on residential amenity and on sensitive locations, receptors and views, will be minimised".*	The proposed scope of the assessment including the approach to residential visual amenity is provided in section 7.7. Other effects, including noise and vibration, and assessed in **Chapter 15, Noise and Vibration**, and **Chapter 16, Socio-economic, Recreation and Tourism**.
EN-5	2.2.6 *"...As well as having duties under section 9 of the Electricity Act 1989, (in relation to developing and maintaining an economical and efficient network), developers will be influenced by Schedule 9 to the Electricity Act 1989, which places a duty on all transmission and distribution licence holders, in formulating proposals for new electricity networks infrastructure, to "have regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest; and … do what [they] reasonably can to mitigate any effect which the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings or objects." Depending on the location of the proposed development, statutory duties under section 85 of the Countryside and Rights of Way Act 2000 and section 11A of the National Parks and Access to the Countryside Act 1949 may be relevant".*	The design of the Project has sought to avoid such features through the application of the Holford Rules and Horlock Rules. **Chapter 4, Description of the Project** describes the evolution of the Project to date and demonstrates that minimising adverse effects on visual amenity through sensitive routeing, siting and design in accordance with the Holford Rules and Horlock Rules was a major consideration during its development and will continue in the

National Policy Statement	NPS section	How it will be considered
		future design evolution of the Project. The proposed approach to assessing likely significant visual effects is set out in **Appendix 7.A Visual Assessment Methodology**.
EN-5	2.8.2 (part) *"Government does not believe that development of overhead lines is generally incompatible in principle with developers' statutory duty under section 9 of the Planning Act to have regard to amenity and to mitigate impacts…In practice new above ground electricity lines, whether supported by lattice steel towers/pylons or wooden poles, can give rise to adverse landscape and visual impacts, dependent upon their scale, siting, degree of screening and the nature of the landscape and local environment through which they are routed. For the most part these impacts can be mitigated, however at particularly sensitive locations the potential adverse landscape and visual impacts of an overhead line proposal may make it unacceptable in planning terms, taking account of the specific local environment and context".*	**Chapter 4, Description of the Project** describes the evolution of the Project to date and demonstrates that minimising adverse effects on visual amenity through sensitive routeing, siting and design in accordance with the Holford Rules and Horlock Rules was a major consideration during its development and will continue in the future design evolution of the Project. The main approach to mitigating the visual effects of tall vertical infrastructure such as pylons, is through careful design and routeing.
EN-5	2.8.2 (part) *"…New substations, sealing end compounds and other above ground installations that form connection, switching and voltage transformation points on the electricity networks can also give rise to landscape and visual impacts. Cumulative landscape and visual impacts can arise where new overhead lines are required along with other related developments such as substations, wind farms and/or other new sources of power generation".*	The proposed approach to assessing likely significant cumulative visual effects is set out in **Appendix 7.A Visual Assessment Methodology**. The proposed approach to mitigation is discussed in **Chapter 4,**

National Policy Statement	NPS section	How it will be considered
		Description of the Project.
EN-5	2.8.3 *"Sometimes positive landscape and visual benefits can arise through the reconfiguration or rationalisation of existing electricity network infrastructure".*	The strategic options and alternatives considered for the Project are summarised in **Chapter 3, Main Alternatives Considered**.
EN-5	2.8.4 *"Where possible, applicants should follow the principles below [Holford Rules] in designing the route of their overhead line proposals and it will be for applicants to offer constructive proposals for additional mitigation of the proposed overhead line. While proposed underground lines do not require development consent under the Planning Act 2008, wherever the nature or proposed route of an overhead line proposals makes it likely that its visual impact will be particularly significant, the applicant should have given appropriate consideration to the potential costs and benefits of other feasible means of connection or reinforcement, including underground and sub-sea cables where appropriate. The ES should set out details of how consideration has been given to undergrounding or sub-sea cables as a way of mitigating such impacts, including, where these have not been adopted on grounds of additional cost, how the costs of mitigation have been calculated".*	The strategic options and alternatives considered for the Project are summarised in **Chapter 3, Main Alternatives Considered**.
EN-5	2.8.5 *"Guidelines for the routeing of new overhead lines, the Holford Rules, were originally set out in 1959 by Lord Holford, and are intended as a common-sense approach to the routeing of new overhead lines. These guidelines were reviewed and updated by the industry in the 1990s and should be followed by developers when designing their proposals".*	**Chapter 4, Description of the Project** describes the evolution of the Project to date and demonstrates that minimising adverse effects on visual amenity through sensitive routeing, siting and design in accordance with the Holford Rules and Horlock Rules was a major consideration during its development and will continue in the

National Policy Statement	NPS section	How it will be considered
		future design evolution of the Project.
EN-5	2.8.8 *"Paragraph 3.7.10 of EN-1 sets out the need for new electricity lines of 132 kV and above, including overhead lines. Although Government expects that fulfilling this need through the development of overhead lines will often be appropriate, it recognises that there will be cases where this is not so. Where there are serious concerns about the likely adverse effects of a proposed overhead line, the IPC will have to balance these against the relevant factors, including the need for the proposed infrastructure, the availability and cost of alternative sites and routes and methods of installation (including undergrounding)".*	The strategic options and alternatives considered for the Project are summarised in **Chapter 3, Main Alternatives Considered**. National Grid's approach to undergrounding on the Project is explained in **Chapter 4, Description of the Project.** The proposed approach to assessing likely significant visual effects is set out in **Appendix 7.A Visual Assessment Methodology**.
EN-5	2.8.9 *"The impacts and costs of both overhead and underground options vary considerably between individual projects (both in absolute and relative terms). Therefore, each project should be assessed individually on the basis of its specific circumstances and taking account of the fact that Government has not laid down any general rule about when an overhead line should be considered unacceptable. The IPC should, however, only refuse consent for overhead line proposals in favour of an underground or sub-sea line if it is satisfied that the benefits from the non-overhead line alternative will clearly outweigh any extra economic, social and environmental impacts and the technical difficulties are surmountable. In this context it should consider:* *The landscape in which the proposed line will be set, (in particular, the impact on residential areas, and those of natural beauty or historic importance such as National Parks, AONBs and the Broads);*	The strategic options and alternatives considered for the Project are summarised in **Chapter 3, Main Alternatives Considered**. **Chapter 4, Description of the Project** describes the evolution of the Project to date and demonstrates that minimising adverse effects on visual amenity through sensitive routeing, siting and design in accordance with the Holford Rules and

National Policy Statement	NPS section	How it will be considered
	the additional cost of any undergrounding or sub-sea cabling (which experience shows is generally significantly more expensive than overhead lines, but varies considerably from project to project depending on a range of factors, including whether the line is buried directly in open agricultural land or whether more complex tunnelling and civil engineering through conurbations and major cities is required. Repair impacts are also significantly higher than for overhead lines as are the costs associated with any later uprating.); and *the environmental and archaeological consequences (undergrounding a 400 kV line may mean disturbing a swathe of ground up to 40 metres across, which can disturb sensitive habitats, have an impact on soils and geology, and damage heritage assets, in many cases more than an overhead line would)".*	Horlock Rules was a major consideration during its development and will continue in the future design evolution of the Project. The proposed approach to assessing the existing character, quality, value and the susceptibility/sensitivity to change of visual receptors is set out in **Appendix 7.A Visual Assessment Methodology**. An overview of the visual characteristics of the study area is provided in section 7.4.
EN-5	2.8.10 *"In addition to following the principles set out in the Holford Rules and considering undergrounding, the main opportunities for mitigating likely adverse landscape and visual impacts of electricity networks infrastructure are:* *consideration of network reinforcement options (where alternatives exist) which may allow improvements to an existing line rather than the building of an entirely new line; and* *selection of the most suitable type and design of support structure (i.e. different lattice tower types, use of wooden poles etc.) in order to minimise the overall visual impact on the landscape".*	The strategic options and alternatives considered for the Project are summarised in **Chapter 3, Main Alternatives Considered**. The design evolution of the Project to date and how it demonstrates good design is reported in **Chapter 4, Description of the Project**.
EN-5	2.8.11 (*part) "There are some more specific measures that might be taken, and which the IPC could require through requirements if appropriate, as follows: Landscape Schemes comprising off-site tree and hedgerow planting are sometimes used for larger overhead line projects to mitigate likely landscape and visual impacts, softening the effect of a new above ground line whilst providing some screening from*	The proposed approach to mitigation is discussed in **Chapter 5, EIA Approach and Methodology**.

National Policy Statement	NPS section	How it will be considered
	important visual receptors. These can only be implemented with the agreement of the relevant landowner(s) and advice from the relevant statutory advisor may also be needed".	
EN-5 (Draft)	2.2.2 *"However, Applicants retain substantial control over routing and site selection within the identified macro-level location or development zone. Moreover, the locational constraints identified above do not, of course, exempt Applicants from their duty to consider and balance the site selection considerations set out below, much less the policies on good design and impact mitigation detailed in Sections 2.7-2.14".*	The design evolution of the Project to date and how it demonstrates good design is reported in **Chapter 4, Description of the Project**.
EN-5 (Draft)	2.2.3 *"Applicants should bear in mind that the connection between the initiating and terminating points of a proposed new electricity line need not go via the most direct route. Indeed, engineering, environmental, and community constraints may make this infeasible or unsuitable".*	The design evolution of the Project to date and how it demonstrates good design is reported in **Chapter 4, Description of the Project**.
EN-5 (Draft)	2.11.2 *"While government does not believe that the development of overhead lines is incompatible in principle with developers' statutory duty under Schedule 9 of the Electricity Act 1989 to have regard to visual and landscape amenity and to mitigate to the fullest extent reasonably possible any impacts thereon, in practice new overhead lines – whether supported by lattice steel towers or monopole structures – can give rise to adverse landscape and visual impacts. These impacts depend on the type, scale, siting, and degree of screening of the lines, as well as the characteristics of the landscape and local environment through which they are routed".*	**Chapter 4, Description of the Project** describes the evolution of the Project to date and demonstrates that minimising adverse effects on visual amenity through sensitive routeing, siting and design in accordance with the Holford Rules and Horlock Rules was a major consideration during its development and will continue in the future design evolution of the Project. The proposed approach to assessing likely significant visual effects is set out in **Appendix 7.A Visual Assessment Methodology**.

National Policy Statement	NPS section	How it will be considered
EN-5 (Draft)	2.11.4 *"Cumulative adverse landscape and visual impacts may arise where new overhead lines are required along with other related developments such as substations, wind farms, and/or other new sources of generation".*	The proposed approach to assessing likely significant cumulative visual effects is set out in **Appendix 7.A Visual Assessment Methodology**.
EN-5 (Draft)	2.11.5 *"Landscape and visual benefits may arise through the reconfiguration, rationalisation, or undergrounding of existing electricity network infrastructure".*	The strategic options and alternatives considered for the Project are summarised in **Chapter 3, Main Alternatives Considered**.
EN-5 (Draft)	2.11.8 *"Where the nature or proposed route of an overhead line will likely result in particularly significant landscape and/or visual impacts, the Applicant should demonstrate that they have given due consideration to the costs and benefits of feasible alternatives to the line, including – where appropriate – underground or subsea cables. The ES should set out details of this consideration, including the Applicant's rationale for eschewing feasible alternatives to the overhead line, and the mitigation cost calculation methodology that this rationale may rely upon".*	The strategic options and alternatives considered for the Project are summarised in **Chapter 3, Main Alternatives Considered**.
EN-5 (Draft)	*2.11.13 "Although it is the government's position that overhead lines should be the strong starting presumption for electricity networks developments in general, this presumption is reversed when proposed developments will cross part of a nationally designated landscape (i.e. National Park, Broads, or Area of Outstanding Natural Beauty). In these areas, and where harm to the landscape cannot feasibly be avoided by mitigation or re-routing, the strong starting presumption will be that the developer should underground the relevant Section of the line. Note however that undergrounding will not be required where it is infeasible in engineering terms, or where the harm that it causes is not outweighed by its corresponding landscape and/or visual benefits".*	The strategic options and alternatives considered for the Project are summarised in **Chapter 3, Main Alternatives Considered**.

National Policy Statement	NPS section	How it will be considered
EN-5 (Draft)	2.11.14 *"Additionally, cases will arise where – though no part of the proposed development crosses a designated landscape – a high potential for widespread and significant adverse landscape and/or visual impacts along certain Sections of its route may nonetheless recommend undergrounding the relevant segments of the line. In these cases, and taking account of the fact that the government has not laid down any further rule on the circumstances requiring undergrounding, the Secretary of State must weigh the feasibility, cost, and any harm of the undergrounding option against i) the adverse implications of the overhead line proposal; ii) the cost and feasibility of rerouting the relevant line Section; and iii) the cost and feasibility of the reconfiguration, rationalisation, and/or undergrounding of proximate existing or proposed electricity National Policy Statement for Electricity Networks Infrastructure (EN-5) networks infrastructure. In such cases the Secretary of State should only grant development consent for underground (or subsea) Sections of a proposed line over an overhead alternative if it is satisfied that the benefits accruing from the former proposal clearly outweigh any extra economic, social, or environmental impacts that it presents, and that any technical obstacles associated with it are surmountable. In this context it should consider:* *the landscape and visual baseline characteristics of the setting of the proposed route (in particular, the impact on high sensitivity visual receptors as defined in the current edition of the Landscape Institute's Guidelines for Landscape and Visual Impact Assessment, residential areas, and areas of natural beauty or historic importance, including those in proximity to nationally designated landscapes);* *the additional cost of the proposed underground or sub-sea alternatives, including their significantly higher lifetime cost of repair and later uprating;* *the potentially very disruptive effects of undergrounding on local communities, habitats, archaeological and heritage sites, soil, geology, and, for a substantial time after construction, landscape and visual*	The strategic options and alternatives considered for the Project are summarised in **Chapter 3, Main Alternatives** Considered.**Chapter 4, Description of the Project** describes the evolution of the Project to date and demonstrates that minimising adverse effects on visual amenity through sensitive routeing, siting and design in accordance with the Holford Rules and Horlock Rules was a major consideration during its development and will continue in the future design evolution of the Project. The proposed approach to assessing the existing character, quality, value and the susceptibility/sensitivity to change of the visual receptors is described in **Appendix 7.A Visual Assessment Methodology**. The proposed approach to assessing likely significant visual effects is described in **Appendix 7.A Visual Assessment Methodology**. An overview of the visual amenity of the study area is provided in section 7.4.

National Policy Statement	NPS section	How it will be considered
	amenity. (Undergrounding a 400kV line may mean digging a deep trench 40-110m wide along the length of the route, and so such works will often be considerably more disruptive – albeit temporarily – to the receptors listed above than would an overhead line of equivalent rating) and; *the developer's commitment, as set out in their ES, to mitigate the potential detrimental effects of undergrounding works on any relevant agricultural land and soils, particularly regarding Best and Most Versatile land. Such a commitment must guarantee appropriate handling of soil, backfilling, and return of the land to the baseline Agricultural Land Classification (ALC), thus ensuring no loss or degradation of agricultural land. Such a commitment should be based on soil and ALC surveys in line with the 1988 ALC criteria and due consideration of the Defra Construction Code*".	The proposed approach to assessing likely significant effects on agriculture and soils is described in **Chapter 12, Agriculture and Soils**.
EN-5 (Draft)	2.11.15 *"In addition to good design in accordance with the Holford and Horlock rules, and the consideration of undergrounding or rerouting the line, the principal opportunities for mitigating adverse landscape and visual impacts of electricity networks infrastructure are:* *consideration of network reinforcement options (where alternatives exist) which may allow improvements and/or extensions to an existing line rather than the building of an entirely new line;* *selection of the most suitable type and design of support structure in order to minimise the overall visual impact on the landscape. In particular, ensuring that lattice steel towers are of the smallest possible footprint and internal volume and;* *the rationalisation, reconfiguration, and/or undergrounding of existing electricity networks infrastructure in the vicinity of the proposed development".*	The strategic options and alternatives considered for the Project are summarised in **Chapter 3, Main Alternatives Considered**.
EN-5 (Draft)	2.11.16 *"Additionally, there are more specific measures that might be taken, and which the Secretary of State*	The proposed approach to mitigation

National Policy Statement	NPS section	How it will be considered
	could mandate through DCO requirements if appropriate, as follows: *landscape schemes, comprising off-site tree and hedgerow planting, are sometimes used for larger new overhead line projects to mitigate potential landscape and visual impacts, softening the effect of a new above ground line whilst providing some screening from important visual receptors. These may be implemented with the agreement of the relevant landowner(s), or the developer may compulsorily acquire the land in question. Advice from the relevant statutory authority may also be needed and;* *screening, comprising localised planting in the immediate vicinity of residential properties and principal viewpoints can also help to screen or soften the effect of the line, reducing the visual impact from a particular receptor".*	is discussed in **Chapter 4, Description of the Project**.
EN-5 (Draft)	2.11.17 *"Note that, as set out in Section 2.3 above, where landscape schemes and/or screening mitigation of the kind described above is required, rights over the land necessary for such measures may be compulsorily acquired as part of the DCO".*	The proposed approach to mitigation is discussed in **Chapter 4, Description of the Project**.
EN-5 (Draft)	2.11.18 *"Also note that since long-term management of the selected mitigation schemes is essential to their mitigating function, a management plan, developed at least in outline at the conclusion of the examination, should secure the integrity and benefit of these schemes and uphold the landscape commitments made to achieve consent, alongside any pertinent commitments to environmental and biodiversity net gain".*	National Grid plc's environmental and Biodiversity Net Gain commitments are described in **Chapter 8, Ecology and Biodiversity**. An outline management plan will be included with the application.
EN-5 (Draft)	2.11.19 *"The Secretary of State should be satisfied that the development, so far as is reasonably possible, complies with the Holford and Horlock Rules or any updates to them. The Secretary of State should also be satisfied that all pertinent options for mitigation – including the rationalisation, reconfiguration, or*	The strategic options and alternatives considered for the Project are summarised in **Chapter 3, Main**

National Policy Statement	NPS section	How it will be considered
	undergrounding of existing electricity networks infrastructure, have been considered and evaluated appropriately".	**Alternatives Considered**. **Chapter 4, Description of the Project** describes the evolution of the Project to date and demonstrates that minimising adverse effects on visual amenity through sensitive routeing, siting and design in accordance with the Holford Rules and Horlock Rules was a major consideration during its development and will continue in the future design evolution of the Project.

National Planning Policy Framework

7.2.6 The National Planning Policy Framework (Ref 2.6) does not set specific policies for NSIPs and is not applicable to NSIP where the requirements of the NPS apply. Its policies may however be material to decision making. The NPPF has limited relevance for the visual assessment.

7.2.7 The National Planning Practice Guidance (Ref 6.2) similarly makes little reference to views and visual amenity noting only (Paragraph 036 (Reference ID: 8-036-20190721) that local plans may include policies to avoid adverse impacts on landscapes and to set out necessary mitigation measures, such as appropriate design principles and visual screening, where necessary. It is however, acknowledged that emerging Government policy increasingly recognises the benefits of design quality and that this may 'range from a long view down to the detailed of a building or landscape' (Ref 7.3).

Local Planning Policy

7.2.8 As detailed in **Chapter 2, Regulatory and Planning Policy Context**, section 2.4 Local Planning Policy, the Project lies within the jurisdiction of East Riding of Yorkshire Council, North Lincolnshire Council, Nottinghamshire County Council, and Bassetlaw District Council. The City of Doncaster Council, West Lindsey District Council, and Newark and Sherwood District Council are located within 10 km of the Project. A summary of the relevant local planning policy which is relevant to the visual assessment in the ES is provided in **Table 7.2**.

Table 7.2: Relevant Local Planning Policies

Local Plan	Policy ref	Policy context
East Riding Local Plan 2012-2029 Strategy Document, Adopted 2016	Policy ENV 1 – Integrating High Quality Design	There are several landmarks in the East Riding that make an important contribution to the sense of place and examples are identified in Policies A1-A6. New development will need to safeguard, including any views of the East Riding's outstanding built and natural features. These include; Important religious buildings; important civic buildings, country houses and industrial heritage; historic cores of the East Riding's settlements and their settings; and views of outstanding natural features. Examples include landmarks such as the Humber Bridge, Skidby Mill (Cottingham), St Johns Church in Goole, and Howden Minster and the diverse character, skyline and views across the rolling tops of the Yorkshire Wolds[1].
Central Lincolnshire Local Plan 2023	Policy S62 Areas of Outstanding Natural Beauty and Areas of Great Landscape Value	Where a proposal may result in adverse impacts, it may exceptionally be supported if the overriding benefits of the development demonstrably outweigh the harm – in such circumstances the harm should be minimised and mitigated through design and landscaping. Reference is made in this policy to retention or enhancement of important views.

Consultation and Engagement

7.2.9 The environmental assessment will be informed by consultation and engagement with stakeholders, including East Riding of Yorkshire Council, North Lincolnshire Council, Bassetlaw District Council, Nottinghamshire County Council, and Natural England, which has been ongoing throughout the early development stages of the Project. A summary of the engagement with the local authorities located within the Scoping Boundary regarding assessment methodology is include in **Table 7.3**.

[1] Policies taken from the Local Plan Update

Table 7.3 Engagement with local authorities

Local Planning Authority	Summary of Response	Consideration in the Scoping Report
North Lincolnshire Council	The proposed approach to visual impacts, as set out in the submitted EIA Methodology (**Appendix 7.A**)…closely matches our standard advice. Julian's Bower should be included in the list of viewpoints (OSGR SE 88002 21750). This is a Scheduled Monument and a key viewpoint from the Northern Lincolnshire Edge across the Humberhead Levels. For landscape and visual impacts assessments, cumulative impact assessments should include the consideration of Keadby Power Station proposals and solar farm proposals, including the very large, proposed Tween Bridge Solar Farm.	These viewpoints will be included in the visual assessment. The cumulative assessment will include the consideration of Keadby Power Station proposals and solar farm proposals, including the proposed Tween Bridge Solar Farm.
Nottinghamshire County Council	7.A.1 (**Appendix 7.A**): 7.A.1.1 Overview LPA to provide support and agreement on selection of Viewpoints All other sections confirmed as agreed 7.A.2 (**Appendix 7.A**): 7.A.2.1 Assessing Visual Effects Confirmed as agreed 7.A.2.2 Study Area The proposed 5 km study area from the Limits of Deviation boundary is accepted. This is assumed to relate to the emerging preferred corridor. Any change to the alignment of preferred corridor and resultant Limits of Deviation boundary will need to be reflected in a modification of the 5 km study area. The statement that the study area will continue to be reviewed is welcomed. It is anticipated that the proposed ZTV plan will assist in identification of any potential sensitive receptors outside the study area. Early review of the ZTV plan by the LPA would be welcomed ahead of viewpoint selection. All other sections confirmed as agreed 7.A.2.3 Baseline Data Gathering • 7.A.2.3.1 Viewpoint photography needs to be clear. Images taken in heavily overcast conditions where detail will be difficult to make out will not be accepted. Photography should	7.A.1.1 as noted in 7.A.2.3.4, the LPA will be consulted on the selection of viewpoints. 7.A.2.2 – as noted in 7.A.2.2.2, the 5 km study area will continue to be reviewed and modified as necessary. The ZTV will be circulated to the LPA for review and comment ahead of the viewpoint selection, but this will be based on indicative pylons locations and will not necessary be a true reflection of the potential visibility of the Project. 7.A.2.3.1 – as noted in 7.A.4.1.2, photography will be undertaken in winter and in good lighting conditions. 7.A.2.3.12 – Table 2.2 (Appendix 7.A) includes the suggested amendment to the definition of categories of view value. 7.A.2.4.4 includes reference to residents.

Local Planning Authority	Summary of Response	Consideration in the Scoping Report
	also be undertaken when leaf cover is not present to demonstrate views when sight lines will be clearest. • 7.A.2.3.12 Table 2.1 Indicators of View Value – categorisation of Medium view value includes the sentence '*Elements or features within the view are likely to be in* ***good condition, with few discordant elements or features****.* The category description for Low view value includes the following extracted statement *'is in an area of ordinary landscape value****, or reasonably good landscape value but with some discordant elements or features****'* We feel the highlighted sections are too similar and could lead to some views having their value assessed lower than would be otherwise expected. Request the description in the Low category is amended to remove the words*, **or reasonably good landscape value but.*** To confirm, this would leave the Low view value description as follows *'Although the view may be valuable to the local community, the location has no formal planning status, is in an area of ordinary landscape value with some discordant elements or features. The value of such views to the local community may have been identified as part of the consultation process and through site visits'*. All other sections confirmed as agreed 7.A.2.4 Establishing Visual Sensitivity • 7.A.2.4.4 For clarification, the word Residents should be included within visual receptors most likely to be susceptible to change. While Communities covers this more broadly we feel it would be helpful to be clear on this point. All other sections confirmed as agreed 7.A.2.5 Predicting Magnitude of change • 7.A.2.5.3 Size and scale of effect – when listing other considerations which can influence the magnitude of likely change, it appears to be inferred that views that are *'open and directionless'* would be an influence to lower magnitude. Care should be taken with this approach as it	7.A.2.5.3 – a statement is included at 7.A.2.4.10 to note that due consideration will be given to the sensitivity of fenland and similar open landscapes. 7.A.2.5.10 – Table 2.3 includes the suggested amendment to the definition of magnitude of change. 7.A.2.6 – 7.A.2.6.3 states that the categories will be major, moderate minor etc., but where an effect falls at the upper or lower end of the category, this will be noted and explained. 7.A.2.7 – 7.A.2.7.4 states that residual effects will be identified as major, moderate, minor or negligible. 7.A.4 – for general site photography, 360° panoramas will be taken unless there are privacy issues in relation to nearby properties. All other comments do not require a response.

Local Planning Authority	Summary of Response	Consideration in the Scoping Report
	could be the open and directionless views of a landscape, such as flat fenland, that is the attraction and valued feature. • 7.A.2.5.10 Table 2.3 Indicators of Magnitude of Visual Change – categorisation of Medium Magnitude of Visual Change includes the sentence '*The duration/reversibility of effect is likely to be long-term, but **potentially reversible'**.* The category description for Low Magnitude of Visual Change includes '*The duration/reversibility of effect is likely to be medium-term and **non-reversible'***. We feel the highlighted sections regarding reversibility should be swapped over. To confirm the description for Medium would end with having non-reversible effect, and the description for Small would end with having potentially reversible effect. All other sections confirmed as agreed 7.A.2.6 Judging Levels of Visual Effect • 7.A.2.6.3 Clarification is required on how the various identified levels of significance will be applied. Will this be strictly one category or another (major or moderate or minor), or will there be a blending of the categories (major, major/moderate, moderate, moderate/minor, etc)? All other sections confirmed as agreed 7.A.2.7 Mitigation and Residual Effects • 7.A.2.7.3 Clarification is required on what level of residual effect will be classed as significant at Year 15. Will it just be major residual effects, or will it include lower ratings or sub-categories, e.g major/moderate, moderate, etc? All other sections confirmed as agreed 7.A.4 Technical information • 7.A.4.1 General site photography – attention is drawn to recommendation made in Technical Guidance Note 06/19 (LI TGN 06/19) section 4.2.5, which states *'Capturing 360° is not always necessary, but may assist in establishing*	

Local Planning Authority	Summary of Response	Consideration in the Scoping Report
	the viewpoint's location and *potentially assist in illustrating cumulative effects, if applicable*'. We would recommend for general site photography, 360° panoramas will be beneficial for the reasons given. • 7.A.4.1.2 Photography for Photomontage – LPA to agree viewpoint locations to be taken forward for Photomontage. All other sections confirmed as agreed • 7.A.4.2 Wireframes Confirmed as agreed • 7.A.4.3 Zone of Theoretical Visibility Confirmed as agreed • 7.A.4.4 Assumptions & limitations Confirmed as agreed	

7.3 Study Area

7.3.1 The extent of the study area is determined by the potential visibility of the Project in the surrounding landscape and is proportionate to the size and scale of the Project and nature of the surrounding landscape. GLVIA3 (Ref 6.7) states that the study area should include *"the full extent of the wider landscape around it which the Proposed Development may influence in a significant manner*".

7.3.2 Based on the type of OHL infrastructure and experience of assessments of 400 kV OHL (the tallest element of the Project), the visibility of individual pylons approximately 50 m tall is assumed to be a maximum distance of 10 km. Beyond this distance the perceptibility of pylons approximately 50 m tall diminishes considerably in most instances, and in all but the clearest of viewing conditions.

7.3.3 At distances greater than 5 km, effects on landscape character and visual amenity are unlikely to be significant. This is because at 5 km distance, when viewed at arm's length, a 50 m tall pylon will appear to be approximately 0.61 cm high in the landscape. This is known as the apparent height of the pylon. If a pylon is seen on the skyline in very clear conditions, or a pair of pylons are seen close together at this distance, perceptibility may increase slightly but this is still unlikely to trigger significant effects.

7.3.4 Initial field survey for the Project has also determined that, where visible at distances between 1km and 3 km, existing pylons are typically noticeable but not prominent. This is because in the rolling well-treed landscapes found north of the Humber Estuary, pylons are often obscured by trees, landform and vegetation, whilst in the flat open landscapes south of the Humber Estuary, the visually permeable nature of the pylon's lattice structure means that they rapidly recede and visually assimilate into the wide landscape.

7.3.5 Where visible within 1 km it is typically seen in a greater proportion of the view, depending on filtering, screening or backgrounding which may reduce the extent visible.

7.3.6 Based on these observations, the proposed study area for the landscape assessment is defined as a 5 km distance from the Project (the 'wider landscape'). This is considered to cover landscape receptors which could be affected to a significant degree. The emphasis of the assessment will, however, be based on receptors lying within 3 km as this is where significant effects are most likely to occur.

7.3.7 To support the assessment, Zone of Theoretical Visibility (ZTV) maps will be produced up to a 10 km distance surrounding the project (see **Appendix 7.A Visual Assessment Methodology** for more details). These will help to determine the area over which the proposed 400 kV OHL could theoretically be visible. The reason the ZTV maps will be prepared over a 10 km distance is to inform the assessment of cumulative landscape impacts with other proposed developments and to ensure that the effects of taller elements such as the pylons at the River Ouse crossing are fully assessed.

7.3.8 These distances will continue to be reviewed and if necessary amend as the design of the Project progresses.

7.4 Baseline Conditions

Data Sources

7.4.1 The known or predicated current and future baseline environment described in this section has been informed by the following data sources:

- Natural England National Character Area Profiles (Ref 6.8);
- East Riding of Yorkshire Landscape Character Assessment (Ref 6.3);
- North Lincolnshire Landscape Character Assessment and Guidelines (Ref 6.9);
- North Lincolnshire Countryside Design Summary (Ref 6.10)
- North Lincolnshire Landscape Character Assessment (Ref 6.11)
- Doncaster Landscape Character Assessment and Capacity Study (Ref 6.12);
- East Midlands Regional Landscape Character Assessment (Ref 6.13);
- Doncaster Landscape Character Assessment Update – Sensitivity to Wind Energy Development (Ref 6.14); and
- East Riding of Yorkshire Important Landscape Areas Boundary Refinement (Ref 6.4).

7.4.2 Neighbourhood Plans and Village Design Statements (or their equivalent) will also be reviewed to supplement the above.

Baseline

7.4.3 The study area for the visual assessment is shown in **Figure 7.1 Proposed Visual Study Area** and an explanation of how it was defined is provided in section 7.3.

7.4.4 Sensitive visual receptors include people[2] living in the many communities across the area and people engaged in recreational activities or using recognised scenic routes.

7.4.5 In accordance with industry guidance, the assessment will focus on public views experienced by those groups of people who are likely to be most sensitive to the construction, operation and maintenance of the Project. This comprises local communities where views contribute to the landscape setting enjoyed by residents in the area and people using recreational routes, features and attractions. It also includes people experiencing the view from protected viewpoints. These are viewpoints, panoramas and viewing corridors that have been designated by county councils, local authorities or other stakeholders, the locations of which will be identified as the assessment progresses. For the purposes of the assessment, views identified in Neighbourhood Plans and Village Design Statements are also categorised as protected views.

7.4.6 Occupants of residential properties likely to be affected by the Project are mainly located around the edges of the settlements and at the many dispersed properties and farmsteads close to the Project. Views from settlement edges are typically filtered and framed by intervening garden and field boundary vegetation, but there are some locations, where there are long views out across the low-lying farmland. Views often include existing 400 kV and 275 kV pylons.

7.4.7 The study area offers a range of formal and informal recreational and leisure opportunities which will be identified and presented in the Preliminary Environmental Information Report (PEIR). These include the following nationally designated and regionally promoted recreational routes:

- The Yorkshire Wolds Way;
- National Cycle Network (NCN) Route 1 – Dover to Scotland;
- NCN Route 65 – Hornsea to Middlesborough;
- NCN Route 64 – Market Harborough to Lincoln;
- NCN Route 647 – West of Lincoln;
- Trans Pennine Trail – Southport to Hull;
- Yorkshire Wolds Way – Hessle to Filey;
- Peatlands Way – A circular route around the Humberhead Peatlands;
- Cuckoo Way – Chesterfield to the River Trent;
- Trent Valley Way – Alkborough to Shardlow along the River Trent;
- High Hunsley Circuit – A circular route in the south of the Yorkshire Wolds; and
- Beverley 20 – Beverly Minster to the Humber Bridge.

7.4.8 Views from the above routes vary depending on the local landscape. In many locations views out will be fully or partially obscured by intervening landform or by vegetation.

[2] It is important to note that it is the people who would be experiencing the view from the viewpoint that are the receptor, not the viewpoint itself. The location affords the view to the recipient, and whilst the location cannot change, the opinion of the viewer can be variable. These people will generally have different responses to a change in view depending on their location, the activity they are engaged in and other factors, including the weather and the time of day/year.

Overview of Current Visual Amenity

7.4.9 The landscape through which the Project passes can be divided into following three geographical areas, all of which are strongly influenced by the estuarine landscape of the Humber Estuary to the north and the River Trent to the south. A broad overview of the visual amenity within these three areas based on Natural England's National Character Area Profiles (Natural England online database) is provided below and an overview of the landscape is provided in section 6.4 of **Chapter 6, Landscape**.

The Yorkshire Wolds

7.4.10 The northern end of the study area includes the southern end of the Yorkshire Wolds which rise in an easterly direction from the Vale of York to create a broad sinuous escarpment above North Newbold, South Cave and Welton. The escarpment is incised by small dry valleys which creates a complex landform that is a feature in easterly views and forms vantage points from which panoramic views can be obtained. When combined with the high woodland cover this provides visual interest and contains many longer views. Views within the valleys are largely enclosed, whilst the valleys themselves may not be apparent (hidden from view) from the wider surroundings, except where they are crossed.

7.4.11 East of the escarpment is a large-scale rolling plateau landscape with large-scale arable farmland punctuated by occasional woodland blocks and shelterbelts. Hedgerows are generally well-maintained but insubstantial which, combined with the limited tree and woodland cover, adds to the sense of openness and big skies. There are long views across the plateau from slightly elevated areas such as at Little Weighton and High Hunsley.

7.4.12 At the base of the Wolds and along the north side of the Humber Estuary, the landscape is much more developed. The small towns of Hessle, North Ferriby and Brough merge eastwards along the northern coast of the Humber Estuary into the City of Hull and are connected by a network of main roads and railway lines. There are many discordant I elements and features including the commercial development along the A63 corridor and several overhead lines. This includes the existing 400 kV OHL (4ZQ) which crosses the A63 between South Cave and Brantingham at the very southern end of the Wolds as it travels between Creyke Beck Substation and the River Ouse.

7.4.13 The nearest settlements to the Scoping Boundary within this section are Skidby, Eppleworth, Raywell, Little Weighton, Riplingham, South Cave, Brantingham with Cottingham, Beverley, Walkington and High Hunsley in the wider area. Views from these settlements typically include the existing 400 kV OHL (4ZQ).

Humberhead Levels

7.4.14 This section comprises the Humberhead Levels, a flat, low-lying and large-scale agricultural landscape bounded to the west by the low ridge of the Southern Magnesian Limestone and to the east by the North Lincolnshire Edge, which runs north from Lincoln to the Humber Estuary. The northern boundary broadly follows the M62/A63 and the southern boundary is formed by the Chesterfield Canal and the River Idle to the west

7.4.15 The Southern Magnesian Limestone Ridge and North Lincolnshire Edge typically form a distant backdrop to easterly views out of the study area.

7.4.16 The River Trent flows slowly across the Levels at the foot of the North Lincolnshire Edge joining the River Ouse to form the Humber Estuary near Alkborough. Much of the

Humberhead Levels comprises highly productive farmland and displays a pattern of large geometric fields defined by ditches. The human influence of drainage channels and canalised main rivers is almost always present and although the watercourses themselves are often not visually prominent, their presence is often marked by reed swamp which has developed along their margins.

7.4.17 The Isle of Axholme is of international historic significance for its extensive strip field system, while other areas reveal distinct field and drainage patterns linked to past uses and drainage of the area. The still extensive tract of Hatfield, Thorne, Goole and Crowle Moors is a remnant of the vast complex of moor, bog and fen that once surrounded the head of the Humber estuary and included much of Lincolnshire's Isle of Axholme. Although extensively drained and improved for agriculture or cut for horticultural peat, several relic pockets of mire vegetation persist and represent the largest area of raised bog in lowland Britain. The Countryside and Rights of Way Act 2000 (CRoW) gives you the right to walk freely in designated areas of Open Access and there are several waymarked paths across the Moors which afford unrestricted views to distant settlement punctuated only by occasional hedgerows, trees and shelterbelts. The presence of several windfarms south of Goole has lowered the remote quality of the area but its distinctiveness remains largely unchanged.

7.4.18 Although there are extensive areas of woodland east of Scunthorpe, much of the Humberhead Levels has a low tree cover. Together with the sparse hedgerow network, this creates an open landscape where trees and woodland are important visual foci.

7.4.19 Outside the main towns of Scunthorpe, Goole and Thorne settlement is limited, with villages and large dispersed and relatively isolated farmsteads generally concentrated on the slightly higher, drier ground or along the scarp foot springline. Views to distant horizons are often long and unbroken, with expansive skies, and vertical elements such as water towers, power stations and wind turbines being prominent. Further settlement concentrations and industrial development are found on the southern shores of the Humber Estuary.

7.4.20 Views across parts of the Humberhead Levels are influenced by development and the presence of discordant elements and features. These areas are typically located on the edge of settlements but may also be in rural locations where there are pockets of industrial development, for example along the M62/A63 corridor at Goole and along the River Trent at Gunness. The M180/A180/A160 is the principal east-west route linking the ports and industrial areas of Grimsby and Immingham to their hinterland and passing south of Scunthorpe.

7.4.21 Power stations at Killingholme and Keadby in North Lincolnshire are connected by with several OHL, which also connect to West Burton Power Station further south along the Trent in Nottinghamshire. These OHL include the parallel 400 kV OHLs (2KN and 4KG) which run between Killingholme and Keadby, the 400 kV OHL (ZDA) running west from Keadby, the 400 kV OHL (4ZQ) running south from the River Ouse and a parallel 400 kV OHL (ZDA and 4TM) running south from Keadby to West Burton.

7.4.22 To the north of the River Ouse, the nearest settlements to the Scoping Boundary are Elerker, Broomfleet, Staddlethorpe, Yokefleet and Blacktoft. Between the River Ouse and Keady, settlements include Ousefleet, Whitgift, Adlingfleet, Garthorpe, Luddington, Eastoft, Crowle, Ealand. The existing 400 kV OHL passes between Yokefleet and Blacktoft and through Ousefleet heading south towards Keadby. The 110m tall pylons associated with the river crossing are prominent in views.

7.4.23 South of Keadby, settlements include Belton, Beltoft, Epworth, Low and High Burnham, Haxey, East Lound, West Butterwick, Owston Ferry and Graizeland. These settlements tend to be located on slightly higher ground to the west of the existing parallel 400 kV OHLs (4TM and ZDA). The exceptions are Owston Ferry and West Butterwick, which are located on the low-lying ground next to the River Trent. Due to the flat and open nature of the landscape, the 400 kV OHLs are very noticeable in easterly views.

7.4.24 The settlements of Skidby, Eppleworth, Raywell, Little Weighton, Riplingham, South Cave, Brantingham with Cottingham, Beverley, Walkington and High Hunsley are dispersed through the wider area. Views from these settlements typically include the existing 400 kV OHL (4ZQ).

Trent and Belvoir Dales

7.4.25 Much of this section of the study area comprises undulating, strongly rural and predominantly arable farmland, centred on the meandering River Trent and its floodplain. The eastern edge of the Vale is defined by the escarpment of the Lincolnshire Edge and to the west, the escarpment of a broad ridge of rolling landscape defines the boundary with the neighbouring Sherwood and Humberhead Levels NCA.

7.4.26 The River Trent supports a variety of wetland habitats which contributes to a diversity of rural views, but the surrounding landscape is mainly arable farmland bordered by hawthorn hedges and ditches. The farmland is only lightly wooded, which together with the sparse hedgerow network creates an open landscape with long views across the open farmland. Wetland habitat created after the extraction of sand and gravel provides further localised visual diversity.

7.4.27 The settlement pattern is characterised by compact villages and dispersed farmsteads linked by a network of small, quiet country lanes, contrasting with the busy towns and main roads that connect them.

7.4.28 Detractors along the Trent floodplain, include power stations and several OHL, industrial estates, sewage treatment works and active sand and gravel extraction sites. An existing parallel 400 kV OHL (ZDA and 4TM) broadly follows the River Trent as it heads south to West Burton. The landscape south of West Burton contains several OHL including the 400 kV OHL (4ZM) which head south-east towards Lincoln, a parallel 400 kV OHL (ZDA and 4VE) between Keadby and High Marnham via Cottom Power Station and a 400 kV OHL (4VK) which heads south from Cottom follows the River Trent. Four 400 kV OHLs (4ZV, ZDF and ZDA) head south-west from High Marnham with a 275 kV (XE) heading west.

Future Baseline

7.4.29 Landscape change and its consequences for visual amenity is an ongoing and inevitable process and will continue across the study area irrespective of whether the Project goes ahead. Change can arise through natural processes (e.g., the maturity of woodlands) and natural systems (e.g., river erosion) or, as is often the case, occurs due to human activity, land use, management, or neglect.

7.4.30 Climate change is increasingly acknowledged as a key driver of future landscape change. The low-lying landscapes around the Humber Estuary are particularly vulnerable to sea level change. Changing weather patterns and increased storms also pose risks to agriculture, tourism and local infrastructure.

7.4.31 Changing weather patterns and increased storms also pose risks to agriculture, tourism and local infrastructure.

7.4.32 Future baseline is also related to consented proposals which are not yet present in the landscape but are expected to be constructed. These will be considered in **Chapter 20, Cumulative Effects**.

7.4.33 Ash (Fraxinus excelsior) trees within the study area may be affected by ash dieback. This is a disease of ash trees caused by a fungus of Asian origin called *Hymenoscyphus fraxineus* (*H. fraxineus*; formerly called *Chalara fraxinea*). The disease causes leaf loss and crown dieback in affected trees and is usually fatal. The future baseline therefore assumes that there would be loss of ash trees in the long term across the study area, but that other tree species would occupy gaps created in the short term, and overall levels of vegetation would remain similar to existing. An Arboriculture Impact Assessment (AIA) will be completed for the DCO Application; the arboricultural surveys will record incidents of ash dieback during the site surveys (see **Appendix 8.C Arboriculture Survey Strategy**). Information contained within the future AIA will be referenced to inform the visual assessment and in relation to mitigation proposals.

7.5 Embedded and Control and Management Measures

Embedded Measures

7.5.1 The Project has been routed to avoid designated sites and sensitive receptors as far as possible. This is in accordance with the Holford Rules and Horlock Rules, which will continue to be used to inform the routeing, siting and design process in order to minimise potential visual effects.

7.5.2 Design decisions which are relevant to the visual assessment are the choice of pylon type, for example to keep a consistent appearance with the existing 400 kV OHL infrastructure along the route and the decision to closely parallel the existing OHL wherever possible to reduce the spread of infrastructure within the landscape. The northern section of the Project proposes to be closely parallel to the existing OHL to reduce the effects on the Yorkshire Wolds.

7.5.3 The visual assessment will inform modifications and refinements to the detailed design of the Project, including consideration of individual pylon locations during the design and assessment process, and the identification of any further appropriate mitigation measures to reduce potential residual effects.

7.5.4 Notwithstanding the application of the principles outlined in the Holford Rules given the intrinsic characteristics of overhead line infrastructure, some significant adverse visual effects are likely to be unavoidable.

Control and Management Measures

7.5.5 An Outline CoCP is provided in **Appendix 4.A Outline Code of Construction Practice**. Measures relevant to the control and management of impacts that could affect the visual assessment are:

- LV01: The contractor(s) will retain vegetation where practicable. Where vegetation is lost and trees cannot be replaced in situ due to the restrictions associated with land rights required for operational safety, native shrub planting approved by National Grid will be used as a replacement, in accordance with the outline vegetation

reinstatement plans included within the Landscape Environmental Management Plan (LEMP).

- LV02: The contractor(s) will apply the relevant protective principles set out in British Standard (BS) 5837:2012: Trees in Relation to Design, Demolition and Construction – Recommendations (Ref 6.15). This will be applied to trees within the Order Limits which will be preserved through the construction phase, and to trees outside of the Order Limits where such measures do not hinder or prevent the use of the relevant working width for construction. All works to high grade trees, including trees under Tree Preservation Orders and veteran trees, will be undertaken or supervised by a suitably qualified arboriculturist.
- LV03: A five-year aftercare period will be established for all reinstatement and mitigation planting.
- LV04: Construction lighting will be directional and minimised where possible.

7.5.6 Additional measures of potential relevance to the avoidance or reduction of effects on views and visual amenity include the following:

- GG21: Construction lighting will be of the lowest luminosity necessary to safely perform each task. It will be designed, positioned and directed to reduce the intrusion into adjacent properties, protected species and habitats.
- NV01: Construction working will be undertaken within the agreed working hours set out in the DCO. Best practicable means to reduce construction noise will be set out in the CEMP.

7.5.7 The project has also committed to producing an Outline LEMP (commitment GG03), which will set out the measures to protect existing vegetation and details regarding the reinstatement and additional planting. This will also account for biodiversity net gain targets (see **Chapter 8, Ecology and Biodiversity**).

7.6 Potential for Significant Effects

7.6.1 The visual assessment will consider the construction, operation, and maintenance of the Project. Details of each of these stages are set out in **Chapter 4, Description of the Project**.

7.6.2 The proposed scope of the visual assessment is set out in **Table 7.4** and has been determined using the approach described in **Chapter 5, EIA Approach and Methodology**.

7.6.3 The potential for the Project to result in the likely significant effects identified in **Table 7.4** takes into account the embedded and control and management measures described in section 7.6.

Sources and Impacts (Step 1)

7.6.4 This section identifies the sources and impacts that would occur as a result of the construction, operation and maintenance of the Project.

7.6.5 The potential construction, operation and maintenance impacts of the Project on visual receptors can be both temporary and permanent and comprise perceptible effects on views through removal and addition of landscape features and infrastructure elements.

Potential sources of impacts

Sources of construction impacts

- Construction activities as detailed in **Chapter 4, Description of the Project**, section 4.3.
  - Site clearance, tree felling and boundary/hedgerow removal.
  - Topsoil stripping and earthworks particularly associated with construction compounds and site accesses.
  - Undergrounding of third-party services.
  - Movement of construction related traffic including delivery and removal of material to and from site, off-site road traffic including workers travelling to and from site.
  - Movement of vehicles along temporary access tracks within the Order Limits.
  - Construction, presence and removal of temporary site accesses and haul routes, including bellmouths.
  - General construction activities and facilities including the movement of large-scale construction equipment including mobile cranes, construction compounds and temporary buildings required for construction, parking on-site and materials stockpiles.
  - Construction, presence and removal of temporary bailey bridges and culverts.
  - Erection, presence and removal of temporary scaffolding.
  - Presence of temporary hoardings and/or security fencing or signage.
  - Construction and removal of temporary pylons and overhead line required for construction.
  - Construction site lighting particularly during the winter months.

Sources of operational impacts

- The introduction of the operational 400 kV OHL into views.
- Introduction of cable sealing ends compounds (CSECs) into views.
- Effects of mitigation measures proposed by other topics, particularly re-contoured landform and new planting in relation to the mitigation of ecological and/or visual effects.
- Localised widening of public highways.
- Operational lighting at potential sealing end compounds and/or tunnel head houses.

Sources of maintenance impacts

- Periodic vehicle access for routine maintenance and emergency repairs.
- General maintenance activities including cutting back of vegetation along wayleave corridor to ensure safety clearances.
- Annual inspection by drone/helicopter.

Potential impacts

7.6.6 **Table 7.4** identifies the potential impacts that could result from the sources identified above.

7.6.7 Where **Table 7.4** identifies the potential for an impact to result in a significant effect the impact is taken through to Step 2. Where **Table 7.4** identifies no potential for an impact to result in a significant effect, that impact is proposed to be scoped out.

Table 7.4: Impacts and the potential for significant effects

Project phase	Source	Impact	Potential for significant effects
Construction	Activities associated with construction as listed in Step 1 including site preparation, assembly and erection of steelwork and conductor stringing.	Perceptible effects on views from construction including vegetation removal and presence of construction compounds, storage areas access tracks, plant (including mobile cranes), vehicles and personnel.	**Yes** – potential for indirect effects on composition and character of views.
Operation	The introduction of the operational 400 kV OHL and/or CSECs into the landscape.	Perceptible effects on views from long-term loss of landscape elements and features, and introduction of new infrastructure.	**Yes** – potential for indirect effects on composition and character of views.
	Effects of mitigation measures proposed by other topics, particularly re-contoured landform, and new planting in relation to the mitigation of ecological and/or visual effects.	Perceptible effects on views from changes to landform and introduction of landscape elements such as trees and hedgerows.	**Yes** – potential for indirect effects on composition and character of views**.** This may include effects from night-time lighting of CSECs.
	Localised widening of public highways.	Perceptible effects on views from permanent loss of roadside vegetation.	No – Any roadside vegetation lost during widening works would be reinstated like for like and therefore unlikely to result in significant effects.
Maintenance	Periodic vehicle/helicopter/ drone access for routine maintenance	Perceptible effects on views from routine maintenance activities including temporary access tracks, storage compounds, vehicle	No – Maintenance activities would be temporary, short term and unlikely to result in significant effects.

Project phase	Source	Impact	Potential for significant effects
	and emergency repairs.	and personnel movements.	
	General maintenance activities including cutting back of vegetation along wayleave corridor to ensure safety clearances.	Perceptible effects on views from general maintenance activities including cutting back of vegetation.	No – Vegetation management is unlikely to have ongoing significant effects, the main effect would be from the initial loss during construction

Impact Pathways with Receptors (Step 2)

7.6.8 This section identifies whether there are any impact pathways from the impacts identified above that could give rise to potentially significant effects on receptors identified within the study area.

7.6.9 **Table 7.5** provides a summary of the impact pathways identified and those proposed to be scoped into and or out of the visual assessment for the Project.

7.6.10 For the purposes of scoping, the visual receptors are not identified individually.

Table 7.5: Impact pathways with receptors

Project Phase	Impact	Receptor	Potential for significant effects	Proposed to be scoped in/out
Construction	Perceptible effects on views from construction including vegetation removal and presence of construction compounds, storage areas access tracks, plant (including mobile cranes), vehicles and personnel.	Receptors outside the ZTV (based on operational ZTV).	No – the effects of the project on visual receptors that are located wholly outside the ZTV (which illustrates a worst-case scenario using bare earth without intervening buildings and vegetation) will not be assessed as there would be no likelihood for any visual effects on these receptors.	Scoped out
		People living and moving around communities and engaging in recreational activities including people	**Yes** – potential for indirect effects on composition and character of views.	**Scoped in**

Project Phase	Impact	Receptor	Potential for significant effects	Proposed to be scoped in/out
		using Public Rights of Way (PRoW) and waterways (within 3 km of the Project).		
		People living and moving around communities and engaging in recreational activities including people using PRoW and waterways (beyond 3 km of the Project).	No – the construction activities are unlikely to be perceptible beyond 3 km. If they are, the short term and temporary nature of the works is highly unlikely to result in significant effects.	Scoped out
		Occupants of individual properties	No – the construction activities would be temporary, short term and unlikely to result in significant effects.	Scoped out
		Road and rail users	No – people travelling by road or rail are not anticipated to experience significant effects because of the glimpsed nature of the views and the short-term temporary nature of the construction works at each pylon.	Scoped out
		People at work	No – people at work are not anticipated to experience significant effects because their attention is likely to be focussed on their work rather than their surroundings and because of the short term and temporary nature of the construction works at each pylon.	Scoped out

Project Phase	Impact	Receptor	Potential for significant effects	Proposed to be scoped in/out
		People at protected viewpoints, panoramas and viewing corridors.	**Yes** – potential for indirect effects on composition and character of views.	**Scoped in**
	Perceptible effects on views from night-time lighting of construction activities.	All visual receptor groups	No – no overnight working is anticipated.	Scoped out
Operation	Perceptible effects on views from long-term loss of landscape elements and features, and introduction of new infrastructure. Perceptible effects on views from changes to landform and introduction of landscape elements such as trees and hedgerows.	Receptors further than 10 km from the scoping boundary and outside the ZTV	No – the effects of the project on visual receptors that are located wholly outside the ZTV (which illustrates a worst-case scenario using bare earth without intervening buildings and vegetation) will not be assessed as there would be no likelihood for any visual effects on these receptors.	Scoped out
		People living and moving around communities and engaging in recreational activities including people using PRoW and waterways (within 3 km of the Project).	**Yes** – potential for indirect effects on composition and character of views.	**Scoped in**
		People living and moving around communities and engaging in recreational activities including people using PRoW	No – where visible at distances over 3 km, a 50 m high pylon when viewed at arm's length will appear to be approximately 1.02 cm high in the landscape. It is also likely to be seen in only a small	Scoped out

Project Phase	Impact	Receptor	Potential for significant effects	Proposed to be scoped in/out
		and waterways (beyond 3 km of the Project).	proportion of views as it will typically be screened by landform and vegetation and is therefore highly unlikely to result in significant effects.	
		Occupants of individual properties	**Yes** – potential for indirect effects on composition and character of views which may impact living conditions – to be covered in the Residential Visual Amenity Assessment which forms part of the LVIA as explained in section 7.7 of this chapter.	**Scoped in**
		Road and rail users	No – people travelling by road or rail are not anticipated to experience significant effects because of the glimpsed nature of the views and the speed of travel.	Scoped out
		People at work	No – people at work are not anticipated to experience significant effects because their attention is likely to be focussed on their work rather than their surroundings.	Scoped out
		People at protected viewpoints, panoramas and viewing corridors.	**Yes** – potential for indirect effects on composition and character of views.	**Scoped in**
	Perceptible effects on views from night-time lighting.	All visual receptor groups	**Yes** – there may be a requirement for night-time lighting of the CSECs	**Scoped in**

7.7 Proposed Assessment Methodology

Proposed Data Sources

7.7.1 In addition to the published landscape character assessments listed at section 7.4.1, the following data sources are proposed to be used to inform the visual assessment:

- Ordnance Survey (OS) 1:10,000, 1:25,000, 1:50,000 and 1:250,000 base mapping;
- OS Terrain® 50 mid-resolution and LIDAR Composite 2017 – 50 cm (DTM);
- Google Earth Pro aerial photography, and Google Maps Street View;
- Base mapping from ArcGIS Map Service; and
- Open source GIS data.

Technical Guidance

7.7.2 The visual assessment will be carried out in accordance with the following good practice and guidance documents:

- The Holford Rules – Guideline for the Routeing of New High Voltage Overhead Transmission Lines;
- The Horlock Rules – Guidelines on the Siting and Design of National Grid Substations;
- Landscape Institute and Institute for Environmental Management and Assessment (IEMA) (2013) Guidelines for Landscape and Visual Impact Assessment – 3rd Edition (GLVIA3);
- Landscape Institute (2021) Technical Guidance Note 02/21 Assessing Landscape Value Outside National Designations (Ref 6.16);
- Landscape Institute (2019) Technical Guidance Note 02/19 Residential Visual Amenity Assessment (RVAA) (Ref 7.1);
- Landscape Institute (2019) Technical Guidance Note 06/19 Visual Representation of Development Proposals (Ref 7.2).
- Planning Inspectorate (2019; Advice Note 17: Cumulative Effects Assessment Relevant to Nationally Significant Infrastructure Projects (AN17) (Ref 5.4); and
- Natural England (2014) An Approach to Landscape Character Assessment (Ref 6.17).

Proposed Assessment Methodology

7.7.3 The following section summarises the methodology proposed to be used for the visual assessment. This which builds on the general assessment methodology presented in **Chapter 5, EIA Approach and Methodology** and is described more fully in **Appendix 7.A Visual Assessment Methodology**.

7.7.4 The methodology for undertaking the visual assessment is based on principles set out in GLVIA3. GLVIA3 is the established good practice guidance for landscape and visual impact assessment and complies with the requirements of EN-1 and EN-5. GLVIA3 advocates that the assessment should reflect the scale and complexity of the

development which is being assessed and should focus on the 'likely' significant effects, rather than every conceivable effect. This approach provides greater opportunity to scope out receptors where it can be justified that significant effects would be unlikely to arise, which should result in more concise and meaningful assessments.

7.7.5 As explained in **Appendix 7.A Visual Assessment Methodology**, the assessment will focus on public views experienced by those groups of people who are likely to be most sensitive to the construction and operation of the project. This comprises local communities where views contribute to the landscape setting enjoyed by residents in the area and people using recreational routes, features, and attractions.

7.7.6 A Residential Visual Amenity Assessment will be undertaken from any properties where the occupants are likely to experience major adverse visual effects in accordance with the methodology in **Appendix 7.A Visual Assessment Methodology**. These are likely to lie within 400 m of the Project.

7.7.7 Where relevant, the LVIA will consider any inter-relationship of baseline information and impacts from the project between different aspects of the environment. For example, the outputs of **Chapter 8, Ecology and Biodiversity** will provide information on existing vegetation and species including ancient woodland and veteran trees (**Appendix 8.C Arboriculture Survey Strategy**), **Chapter 9, Cultural Heritage** will be cross-referenced in relation to historic assets including historic landscapes and registered parks and gardens which may contribute to the value of a view.

Zone of Theoretical Visibility

7.7.8 ZTV maps will be produced to inform the assessment. These will illustrate theoretical visibility during the operational phase.

7.7.9 The ZTVs will be generated in Geographic Information System (GIS) using an Ordnance Survey Terrain 5 Digital Terrain Model and available Lidar data. Firstly, a 'bare earth' ZTV will be produced which takes no account of the screening effects of buildings and vegetation, which may in reality preclude visibility from certain areas. It therefore provides the 'worst case' scenario (largest geographical area) from which the project may be visible. If data is available, a second ZTV will be produced using Lidar data which will take account of screening from buildings and vegetation.

7.7.10 The ZTV will be refined and updated as the assessment progresses.

7.7.11 As the ZTVs are theoretical, fieldwork will be undertaken to take into account local screening elements within the landscape and confirm locations from where the different elements of the project would actually be visible (i.e. a more realistic scenario). The results of the fieldwork will inform the assessment.

Site-based assessment

7.7.12 The findings of the desk-based study will be supplemented with a programme of seasonal site surveys. This will include surveys during both summer and winter months to fully understand the visual baseline.

7.7.13 Visual site surveys will be undertaken for a selection of agreed representative public viewpoints for a variety of receptor types and at a range of distances from the Project. Surveys will include viewpoint photography to assist in the creation of wireframes and for photomontages as explained in **Appendix 7.A Visual Assessment Methodology**.

7.7.14 Whilst the main aim of these viewpoint surveys will be to obtain baseline photographs, the site visits will also provide the opportunity to gain an understanding and appreciation of the landscape character of the study area.

7.7.15 Viewpoints will be selected to represent the different groups of people likely to be affected by the project. The selection of viewpoints will be informed by the ZTV analysis, site visits, desk-based research on access and recreation, (including footpaths, bridleways and public land), including protected viewpoints, panoramas and view corridors, and by the distribution of the different groups of visual receptors.

7.7.16 Viewpoints will then be examined in detail to determine the value of the view and the magnitude of change that would be likely to arise from the project during construction, operation in Year 1 and operation Year 15. The value of a view and magnitude of change does not change depending on the receptor and then can therefore be reported on by viewpoint.

7.7.17 The visual assessment will focus on the wider visual amenity of people living and moving around settlements or aggregated groups of dispersed properties. Wherever possible, viewpoints will be selected to represent several different receptor groups, for example on the edge of a settlement, on a promoted PRoW, at a trig point or near to a cluster of properties.

7.7.18 Because each viewpoint will typically represent more than one receptor group, the level of effect will vary depending on the sensitivity of a receptor. The overall significance of effect will therefore be based on the most sensitive receptor group (typically residents) at each viewpoint. This information will then be used to summarise the geographical effects of the Project on visual receptors across the study area.

7.7.19 Each viewpoint will include baseline photography and wireline visualisations. A selection of viewpoints will be illustrated with photomontage visualisations to provide a photorealistic illustration of the change in views.

Sensitivity

7.7.20 As explained in **Appendix 7.A Visual Assessment Methodology**, the sensitivity of visual receptors will be determined through consideration of the value attached to the view experienced (which is established and reported as part of the baseline) and the susceptibility of the visual receptor to change arising from the Project, which will be determined through informed professional judgement guided by the indicative criteria set out in **Tables 2.1**, and **2.2** of **Appendix 7.A Visual Assessment Methodology**.

7.7.21 Judgements on the value attached to a view are unrelated to the nature of the development being proposed, whilst judgements on susceptibility may vary depending on the type of visual receptor and the level of interest they may have in their surroundings.

7.7.22 Judgements on value and susceptibility will be recorded as either **very high**, **high**, **medium** or **low**.

Magnitude

7.7.23 As explained in **Appendix 7.A Visual Assessment Methodology**, the magnitude of change will be determined through consideration of the likely size and scale of the change and its duration and reversibility, which will be determined through informed professional judgement guided by the indicative criteria set out in **Table 2.3** of **Appendix 7.A Visual Assessment Methodology**.

7.7.24 Judgements will be recorded as either **large**, **medium**, **small** or **negligible**.

7.7.25 As explained in paragraph 2.5.9 of **Appendix 7.A Visual Assessment Methodology**, once the magnitude of change likely to be experienced by each visual receptor has been assessed, a separate description of the geographical distribution of effects across the study area will be provided in the visual assessment summary.

Significance of effects

7.7.26 As explained in **Appendix 7.A Visual Assessment Methodology**, an 'overall profile' approach will be adopted whereby, "*all the judgements against the individual criteria are arranged in a table to provide an overall profile of each identified effect*". GLVIA3 Page 92, para 5.55. This determination requires the application of professional judgement and experience to balance the different variables.

7.7.27 In accordance with GLVIA3, the use of an overly mechanistic approach through reliance upon a matrix will be avoided. Instead, judgements will be supported by clear and accessible narrative explanations of the rationale underlying the assessment made for each visual receptor. Reference will be made to the relevant viewpoints to support and explain the rationale.

7.7.28 Significance will be recorded as **major**, **moderate**, **minor** or **negligible** and the direction of change will be categorised as beneficial or adverse.

Limitations of assessment

7.7.29 The assessment will be undertaken based upon the design which will indicate the maximum extent and indicative locations of temporary construction and storage areas, access tracks, the location, number and heights of pylons and any other temporary or permanent infrastructure required to facilitate the Project.

7.7.30 To take account of the flexibility allowed for in the draft DCO, consideration will be given to the potential for effects to be of greater significance should any of the permanent or temporary infrastructure elements be moved within the Limits of Deviation (LOD) or Order Limits. The assumptions made regarding the use of flexibility for the main assessment, and any alternative assumptions, are set out in **Chapter 4, Description of the Project**.

7.7.31 The operational assessment will assume that the works to underground or relocate existing distribution infrastructure as part of the Project has been undertaken.

7.7.32 Assessment, site work, and photography will be undertaken from publicly accessible locations, such as the public highway and PRoW. The assessment will be based on views from the ground (therefore not taking into consideration private views from upper storeys of buildings).

7.7.33 It is not proposed to prepare a ZTV for the construction phase of the Proposed Development as there is a great degree of variability in the extent and timeframes of visibility of construction activity. Also, tall construction plant (for example tower cranes and piling rigs) rarely gives rise to significant visual effects as it is present at each pylon location for a short period of time. Tall construction plant will, however, be considered in the assessment of construction effects on visual receptors.

7.7.34 The visibility of the Project will not remain constant throughout the year, and as such the assessment will be based on the worst-case scenario of winter views, with reference made to any potential difference in the view during summer.

7.8 Conclusion

Summary

7.8.1 The proposed scope, as set out in this chapter, is intended to focus the attention of the visual assessment on likely significant effects and to avoid assessing the same impact twice.

7.8.2 There are many visual receptors that would be affected by the Project including people living and moving through the study area, people accessing recreational resources such as the local PRoW, national trails and promoted recreational routes, and recreational receptors on the waterways including rivers and canals.

7.8.3 It is likely that significant effects will arise when the Project is seen in close proximity (typically within 1 km), and these will diminish with distance.

7.8.4 No significant visual effects are anticipated during maintenance operations.

7.8.5 No significant effects are anticipated from night-time lighting during construction, operation or maintenance.

Proposed Scope of the Assessment

7.8.6 A summary of the proposed scope of the assessment is provided in **Table 7.6**.

Table 7.6: Proposed scope of the assessment

Receptor	Potential for significant effect	Project phase(s)	Proposed to be scoped in/out
Receptors outside the ZTV	No	Construction, operation, and maintenance	Scoped out
People living and moving around communities and engaging in recreational activities including people using Public Rights of Way (PRoW) and waterways (within 3 km of the Project).	Yes	Construction and operation	**Scoped in**
	No	Maintenance	Scoped out
People living and moving around communities and engaging in recreational activities including people using PRoW and waterways (beyond 3 km of the Project).	No	Construction, operation, and maintenance	Scoped out
Occupants of individual properties	Yes	Operation	**Scoped in**
	No	Construction, and maintenance	Scoped out

Receptor	Potential for significant effect	Project phase(s)	Proposed to be scoped in/out
Road and rail users	No	Construction, operation, and maintenance	Scoped out
People at work	No	Construction, operation, and maintenance	Scoped out
People at protected viewpoints, panoramas and viewing corridors.	Yes	Construction and operation	**Scoped in**
	No	Maintenance	Scoped out
Effects on visual receptors from night-time lighting	Yes	Construction, operation, and maintenance	**Scoped in**

8. Ecology and Biodiversity

8.1 Introduction

8.1.1 This chapter presents how the ecology and biodiversity assessment will consider the potentially significant effects on ecological features that may arise from the construction, operation, and maintenance of the Project (as described in **Chapter 4, Description of the Project**). It describes the methodology and datasets to be used within the assessment, presents an overview of the baseline conditions, and identifies the potential significant effects to be considered within the assessment, and how the potential significant effects will be assessed for the purpose of an Environmental Impact Assessment (EIA). As detailed in **Chapter 4, Description of the Project**, the decommissioning has been scoped out of the environmental assessment.

8.1.2 The Project Scoping Boundary is illustrated on **Figure 1.1 Project Scoping Boundary**.

8.1.3 This chapter should be read in conjunction with:

- **Chapter 4, Description of the Project**; and
- **Chapter 5, EIA Approach and Methodology**.

8.1.4 This chapter is supported by the following figures and appendices:

- **Figure 8.1 Statutory Designated Sites for Nature Conservation**;
- **Figure 8.2 Non-Statutory Designated Sites and Notable Habitats for Nature Conservation**;
- **Appendix 8.A Statutory and Non-Statutory Designated Sites**;
- **Appendix 8.B Habitats Regulations Assessment Methodology**; and
- **Appendix 8.C Arboricultural Scoping Document**.

8.2 Regulatory and Planning Context

8.2.1 **Chapter 2, Regulatory and Planning Context** describes the overall regulatory and planning policy context for the Project. Key legislation, policy and planning guidance relevant to the assessment of potential effects on ecology and biodiversity associated with the construction, operation and maintenance of the Project is presented below.

Legislation

8.2.2 Legislation, planning policy and guidance relating to protected nature conservation sites, significant habitats and protected and/or notable species pertinent to the Project is outlined below:

- Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (Habitats Directive) (Ref 8.1);

- Directive 2009/147/EC on the conservation of wild birds (the codified version of Council Directive 79/409/EEC as amended) (Ref 8.2) (Birds Directive);
- Regulation (EU) 1143/2014 on the prevention and management of the introduction and spread of invasive alien species (IAS) (Ref 8.3) as enacted in England by The Invasive Alien Species (Enforcement and Permitting) Order 2019 (as amended) (Ref 8.4);
- The Invasive Non-native Species (Amendment etc.) (EU Exit) Regulations 2019 (Ref 8.5);
- Wildlife and Countryside Act 1981(WCA) (as amended) (Ref 8.6)
- Countryside and Rights of Way Act 2000 (CRoW) (Ref 8.7);
- The Conservation of Habitats and Species Regulations 2017 (as amended) (the Habitats Regulations 2017) (Ref 8.8);
- Natural Environment and Rural Communities Act 2006 (NERC) (Ref 8.9);
- Environment Act 2021 (Ref 8.10);
- Protection of Badgers Act 1992 (Ref 8.11);
- The Hedgerows Regulations 1997 (Ref 8.12);
- Animal Welfare Act 2006 (Ref 8.13);
- Salmon and Freshwater Fisheries Act 1975 (Ref 8.14);
- The Eels (England and Wales) Regulations 2009 (Ref 8.15); and
- The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (Ref 8.16).

8.2.3 Prior to 31 December 2020, Annex 1 of the European Council (EC) Birds Directive listed rare and vulnerable species of regularly occurring or migratory wild birds that were subject to special conservation measures. The Directive also provided for the designation of Special Protection Areas (SPAs) for the protection of these species, which formed part of the Natura 2000 network of sites protected by European wildlife legislation. European Union (EU) legislation as it applied to the UK on 31 December 2020 is now a part of UK domestic legislation as 'retained EU legislation'. Changes have been made to parts of the Habitats Regulations 2017 and The Conservation of Offshore Marine Habitats and Species Regulations 2017 (Ref 8.17) so that they effectively continue the legislation which implemented the EU Habitats and Species Directive and parts of the Wild Birds Directive through the provisions of The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 (Ref 8.18). Most of these changes involve transferring functions from the European Commission to the appropriate authorities in England. All other processes or terms of the 2017 Regulations remain unchanged. Internationally designated wetlands 'Ramsar Sites' are protected under the CRoW Act 2000 and are not affected by the exit from the EU.

8.2.4 The above legislation will be considered when identifying potential constraints to the Project, design options, mitigation and compensation. Compliance with the above legislation may require obtaining relevant protected species licences prior to the implementation of the Project.

Planning Policy

National Planning Policy

National Policy Statements

8.2.5 As detailed in **Chapter 2, Regulatory and Planning Policy Context**, National Policy Statements (NPSs) set out the primary policy tests against which the application for a Development Consent Order (DCO) for the Project would be considered. The two relevant NPSs are Overarching National Policy Statement for Energy (EN-1) and National Policy Statement for Electricity Networks Infrastructure (EN-5). **Table 8.1** sets out how both the current and draft NPSs relevant to electricity networks infrastructure are relevant to the ecology and biodiversity assessment.

Table 8.1: Relevant sections of the relevant National Policy Statements

National Policy Statement	NPS section	How it will be considered
EN-1	*4.3.1 "Prior to granting a development consent order, the IPC must, under the Habitats and Species Regulations79, (which implement the relevant parts of the Habitats Directive and the Birds Directive80 in England and Wales) consider whether the project may have a significant effect on a European site, or on any site to which the same protection is applied as a matter of policy, either alone or in combination with other plans or projects".*	A Habitats Regulations Assessment (HRA) will be undertaken to determine whether the Project is likely to have a significant effect on any European designated site (now included within the national site network), or on any site to which the same protection is applied as a matter of policy, either alone or in combination with other plans or projects. The HRA will inform the Ecology and Biodiversity chapter of the Environmental Statement (ES) and it is anticipated that 'Information to Inform and Appropriate Assessment' will be included as a separate report within the DCO application.
EN-1	*5.3.3 "Where the development is subject to Environmental Impact Assessment (EIA) the applicant should ensure that the ES clearly sets out any effects on internationally, nationally and locally designated sites of ecological or geological conservation importance, on protected species and on habitats and other species identified as being of principal importance for the conservation of biodiversity. The applicant should provide environmental information proportionate to the infrastructure where EIA is not required to help the*	Designations, habitats and protected species have been identified within the Baseline section of this chapter. The likely effects on these features (and any additional features identified) will be assessed and reported as part of the Ecology and Biodiversity chapter of the ES.

National Policy Statement	NPS section	How it will be considered
	Infrastructure Planning Commission (IPC)31 consider thoroughly the potential effects of a proposed project".	
EN-1	*5.3.4 "The applicant should show how the project has taken advantage of opportunities to conserve and enhance biodiversity and geological conservation interests".*	Mitigation measures to ensure the conservation of ecological receptors will be reported in the ES. Where the EIA process identifies opportunities to enhance biodiversity interests these will be reported in the Ecology and Biodiversity chapter and relevant documents such as the Planning Statement submitted with the application for development consent. National Grid has committed to 10% Net Gain (BNG) in Environmental value including, as a minimum, 10% Biodiversity Net Gain across all its construction projects. A BNG assessment will be undertaken and presented in a separate BNG report that will be submitted as part of the DCO application.
EN-1	*5.3.9 "The most important sites for biodiversity are those identified through international conventions and European Directives. The Habitats Regulations provide statutory protection for these sites but do not provide statutory protection for potential Special Protection Areas (SPAs) before they have been classified as a SPA. For the purposes of considering development proposals affecting them, as a matter of policy the Government wishes SPAs to be considered in the same way as if they had already been classified. Listed Ramsar sites should, also as a matter of policy, receive the same protection".*	The Ecology and Biodiversity chapter of the ES and the HRA will consider the potential for likely significant effects on potential SPAs and Ramsar sites, where relevant. Design adjustments may be required as a result of the HRA process, which will be fed into the final ES/DCO application.
	5.3.10 "Many SSSIs are also designated as sites of international importance and will be protected accordingly. Those that are not, or those features of SSSIs not covered by an international designation,	SSSI's and NNR's located within the relevant Study Area (as detailed in **Appendix 8.A**) have been identified within the Baseline section of this chapter. Project design-development work is being carried out to protect such

National Policy Statement	NPS section	How it will be considered
	should be given a high degree of protection. All National Nature Reserves are notified as SSSIs".	sites by avoidance where possible, with mitigation being identified in the event that impacts are unavoidable.
	5.3.17 "Other species and habitats have been identified as being of principal importance for the conservation of biodiversity in England and Wales and thereby requiring conservation action. The IPC should ensure that these species and habitats are protected from the adverse effects of development by using requirements or planning obligations. The IPC should refuse consent where harm to the habitats or species and their habitats would result, unless the benefits (including need) of the development outweigh that harm. In this context the IPC should give substantial weight to any such harm to the detriment of biodiversity features of national or regional importance which it considers may result from a proposed development".	The Ecology and Biodiversity chapter of the ES will consider other notable habitats and species (e.g. habitats of principal importance) as part of the assessment. The ES will also detail any mitigation that will be undertaken to protect such features.
EN-1	*5.3.18 "The applicant should include appropriate mitigation measures as an integral part of the proposed development. In particular, the applicant should demonstrate that:* • *during construction, they will seek to ensure that activities will be confined to the minimum areas required for the works;* • *during construction and operation best practice will be followed to ensure that risk of disturbance or damage to species or habitats is minimised, including as a consequence of transport access arrangements;* • *habitats will, where practicable, be restored after*	The Ecology and Biodiversity chapter of the ES will set out information on how the development will minimise working areas during construction, follow best practice during construction and operation to avoid or minimise disturbance or damage to species or habitats, restore habitats following construction/maintenance activities and where possible identify opportunities to enhance existing habitats and create new biodiverse habitats. Consultation will be held with relevant Statutory Nature Conservation Body (SNCB)/stakeholders throughout the project to discuss and agree the required mitigation and opportunities for enhancement.

National Policy Statement	NPS section	How it will be considered
	construction works have finished; and • *opportunities will be taken to enhance existing habitats and, where practicable, to create new habitats of value within the site landscaping proposals".*	
EN-1 (Draft)	*5.4.13 "National planning policy expects plans to identify and map Local Wildlife sites, and to include policies that not only secure their protection from harm or loss but also help to enhance them and their connection to wider ecological networks".*	The Ecology and Biodiversity chapter of the ES will consider potential impacts on designated sites of ecological importance, including sites of regional and local biodiversity interest.
EN-1 (Draft)	*5.4.15 "Ancient woodland is a valuable biodiversity resource both for its diversity of species and for its longevity as woodland. Ancient or veteran trees found outside ancient woodland are also particularly valuable. Other types of irreplaceable habitats include blanket bog, limestone pavement, sand dunes, salt marsh and lowland fen".*	The Ecology and Biodiversity chapter of the ES will set out mitigation measures to protect ancient woodland, ancient/veteran trees and other types of habitat that are considered irreplaceable as far as reasonably practicable.
EN-1 (Draft)	*5.4.21 "As set out in Section 4.6, the design process should embed opportunities for nature inclusive design. Energy infrastructure projects have the potential to deliver significant benefits and enhancements beyond Biodiversity Net Gain, which result in wider environmental gains (see Section 4.5 on Environmental and Biodiversity Net Gain). The scope of potential gains will be dependent on the type, scale, and location of each project".*	As the Project and design evolves, opportunities for inclusive design for nature, both as part of BNG and beyond, will be sought and included. These will be set out within the Ecology and Nature Biodiversity chapter of the ES and appropriate appendices.
EN-1 (Draft)	*5.4.22 "The design of Energy NSIP proposals will need to consider the movement of mobile/migratory species such as birds, fish and marine and terrestrial mammals and their potential to interact with infrastructure. As energy*	The Ecology and Biodiversity chapter of the ES will consider potential impacts on mobile and migratory species as part of the assessment. Mitigation measures will be embedded in the Project design with the aim to enable the continued movement of species,

National Policy Statement	NPS section	How it will be considered
	infrastructure could occur anywhere within England and Wales, both inland and onshore and offshore, the potential to affect mobile and migratory species across the UK and more widely across Europe (transboundary effects) requires consideration, depending on the location of development".	including birds, fish, aquatic and terrestrial mammals. This will be detailed in the Ecology and Biodiversity chapter of the ES and within appropriate appendices. Surveys for breeding and migratory/over-wintering birds, and other mobile species as appropriate, will be conducted and will inform the HRA process and the assessments presented in the ES.
EN-1 (Draft)	*5.4.30 "Applicants should work closely at an early stage in the pre-application process with SNCB and Defra/Welsh Government to develop a compensation plan for all protected sites adversely affected by the development".*	Natural England will be consulted on the proposed mitigation measures for protected sites that could be adversely impacted by the Project.
EN-1 (Draft)	*5.4.34 "Consideration should be given to improvements to, and impacts on, habitats and species in, around and beyond developments, for wider ecosystem services and natural capital benefits, beyond those under protection and identified as being of principal importance. This may include considerations and opportunities identified through Local Nature Recovery Strategies, and national goals and targets set through the government's strategy for nature for example".*	As the Project and design evolves, opportunities for inclusive design for nature, both as part of BNG and beyond, will be sought and included. These will be set out within the Ecology and Biodiversity chapter of the ES and appropriate appendices.
EN-5	*2.7 "The applicant will need to consider whether the proposed line will cause such problems at any point along its length and take this into consideration in the preparation of the Environmental Impact Assessment (EIA) and ES (see Section 4.2 of EN-1). Particular consideration should be given to feeding and hunting grounds, migration corridors and breeding grounds".*	The ES will consider potential impacts on species. Consideration will be given to feeding and hunting grounds, migration corridors and breeding grounds.
EN-5	*2.10.1 and 2.10.2 (part) "…Large birds may also be electrocuted when landing or taking off by completing an electric circuit between live and*	The ES will consider potential impacts on birds. Particular consideration will be given to feeding and hunting grounds, migration corridors and breeding

National Policy Statement	NPS section	How it will be considered
	ground wires. Even perching birds can be killed as soon as their wings touch energised parts of the infrastructure…The Applicant will need to consider whether the proposed line will cause such problems at any point along its length and take this into consideration in the preparation of the ES (see Section 4.2 of EN-1). Particular consideration should be given to feeding and hunting grounds, migration corridors and breeding grounds, where they are functionally linked to sites designated or allocated under the 'national site network' provisions of the Conservation of Habitats and Species Regulations".	grounds, where they are functionally linked to sites designated or allocated under the 'national site network' provisions of the Habitats Regulations 2017 (Ref 8.8).
EN-5	*2.10.3 "Careful siting of a line away from, or parallel to, but not across, known flight paths can reduce the numbers of birds colliding with overhead lines considerably".*	Bird collision risk will be considered in the ES and this will be informed by appropriate surveys and assessment, as set out in paragraphs 8.4.16 – 8.4.19. Consultation will be sought with key stakeholders regarding the ongoing baseline surveys, assessment methods and the identification of key risks and acceptable strategies for their avoidance and mitigation.
EN-5	*2.10.4 "Making lines more visible by methods such as the fitting of bird flappers and diverters to the earth wire, which swivel in the wind, glow in the dark and use fluorescent colours designed specifically for bird vision can also reduce the number of deaths. The design and colour of the diverters will be specific to the conditions – the line and pylon/transmission tower specifications and the species at risk".*	Bird collision risk will be considered in the ES and any mitigation requirements will be reported. This will be informed by appropriate surveys and assessment, as set out in paragraphs 8.4.16 – 8.4.19. Consultation will be sought with key stakeholders regarding the ongoing baseline surveys, assessment methods and the identification of key risks and acceptable strategies for their avoidance and mitigation.
EN-5	*2.10.5 "Electrocution risks can be reduced through the design of crossarms, insulators and the construction of other parts of high voltage power lines so that birds find no opportunity to perch near*	The risk of electrocution will be considered in the ES and any mitigation requirements will be reported. This will be informed by appropriate surveys and assessment, as set out in paragraphs 8.4.16 – 8.4.19. Consultation will be

National Policy Statement	NPS section	How it will be considered
	energised power lines on which they might electrocute themselves".	sought with key stakeholders regarding the ongoing baseline surveys, assessment methods and the identification of key risks and acceptable strategies for their avoidance and mitigation.

National Planning Policy Framework

8.2.6 The National Planning Policy Framework (NPPF) (Ref 2.6), with particular reference to Section 15 and paragraphs 174, 175, 179,180-182 and 185, states that the planning system should contribute to and enhance the natural and local environment by minimising impacts on biodiversity and providing net gains in biodiversity. The NPPF is clear that pursuing sustainable development includes moving from a net loss of biodiversity to achieving net gains for nature, and that a core principle for planning is that it should contribute to conserving and enhancing the natural environment and reducing pollution. The NPPF also specifies the obligations that the Local Authorities and the UK Government have regarding statutory designated sites and protected species under UK and international legislation and how this is to be delivered in the planning system, including those that are potential, possible, listed or proposed sites (paragraph 176). Protected or notable habitats and species can be a material consideration in planning decisions and may therefore make some sites unsuitable for particular types of development, or if development is permitted, mitigation measures may be required to avoid or minimise impacts on certain habitats and species, or where impact is unavoidable, compensation may be required.

8.2.7 The National Planning Practice Guidance (NPPG) on the Natural environment (Ref 6.2) provides additional guidance to the NPPF. Guidance of particular relevance to biodiversity and the natural environment includes Paragraphs 10 to 35 which set out how development plans and planning decisions have the potential to affect biodiversity and how individual development proposals may provide opportunities to conserve and enhance biodiversity and contribute to habitat connectivity in the wider area.

Biodiversity Net Gain

8.2.8 The Environment Act 2021 (Ref 8.10) includes provisions to make BNG a mandatory requirement within the planning system in England requiring all relevant developments to achieve a minimum 10% net gain in biodiversity units relative to the site baseline biodiversity value. It is anticipated the secondary legislation mandating the need for 10% net gain for DCO projects will be in place by 2025.

8.2.9 As detailed in **Chapter 1, Introduction**, National Grid has committed to 10% Net Gain in environmental value including as a minimum 10% BNG across all its construction projects, in line with the Environment Act 2021. This commitment is underpinned by the delivery of quantifiable enhancements for biodiversity measures from a baseline using the DEFRA Biodiversity Calculator (Ref 1.6) with actions formalised and secured by long term management arrangements with external organisations and partners.

Biodiversity 2020: A strategy for England's wildlife and ecosystem services

8.2.10 Biodiversity 2020 (Ref 8.19) was published by DEFRA in 2011. The strategy builds on the Natural Environment White Paper: The Natural Choice: securing the value of nature (2011) (Ref 8.20), with an overall mission 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"*.

8.2.11 The strategy includes consideration of planning and development including commitments to (i) retain protection and improvement of the natural environment as core objectives for local planning and development management, (ii) support biodiversity offsetting pilots through a two-year test phase, until spring 2014, and the government's expectation that the planning system contributes to achieving no net loss of biodiversity.

Local Planning Policy

8.2.12 The Project lies within the jurisdiction of East Riding of Yorkshire, North Lincolnshire and Bassetlaw District (Nottinghamshire). A summary of the relevant local planning policy and emerging policy which is relevant to a study of ecology matters and will inform the ecology and biodiversity assessment in the ES is provided in **Table 8.2**.

Table 8.2: Relevant Local Planning Policies

Local Plan	Policy ref	Policy context	How it will be considered
East Riding Local Plan 2012-2029 Strategy Document, Adopted 2016 (Ref 2.7)	Policy ENV4: Conserving and enhancing biodiversity and geodiversity	This policy sets out that *"development resulting in loss or significant harm to a Local Site, or habitats or species supported by Local Sites, whether directly or indirectly, will only be supported if it can be demonstrated there is a need for the development in that location and the benefit of the development outweighs the loss or harm. Development will be refused if loss or significant harm cannot be prevented, adequately mitigated against or compensated for"*. In addition, it states that "*Proposals should further the aims of the East Riding of Yorkshire Biodiversity Action Plan (ERYBAP), designated Nature Improvement Areas (NIAs) and other landscape scale biodiversity initiatives"*.	Designations, habitats and protected species have been identified within section 8.4 Baseline Conditions. The likely effects on these features (and any additional features identified) will be assessed and reported as part of the Ecology and Biodiversity chapter of the ES. Mitigation measures to ensure the conservation of ecological receptors will be reported in the ES. Where the EIA process identifies opportunities to enhance biodiversity interests these will be reported in the Planning Statement submitted with the application for development consent.
	Policy ENV5: Strengthening	This policy states that *"development proposals should:*	The Project will aim to retain and enhance

Local Plan	Policy ref	Policy context	How it will be considered
	green infrastructure	*1. Incorporate existing and/or new green infrastructure features within their design; and* *2. Capitalise on opportunities to enhance and/or create links between green infrastructure features such as those listed in Table 10. Links should be created both on-site and, where possible, with nearby green infrastructure features.* *B. Development proposals within, or in close proximity to, a green infrastructure corridor should enhance the functionality and connectivity of the corridor*".	existing green infrastructure features wherever possible. This would include retaining habitat corridors such as woodlands, hedgerows and tree lines to maintain links between areas of habitat, particularly those which are designated. Opportunities would be sought to create new, or enhance existing, areas of green infrastructure such as new links between existing areas.
East Riding Local Plan Update 2020 – 2039 Draft Strategy Document Update (Ref 2.8)	Policy ENV4: Conserving and enhancing biodiversity and geodiversity	This policy states that *"proposals that are likely to have a significant effect on an International Site will be considered in the context of the statutory protection which is afforded to the site"*. It goes on to state that *"Proposals should further the aims of the Nature Recovery Strategy and Nature Recovery Network, Net Gain and other relevant strategic landscape scale biodiversity initiatives"*.	A HRA will be undertaken to determine whether the Project is likely to have a significant effect on any European designated site (now included within the national site network), or on any site to which the same protection is applied as a matter of policy, either alone or in combination with other plans or projects. The HRA will inform the Ecology and Biodiversity chapter of the ES and will be included with the DCO submission. Design adjustments may be required as a result of the HRA process, which will be fed into the final ES/DCO application. National Grid has committed to 10% Net Gain in environmental value including as a minimum 10% BNG across all its construction projects. A BNG assessment will be undertaken and presented in a separate

Local Plan	Policy ref	Policy context	How it will be considered
			BNG report that will be submitted as part of the DCO application.
	Policy ENV5: Strengthening green infrastructure	This policy states that *"Development proposals will:* *1. Incorporate a comprehensive design that is underpinned by its consideration of existing and new blue/green infrastructure features, including those features required by policies ENV1, 2, 3, 4, 6 and C3;* *2. Capitalise on opportunities to:* *I. Enhance and/or create links between blue/green infrastructure features such as those listed in Table 14. Links should be created both on-site and, where possible, with nearby blue/green infrastructure features; and* *II. Utilise potential multifunctional benefits of blue/green infrastructure features.* *B. Development proposals within, or in close proximity to, a blue/green infrastructure corridor should enhance the functionality and connectivity of the corridor; and* *C. Development Proposals that have the potential to increase recreational pressures on designated biodiversity assets should provide mitigation in the form of blue/green infrastructure provision".*	The Project will aim to retain and enhance existing green infrastructure features wherever possible. This would include retaining and potentially strengthening habitat corridors, such as woodlands, hedgerows and tree lines to maintain links between areas of habitat, particularly those which are designated. Opportunities would be sought to create new, or enhance existing, areas of green infrastructure such as new links between existing areas.
North Lincolnshire Local Development Framework – Core Strategy (2011) (Ref 2.11)	CS17: Biodiversity	*"North Lincolnshire council will promote effective stewardship of North Lincolnshire's wildlife through:* • Safeguarding national and international protected sites for nature conservation from	Designations, habitats and protected species have been identified within section 8.4 Baseline Conditions. The likely effects on these features (and any additional features identified) will be

Local Plan	Policy ref	Policy context	How it will be considered
		inappropriate development. • *Appropriate* consideration *being given to European and nationally important habitats and species.* • *Maintaining and* promoting *a North Lincolnshire network of local wildlife sites and corridors, links and stepping stones between areas of natural green space.* • *Ensuring development retains, protects and enhances features of biological and geological interest* and *provides for the appropriate management of these features.* • *Ensuring development seeks to produce a net gain in biodiversity by designing in wildlife, and ensuring any unavoidable impacts are appropriately mitigated for.* • *Supporting wildlife enhancements that contribute to the habitat restoration targets set out in the North Lincolnshire's Nature Map and in national, regional and local biodiversity action plans.* • *Improving access to and education/interpretation of biodiversity sites for tourism and the local population, providing their ecological integrity is not harmed".*	assessed and reported as part of the Ecology and Biodiversity Chapter of the ES. Mitigation measures to ensure the conservation of ecological receptors will be reported in the ES. Where the EIA process identifies opportunities to enhance biodiversity interests these will be reported in the Planning Statement submitted with the application for development consent.

Local Plan	Policy ref	Policy context	How it will be considered
Bassetlaw District Local Development Framework – Core Strategy and Development Management Policies DPD (2011) (Ref 2.15)	Policy DM9: Green Infrastructure; Biodiversity and Geodiversity; Landscape; Open Space and Sports Facilities	*Part b states: "Development proposals will be expected to take opportunities to restore or enhance habitats and species' populations and to demonstrate that they will not adversely affect or result in the loss of features of recognised importance, including:* *i. Protected trees and hedgerows;* *ii. Ancient woodlands;* *iii. Sites of Special Scientific Interest (SSSI);* *iv. Regionally Important Geodiversity Sites; Bassetlaw Core Strategy and Development Management Policies DPD 66* *v. Local Wildlife Sites (Sites of Importance for Nature Conservation (SINC));* *vi. Local and UK Biodiversity Action Plan Habitats (including Open Mosaic Habitats on Previously Developed Land); and* *vii. Protected Species (As defined in Conservation of Habitats and Species Regulations (2010) or any replacement).* *Development that will result in the loss of such features may be supported where replacement provision is made that is considered to be of equal or greater value than that which will be lost and which is likely to result in a net gain in biodiversity. Where new development may have an adverse impact on such features, alternative scheme designs that minimise impact must be presented to the Council for consideration before*	Designations, habitats and protected species have been identified within section 8.4 Baseline Conditions. The likely effects on these features (and any additional features identified) will be assessed and reported as part of the Ecology and Biodiversity Chapter of the ES. Mitigation measures to ensure the conservation of ecological receptors will be reported in the ES. Where the EIA process identifies opportunities to enhance biodiversity interests these will be reported in the Planning Statement submitted with the application for development consent.

Local Plan	Policy ref	Policy context	How it will be considered
		the use of mitigation measures is considered. Where sufficient mitigation measures cannot be delivered, compensation measures must be provided as a last resort".	

Consultation and Engagement

8.2.13 The environmental assessment will be informed by consultation and engagement with stakeholders, including East Riding of Yorkshire Council, North Lincolnshire Council, Bassetlaw District Council, Nottinghamshire County Council, Natural England, Environment Agency, Forestry England, RSPB, Woodland Trust, and local groups, which has been ongoing throughout the early development stages of the Project.

8.2.14 A summary of the proposed survey and assessment methodology for ecology and biodiversity was shared with Natural England, East Riding of Yorkshire Council, North Lincolnshire Council, Bassetlaw District Council and Nottinghamshire County Council. The feedback received from this pre-scoping consultation is included in **Table 8.3**, along with a response on how the comments has been considered in this Scoping Report, where applicable.

Table 8.3 Pre-scoping engagement

Local Planning Authority	Summary of Response	Consideration in the Scoping Report
East Riding of Yorkshire Council	Desk Study The scope of the Desk Study is acceptable.	
	Extended Phase 1 habitat Survey/habitat Condition Assessment Use of aerial imagery is an accepted technique during the initial Phase 1 Habitat Survey with verification of selected areas where potentially important habitats are identified, followed by full verification within the draft Order Limits (+50 m buffer) once known. The methodology of the extended Phase 1 habitat survey is accepted as standard. Has use of the UK Habitat Classification System (UK Habs) been considered in place of the Phase 1 habitat codes or will the data be subsequently translated to UK Habs for inputting into the BNG metric calculator at a later date? Inclusion of photographs is welcomed.	Required areas will be verified following data capture using aerial imagery. The data will either be collected in UK Habs or translated when needed.

Local Planning Authority	Summary of Response	Consideration in the Scoping Report
	The aim to achieve a minimum 10% BNG is welcomed. <u>Detailed habitat/Vegetation Surveys (National Vegetation Classification (NVC)/Hedgerows)</u> The approach to NVC/vegetation survey is acceptable, except where ecologically important vegetation is identified to be impacted where detailed survey of the full extent of the impacted area should be considered as opposed to randomly selected locations. <u>Protected Species Surveys</u> With respect to great crested newts (GCN), participation within the relevant GCN District Level Licence (DLL) scheme is welcomed if required. Re-assessment and further consultation with respect to the extent and methodologies in respect to bat surveys is welcome considering the potential introduction of new survey guidance during the proposed project survey period. Where possible Preliminary Bat Roost Appraisals should preferably be undertaken by a suitably licenced bat ecologist. Proposed use of night vision aids in anticipation of the new BCT guidance is welcomed. The use of three activity transect surveys where potential impacts on 'notable bat commuting corridors' are identified should be justified, and increased where required, in line with current survey guidance where monthly transects are required for moderate/high suitability habitats. Confirm automated (static) bat detectors to be employed for a minimum of five (as opposed to four noted at the start of the section) consecutive nights within each transect period. The decision to not undertake a second water vole survey in the event of the initial survey identifying presence should be fully justified as should the extent of survey undertaken. With respect to reptile surveys the use of a minimum of ten refuges per hectare as a minimum would be encouraged and more would be welcome taking into consideration the difficulty of survey for these species, with	Each area required to be surveyed using NVC methodology will be assessed on a case-by-case basis. Smaller areas may be subject to detailed survey of the full area, whereas larger areas of habitats may be better suited to being surveyed using an appropriate number of quadrats. The bat survey methodology will be reassessed following the anticipated updated survey guidelines in September 2023 and discussed. Transect frequencies will be undertaken where appropriate and justified accordingly for each location. Static detectors will be left out for five consecutive nights. Where a decision is taken to only undertake one water vole survey at any location, this will be justified accordingly. For reptile surveys, a minimum of 10 refugia per hectare will be utilised for most areas. Justification will be given where fewer are used such as five to ten per hectare.

Local Planning Authority	Summary of Response	Consideration in the Scoping Report
	the careful, non-destructive, checking of natural refugia to be included.	
	Proposed Ornithological Assessment/Survey Methodology The surveys and assessment proposed are in accordance with accepted guidance and have been informed by consultations with Natural England in respect to other OHL projects. Where surveys are related to assessing the impact of the proposals on Natura 2000 designated sites and/or SSSI we would look to Natural England with respect to advice and comment on the detailed methodologies proposed.	For information only.
North Lincolnshire Council	The surveys proposed appear sensible. Dormice and white clawed crayfish do not occur in North Lincolnshire and do not need to be considered further in our area. Extended Phase 1 Habitat Survey will be very useful. However, results will need to be converted to UK Habitats standards in order to create a biodiversity net gain baseline. If NVC communities are to be assigned based on quadrat data, then a sufficient number of quadrats per area of vegetation will be required to allow meaningful assessment using classification software. Particular care will be required interpreting results where species have been planted. In terms of hedgerows, surveyors should note that it is relatively easy for a hedgerow to be 'important' in North Lincolnshire, due to the reduced threshold for importance (section 7 (2) of the Hedgerow Regulations 1997) and the potential to count additional features. Where hedgerows are covered in an ES, it may be necessary to spell out the thresholds that have been applied for the sake of clarity. I support the use of DLL for GCN and eDNA survey (if necessary). Overall, the survey methods proposed for all species/groups are acceptable.	The data will either be collected in UK Habs or translated when needed. Each area required to be surveyed using NVC methodology will be assessed on a case-by-case basis. Smaller areas may be subject to detailed survey of the full area, whereas larger areas of habitats may be better suited to being surveyed using an appropriate number of quadrats. Thresholds for important hedgerows will be stated within the ES and/or the baseline reports and noted where differences in thresholds occur between the counties.
	Bird survey proposals are acceptable. Vantage point survey proposals should include checks for common cranes, which may fly between Alkborough Flats and Thorne and Hatfield Moors SPA.	For information only. Survey method statements to include common cranes as target species.

Local Planning Authority	Summary of Response	Consideration in the Scoping Report
	The Applicant should provide the competent authority with the information reasonably required to carry out Habitats Regulations Assessments in relation to the Humber Estuary SPA and Ramsar site and Thorne and Hatfield Moors SPA.	
	The National Planning Policy Framework states that: *"174. Planning policies and decisions should contribute to and enhance the natural and local environment by:* *a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils […]* *b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;* *[…]* *d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;* *e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans;* *[…]* *and* *"180 d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate..;"*	The latest metric available at the time of analysis and data capture will be used, currently Metric 4.0, along with the associated requirements that accompany this metric.

Local Planning Authority	Summary of Response	Consideration in the Scoping Report
	In order to make sure that BNG is quantified and deliverable, the applicant is advised to make use of Defra's Biodiversity Metric Version 4.0. It will be important to clearly define the area for BNG baseline survey and habitat creation and enhancement in accordance with the latest government guidance. The aim should be to deliver a measurable net gain in habitat, hedgerow and river values of at least 10%, in accordance with local conservation priorities.	
Nottinghamshire County Council	No comments on survey methodology for ecology. Regarding the Survey Methodology for Ornithology, I would highlight the following important ornithological sites (from a Nottinghamshire perspective), which should be factored into the various surveys where appropriate: • Beckingham Marshes LWS and RSPB reserve (just east of the corridor and important for wintering wildfowl and breeding waders). • River Idle Washlands SSSI (west of the corridor, important for wintering wildfowl, breeding waders and birds on passage with potential flyway along the River Idle across the consultation corridor). • Sutton and Lound Gravel Pits SSSI/Idle Valley NR (some way west of the corridor and potentially sufficiently distant not to be of concern, but important for wintering wildfowl and birds on passage). • Various LWS wetlands along the River Trent (some way east of the corridor, and again and potentially sufficiently distant not to be of concern). • Undesignated carrlands around Misterton (herds of wintering wild swans in this area).	Noted, this information will be used to finalise the survey methods.
Natural England	<u>Desk Study</u> The scope of the Desk Study is acceptable. Encouraged to make use of the SSSI Impact Risk Zones on the MAGIC map.	SSSI Impact Risk Zones will be incorporated into

Local Planning Authority	Summary of Response	Consideration in the Scoping Report
	Extended Phase 1 habitat Survey/habitat Condition Assessment No specific comments made on phase 1 habitat surveys but welcome the intention to conduct condition assessments for use in BNG assessment and the commitment to use the latest metric to evidence a minimum of 10% BNG and undertake river morphology assessment.	the assessment as per **Table 8.4**.
	Detailed habitat/Vegetation Surveys (NVC/Hedgerows) Noted that NVC survey will be conducted at Brantingham Dale SSSI unless the site is sufficiently avoided. Emphasise that priority is to avoid SSSI in line with the mitigation hierarchy but welcome the acknowledgement of the value of the SSSI and intension to undertake an NVC if it cannot be avoided.	Priority remains to avoid SSSIs where possible. SSSI will be avoided, if possible, in line with the mitigation hierarchy. NVC survey will be undertaken as necessary.
	Proposed Ornithological Assessment/Survey Methodology Nocturnal bird activity might not mirror daytime, thus nocturnal surveys for birds are recommended where risk is identified (i.e. habitat suitable for SPA and SSSI birds within likely foraging areas are identified). Where one year's worth of surveys has already been undertaken, it is strongly recommended that this effort is continued for another year. An additional year's survey of the particularly sensitive areas around the Humber crossing would be very beneficial. The points to be considered when shortlisting VP locations (at paragraph 3.1.32) are welcomed. We would also suggest that locations of the survey points should also be based on the suitability of the habitat to be used as Functionally Linked Land (FLL), and that there should obviously be a reasonable spread across the cable route. The altered methodology for recording data at the River Ouse crossing is noted, and the justification for this, and alternative approach, considered suitable.	The need for nocturnal bird surveys at specific locations will be identified through an assessment of the risk areas identified during diurnal bird surveys, a review of the availability of suitable foraging and roosting habitats within the IRZs of the Humber Estuary SPA and SSSI and intelligence gained from data supplied by third parties and advice from statutory consultees. The scope of such surveys will be developed such that they can contribute sufficiently robust baseline to the assessment of impacts of the proposed development on SPA and SSSI birds. Survey methodology recommendations will be fed into the appropriate method statements.

Local Planning Authority	Summary of Response	Consideration in the Scoping Report
	Protected Species Surveys No specific comments with regards to protected species but advise to follow the standing advice for protected species.	NE standing advice will be followed.

8.3 Study Area

8.3.1 The study area for the ecological assessment includes the land within the Scoping Boundary and appropriate buffer zones, as described below. These buffers will be applied to the subsequent refined Order Limits when defined later within the project.

8.3.2 The boundaries and zones for the ecology study area reflect standard industry good practice and the scoping distances that statutory consultees would typically expect to be considered for identification of features external to the Project that could be affected. These have been informed by published guidance and professional judgement. A 'zone of potential influence' representing the areas within which effects could occur from the Project and associated activities will be identified and detailed in the assessment.

8.3.3 The study areas include the following (**Figure 8.1 Statutory Designated Sites for Nature Conservation**):

Table 8.4: Study areas for different ecological features

Study area (distance from Scoping Boundary)	Feature
30 km	SACs and SPAs where (respectively) bats or bird species with large foraging ranges are noted as, or one of, the qualifying features.
10 km	Statutory designated sites of international nature conservation value e.g. Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar sites (as well as proposed or potential sites).
5 km	Statutory designated sites of national and local nature conservation value e.g. Sites of Special Scientific Interest (SSSI) (also referencing Natural England Impact Risk Zones for SSSIs on the 'Multi-Agency Geographic Information for the Countryside' (MAGIC) website (Ref 8.21), National Nature Reserves (NNR) and Local Nature Reserves (LNRs))[1]. Ornithological records for specific records and data for wetland birds from the British Trust for Ornithology (BTO) Wetland Birds Survey (WeBS).

[1] There is often spatial overlap between SSSIs/SPAs and qualifying ornithological features of SSSIs in some cases might forage over relatively large distances outside of the designated site. Therefore, the study area for SSSIs with qualifying ornithological features is extended to 10 km.

Study area (distance from Scoping Boundary)	Feature
2 km	Non-statutory designated sites of nature conservation value e.g. Local Wildlife Sites (LWSs), Roadside Nature Reserves (RNR) (Lincolnshire), Verge Nature Reserves (ERYC), Notified Road Verges (NRV) (Nottinghamshire), ancient woodland and other notable habitats (e.g. habitats of principal importance (Ref 8.9)). Records of protected and notable species received from Local Environmental Records Centres (LRC). Ornithological records for general species records.

8.3.4 Data from regional volunteer wildlife conservation and recording groups, such as the Royal Society for the Protection of Birds (RSPB) and the Humber Nature Partnership, will be obtained within an appropriate distance to be determined by the spatial extent of the areas studied by these organisations for individual species or species groups.

8.4 Baseline Conditions

Data Sources

8.4.1 The known or predicted current and future baseline environment described in this section has been informed by the following data sources:

- Following on from the data collected for the routeing and siting stage of the Project, LRCs were contacted in April 2023 to gain information on pre-existing ecological data (i.e. locations of non-statutory sites designated for nature conservation, existing records of protected, notable and invasive non-native species (INNS). The data received has been considered when determining the assessment scope. The LRC's that were contacted are:
  - North and East Yorkshire Ecological Data Centre (NEYEDC);
  - Greater Lincolnshire Nature Partnership (GLNP); and
  - Nottinghamshire Biological and Geological Records Centre (NBGRC).
- Online data resources that were reviewed include:
  - the Natural England website (Ref 8.22) for information on statutory designated sites of nature conservation interest and to confirm reasons for designation and their condition;
  - the MAGIC website (Ref 8.21) to identify the location (and details) of statutorily designated sites, ancient woodland, priority habitats and for any granted European Protected Species (EPS) Licence applications;
  - the Joint Nature Conservation Committee (JNCC) website (Ref 8.23) for site information and designation details of SACs, SPAs and Ramsar Sites;
  - aerial imagery (Google Maps);
  - East Riding of Yorkshire Biodiversity Action Plan Strategy (Ref 8.24);

- Lincolnshire Biodiversity Action Plan (Ref 8.25); and
- Nottinghamshire Local Biodiversity Action Plan (Ref 8.26).

Baseline

8.4.2 The known or predicted ecological baseline conditions are summarised in the following sections.

Statutory sites

8.4.3 Statutory sites that are designated for nature conservation were identified through a review of the MAGIC website (Ref 8.21) within the study areas set out in section 8.3. There are six international designated sites within 10 km and one additional internationally designated site (for qualifying ornithological features) within 15 km[2]; and 42 other statutory designated sites within the 5 km study area plus one additional statutory designated site with qualifying ornithological features within the 10 km study area[3]. These sites are shown on **Figure 8.1 Statutory Designated Sites for Nature Conservation** and summarised in **Appendix 8.A**. There are no Statutory designated sites with bats listed as a qualifying feature located within the 30 km study area, nor are there any international statutory designations within this distance for which species with particularly long foraging distances (including some geese, in particular pink-footed goose *Anser Brachyrhynchus*[4]) are qualifying features.

Non statutory sites

8.4.4 There are 123 non-statutory sites designated for nature conservation identified within 2 km of the Scoping Boundary. These sites have been designated as Local Wildlife Sites (LWS) for their biodiversity value at a local level and are known to have supporting value to a wide variety of protected and ecologically important species and, or habitats. These sites are shown on **Figure 8.2 Non-statutory Designated Sites and Notable Habitats for Nature Conservation** and summarised in **Appendix 8.A**. The data received from NEYEDC includes 'historic' and 'deleted' LWS's; which are not included in **Appendix 8.A** and are not shown on **Figure 8.2 Non-statutory Designated Sites and Notable Habitats for Nature Conservation** due to their unconfirmed or deleted status. Historic LWS's are defined as sites that have never been surveyed under the current system and lack evidence that the site if of any substantive value, but equally lack compelling evidence to support their deletion.

8.4.5 In addition, each county has a series of protected road verges that are not designated as LWS but are afforded their own protection and management. These include Roadside Nature Reserves (RNR) (Lincolnshire), Verge Nature Reserves (ERYC), and Notified Road Verges (NRV) (Nottinghamshire). The locations of these protected road verges have not all been confirmed at the time of scoping; however, this information will be requested from the relevant authorities for consideration within the assessment.

[2] Lower Derwent Valley SPA in East Yorkshire.
[3] Hatfield Moors SSSI in South Yorkshire.
[4] Although the Humber Estuary is not designated as an SPA for pink-footed geese, it is of international importance for the species (Brides *et al.*, Ref 8.65) However there are no other international designated sites for which this species is a qualifying feature within 30 km of the Scoping Boundary.

Habitats

8.4.6 A review of the MAGIC website (Ref 8.21) indicates that the following priority habitats under Section 41 of the NERC Act 2006 (Ref 8.9) are present, or likely to be present (where determination by further survey is required), on land within the Scoping Boundary;

- coastal and floodplain grazing marsh;
- coastal saltmarsh;
- deciduous woodland;
- good quality semi-improved grassland;
- lowland calcareous grassland;
- lowland fens;
- mudflats; and
- traditional orchard.

8.4.7 In addition to those habitats listed above, MAGIC (Ref 8.21) indicates that the following priority habitats are present within the 2 km study area; lowland dry acid grassland, lowland meadows, purple moor grass and rush pasture and reedbeds.

8.4.8 Ancient woodland is present on land within the Scoping Boundary, including ancient and semi-natural woodland, restored ancient woodland, and ancient replanted woodland.

Species

8.4.9 Protected and notable habitats and species comprise those listed under Schedules 1, 5 and 8 of the WCA (as amended) (Ref 8.6); Schedules 2, 4 and 5 of the Habitat Regulations (Ref 8.8); and species and habitats of principal importance for nature conservation in England listed pursuant to Section 41 of the NERC Act (Ref 8.9). Other species are also considered and have been assessed e.g. those included in national, regional or local Red Data Books and Lists but not protected by legislation.

8.4.10 INNS include those which are listed under Schedule 9 of the WCA 1981 (as amended) (Ref 8.6) and the Invasive Alien Species (Enforcement and Permitting) Order 2019 (Ref 8.5).

8.4.11 The MAGIC website (Ref 8.21) shows three granted bat licences inside the Scoping Boundary, located south-west of the Beltoft area, in Lincolnshire. Two of these, dated 2013 to 2014 and 2014 to 2015, are in the same location and the third (in a separate location) is dated 2017 to 2019. All three of these granted licences relate to common pipistrelle (*Pipistrellus pipistrellus*) roosts. Nine additional granted bat licences are shown on MAGIC within the 2 km study area, which cover the following species; common pipistrelle, brown long-eared (*Plecotus auratus*), whiskered (*Myotis mystacinus*) and Brandt's (*Myotis brandti*). MAGIC also shows five granted great crested newt (*Triturus cristatus*) licences within the 2 km study area, none of these lies within the Scoping Boundary (the closest is just under 500 m from the Scoping Boundary, in Nottinghamshire).

8.4.12 Data received from NEYEDC, GLNP and NBGRC includes records of the following protected and notable species of flora and fauna within the study area.

8.4.13 NEYEDC:

- one amphibian species; great crested newt;
- one reptile species; grass snake (*Natrix helvetica*);
- numerous bird species, including (but not limited to); black headed gull (*Chroicocephalus ridibundus*), whooper swan (*Cygnus cygnus*), barn owl (*Tyto alba*) and lapwing (*Vanellus vanellus*);
- several bat species, including; Myotis sp., common pipistrelle, soprano pipistrelle (*Pipistrellus pygmaeus*) and brown long-eared bat;
- three other protected and notable mammal species; badger *(meles meles*), water vole (*Arvicola amphibius*) ,brown hare (*Lepus europaeus*) and hedgehog;
- fish species, including; European eel (*Anguilla Anguilla*), herring (*Clupea harengus*), bullhead (*Cottus gobio*), smelt (*Osmerus eperlanus*), Atlantic salmon (*Salmo salar*) and brown/sea trout (*Salmo trutta*);
- two invertebrates; cramp-ball fungus weevil (*Platyrhinus resinosus*) and variable damselfly (*Coenagrion pulchellum*); and
- non-native species, including; Japanese knotweed (*Reynoutria japonica*), giant hogweed (*Heracleum mantegazzianum*), Japanese rose (*Rosa rugosa*) and Canadian Waterweed (*Elodea canadensis*).

8.4.14 GLNP:

- four amphibian species; great crested newt, common toad (*Bufo bufo*), smooth newt (*Lissotriton vulgaris*) and common frog (*Rana temporaria*);
- two reptile species; grass snake and adder (*Vipera berus*);
- numerous bird species, including (but not limited to); avocet (*Recurvirostra avosetta*), barn owl (*Tyto alba*), Bewick's swan (*Cygnus columbianus*), bittern (*Botaurus stellaris*), black redstart (*Phoenicurus ochruros*), hen harrier (*Circus cyaneus*), hobby (*Falco subbuteo*), yellowhammer (*Emberiza citrinella*) and hawfinch (*Coccothraustes coccothraustes*);
- several bat species, including; brown long eared, common pipistrelle Daubenton's (*Myotis daubentonii*), *Myotis* sp., noctule bat (*Nyctalus noctule*), soprano pipistrelle, whiskered/brandt's bat;
- five other protected and notable mammal species; badger, otter (*Lutra lutra)*, water vole, brown hare and hedgehog (*Erinaceus europaeus*);
- one notable fish species; European eel;
- invertebrates, including; small heath butterfly (*Coenonympha pamphilus*), wall butterfly (*Lasiommata megera*), white admiral (*Limenitis Camilla*), tormentil mining bee (*Andrena tarsata*), five-banded weevil-wasp (*Cerceris quinquefasciata*), beaded chestnut moth (*Agrochola lychnidis*), green-brindled crescent moth (*Allophyes oxyacanthae*), mouse moth (*Amphipyra tragopoginis*), mottled rustic moth (*Caradrina Morpheus*), latticed heath moth (*Chiasmia clathrate*), sallow moth (Cirrhia icteritia), small square-spot moth (*Diarsia rubi*), small phoenix moth (*Ecliptopera silaceata),* shaded broad-bar moth (*Scotopteryx chenopodiata*), white ermine moth (*Spilosoma lubricipeda*), buff ermine moth (*Spilosoma lutea*), blood-vein moth (*Timandra comae*), cinnabar moth (*Tyria jacobaeae*) and oak hook-tip moth (*Watsonalla binaria*); and

- non-native invasive species, including (but not limited to) Japanese knotweed, Himalayan balsam (*Impatiens glandulifera*), American mink (*Neovison vison*) and Chinese mitten crab (*Eriocheir sinensis*).

8.4.15 NBGRC

- five amphibian species; great crested newt, common toad, smooth newt, palmate newt (*Lissotriton helveticus*) and common frog;
- one reptile species; grass snake;
- numerous bird species, including (but not limited to); whooper swan (*Cygnus cygnus*), grey partridge (*Perdix perdix*), lapwing (*Vanellus vanellus*), European Honey-buzzard (*Pernis apivorus*) and curlew (*Numenius arquata*);
- several bat species, including; brown long eared, common pipistrelle, leisler's (*Nyctalus leisleri*), whiskered/brandt's, nathusius's pipistrelle (*Pipistrellus nathusii*), Natterer's (*Myotis nattereri*), noctule (*Nyctalus noctule*) and soprano pipistrelle;
- three other protected and notable mammal species; badger, brown hare, and hedgehog;
- fish species, including; European eel and bullhead;
- ten invertebrate species; Banded demoiselle (*Calopteryx splendens*), brown argus (*Aricia agestis*), common blue butterfly (*Polyommatus icarus*), hairy dragonfly (*Brachytron pratense*), migrant hawker dragonfly (*Aeshna mixta*), purple hairstreak butterfly (*Neozephyrus quercus*), red-eyed damselfly (*Erythromma najas*), silver washed fritillary butterfly (*Argynnis paphia*), small copper butterfly (*Lycaena phlaeas*) and small heath (*Coenonympha pamphilus*); and
- non-native invasive species, including; American mink, Japanese knotweed, Himalayan balsam.

Surveys

8.4.16 Preliminary bird surveys[5] are ongoing at selected locations primarily focused on an approximately 1 km stretch of the River Ouse that accommodates the location at which the Scoping Boundary crosses the River Ouse, plus 500 m either side of this, and some of the adjacent terrestrial habitat where it was likely that this could support qualifying species of the Humber Estuary Ramsar, SPA and SSSI. These surveys include:

- counts of water birds on open water, intertidal habitats and terrestrial habitats within the River Ouse Corridor, immediately adjacent to it and on farmland either side of the proposed River Ouse crossing; and
- vantage point (VP) surveys to monitor flights along the River Ouse Corridor and over terrestrial habitats adjacent to it, and to monitor bird flights adjacent to and through the Scoping Boundary where it terminates at the northern end of the Project.

8.4.17 Nature Scot guidance (2020; Ref 8.27) and Band et al. (2007; Ref 8.28) set out a method of quantifying bird mortality arising from mid-flight collisions with operational wind turbines, by means of a mathematical collision risk model (CRM). However, an equivalent model to quantify collisions with static infrastructure such as guyed anemometer masts

[5] The objective of these preliminary bird surveys is to gather targeted baseline data over an extended period to enable a thorough evaluation and aid in making informed decisions regarding the selection of the most suitable crossing technology

and OHPLs is not available and therefore a quantified assessment of collision risk cannot be applied for the purposes of the proposed development.

8.4.18 The potential pathway of bird mortality resulting from in-flight collisions with the proposed OHL will be assessed qualitatively and a risk level derived for the River Ouse crossing, and for any other locations along the proposed route that are identified as being of relatively high risk by virtue of the proximity of designated sites and habitats that provide important or regularly used roosting and feeding resources and where potentially significant flyways are identified. A collision risk index based on observed flight activity will be derived for each sensitive location based on the observed number and height of bird passes (for relevant species[6]) across the route of proposed OHL.

8.4.19 The above surveys and assessment of collision risk will be reported within the ES along with the surveys detailed in section 8.7.

Future Baseline

8.4.20 Relative to the current baseline, the value of ecological features present is not expected to change significantly by the end of the construction period. Management of the habitats is unlikely to change over this period, and consequently no significant degradation or improvement of habitat condition is expected. Due to development pressure year on year within the wider landscape, protected and notable species and habitats are likely to remain priorities for conservation within future baseline scenarios. Large parts of land within the Scoping Boundary are located on agricultural land and current agricultural practices are likely to be maintained.

8.5 Embedded and Control and Management Measures

Embedded Measures

8.5.1 The Scoping Boundary has been routed to avoid designated sites and sensitive receptors as far as possible. This is in accordance with the Planning Inspectorate's Advice Note Ten: Habitats Regulations Assessment relevant to nationally significant infrastructure projects, Version 9 (November 2022) (Ref 8.29), the Habitats Regulations 2017 (Ref 8.30), The Holford Rules (Ref 2.20) and relevant legislation and policies outlined within section 8.2.

8.5.2 **Chapter 3, Main Alternatives Considered** and the Corridor and Preliminary Routeing and Siting Study (CPRSS) detail the evolution of the Project to avoid some of the known major constraints between the two connection points, including crossing the River Ouse upstream of the River Trent to minimise the width of the crossing of the Humber Estuary SAC/SPA/Ramsar/SSSI. A small number of designated sites, areas of ancient woodland and priority habitats lie within the Scoping Boundary. The design development will progress with a view to avoid these areas as far as practicable as the route and Order Limits are defined.

8.5.3 Further embedded measures will be developed as the Project design evolves, such as micro-siting of individual pylons and access routes to avoid direct and indirect impacts on receptors, protected habitats and species where possible. Other measures may include

[6] "Relevant Species" would be determined for each location where this exercise is undertaken, but would as minimum include all species that are qualifying features of national and international statutory designated sites and any other species of principal importance that are known to be vulnerable to collision with overhead infrastructure, identified on a case by case basis.

oversailing to avoid direct effects on receptors such as Chesterfield Canal SSSI, applying appropriate buffers to designated sites and priority habitats (including ancient woodland) to avoid direct effects, combined with standard control measures to avoid indirect effects on such sites and habitats.

8.5.4 At sensitive crossing locations (e.g. rivers), existing access routes would be used as far as possible and the width of any required working area reduced as far as practicable. If access upgrades are required, temporary bridges will be used in preference to culverts. Where culverts are unavoidable, these will either be arch culverts, leaving the natural bed undisturbed, or they would be installed with the invert set below the natural bed level for a semi-natural bed to establish within the culvert.

8.5.5 Micro-siting of pylons would take into account swing of the overhead lines to avoid or minimise loss of woodland and trees.

8.5.6 Vegetation would be retained where possible. In order to avoid destruction of active bird nests, where practicable, in any areas where vegetation clearance is required, such works would be undertaken outside the breeding bird season (outside March-August) unless clear reasons to take an alternative approach have been identified following review of the baseline data (for example, where there are risks to sensitive or ecologically important roosting or feeding birds during the non-breeding season at locations where breeding birds are unlikely to occur). Where this is not possible, vegetation removal would be undertaken under supervision of appropriately qualified ecologist and appropriately managed to remove the risk of damaging or destroying active nests, young or eggs. Suitable methods would also be used to ensure vegetation with potential to support other legally protected species (e.g. reptiles) is removed sensitively and in compliance with legal requirements.

8.5.7 An environmental gain (BNG) equivalent to a minimum 10% uplift above the current baseline situation will be built into the Project through the design process, in line with the Environment Act 2021. It is anticipated the legislation mandating the need for 10% net gain for DCO projects will be in place by 2025. As detailed in **Chapter 1, Introduction**, National Grid has committed to 10% Net Gain in environmental value including as a minimum 10% BNG across all its construction projects (Ref 8.30).

8.5.8 Areas of temporary habitat loss would be reinstated, wherever practicable, following the completion of construction in each area. Wherever possible, reinstatement would be back to the type of habitat affected or improved/enhanced where possible. Areas of permanent habitat loss would be considered during the environmental gain described above.

Control and Management Measures

8.5.9 An Outline CoCP is provided in **Appendix 4.A Outline Code of Construction Practice**. Measures relevant to the control and management of impacts that could affect the ecology and biodiversity assessment are:

- GG01: The Project will be run in compliance with all relevant legislation, consents and permits.
- GG03: A Construction Environmental Management Plan (CEMP), a Landscape and Ecological Management Plan (LEMP), a Construction Traffic Management Plan (CTMP), and a Site Waste Management Plan (SWMP) will be produced prior to construction. These are collectively referred to as ‘the Management Plans’.
- GG04: The CEMP shall include measures to manage dust, waste, water, noise, vibration and soil during construction. The contractor(s) shall undertake daily site

inspections to check conformance to the Management Plans. The Main Works Contractor shall undertake daily site inspections to check conformance with the Management Plans.

- GG05: A suitably experienced Environmental Manager will be appointed for the duration of the construction phase. In addition, a qualified and experienced Environmental Clerk of Works will be available during the construction phase to advise, supervise and report on the delivery of the mitigation methods and controls outlined in the CEMP. The Environmental Clerk of Works will monitor that the works proceed in accordance with relevant environmental DCO requirements and adhere to the required good practice and mitigation measures. The Environmental Clerk of Works will be supported as necessary by appropriate specialists, including ecologists and arboriculturists.
- GG07: A record of condition will be carried out (photographic and descriptive) of the working areas that may be affected by the construction activities, prior to works commencing. This record will be available for comparison following reinstatement after the works have been completed to ensure that the standard of reinstatement at least meets that recorded in the pre-condition survey.
- GG08: Land used temporarily will be reinstated where practicable to its pre-construction condition and use. Hedgerows, fences and walls (including associated earthworks and boundary features) will be reinstated to a similar style and quality to those that were removed, unless otherwise agreed.
- GG09: Where sensitive features are to be retained within or immediately adjacent to the Order Limits, an appropriate protective area will be established using appropriate fencing and signage and will be inspected, repaired and replaced as necessary. The protective areas will be shown on the Retention and Reinstatement Plans contained within the LEMP.
- GG11: Any activity carried out or equipment located within a construction compound that may produce a noticeable nuisance, including but not limited to dust, noise, vibration and lighting, will be located away from sensitive receptors such as residential properties or ecological sites where practicable.
- GG15: Fuels, oils and chemicals will be stored responsibly, away from sensitive water receptors. Where practicable, they will be stored >15 m from watercourses, ponds and groundwater dependent terrestrial ecosystems. Where it is not practicable to maintain a >15 m distance, additional measures will be identified. All refuelling, oiling and greasing of construction plant and equipment will take place above drip trays and also away from drains as far as is reasonably practicable. Vehicles and plant will not be left unattended during refuelling. Appropriate spill kits will be made easily accessible for these activities. Potentially hazardous materials used during construction will be safely and securely stored including use of secondary containment where appropriate. Stored flammable liquids such as diesel will be protected either by double walled tanks or stored in a bunded area with a capacity of 110% of the maximum stored volume. Spill kits will be located nearby.
- GG16: Runoff across the site will be controlled through a variety of methods including header drains, buffer zones around watercourses, on-site ditches, silt traps and bunding. There will be no intentional discharge of site runoff to ditches, watercourses, drains or sewers without appropriate treatment and agreement of the appropriate authority (except in the case of an emergency).

- GG17: Wash down of vehicles and equipment will take place in designated areas within construction compounds. Wash water will be prevented from passing untreated into watercourses and groundwater. Appropriate measures will include use of sediment traps.
- GG19: Earthworks and stockpiled soil will be protected by covering, seeding or using water suppression where appropriate.
- GG21: Construction lighting will be of the lowest luminosity necessary to safely perform each task. It will be designed, positioned and directed to reduce the intrusion into adjacent properties, protected species and habitats.
- B01: The contractor(s) will comply with relevant protected species legislation. Appropriate licences will be obtained where necessary from Natural England for all works affecting protected species as identified by the Environmental Statement and through pre-construction surveys. All applicable works will be undertaken in accordance with the relevant requirements and conditions set out in those licences.
- B02: In the event that vegetation with the potential to support breeding birds is required to be removed during breeding bird season, works will be supervised by an Environmental Clerk of Works. Appropriate protection measures will be put in place should active nests be found. These will include exclusion zones around active nests until chicks fledge or nests become inactive as determined by monitoring by the Environmental Clerk of Works.
- B03: Where there will be a risk of animal entrapment, a means of escape will be installed into all excavations left open overnight.
- B04: To control the spread of invasive weeds in accordance with the Wildlife and Countryside Act 1981, any plant or machinery that has been used in areas infested with invasive species (both terrestrial and aquatic), such as Japanese knotweed and Himalayan balsam, will be thoroughly cleaned. Water used to clean vehicles will be controlled to prevent the spread of the plant (through seeds, rhizomes, fragments, etc.). The area will be cordoned off to prevent any inadvertent spreading.
- B05: All habitats suitable for common reptiles will be subject to two-stage habitat manipulation that will take place between mid-March and mid-October. Firstly, vegetation will be cut to approximately 150mm (with the arisings removed) under the supervision of an Environmental Clerk of Works and the site left for a minimum of two days to allow reptiles to naturally disperse from the area. Secondly, vegetation will be cleared down to ground level under the supervision of an Environmental Clerk of Works. Vegetation will be cleared using appropriate equipment based on the type of vegetation to be removed, the area affected, and the risk of mortality or injuring reptiles. Construction works could commence immediately after completion of the second stage. Reptile hibernacula will be retained and protected during construction where practicable. If unavoidable, the removal of vegetation and groundworks at hibernacula will be timed to avoid the hibernation season (late October to early March). Replacement hibernacula and refugia will be provided.
- B06: Alternative roost structures (bat boxes) will be provided (with landowner consent) on retained trees within the Order Limits or areas outside of the Order Limits agreed with landowners. Three boxes will be provided for each tree with moderate bat roost potential to be felled. Five boxes will be provided for each tree with high bat roost potential to be felled.

- B07: Where the works require the crossing or removal of hedgerows, the gap will be reduced to a width required for safe working. Where hedge removals are necessary, 'dead hedging' should be used, where practicable, in the interim periods to retain connectivity during construction. Dead hedging can comprise vegetation arisings or artificial provision, such as willow screening panels or Heras fencing covered in camouflage netting. New hedgerow planting will contain native, woody species of local provenance.

8.5.10 The CEMP will include other standard measures relating to ecology such as:

- Pre-construction surveys to validate and, where necessary, update the baseline survey findings. The purpose of these pre-construction surveys would be to ensure mitigation during the construction phase is based on the latest protected species information. This would also be required for any protected species licensing.
- Reasonable avoidance measures, including appropriate buffers around identified active badger setts (if present), or trees with bat roost suitability where possible throughout the site.

8.6 Potential for Significant Effects

8.6.1 The ecology and biodiversity assessment will consider the construction, operation and maintenance of the Project. Details of each of these stages are set out in **Chapter 4, Description of the Project.**

8.6.2 The proposed scope of the ecology and biodiversity assessment is set out below and has been determined using the approach described in **Chapter 5, EIA Approach and Methodology**.

8.6.3 The potential for the Project to result in the likely significant effects identified in **Table 8.6** takes into account the embedded and control and management measures described in section 8.5, but does not take into account any additional mitigation that could be identified as being required as the ecology surveys progress and the design evolves.

Sources and Impacts (Step 1)

8.6.4 This section identifies the sources and impacts that would occur as a result of the construction, operation and maintenance of the Project.

Potential sources of impacts

Sources of construction impacts

- Construction activities as detailed in **Chapter 4, Description of the Project**, section 4.3, in areas of natural and semi-natural habitats.
- Construction traffic movement.
- Pollution generated by construction works.
- Changes in groundwater levels during installation of infrastructure.

Sources of operational impacts

- Security lighting used at the development.

- Permanent structures/barriers.

Sources of maintenance impacts

- Maintenance of transmission line infrastructure, including supporting structures, and associated access tracks in areas of natural and semi-natural habitats.
- Maintenance traffic movement.
- Pollution generated by maintenance works.
- Changes in groundwater levels during modification/replacement of infrastructure.

Potential impacts

8.6.5 **Table 8.5** identifies the potential impacts that could result from the sources identified above. Where **Table 8.5** identifies the potential for an impact to result in a significant effect the impact is taken through to Step 2. Where **Table 8.5** identifies no potential for an impact to result in a significant effect, that impact is proposed to be scoped out.

Table 8.5: Impacts and the potential for significant effects

Project phase	Source	Impact	Potential for significant effects
Construction and maintenance	Construction/ maintenance of transmission line infrastructure, including supporting structures, and associated access tracks in areas of natural and semi-natural habitats.	Permanent habitat loss.	**Yes** – during the construction phase. The installation of the transmission line infrastructure, supporting structures, and associated access tracks will result in an unavoidable permanent loss of habitat. No – during the maintenance phase.
		Temporary habitat loss, disturbance and fragmentation.	**Yes** – infrastructure installation and maintenance will result in a degree of temporary habitat loss/disturbance and fragmentation to terrestrial and potentially aquatic habitat. Maintenance would be at a much smaller scale than construction.
		Incidental mortality of protected or notable species.	**Yes** – there is potential for construction and maintenance works to result in the accidental killing or injuring of protected or notable species, although maintenance would be at a much smaller scale than construction. However, it is anticipated that suitable mitigation would be put in place to avoid a significant effect. Scoped in until further details and exact locations to the Project are known, surveys are undertaken, and a full assessment is made.
		Disturbance to protected or	**Yes** – there is potential for construction and maintenance works to result in the

Project phase	Source	Impact	Potential for significant effects
		notable species (noise/vibration, visual, lighting).	accidental disturbance of protected or notable species. Maintenance would be at a much smaller scale than construction. However, it is anticipated that suitable mitigation would be put in place to avoid a significant effect. Scoped in until further details and exact locations to the project are known, surveys are undertaken, and a full assessment is made.
		Introduction of invasive non-native species leading to degradation of existing habitat quality and reduction in native species due to being outcompeted.	**Yes** – there is potential for construction and maintenance works to result in the introduction/spread of invasive non-native species within designated sites and habitats. Maintenance would be at a much smaller scale than construction. However, it is anticipated that suitable mitigation would be put in place to avoid a significant effect. Scoped in until further details and exact locations to the project are known, surveys are undertaken, and a full assessment is made.
	Construction/ maintenance traffic movement	Changes in air quality, negatively impacting protected or otherwise notable habitats within 200 m of the affected road network.	**Yes** – should screening of construction traffic flows show vehicle trips exceed the Institute of Air Quality Management (IAQM) criteria (Ref 8.31). Vehicle trips for maintenance activities are not expected to exceed this threshold.
	Pollution generated by construction/ maintenance works.	Pollution impacts (dust deposition, water)	**Yes** – in the absence of mitigation, there is potential for construction works and maintenance works to result in pollution impact pathways upon designated sites, habitats and species, although maintenance would be at a much smaller scale than construction.
	Changes in groundwater levels during installation of	Loss/reduction in habitat quality including for	**Yes** – there is potential for construction and maintenance works to result in changes to ground water levels within designated sites and sensitive habitats,

Project phase	Source	Impact	Potential for significant effects
	infrastructure or modification/ replacement of infrastructure.	protected and notable species	although this would likely be limited to unavoidable siting of pylons and construction of supporting structures in sensitive habitats. Maintenance would be at a much smaller scale than construction.
Operation	Security lighting used at the development.	Light pollution spilling onto surrounding habitats, resulting in disturbance impacts to protected or notable species.	**Yes** – there is potential for operational lighting to result in the accidental disturbance of protected or notable species. This potential impact is therefore scoped in until further details on lighting requirements are known.
	Permanent structures/ barriers.	Habitat fragmentation through the development creating a barrier to species dispersal.	**Yes** – infrastructure could result in a degree of habitat fragmentation to terrestrial and potentially aquatic habitat.
		Collision mortality due to permanent structures/ barriers.	**Yes** – there is potential for a bird to fly into the OHL and be killed either from the impact with the line, from hitting the ground, or from injuries sustained in the process. Birds that perch or nest on pylons can be electrocuted by causing a short circuit, either by touching two live wires, or a live and an earthed component.
		Habitat gains for nesting birds due to pylons and overhead lines.	**Yes** – the pylons would be most likely to benefit nesting corvids and certain birds of prey (principally kestrel, hobby and peregrine) and may contribute to regional or local population gains for these species.
		Increased occurrence of predation by birds of prey, arising from the increased quantity of nesting and perching habitat on new pylons	**Yes** – where this occurs there may be local depletions of prey species, particularly other birds. Any local or regional population decreases arising from this impact might adversely affect the conservation objectives of sites designated for qualifying ornithological interest features, although impacts on bird populations more generally are unlikely to be significant.

Project phase	Source	Impact	Potential for significant effects
		affording predatory birds more opportunities to hunt.	Where this occurs near designated sites, there may be an impact on the populations of qualifying features, adversely affecting the integrity and function of the site.

Impact Pathways with Receptors (Step 2)

8.6.6 This section identifies whether there are any impact pathways from the impacts identified above that could give rise to potentially significant effects on receptors identified within the study area.

8.6.7 **Table 8.6** provides a summary of the impact pathways identified and those proposed to be scoped into and or out of the ecology and biodiversity assessment for the Project.

Table 8.6: Impact pathways with receptors

Project Phase	Impact	Receptor	Potential for significant effects	Proposed to be scoped in/out
All	Permanent habitat loss. Temporary habitat loss, disturbance and fragmentation Indirect impacts	Statutory and non-statutory designated sites (without mobile qualifying criteria) located greater than 2 km from the site	**No**	**Scoped out**
Construction and maintenance	Permanent habitat loss. Temporary habitat loss, disturbance and fragmentation	Statutory designated sites: Humber Estuary SAC/SPA/ Ramsar/SSSI Brantingham Dale SSSI Chesterfield Canal SSSI	**Yes** – the transmission line infrastructure, supporting structures, and associated access tracks have the potential for direct habitat loss within designated sites. Until the proposed alignment and working methods are confirmed this impact pathway will be included as a possibility. No permanent habitat loss of a designated site will occur as a result of the transmission line infrastructure other than potential siting of a pylon or loss of trees due to required	**Scoped in** for construction (all impacts) and maintenance (temporary habitat loss, disturbance and fragmentation only)

Project Phase	Impact	Receptor	Potential for significant effects	Proposed to be scoped in/out
			clearance below the OHL/conductors. It is however possible that habitats utilised by birds or other species associated with nearby designated sites (i.e. functionally linked land) such as the Humber Estuary SPA/SAC/Ramsar could be lost. Surveys will investigate use of these habitats by such species and inform any requirement for mitigation or necessity for design adjustments.	
	Permanent habitat loss. Temporary habitat loss, disturbance and fragmentation	Non-statutory designated sites; LWS RSPB reserves RNRs (Lincolnshire), VNRs (ERYC), NRVs (Nottinghamshire) Wildlife Trust sites	**Yes** – the transmission line infrastructure, supporting structures, and associated tracks have the potential for direct habitat loss within non-statutory designated sites. Until the proposed alignment and working methods are confirmed this impact pathway will be included as a possibility. Permanent habitat loss of a non-statutory designated site could occur as a result of the transmission line infrastructure such as the siting of a pylon, or the required clearance below the OHL/conductors.	**Scoped in** for construction (all impacts) and maintenance (temporary habitat loss, disturbance and fragmentation only)
	Permanent habitat loss. Temporary habitat loss, disturbance and fragmentation	Priority and notable habitats Ancient woodland and ancient and veteran trees	**Yes** – semi-natural woodland (if present), hedgerows, arable field margins, and other notable habitats could be impacted by pylon locations, supporting structures and access routes. However, a combination of routeing, micro-siting, and habitat re-instatement and replacement will be employed as mitigation and	**Scoped in** for construction (all impacts) and maintenance (temporary habitat loss, disturbance and fragmentation only)

Project Phase	Impact	Receptor	Potential for significant effects	Proposed to be scoped in/out
			reduce these impacts to temporary where possible. These impacts will therefore be assessed as temporary rather than permanent where appropriate. Permanent habitat loss of notable habitats could occur as a result of the transmission line infrastructure such as the siting of a pylon, or the required clearance below the OHL/conductors.	
	Permanent habitat loss. Temporary habitat loss, disturbance and fragmentation	Protected and notable species: Invertebrates GCN Reptiles Non-breeding birds (terrestrial) Breeding birds Bats Badger Otter Water vole Hazel Dormouse Other mammals (including only brown hare, hedgehog, polecat)	**Yes** – habitats with potential to support protected and notable species to be potentially impacted by transmission line infrastructure, supporting structures, and associated access tracks, will be subject to mitigation measures including route assessment, reinstatement and compensation. Habitat connectivity may be impacted in the short term but will be minimised where possible to avoid key habitats. Where unavoidable fragmentation or habitat degradation is unavoidable this will be a temporary effect until habitat re-instatement is established.	**Scoped in** for construction (all impacts) and maintenance (temporary habitat loss, disturbance and fragmentation only)
	Incidental mortality of protected or notable species	Invertebrates	**No** – it is unlikely that notable population assemblages will be significantly affected by direct mortality once mitigation measures are in	**Scoped out** for all phases

Project Phase	Impact	Receptor	Potential for significant effects	Proposed to be scoped in/out
			place, as such populations will be linked to habitat.	
	Incidental mortality of protected or notable species	GCN	**Yes** – while potential exists for GCN mortalities during construction, the overall favourable population status is to be maintained through either implementation of District Level (DLL) or EPS Mitigation licence.	**Scoped in** for construction and maintenance unless DLL approach followed
	Incidental mortality of protected or notable species	Reptiles Breeding birds Non-breeding birds Bats Badger Other mammals (including only brown hare, hedgehog, polecat)	**Yes** – potential exists for unmitigated works to impact protected and notable species which may be relatively isolated along the transmission route corridor depending on the access routes (haul road) and result in direct mortalities. If route selection cannot avoid suitable habitat, mitigation options include works Ecological Method Statement or Natural England EPS/DLL mitigation licence to avoid direct mortalities.	**Scoped in** for all during construction and maintenance
	Incidental mortality of protected or notable species	Dormouse	**Yes** – hedgerows and other suitable habitats within Nottinghamshire in proximity to known release sites may be suitable for dormouse and may be impacted by works (primarily access routes and required tree clearance below the OHL/conductors) and require mitigation (i.e. under Natural England mitigation licence). Until further assessment can confirm likely absence of dormouse, effect will be scoped in.	**Scoped in** for all during construction and maintenance for Nottinghamshire only
	Incidental mortality of protected or	Riparian mammals (otter and	**Yes** – it is expected that direct impacts on watercourses (and therefore	**Scoped in** for all during

Project Phase	Impact	Receptor	Potential for significant effects	Proposed to be scoped in/out
	notable species	water vole) and other aquatic species	water vole and otter) can be avoided through appropriate design and routing of access requirements. Until routing and design can be confirmed, there is a potential requirement for mitigation and these receptors remain scoped in.	construction and maintenance
	Disturbance to protected or notable species (noise/ vibration, visual, lighting)	GCN Non-breeding birds (intertidal) Non-breeding birds (terrestrial) Breeding birds Bats Dormouse Badger Otter Water vole	**Yes** – trees, hedgerows and other habitats within the Scoping Boundary may be suitable for protected or notable species. If route selection cannot avoid disturbance impacts, then mitigation (i.e. works under Ecological Method Statement or Natural England mitigation licence) could be required.	**Scoped in** for all during construction and maintenance
	Changes in air quality, negatively impacting protected or otherwise notable habitats within 200 m of the affected road network.	Designated sites and notable habitats (ancient woodland and ancient and veteran trees) within 200 m of roads that may be affected by the Project.	**Yes** – should screening of construction traffic flows show vehicle trips exceed the IAQM criteria.	**Scoped** in for construction
	Pollution impacts (dust deposition water)	Designated sites and notable habitats	**Yes** – potential for pollution or other indirect impacts during construction on adjacent habitats and species will be mitigated though implementation of the CEMP.	**Scoped in** for all during construction and maintenance
	Introduction of invasive non-native	Designated Sites and Protected and	**Yes** – potential for spread of invasive non-native species during works and movement	**Scoped in** for all during construction

Project Phase	Impact	Receptor	Potential for significant effects	Proposed to be scoped in/out
	species leading to degradation of existing habitat quality and reduction in native species due to being outcompeted.	Notable Habitats and Species	around the site. Introduction of INNS can be detrimental to native habitats and species present.	and maintenance
	Loss/ reduction in habitat quality for protected and notable species due to changes in ground water levels	Designated/ priority habitats. Also loss/ reduction in habitat quality for protected/ notable species.	**Yes** – potential for degradation of existing habitat quality, which could impact designated or otherwise notable habitat and protected and notable species.	**Scoped in** during construction
Operation	Collision mortality due to permanent structures/ barriers.	Breeding and non-breeding birds	**Yes** – potential exists for the OHL to affect breeding and non-breeding birds through collision risk.	**Scoped in** for breeding and non-breeding birds
	Light pollution spilling onto surrounding habitats, resulting in disturbance impacts to protected or notable species	Protected and notable species	**Yes** – in the absence of mitigation and appropriate design, there is potential for operational lighting to result in the accidental disturbance of protected or notable species, limited to sealing end compounds (SECs).	**Scoped in** for potential sealing end compounds and/or tunnel head house locations only
	Habitat fragmentation through the development creating a barrier to species dispersal.	Protected and notable species	**Yes** – infrastructure could result in a degree of habitat fragmentation to terrestrial and potentially aquatic habitat.	**Scoped in** for protected and notable species
	Habitat gains for nesting birds, created	Nesting birds (primarily corvids,	**Yes** – proposed pylons could provide additional nesting habitat for species where this was not	**Scoped in** for corvids

Project Phase	Impact	Receptor	Potential for significant effects	Proposed to be scoped in/out
	by proposed pylons.	kestrel, hobby and peregrine)	previously available, with a beneficial effect on local or regional populations for these species. Hobby and peregrine are rare breeding birds in the UK[7].	
	Increased predation of birds arising from potential increased population of predatory bird species nesting and roosting on proposed pylons	Statutory designated sites: Humber Estuary SAC/SPA/ Ramsar/ SSSI[8] Breeding and non-breeding birds	**Yes** – increased occurrences of nesting corvids, kestrel, hobby and peregrine may increase predation rates of birds across the route. However, this is only likely to be significant for designated sites; this would be expected to occur only where the distance between proposed pylons and designated site(s) with ornithological qualifying features is less than the foraging range of the predatory species in question.	**Scoped in** (for designated sites)

8.7 Proposed Assessment Methodology

Proposed Data Sources

8.7.1 In addition to the data sources listed in section 8.4, the following data sources are proposed to be used to inform the ecology and biodiversity assessment:

- Woodland Trust Ancient Tree Inventory (Ref 8.32) for records of veteran and ancient trees;
- Environment Agency Ecology and Fish Data for species records of fish, macroinvertebrate and macrophytes species (Ref 8.33);
- Environment Agency Catchment Data Explorer for data on WFD water bodies and water catchments (Ref 8.34);
- National Biodiversity Network (NBN) Gateway for open-source records of protected and, or notable species recorded within 2 km of the Project Boundary (Ref 8.35);

[7] As per their inclusion on the list of native species monitored by the Rare Breeding Birds Panel (RBBP); https://rbbp.org.uk/list-of-species-currently-reported-on-by-rbbp/, accessed 06/06/23.
[8] Humber Estuary Ramsar, SPA and SSSI is identified because it overlaps the Scoping Boundary. The list of sites will be amended as required as the project design evolves and foraging ranges for the species concerned are evaluated.

- data relating to protected/notified verges will be requested from the relevant authorities;
- data held by the relevant councils, and local groups and organisations such as the Nottinghamshire Dormouse Group, where not already accessed through the LRCs;
- The British Trust for Ornithology (BTO) Wetland Birds Survey (WeBS);
- The British Trust for Ornithology (BTO) data report (all species);
- avifauna and bird reports at a regional, county or local level, collected by regional volunteer wildlife conservation and recording groups;
- data held by the RSPB; and
- Humber Nature Partnership data.

Technical Guidance

8.7.2 The ecology and biodiversity assessment will be carried out in accordance with the following good practice and guidance documents, please refer to chapters such as **Chapter 10, Water Environment, Chapter 14, Air Quality and Chapter 15, Noise and Vibration** for relevant guidance in relation to assessments undertaken that this chapter may use to inform the ecology and biodiversity assessment:

- CIEEM Guidelines for Ecological Impact Assessment in the UK and Ireland Terrestrial, Freshwater, Costal and Marine (Ref 8.36);
- Natural England and Department for Environment, Food and Rural Affairs (Defra) Standing Advice (protected species) (Ref 8.37);
- Birds of Conservation Concern (BoCC) (Ref 8.38);
- The International Union for Conservation of Nature Red List of Threatened Species (Ref 8.39);
- Bat Surveys for Professional Ecologists: Good Practice Guidelines (Ref 8.40);
- JNCC Handbook for Phase 1 habitat survey (Ref 8.41);
- Evaluating the suitability of habitat for the great crested newt (*Triturus cristatus*) (Ref 8.42);
- Reptile Survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation (Ref 8.43);
- The Mammal Society Surveying Badgers (Ref 8.44).
- The Water Vole Mitigation Handbook (Ref 8.45);
- The Water Vole Conservation Handbook (Ref 8.46);
- Ecology of the European Otter (Ref 8.47);
- The Dormouse Conservation Handbook (Ref 8.48);
- The Biodiversity Metric 4.0 – User Guide and Technical Supplements (Ref 8.49);
- Biodiversity Net Gain: Good Practice Principles for Development, A Practical Guide (Ref 8.50);

- The UK Habitat Classification System (Ref 8.51);
- Freshwater macro-invertebrate analysis of riverine samples (Ref 8.52);
- Freshwater macro-invertebrate sampling in rivers (Ref 8.53);
- UKTAG River Assessment Method Macrophytes and Phytobenthos: Macrophytes (River LEAFPACS2) (Ref 8.54);
- NatureScot (2017) Recommended bird survey methods to inform impact assessment of onshore windfarms (Ref 8.55);
- Bird Survey & Assessment Steering Group. (2022). Bird Survey Guidelines for assessing ecological impacts (Ref 8.56);
- RSPB Bird Monitoring Methods (1998) (Ref 8.57);
- British Trust for Ornithology Common Birds Census Instructions (1983) (Ref 8.58);
- BTO WeBS methods[9] (Ref 8.59); and
- Species – specific methods for raptors (Hardey *et al.*, 2013; Ref 8.60) and barn owl (Shawyer, 2012; Ref 8.61).

Expected Survey requirements

8.7.3 The desk study identified the requirements for the following surveys to support the ecology and biodiversity impact assessment where they are appropriate:

- extended Phase 1 habitat survey;
- detailed habitat/vegetation surveys; National Vegetation Classification (NVC) surveys and hedgerow surveys;
- badger surveys;
- GCN Habitat Suitability Index (HSI) surveys;
- GCN Environmental DNA (eDNA) surveys – unless the Project applies for a District Level Licence (DLL). DLL is an alternative approach to mitigation licensing for planning applications to develop sites which could affect GCN and does not necessarily require survey data to inform the application;
- preliminary bat roost appraisal of trees/woodland, buildings and structures, which may identify requirements for bat emergence and/or re-entry survey;
- bat activity surveys, supplemented with automated (static) bat detectors;
- riparian mammal surveys (otter and water vole);
- hazel dormouse (*Muscardinus avellanarius*) surveys (specific areas within Nottinghamshire only);
- reptile presence/absence surveys;
- terrestrial invertebrate surveys;

[9] Published on the BTO WeBS webpage: https://www.bto.org/our-science/projects/wetland-bird-survey/taking-part/counter-resources, accessed 06/06/23

- potential for other aquatic species survey requirements (macroinvertebrates, macrophytes, and fish);
- VP surveys for birds;
- wetland bird counts;
- transect and habitat surveys;
- breeding bird walkover surveys;
- wintering bird walkover surveys; and
- species – specific surveys for birds.

8.7.4 The surveys undertaken will inform any EPS mitigation licences (where required) prepared in draft for advisory comment from Natural England, all of which will form part of the DCO application for the Project.

8.7.5 A habitat condition assessment will also be carried out on affected land within the Order Limits, where required, to inform a BNG assessment. The baseline information gathered from this, and other surveys, will be used to develop an appropriate strategy in line with the policies identified in section 8.2.

8.7.6 All ecological surveys will be targeted to be undertaken within the appropriate seasons, where possible, and will follow best-practice methodologies. Any limitations to this will be documented accordingly. Due to the variability of species, the distance at which the Project could affect each species can be different and therefore the study areas used for specific ecological surveys will differ dependent on the species and these will be assessed and updated using appropriate guidelines. The study areas that will be used can be found in **Table 8.7**.

Table 8.7: Study areas and methods to be used during further ecological surveys

Ecological Survey	Study Area and survey methodology reference
Fixed Wing Flyover Survey	Within and up to 50 m of the Scoping Boundary, to provide an indication of the habitats present, prior to the Phase 1 habitat survey being undertaken on the ground. This will be used to anticipate and pre digitise the Phase 1 habitat survey results to assist in the design process.
Extended Phase 1 Habitat Survey	Survey/verify in selected areas to inform the design process where potential habitats present may have greater influence on the draft Order Limits, followed by within and up to 50 m of the Order Limits, in accordance with the JNCC Handbook for Phase 1 habitat survey (Ref 8.41).
Habitat Condition Assessments (HCA)	Within affected land within the Order Limits, where required, in accordance with the most up-to-date guidance (Ref 8.51) at the time the surveys are conducted.
Detailed Habitat/Vegetation Surveys (NVC)	Affected locations within the Order Limits where the Phase 1 habitat survey identifies habitat as being particularly species diverse and/or sensitive and/or a type restricted in the UK/region. The survey would be undertaken in accordance with the JNCC NVC Users' Handbook (Ref 8.62).

Ecological Survey	Study Area and survey methodology reference
	NVC surveys will be required in Brantingham Dale SSSI unless sufficiently avoided during preferred route selection and design phases, as well as important habitats such as chalk grasslands, fens, and woodlands that would unavoidably have a pylon or access track located within them, or otherwise be affected.
Detailed Habitat/Vegetation Surveys (Hedgerows)	Affected locations within the Order Limits where Phase 1 habitat survey identifies hedges as being particularly species diverse and/or more than thirty years old, and potentially 'Important' under the Hedgerow Regulations 1997. The survey would be undertaken in accordance with the Hedgerow Survey Handbook (8.ii).
Badger surveys	Within and up to 30 m of the Order Limits (Ref 8.44).
GCN HSI Survey	Within and up to 250 m of the Order Limits, in accordance with Oldham et al., 2000 (Ref 8.42). May not be required if DLL route is pursued.
GCN eDNA surveys (if required)	Within and up to 250 m of the Order Limits, in accordance with Biggs et al. (2014) (Ref 8.64). May not be required if DLL route is pursued.
Preliminary bat roost assessment of trees/woodland, buildings and structures. Bat Emergence and/or re-entry surveys. Bat activity surveys, supplemented with automated (static) bat detector surveys.	Within and up to 50 m from the Order Limits, where required/affected. Bat Surveys for Professional Ecologists: Good Practice Guidelines (Ref 8.40) or as per updated guidance published
Riparian mammal surveys (otter and water vole) and potential for other aquatic species survey requirements.	Targeted affected sections of watercourses/ditches that cross the Order Limits and up to 50 m adjacent, in accordance with standard guidance (Ref 8.45, 8.46, 8.47). The survey methodology for other aquatic species would be dependent on the target species.
Hazel dormouse surveys	Suitable habitat that falls within the Order Limits, in proximity to Treswell Wood, the location of a known hazel dormouse release site. Surveys would be in accordance with the Dormouse Conservation Handbook (Ref 8.48).
Reptile presence/absence surveys	Affected and unavoidable locations within the Order Limits where the Phase 1 habitat survey identifies habitat as being particularly suitable habitat for reptiles. Professional judgement based on the habitat and Froglife's Advice Sheet 10 for Reptile Surveys (Ref 8.43).

Ecological Survey	Study Area and survey methodology reference
Terrestrial invertebrate surveys	Affected and unavoidable locations within the Order Limits where the Phase 1 habitat survey identifies habitat as being potential significant habitat for terrestrial invertebrates. The survey methodology would be dependent on the target species.
Wetland bird counts	Surveys will be carried out each month for minimum of a full year, at the River Ouse within the Scoping Boundary plus up to 500 m either side of it, including any suitable adjacent wetland and terrestrial habitats. Surveys will be carried out at one low tide and one high tide per month. The need to carry out wetland bird counts at other locations will be reviewed as the design of the Project progresses to ensure that the data set is spatially appropriate and sufficiently contemporary.
Wintering bird surveys	VP surveys will be carried out at strategic locations across the Scoping Boundary (Ref 8.55). A ground-truthing visit has been carried out to locate suitable locations for VPs, and desk-based work is ongoing to determine the short list of VPs that will be taken forward to the final survey design. It is proposed that each VP viewshed will be observed for a minimum of 6 hours per month over 12 months. The survey corridor will extend 500 m either side of the Scoping Boundary where possible. Transects and habitat surveys will be carried out where birds, especially those that are qualifying features of designated sites, are likely to feed or roost and the areas potentially affected by the Project on a monthly basis between October and February inclusive. This is subject to change dependant on data requirements to inform the HRA and assessment of potential impacts of the Proposed Development.
Breeding bird surveys	VP surveys and transect and habitat surveys for breeding birds will follow the same broad methodology as for breeding birds, described above. Walkover surveys will be completed over a total of six repeat visits (Ref 8.56). The visits will be spaced as evenly as possible throughout the generic breeding season (March to August inclusive), subject to conditions (Ref 8.57). Nightjar is a qualifying feature of Thorne and Hatfield Moors SPA and SSSI during the breeding season. Transects to detect and monitor nightjar activity will be undertaken within the scoping corridor and up to 500 m either side of it, where this lies within 5 km of Thorne and Hatfield Moors SPA/SSSI. Two repeat surveys will be carried out between June and Mid July, over at least one season (Ref 8.57). Where target species of raptor are encountered on transect surveys outside of the viewing arcs of the VP locations, short ad

Ecological Survey	Study Area and survey methodology reference
	hoc VPs of between one and two hours duration will be undertaken. Common Birds Census (CBC) (Ref 8.58) transect surveys will be undertaken at locations where proposed infrastructure is likely to require the clearance of habitat suitable for assemblages of breeding passerines (typically woodland, scrub, dense networks of mature hedgerows and reedbeds). These will be identified as the Project design is progressed.

Proposed Assessment Methodology

8.7.7 The following section summarises the methodology proposed to be used for the ecology and biodiversity assessment which builds on the general assessment methodology presented in **Chapter 5, EIA Approach and Methodology.**

8.7.8 The impact assessment will be undertaken in accordance with best practice guidance for Ecological Impact Assessment (EcIA), issued by CIEEM entitled 'Guidelines for Ecological Impact Assessment in the UK and Ireland Terrestrial, Freshwater, Costal and Marine' (Ref 8.36) as summarised below.

8.7.9 The principal steps involved in the CIEEM approach can be summarised as:

- ecological features that are both present and might be affected by the Project are identified (both those likely to be present at the time works begin and those predicted to be present at a set time in the future) through a combination of targeted desk-based study and field survey work to determine the relevant baseline conditions;
- the importance of the identified ecological features is evaluated, placing their relative biodiversity and nature conservation value into geographic context, which is then used to define the relevant ecological features that need to be considered further;
- the changes or perturbations predicted to result as a consequence of the Project (i.e. the potential impacts) and which could potentially affect relevant ecological features are identified and their nature described. Established best-practice, legislative requirements or other incorporated design measures to minimise or avoid impacts are also described and are taken into account;
- the likely significant effects (beneficial or adverse) on relevant ecological features are then assessed, and where possible quantified;
- measures to avoid or reduce any likely significant effects, if possible, are then developed in conjunction with other elements of the design (including mitigation for other environmental disciplines) and if necessary, measures to compensate for likely significant effects on features of nature conservation importance are also included;
- the residual effects of the Project are reported; and
- scope for ecological enhancement is considered.

Sensitivity/value of ecological feature

8.7.10 The CIEEM guidelines (Ref 8.36) make clear that there is no need to *"carry out detailed assessment of ecological features that are sufficiently widespread, unthreatened and resilient to project impacts and will remain viable and sustainable"*. Therefore, it is not necessary for the assessment to address all habitats and species with potential to occur in the relevant Study Area and instead the focus is on those that are "relevant" i.e. ecological features that are considered to be important and potentially affected by the Project. This does not mean that efforts will not be made to safeguard wider biodiversity.

8.7.11 To support a focussed assessment, there is a need to determine the scale at which the relevant ecological features identified through the desk studies and field surveys undertaken for the Project are of value. The value of each relevant ecological feature has been defined with reference to the geographical level at which it matters.

8.7.12 The frames of reference that will be used for the assessment, based on Section 4.7 of the CIEEM guidelines (Ref 8.36), are:

- international (i.e. Ramsar Sites, SACs and SPAs) (normally within the geographic area of Europe);
- UK or national (Great Britain, but considering the potential for certain ecological features to be more notable (of higher value) in England, with context relative to Great Britain as a whole);
- regional (North-east England);
- county (East Riding of Yorkshire, North Yorkshire, Nottinghamshire, Lincolnshire);
- district (town or parish area e.g. Garthorpe, Beckingham etc);
- local (ecological features that do not meet criteria for valuation at a District or higher level, but that have sufficient value to merit retention or mitigation); and
- site (common and widespread ecological features of such low priority that they do not require retention or mitigation at the relevant location to otherwise maintain a favourable nature conservation status).

8.7.13 Species populations are valued on the basis of their size, recognised status (such as recognised through published lists of species of conservation concern and designation of Biodiversity Action Plan (BAP) status) and legal protection. For example, bird populations exceeding 1% of published information on biogeographic populations are considered to be of international importance, those exceeding 1% of published data for national populations are considered to be of national importance, and so on.

8.7.14 In assigning values to species populations, it is important to consider the status of the species in terms of any legal protection. However, it is also important to consider other factors such as its distribution, rarity, population trends and the size of the population which would be affected. For example, whilst GCN is afforded EPS protection under the relevant legislation and therefore conservation of the species is of significance at the international level, this does not mean that every population of GCN is internationally important. It is important to consider the particular population in its context. Therefore, in assigning values to species the geographic scale at which they are important has been considered. The assessments of value rely on the professional opinion and judgment of suitably experienced ecologists.

8.7.15 Plant communities will be assessed both in terms of their intrinsic value and as habitat for protected species whose habitat is also specifically protected and for species of nature conservation concern which are particularly associated with them.

8.7.16 Due regard will also be paid to the legal protection afforded to species during the development of mitigation and compensation measures to be implemented for the Project. For EPS there is a requirement that the Project should not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.

8.7.17 Assessing the value of features requires consideration of both existing and future predicted baseline conditions. Therefore, the description and valuation of ecological features takes account of any likely changes, such as trends in the population size or distribution of species, likely changes to the extent of habitats and the effects of other proposed developments or land use changes.

8.7.18 All ecological features of local value and above, where there is the potential for the Project to impact them directly or indirectly, will be taken forward to impact assessment and will be the 'relevant ecological features' for the purposes of EcIA.

8.7.19 In line with Section 1.21 of the CIEEM guidelines (Ref 8.36), the terminology used within the EcIA draws a clear distinction between the terms 'impact' and 'effect'. For the purposes of this EcIA these terms are defined as follows:

- impact – actions resulting in changes to an ecological feature. For example, construction activities of a development removing a hedgerow; and
- effect – outcome resulting from impact acting upon the conservation status or structure and function of an ecological feature, e.g. the effects on a population of bats as a result of the loss of a bat roost.

8.7.20 When describing potential impacts (and where relevant the resultant effects) consideration is given to the following characteristics likely to influence this:

- positive or negative (beneficial or adverse) – i.e. is the change likely to be in accordance with nature conservation objectives and policy and is that change:
- positive (beneficial) – a change that improves the quality of the environment, or halts or slows an existing decline in quality e.g. increasing the extent of a habitat of conservation value; or
- negative (adverse) – a change that reduces the quality of the environment e.g. destruction of habitat.
- spatial extent – the spatial or geographical area or distance over which the impact or effect may occur under a suitably representative range of conditions;
- magnitude – the 'size', 'amount' or 'intensity' and 'volume' of an impact – this is described on a quantitative basis where possible;
- duration – the time over which an impact is expected to last prior to recovery or replacement of the resource or feature. Consideration has been given to how this duration relates to relevant ecological characteristics such as a species' lifecycle. However, it is not always appropriate to report the duration of impacts in these terms. The duration of an effect may be longer than the duration of an activity or impact;

- timing and frequency – i.e. consideration of the point at which the impact occurs in relation to critical life-stages or seasons; and
- reversibility – i.e. is the impact temporary or permanent. A temporary impact is one from which recovery is possible or for which effective mitigation is both possible and enforceable. A permanent effect is one from which recovery is either not possible or cannot be achieved within a reasonable timescale (in the context of the feature being assessed).

8.7.21 Cumulative effects result from the combined impacts of multiple developments on a receptor, as well as 'in-combination' multiple in-scheme impacts, for example, combined noise and lighting impacts on the same sensitive receptor.

Significance of effects

8.7.22 For each ecological feature only those characteristics relevant to understanding the ecological effect of the Project and determining the significance are described. The determination of the significance of effects will be made based on the predicted effect on the structure and function, or conservation status, of relevant ecological features, as follows:

- not significant – no effect on structure and function, or conservation status; and
- significant – structure and function, or conservation status is affected.

8.7.23 Sections 5.24 to 5.28 of the CIEEM guidelines (Ref 8.36) state that effects should be determined as being significant when "*an effect either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general. Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national / local nature conservation policy) or more wide-ranging (enhancement of biodiversity). Effects can be considered significant at a wide range of scales from international to local. A significant effect is an effect that is sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project. In broad terms, significant effects encompass impacts on structure and function of defined sites, habitats or ecosystems and the conservation status of habitats and species (including extent, abundance and distribution)*".

8.7.24 Using this information and judgment, it is determined whether the effects will be significant or not on the structure and integrity (of site or ecosystems) or conservation status (of habitats and or species) of each ecological feature and the effect significance is determined at the appropriate geographical scale.

8.7.25 There are a number of approaches for determining the significance of effects on ecological features. Whilst the CIEEM guidelines (Ref 8.36) recommends the avoidance of the use of the matrix approach for categorisation (major, moderate and minor), in order to provide consistency of terminology within the Environmental Statement, as presented in **Chapter 5, EIA Approach and Methodology**, the findings of the CIEEM assessment will be translated into the classification of effects scale, as outlined in **Table 8.8**, but still remain consistent with the CIEEM guidelines. As a rule, major and moderate effects are considered to be significant, whilst minor and neutral/negligible effects are considered to be not significant. However, professional judgement will also be applied when concluding whether an effect is significant or not, including taking account of whether the effect is permanent or temporary, its duration and frequency, whether it is reversible, and/or its likelihood of occurrence.

Table 8.8: Relating CIEEM assessment terms to those used in Chapter 5, EIA Approach and Methodology

Effect classification terminology used in Chapter 5, EIA Approach and Methodology	Equivalent CIEEM assessment
Major beneficial	Beneficial effect on structure/function or conservation status at regional, national or international level.
Moderate beneficial	Beneficial effect on structure/function or conservation status at county and district level.
Minor beneficial	Beneficial effect on structure/function or conservation status at local level.
Neutral/negligible	No effect on structure/function or conservation status.
Minor adverse	Adverse effect on structure/function or conservation status at local level.
Moderate adverse	Adverse effect on structure/function or conservation status at county and district level.
Major adverse	Adverse effect on structure/function or conservation status at regional, national or international level.

Limitations of assessment

8.7.26 Baseline ornithological surveys commenced in priority areas in 2022 and will continue as required. The remaining ecology field surveys will commence in summer 2023 and will continue through 2024/2025 as required to determine the baseline ecological conditions. The surveys may highlight new important ecological features with potential to be significantly affected which have not been identified (or considered not to be significant) at this stage of the assessment. These would be discussed on a case-by-case basis with the local authorities and Natural England as appropriate, and the assessment scope may be modified accordingly to take account of these.

8.7.27 An assumption has been made that the following habitats will be retained as part of the Project where possible: priority habitats, woodlands, ponds, watercourses (assuming watercourses are not lost as a whole and small crossings of minor watercourses could be required but main rivers would be crossed using trenchless techniques) and the majority of hedgerows (assuming hedgerows are not lost as a whole, but could require either a temporary or permanent gap through occasionally, which would be minimised to smallest necessary).

8.7.28 It is assumed that works within the boundaries of designated sites and areas of ancient woodland will be avoided as far as possible.

8.7.29 It is currently assumed that should there be the requirement for the potential mitigation of ecological features and recommended enhancement measures, suitable on-site areas will be made available to deliver the required outcomes.

8.7.30 An assumption has been made that any compound and material storage areas will be contained within the site boundary.

8.8 Conclusion

Summary

8.8.1 From the review of data undertaken as part of the desk-based study to inform the scoping exercise, a number of statutory and non-statutory designated sites, as well as protected or notable habitats and species have been identified within and immediately adjacent to the Scoping Boundary and associated study areas.

8.8.2 Project construction, maintenance and operation activities have the potential to impact on important ecological features through the installation of new infrastructure, construction traffic movement, pollution, changes in groundwater, and the spread of INNS. These activities could potentially result in habitat loss/disturbance/fragmentation (temporary or permanent), incidental species mortality and disturbance of protected or notable species.

8.8.3 As a result, an ecology and biodiversity assessment will be undertaken, following the method outlined in this scoping chapter and will be reported in the ES. The HRA process may result in the recommendation of design adjustments, which will be fed into the final ES/DCO application.

Proposed Scope of the Assessment

8.8.4 A summary of the proposed scope of the assessment is provided in **Table 8.9**.

Table 8.9: Proposed scope of the assessment

Receptor	Potential for significant effect	Project phase(s)	Proposed to be scoped in/out
Statutory designated sites (without mobile qualifying criteria) located greater than 2 km from the site	No	N/A	Scoped out
Statutory designated sites (within the site or 2 km of the site)	Potential for permanent habitat loss, fragmentation/modification (including functionally linked habitat). Temporary habitat Loss, fragmentation and disturbance (including functionally-linked habitat). Changes in air quality, negatively impacting protected or otherwise notable habitats within 200 m of the affected road network. Indirect pollution impacts (dust deposition, water). Introduction of invasive non-native species leading to degradation of existing habitat quality and	Construction, operation and maintenance	**Scoped in**

Receptor	Potential for significant effect	Project phase(s)	Proposed to be scoped in/out
	reduction in native species due to being outcompeted. Loss/reduction in habitat quality for protected and notable species due to changes in ground water levels Displacement of birds that forage within land distant from the designated site (functionally linked land) Increased predation of qualifying features by predatory birds afforded additional nesting or roosting habitat by proposed pylons. Collision mortality due to permanent structures/barriers (operation only), affecting qualifying features.		
Statutory designated sites (with mobile qualifying criteria) located up to 10 km[10] from the site	Potential for permanent habitat loss, fragmentation/ modification (including functionally linked habitat). Temporary habitat Loss, fragmentation and disturbance (including functionally- linked habitat). Displacement of birds that forage within land distant from the designated site (functionally linked land). Increased predation of qualifying features by predatory birds afforded additional nesting or roosting habitat by proposed pylons. Collision mortality due to permanent structures/barriers (operation only), affecting qualifying features.	Construction, operation, and maintenance	**Scoped in**
Non-statutory designated sites (within the site or 2 km of the site)	Potential for permanent habitat loss, fragmentation/modification. Temporary habitat Loss, fragmentation and disturbance.	Construction, operation, and maintenance	**Scoped in**

[10] Extended to up to 30 km for SPA and Ramsar Sites supporting qualifying ornithological features with large foraging ranges

Receptor	Potential for significant effect	Project phase(s)	Proposed to be scoped in/out
	Changes in air quality, negatively impacting protected or otherwise notable habitats within 200 m of the affected road network. Indirect Pollution impacts (dust deposition, water). Introduction of invasive non-native species leading to degradation of existing habitat quality and reduction in native species due to being outcompeted. Loss/ reduction in habitat quality for protected and notable species due to changes in ground water levels.		
Non-statutory designated sites (greater than 2 km of the site)	No	Construction, operation, and maintenance	Scoped out
Impacts to priority habitats or otherwise of biodiversity importance/value within the site	Potential for permanent habitat loss, fragmentation/modification. Temporary habitat Loss, fragmentation and disturbance. Changes in air quality, negatively impacting protected or otherwise notable habitats within 200 m of the affected road network. Indirect Pollution impacts (dust deposition, water). Introduction of invasive non-native species leading to degradation of existing habitat quality and reduction in native species due to being outcompeted. Loss/reduction in habitat quality for protected and notable species due to changes in ground water levels.	Construction, operation, and maintenance	**Scoped in**
Impacts to common and widespread habitats of low sensitivity and/or conservation interest	No	N/A	Scoped out
Breeding birds	Collision mortality due to permanent structures/barriers (operation only).	Construction, operation and maintenance	**Scoped in**

Receptor	Potential for significant effect	Project phase(s)	Proposed to be scoped in/out
	Incidental mortality of protected or notable species. Disturbance to protected or notable species (noise/ vibration, visual, lighting). Permanent habitat loss. Temporary habitat loss and fragmentation. Increased predation due to greater numbers of predatory birds. nesting and roosting on proposed pylons with adverse effects on bird populations. Beneficial effects on populations of predatory birds (predominantly corvids, kestrel, hobby and peregrine) due to increased nesting opportunities provided by proposed pylons.		
Wintering birds[11]	Collision mortality due to permanent structures/barriers (operation only). Incidental mortality of protected or notable species. Disturbance to protected or notable species (noise/vibration, visual, lighting). Permanent habitat loss. Temporary habitat loss and fragmentation. Increased predation due to greater numbers of predatory birds nesting and roosting on proposed pylons[12].	Construction, operation and maintenance	**Scoped in**
Bats (roosting)	Incidental mortality of protected or notable species. Disturbance to protected or notable species (noise/vibration, visual, lighting). Permanent habitat loss. Temporary habitat loss and fragmentation.	Construction, and maintenance	**Scoped in**

[11] The term 'wintering' is used as a catch-all for any period when birds are not engaged in breeding activity

[12] This potential effect is listed for "wintering" birds, because the duration and timing of breeding seasons varies for each species. Therefore, the breeding season of one species might overlap the non- breeding period of another species.

Receptor	Potential for significant effect	Project phase(s)	Proposed to be scoped in/out
Bats (foraging/commuting)	Incidental mortality of protected or notable species. Disturbance to protected or notable species (noise/vibration, visual, lighting). Permanent habitat loss. Temporary habitat loss and fragmentation	Construction, operation (lighting at potential sealing end compound and/or tunnel head house locations only) and maintenance	**Scoped in**
Otter and water vole	Yes – if watercourses impacted. Incidental mortality of protected or notable species. Disturbance to protected or notable species (noise/vibration, visual, lighting). Permanent habitat loss. Temporary habitat loss and fragmentation.	Construction, operation (lighting at potential sealing end compound and/or tunnel head house locations only) and maintenance	**Scoped in**
Badger	Incidental mortality of protected or notable species. Disturbance to protected or notable species (noise/ vibration, visual, lighting). Permanent habitat loss. Temporary habitat loss and fragmentation.	Construction, operation (lighting at potential sealing end compound and/or tunnel head house locations only) and maintenance	**Scoped in**
GCN	Incidental mortality of protected or notable species. Disturbance to protected or notable species (noise/ vibration, visual, lighting). Permanent habitat loss. Temporary habitat loss and fragmentation.	Construction and maintenance	**Scoped in** but as likely to be using a DLL it would be scoped out of the detailed impact assessment in the ES as the effects would be not significant at the population level. This would be assessed by

Receptor	Potential for significant effect	Project phase(s)	Proposed to be scoped in/out
			Natural England using their risk zone modelling as part of the DLL which would inform the findings in the ES.
Other amphibians	Incidental mortality of protected or notable species. Disturbance to protected or notable species (noise/vibration, visual, lighting). Permanent habitat loss. Temporary habitat loss and fragmentation	Construction and maintenance	**Scoped in**
Reptiles	Incidental mortality of protected or notable species. Disturbance to protected or notable species (noise/vibration, visual, lighting). Permanent habitat loss. Temporary habitat loss and fragmentation.	Construction and maintenance	**Scoped in**
Dormouse	Incidental mortality of protected or notable species. Disturbance to protected or notable species (noise/vibration, visual, lighting). Permanent habitat loss. Temporary habitat loss and fragmentation.	Construction and maintenance	**Scoped in** – for Nottinghamshire only
Other mammals (including only brown hare, hedgehog, polecat)	Incidental mortality of protected or notable species. Disturbance to protected or notable species (noise/vibration, visual, lighting). Permanent habitat loss. Temporary habitat loss and fragmentation.	Construction and maintenance	**Scoped in**
Aquatic invertebrates/fish	Yes – if watercourses impacted. Incidental mortality of protected or notable species.	Construction and maintenance	**Scoped in**

Receptor	Potential for significant effect	Project phase(s)	Proposed to be scoped in/out
	Disturbance to protected or notable species (noise/ vibration, visual, lighting). Permanent habitat loss. Temporary habitat loss and fragmentation.		

9. Cultural Heritage

9.1 Introduction

9.1.1 This chapter presents how the cultural heritage assessment will consider the potentially significant effects on cultural heritage receptors that may arise from the construction, operation, and maintenance of the Project (as described in **Chapter 4, Description of the Project**). It describes the methodology and datasets to be used within the cultural heritage assessment, presents an overview of the baseline conditions, and identifies the potential likely significant effects to be considered within the assessment, and how these will be assessed for the purpose of an Environmental Impact Assessment (EIA). As detailed in **Chapter 4, Description of the Project**, the decommissioning has been scoped out of the environmental assessment.

9.1.2 The Project Scoping Boundary is illustrated on **Figure 1.1 Project Scoping Boundary**.

9.1.3 This chapter should be read in conjunction with:

- **Chapter 4, Description of the Project**;
- **Chapter 5, EIA Approach and Methodology**;
- **Chapter 6, Landscape**;
- **Chapter 7, Visual;** and
- **Chapter 16, Socio-economics, Recreation and Tourism.**

9.1.4 This chapter is supported by the following figures.

- **Figure 9.1 Designated Assets**;
- **Figure 9.2 Non-designated Assets**;
- **Appendix 9.A Designated and Non-Designated Assets**.

9.2 Regulatory and Planning Context

9.2.1 **Chapter 2, Regulatory and Planning Context** describes the overall regulatory and planning policy context for the Project. Key legislation, policy, and planning guidance relevant to the assessment of potential effects on cultural heritage associated with the construction, operation, and maintenance of the Project is presented below.

Legislation

9.2.2 Legislation relevant to the historic environment provides legal protection for heritage assets of national significance as well as a mechanism by which such assets can be identified. Relevant historic environment legislation is listed below:

- Ancient Monuments and Archaeological Areas Act 1979 (Ref 9.1) (amended by the National Heritage Act 1983 (Ref 9.2) and 2002 (Ref 9.3);
- Planning (Listed Buildings and Conservation Areas) Act 1990 (Ref 9.4); and

- The Hedgerows Regulations 1997 (Ref 8.12).

Planning Policy

National Planning Policy

National Policy Statements

9.2.3 As detailed in **Chapter 2, Regulatory and Planning Policy Context**, National Policy Statements (NPSs) set out the primary policy tests against which the application for a Development Consent Order (DCO) for the Project would be considered. The two relevant NPSs are Overarching National Policy Statement for Energy (EN-1) and National Policy Statement for Electricity Networks Infrastructure (EN-5). **Table 9.1** sets out how both the current and draft NPSs (March, 2023) relevant to electricity networks infrastructure are relevant to the cultural heritage assessment.

Table 9.1: Relevant sections of the relevant National Policy Statements

National Policy Statement	NPS section	How it will be considered
EN-1	Section 5.8.8 The applicant should provide a description of the significance of the heritage assets affected by the proposed development and the contribution of their setting to that significance. The level of detail should be proportionate to the importance of the heritage assets and no more than is sufficient to understand the potential impact of the proposal on the significance of the heritage asset. As a minimum the applicant should have consulted the relevant Historic Environment Record (HER) (or, where the development is in English or Welsh waters, English Heritage or Cadw) and assessed the heritage assets themselves using expertise where necessary according to the proposed development's impact.	A desk-based assessment will be carried out and the results of this included in the Environmental Statement (ES). The desk-based assessment will assess the significance of all relevant known heritage assets likely to be impacted by the Project, including any contribution from setting. It will include a review of the relevant HER as well as an assessment of the potential for previously unrecorded archaeological remains to be present. Furthermore, it will assess the significance (i.e. sensitivity) of the surrounding historic landscape. The ES will assess the potential likely significant effects of the Project on each individual asset.
EN-1	Section 5.8.9 Where a development site includes, or the available evidence suggests it has the potential to include, heritage assets with an archaeological interest, the applicant should carry out appropriate desk-based assessment and, where such desk-based research is insufficient to properly assess the interest, a field evaluation. Where proposed	A desk-based assessment will be carried out and the results of this included in the ES. The scope of further evaluation including fieldwork will be discussed with consultees and, if required, the results will be included in the ES.

National Policy Statement	NPS section	How it will be considered
	development will affect the setting of a heritage asset, representative visualisations may be necessary to explain the impact.	
EN-1	Sections 5. 8.11-22 Concerns decision making by the Infrastructure Planning Commission (IPC) in relation to heritage assets. They state that, in determining applications, great weight should be given to the asset's conservation. The more important the asset, the greater the weight should be. Any harm or loss should require clear and convincing justification; substantial harm to or loss of a Grade II listed building, park or garden should be exceptional; substantial harm to or loss of designated heritage assets of the highest significance, should be wholly exceptional. It describes the balance to be made in the planning process: Any harm should be weighed against the wider benefits of the application, although the stringency of the test is scaled in relation to the degree of harm to the heritage significance of the asset and whether or not the asset is designated. Furthermore, it states that the IPC should require developers to record and advance understanding of the significance of any heritage assets to be lost (wholly or in part) in a manner proportionate to their importance and the impact, and to make this evidence publicly accessible. However, the ability to record evidence of our past should not be a factor in deciding whether such loss should be permitted.	The ES will include an assessment of the significance of all heritage assets, including the contribution setting makes to that significance. The ES will assess the impact of the Project on the significance of affected heritage assets and the potential for any harm or loss to occur.
EN-1 (Draft)	The draft EN-1 specifically states that the applicant will be responsible for undertaking studies to assess the impacts of noise, vibration, light and indirect impacts on heritage assets.	The ES will include, where relevant to the Project, chapters to assess matters such as hydrology, air quality, noise, vibration and light. Where relevant these assessments will be referenced within the cultural heritage chapter and potential impacts to heritage assets included within the overall assessment of impact.

National Policy Statement	NPS section	How it will be considered
EN-1 (Draft)	The draft EN-1 removes the presumption in favour of the conservation of designated assets. It also states that the Secretary of State should refuse consent unless it can be demonstrated that the substantial harm to or loss of significance is necessary to achieve substantial public benefits that outweigh that harm or loss, or all of the following apply: • the nature of the heritage asset prevents all reasonable uses of the site; • no viable use of the heritage asset itself can be found in the medium term through appropriate marketing that will enable its conservation; • conservation by grant-funding or some form of not for profit, charitable or public ownership is demonstrably not possible; and • the harm or loss is outweighed by the benefit of bringing the site back into use.	The Project design will ensure that no designated asset will be removed or rendered unviable. Any harm to an asset which needs to feature in the planning balance will be clearly set out in the EIA.
EN-1 (Draft)	While the current EN-1 acknowledges that impacts to non-designated assets should be considered by the IPC, the draft EN-1 explicitly states that the effect of an application on the significance of non-designated assets should be considered in determining the application.	Non-designated heritage assets are to be identified within the cultural heritage baseline, and their significance assessed including any contribution from setting. The cultural heritage chapter will identify potential likely significant effects on the significance of non-designated assets arising from the Project.

National Planning Policy Framework

9.2.4 The NPS EN-1 (Ref 2.2) policies are the primary source of policy guidance regarding the historic environment and this assessment. Although these policies are largely aligned with those of the National Planning Policy Framework (NPPF), with particular reference to Section 16 Conserving and Enhancing the Historic Environment, the NPPF is not expected to be a material consideration. The NPS EN-1 does, however, defer to the NPPF Annex 2 in defining cultural heritage significance. This is reflected in the proposed methodology below.

Local planning policy

9.2.5 The Project lies within the jurisdictions of East Riding of Yorkshire, North Lincolnshire, and Bassetlaw District (Nottinghamshire) Councils. A summary of the local planning policy and emerging policy which is relevant to a study of heritage matters and will inform the cultural heritage assessment in the ES is provided in **Table 9.2**.

Table 9.2: Relevant Local Planning Policies

Local Plan	Policy ref	Policy context	How it will be considered
East Riding Local Plan 2012-2029 Strategy Document, Adopted 2016 (Ref 2.7)	ENV3	The significance, views, setting, character, appearance, and context of heritage assets, both designated and non-designated, should be conserved, especially the key features that contribute to the East Riding's distinctive historic character. Where assets are harmed by a proposed development, this harm should be weighed against public benefit. Where archaeological remains are impacted by a development and cannot be preserved *in situ*, the developer should make adequate provision for excavation and recording before or during development.	This policy is aligned with the NPPF and NPS-EN1. The cultural heritage chapter will identify all designated and non-designated assets with a potential to be impacted by the Project and will assess their significance including any contribution from setting. Impacts on the significance including the setting of assets arising from the Project will be assessed.
North Lincolnshire Local Development Framework – Core Strategy (2011) (Ref 2.11)	CS6	The policy is aimed at protecting, conserving, and enhancing the historic environment. It requires developments to ensure that they respect designated assets and that developments provide appropriate archaeological assessments. The policy specifically aims at preserving the nationally significant medieval landscapes of the Isle of Axholme, preserving archaeological heritage, and preserving the character and setting of assets within Epworth and other market towns.	The cultural heritage chapter will identify all designated and non-designated assets with a potential to be impacted by the Project, including those specifically highlighted by Policy CS6, and will assess their significance including any contribution from setting. Impacts on the significance including the setting of assets arising from the Project will be assessed.
Draft North Lincolnshire Local Plan	HE1	The policy states that development proposals must value, protect, conserve, and seek opportunities to enhance the historic environment. Where harm	The emerging local plan policy HE1 is aligned with the NPPF and NPS-EN1. The cultural heritage chapter will identify all designated and

Local Plan	Policy ref	Policy context	How it will be considered
(2022) (Ref 2.12)		to the heritage assets is unavoidable, that harm will need to be outweighed by public benefit. Harm to assets of highest significance would be wholly exceptional and all harm should be minimised and mitigated. It requires that an appropriate level of assessment be carried out for all developments to assess the significance of an impact to the historic environment. The policy specifically aims at preserving the nationally significant medieval landscapes of the Isle of Axholme, preserving archaeological heritage, and preserving the character and setting of assets within Epworth and other market towns.	non-designated assets with a potential to be impacted by the Project, including those specifically highlighted by Policy HE1, and will assess their significance including any contribution from setting. Impacts on the significance including the setting of assets arising from the Project will be assessed.
Bassetlaw District Local Development Framework – Core Strategy and Development Management Policies DPD (2011) (Ref 2.15)	DM8	The policy is aimed at protecting and enhancing the historic environment and secure its long-term future. All proposals must recognise the significance of assets and rely on an assessment and relevant studies to guide the design. The policy assumes a presumption against development, alteration, advertising, or demolition that will be detrimental to the significance of a heritage asset.	The cultural heritage chapter will identify all designated and non-designated assets with a potential to be impacted by the Project and will assess their significance including any contribution from setting. Impacts on the significance including the setting of assets arising from the Project will be assessed.
Emerging Bassetlaw Local Plan 2020-2037 (2021) (Ref 2.19)	ST42	The policy requires development proposals to assess the significance of any heritage assets affected, including any contribution made by their setting. It puts great weight on the conservation and enhancement of heritage assets.	The emerging local plan policy HE1 is aligned with the NPPF and NPS-EN1. The cultural heritage chapter will identify all designated and non-designated assets with a potential to be impacted by the Project and will assess their significance including any contribution from setting. Impacts on the significance including the setting of assets arising from the Project will be assessed.

Local Plan	Policy ref	Policy context	How it will be considered
	ST43	This policy specifically states how developments can achieve the council's aim of preserving and enhancing the historic environment. It states that harm to designated and non-designated assets should only be approved when it is outweighed by public benefit. The policy also states that, where *in situ* preservation is not possible or desirable, suitable provisions should be made by a developer to excavate and record the remains followed a methodology approved by the Local Planning Authority.	The emerging local plan policy HE1 is aligned with the NPPF and NPS-EN1. The cultural heritage chapter will identify all designated and non-designated assets with a potential to be impacted by the Project and will assess their significance including any contribution from setting. Impacts on the significance including the setting of assets arising from the Project will be assessed.

Consultation and Engagement

9.2.6 The environmental assessment will be informed by consultation and engagement with stakeholders, including East Riding of Yorkshire Council, North Lincolnshire Council, Bassetlaw District Council, Nottinghamshire County Council, and Historic England, which has been ongoing throughout the early development stages of the Project.

9.2.7 A summary of the proposed survey and assessment methodology for Heritage was shared with East Riding of Yorkshire Council, North Lincolnshire Council, Bassetlaw District Council and Nottinghamshire County Council. The feedback received from this pre-scoping consultation is included in **Table 9.3,** along with a response on how the comments has been considered in this Scoping Report, where applicable. A meeting was also held with Historic England to discuss the proposed methodology, and whilst a formal response had not been received at the time of writing this scoping report, the initial feedback during this meeting has been incorporated into this report where necessary.

Table 9.3 Engagement with local authorities

Local Planning Authority	Summary of Response	Consideration in the Scoping Report
East Riding of Yorkshire Council	Due to the scale and height of pylons and associated infrastructure, consideration should be given to using a greater minimum distance than 1 km. Although the study area will be selectively extended, informed by the ZTV, it will be necessary to demonstrate that for the areas where it is not extended, 1 km is a sufficient distance to identify all designated and non-designated heritage assets, their settings, and important views that may be impacted	The Council's comment is noted. The Council will be fully consulted during the impact assessment process to ensure that heritage assets that the Council has concerns about, beyond the 1 km distance, are considered.

Local Planning Authority	Summary of Response	Consideration in the Scoping Report
	by the project. When identifying potential impact, it is important that views from, to and past heritage assets are considered. The technical guidance section needs to be updated; it includes PPG16 which was superseded in 2010.	The Technical Guidance section refers to the Ministry of Housing, Communities & Local Government (2019) Planning Practice Guidance: Historic Environment (Ref 9.5). It does not refer to the superseded Planning Policy Guidance 16 (PPG16) Archaeology and Planning.
North Lincolnshire Council	It is noted that an additional viewpoint has been included as requested in the scoping workshop. Subject to these comments and consideration of the [seven] suggested additional/amended viewpoint locations in relation to the historic landscape I am otherwise happy with the suggested viewpoints.	The Council's comment is noted and their input to the LVIA viewpoints from a cultural heritage perspective is gratefully acknowledged. Viewpoints are considered in the **Chapter 7, Visual**.
North Lincolnshire Council	Study Area As the proposed large structures are in a largely flat landscape overlooked from higher ground the following scope is required: • 10 km from the corridor boundary for Designated heritage assets (Scheduled Monuments, LBs I,II* & II, Conservation Areas, RPGs etc). • 3 km from the corridor boundary for assessing effects on the Isle of Axholme Historic Landscape Character. • 1 km from the corridor boundary for non-designated archaeology. We would expect the use of photographic visualisations from appropriate viewpoints to demonstrate indirect effects of the proposals on all heritage assets and their settings, including evidence of no effects. Impacts other than visual, such as noise, dust and odour, should also be considered.	The Council's comment is noted. The Council will be fully consulted during the impact assessment process to ensure that heritage assets that the Council has concerns about, beyond the 1 km distance, are considered. Photographic visualisations will be used to demonstrate effects on a case-by-case basis and in consultation with the Council. Other factors that may impact on heritage assets from construction and operation will also be considered – such as noise, dust and air quality.

Local Planning Authority	Summary of Response	Consideration in the Scoping Report
North Lincolnshire Council	Data Sources This section suggests that the cultural heritage chapter of the EIA would be informed by desk-based assessment of these data sources and a walkover survey. This would be inadequate. EIA for the proposed development must be informed by adequate archaeological assessment based on the results of archaeological field evaluation to identify and characterise the significance of known and as yet unknown archaeology that the development impacts may affect. The results of archaeological evaluation will inform the design of the development and a mitigation strategy that may include avoidance measures and/or the development of a programme of work for pre-construction archaeological excavation and recording. North Lincolnshire will require the ES to include the results of the following stages of archaeological evaluation: Pre-Application Archaeological Field Evaluation: • Geo-archaeological assessment and borehole survey to identify deposits with potential for preservation of organic archaeological and palaeoenvironment remains. • Measured survey of upstanding earthwork remains to assess survival, condition and potential for reinstatement following construction. • Systematic fieldwalking and metal detection with the project corridor to identify potential below-ground archaeological remains. • Geophysical survey within the project corridor to identify and plot anomalies of potential archaeological origin. • Excavation of trial trenches to determine the nature, extent, state of preservation and importance of	As stated above, in response to EN-1, desk-based assessment will be carried out and the results of this will be included in the ES. The scope of any archaeological evaluation fieldwork will be discussed with the Council as the Project progresses and, if required, the results will be included in the ES.

Local Planning Authority	Summary of Response	Consideration in the Scoping Report
	any archaeological remains within the project corridor informed by the results of the preceding stages of desk study and field surveys. • The archaeological field evaluation to be carried out by a suitably experienced archaeological contractor, such as a Registered Organisation accredited by the Chartered Institute for Archaeology or an organisation that can demonstrate that they have equivalent experience, capability and quality management systems in place. The appointed contractor must have access to appropriate geo-archaeological expertise. All fieldwork should be undertaken in accordance with CIFA's published Standards and Guidance for evaluation, and Historic England professional guidelines to written specifications that have been agreed with the HER prior to commencement. Because archaeological evaluation needs to be undertaken in stages and for all stages to be complete to inform the EIA prior to any planning application, the applicant is urged to commission this work at the earliest opportunity to avoid unnecessary delay at a later stage. It should also be noted that undertaking archaeological evaluation can be dependent on weather and ground conditions as well as the agricultural cycle. In order that land access issues do not occur, early consultation to secure the prompt undertaking of archaeological surveys is urged.	
North Lincolnshire Council	Note the primary source for the Isle of Axholme Historic Landscape Character assessment: Miller, K. 1997 The Isle of Axholme, Historic Landscape Characterisation Project Countryside Commission, Leeds	The Council's comments are noted and impacts on the Isle of Axholme Historic Landscape Character Area will be considered in the ES, where the Project has the potential to impact this Character Area.

Local Planning Authority	Summary of Response	Consideration in the Scoping Report
North Lincolnshire Council	Proposed Assessment Methodology Sources of construction impacts should not be limited to those listed in this paragraph, all construction impacts must be assessed. Sources of operational impacts must also consider the requirement to maintain future accessibility to conduct archaeological investigations to ensure the archaeological interest is available for future generations to investigate. Impacts should not be scoped out prior to full assessment of significance and for known and potential archaeological heritage assets this will require a programme of archaeological evaluation as set out above.	The Council's comment is noted. All construction impacts will be assessed in the ES. Future access for archaeological investigations beneath OHL depends on the access rights requested as part of the DCO, alongside relevant health and safety considerations. This will be considered in the ES. See above for response on archaeological evaluations.
North Lincolnshire Council	References should include: Conservation Principles, Policies and Guidance for the sustainable management of the historic environment, Historic England, 2008 to guide the assessment of the value of the heritage assets.	Historic England's 2008 publication has been superseded with regards to 'value and significance' of heritage assets by the GPAs, the NPPF and its glossary and guidance as set out in the Planning Practice Guidance.
North Lincolnshire Council and Nottinghamshire County Council	Findspots should not be excluded from the assessment as they have the potential to indicate the presence of in situ archaeological remains.	The scoping chapter has been rewritten taking into account both Council's comments regarding findspots.
Nottinghamshire County Council	The heritage team have reviewed the Cultural Heritage Methodology (proposed) and find that NCC are quite comfortable with the approach as described. NCC are pleased to see that the LVIA will be coordinated with the cultural heritage specialists to ensure that visual impacts on the setting of cultural heritage assets are thoroughly considered. NCC would add that the traffic and noise assessments for the construction phase of the works should	The Council's comments are noted. Other factors that may impact on heritage assets from construction and operation will also be considered – such as traffic, noise, dust and air quality.

Local Planning Authority	Summary of Response	Consideration in the Scoping Report
	take into account the impacts on conservation areas and listed buildings on the proposed routes to site.	

9.3 Study Area

9.3.1 The study area is the area within which cultural heritage assets may experience effects as a result of the Project. Effects to heritage assets may arise during construction or operation. Effects to heritage assets may arise as a result of physical impacts to their fabric or through changes to their setting.

9.3.2 For the purpose of this Scoping Report, the study area has been defined as 1 km from the Scoping Boundary for all designated and non-designated cultural heritage assets. For higher graded assets (i.e. World Heritage Sites, grade I and II* listed buildings, registered battlefields, Registered Parks and Gardens (RPG) and scheduled monuments) the study area has been extended to 3 km from the Scoping Boundary in recognition that high value assets have a greater potential for setting and contribution to significance to extend over a larger area.

9.3.3 For the EIA, which require a more granular study area to adequately assess all potential impacts, the study area will be defined according to the significance of the asset and the potential impacts of the Project, following further assessment and design work to identify a proposed alignment. The proposed study area for the EIA is set out in section 9.6 below.

9.4 Baseline Conditions

9.4.1 The following section provides a summary of the baseline environmental conditions within the study area.

Data Sources

9.4.2 The known current and predicted future baseline environment described in this section has been informed by the following data sources:

- Historic England's National Heritage List for England (NHLE) (Ref 9.6);
- The Humber, North Lincolnshire and Nottinghamshire Historic Environment Records (HER); and
- Other readily available online sources.

Baseline

9.4.3 The locations of designated assets with respect to the Scoping Boundary, the 1 km study area and the 3 km study area are identified in **Figure 9.1 Designated Heritage Assets**. The locations of non-designated assets with respect to the Scoping Boundary, the 1 km study area and the 3 km study area are identified in **Figure 9.2 Non-Designated Heritage Assets**.

Overview

9.4.4 There are no World Heritage Sites (Cultural), registered historic battlefields, or protected wrecks within the Scoping Boundary or within 3 km of it.

9.4.5 Designated assets within the Scoping Boundary include two scheduled monuments; 17 listed buildings, all of which are grade II, and a single conservation area.

9.4.6 A further 12 scheduled monuments, 11 grade I listed buildings, 13 grade II* listed buildings, a single grade II registered park and garden, eight conservation areas and 182 grade II listed buildings are located within 1 km of the Scoping Boundary. Of these the Risby Hall RPG (grade II, NHLE 1001419); the Remains of Church of St Helen (grade I, NHLE 1216694); and the Church of St Giles (grade II*, NHLE 1212465) are all approximately 150 m from the Scoping Boundary while the grade II* listed North Leverton Windmill (NHLE 1234469) is approximately 50 m from the Scoping Boundary.

9.4.7 Beyond 1 km but within 3 km of the Scoping Boundary, there are another 14 scheduled monuments, 15 grade I listed buildings, 24 grade II* listed buildings and one grade II registered park and garden.

9.4.8 Within the Scoping Boundary there are 335 non-designated assets listed within the HERs, 52 of which are identified as built heritage assets while the remainder are archaeological assets. A full list of non-designated assets within the Scoping Boundary is provided as **Appendix 9.A**. A further 1,571 non-designated assets have been identified in the HERs within the 1 km study area.

9.4.9 The two scheduled monuments within the Scoping Boundary are of medieval date and form part of the once extensive medieval landscape that the Project is situated in, now much altered by modern farming. They are:

- Hall Garth Moated Site, Associated Drainage Channels and Fishpond (NHLE 1013190), located within the Scoping Boundary to the west of Ousefleet; and
- Whimpton Moor medieval village and moated site, which is located on the eastern edge of the Scoping Boundary to the south of the A57 crossing (NHLE 1017567).

9.4.10 The listed buildings within the Scoping Boundary comprise four houses, seven farmhouses, one farm building and two churches, all post-medieval in date. There are three non-domestic, agricultural, or ecclesiastical listed buildings within the Scoping Boundary; an obelisk, a road bridge, and a syphon (sic.) for water management.

9.4.11 The listed buildings within the Scoping Boundary are:

- The Hall (grade II, NHLE 1103353);
- Mill Cottage (grade II, NHLE 1347001);
- Emsall House (grade II, NHLE 1347000);
- Church of St Anne (grade II, NHLE 1103352);
- Garth Farmhouse (grade II, NHLE 1103354);
- Broomfleet Grange (grade II, NHLE 1083335);
- Church of St Mary (grade II, NHLE 1346687);
- Ross Farmhouse (grade II, NHLE 1083148);

- Syphon Carrying South Level Engine Drain under the River Torne Approximately 200 Metres South-east of Pilfrey Farm (grade II, NHLE 1346690);
- Belwood Obelisk (grade II, NHLE 1083288);
- High Melwood Farmhouse (grade II, NHLE 1346693);
- Langholme Manor Farmhouse (grade II, NHLE 1067741);
- Haxey Gate Bridge (grade II, NHLE 1302728);
- Manor Farmhouse and Outbuildings (grade II, NHLE 1156795);
- Highfield Farmhouse (grade II, NHLE 1156811);
- Pigeoncote and Fodder Store at Pear Tree Farm (grade II, NHLE 1370368); and
- Field Farmhouse (grade II, NHLE 1213011).

9.4.12 The sole conservation area within the Scoping Boundary is the Ellerker Conservation Area.

9.4.13 The majority of the listed buildings within the 1 km and 3 km study area are located within the surrounding settlements with concentrations in Brantingham, Ellerker, Whitgift, Adlingfleet, Garthorpe, Eastoft, Crowle, Ealand, Churchtown; Epworth; Owston Ferry; Graizelound; Misterton; Gringley on the Hill; Beckingham; North Wheatley, South Wheatley, North Leverton; South Leverton, East Drayton, Darlton, and Ragnall. Listed buildings within the 1 km and 3 km study areas are generally of post-medieval to modern date, although a few, mainly churches, are of medieval date.

Geology

9.4.14 The Scoping Boundary's bedrock geology is largely defined by north-south bands of sedimentary bedrock of Triassic to Jurassic date and capped by chalk of Cretaceous date, which were first uplifted and subsequently eroded into a number of ridges and escarpments across the region. The most prominent of these escarpments are the Yorkshire Wolds, which crosses the northern section of the Scoping Boundary, and the Lincolnshire Wolds, to the east of the southern portion of the Scoping Boundary. These deposits are overlain across much of the Scoping Boundary by several intermittent glacial deposits including glacial till and glaciolacustrine and glaciofluvial sand, silt, and clay. The superficial glacial deposits are particularly complex in the region due to the formation of several glacial lakes and glacial flood events responsible for the erosion and flattening of the landscape and for the formation of the Humber Gap. Lastly, the Humber Estuary and its tributaries have deposited further fluvial and riverine gravel, silt, sand, and clay and led to the formation of extensive peat deposits throughout the region.

Archaeological background

9.4.15 A review of non-designated assets recorded in the three HERs has revealed extensive evidence of human occupation from the prehistoric period onwards within the Scoping Boundary and extending to within the 1 km study area.

9.4.16 There is little evidence of early prehistoric occupation and few such remains are expected to be present due to the effects of glacial advances and retreats. Although palaeo-environmental evidence may survive, particularly those relative to former glacial lakes, it is unlikely that archaeological remains pre-dating the Holocene will be present within the Scoping Boundary.

9.4.17 Although seven lithic scatters identified within the North Lincolnshire section of the Scoping Boundary are reportedly Mesolithic, none are securely dated to the period and are best described of 'prehistoric' date. Within the 1 km study area, there are seven finds which seem to be securely dated to the Mesolithic and a further 33 lithic scatters, tools, and flints which are dated to a range of possible prehistoric periods which include the Mesolithic period.

9.4.18 The Neolithic period is better represented in the Scoping Boundary, with seven securely single find lithic objects, a lithic scatter (19447) and the site of possible long barrows known as Giants Graves (2480). A further 26 flint tools and assemblages are reported as potentially Neolithic but not securely dated. This same distribution pattern extends to the 1 km study area, with most Neolithic finds comprising isolated finds or scatters of lithic material. Of note are two possible henge monuments located 200 m east (904) and 900 m north (6625) of the Scoping Boundary. Most Neolithic finds are recorded in North Lincolnshire, which, if not a consequence of a sampling and recording bias, may indicate the preference of early Neolithic settlers for the fertile region of the Isle of Axholme.

9.4.19 A number of barrows of likely Bronze Age date are known to exist within the Scoping Boundary in the Humber region (1381, 6593, 1377) and Nottinghamshire (25825). Other features within the Scoping Boundary include ring ditches (6631), enclosures (167), and lithic scatters (19399). The 1 km study area contains a similar array of finds and features, although it is worth noting that there is a clear concentration of Bronze Age to Iron Age round barrows near the north-eastern extremity of the Scoping Boundary (832, 833, 1831, 1832, 14122, 14123, 18737, 3532, 6593, 6614, 6618), suggesting the presence of a large late prehistoric funerary landscape along the escarpment of the Yorkshire Wolds.

9.4.20 The Iron Age period is represented within the Scoping Boundary by a ditch system, track and enclosure south-west of Skidby (6595), a settlement complex and 'square barrows' west of Broomfield (2930, 2915) and several enclosures (3521, 20929, 21027, 20220, 20177). There are notably fewer Iron Age funerary monuments (1497, 22307, 2915, 2934) in the study area than the earlier Bronze Age period, but conversely there appears to be a proliferation of settlement sites. This is particularly evident near the north-east portion of the Scoping Boundary where settlements (164, 21657, 2930, 2931, 2936, 7587) and enclosures are widely reported (160, 21693, 21700, 21701, 21757, 22308, 22616, 2531, 6595, 6707, 6710, 6714). Although this correlation does not necessarily suggest continuity, it does show an increase in population and intensification of agricultural activity in the area in the Iron Age. Several enclosures (20177, 20218, 20220, 20929, 21027, 21518, 22719, 22720) are also reported within the remainder of the study area but in lesser concentrations. Of note are a possible hillfort in South Wheatley (5110) 450 m west of the Scoping Boundary and an Iron Age settlement north of Gringley on the Hill (15550) 400 m west of the Scoping Boundary.

9.4.21 As is common for this period, many of the Iron Age features located within the study area (6595, 3531, 20929, 21027, 20220) have a later Roman component. This exemplifies the strong continuity between the periods, with increasing Roman influence reflected in the archaeological record. The scoping boundary also crosses the Roman roads between Brough and York (63) and Doncaster to Littleborough. Other notable features of Roman date within the Scoping Boundary include the Cockle Pits Roman villa (725), other smaller Roman settlements (19899, 18168, 8172, 20919), a marching camp at Miserton (18168, 18165) and a large number of Roman pottery and isolated finds. This settlement pattern is reflected in the study area.

9.4.22 In addition, the Scoping Boundary contains a number of undated enclosures, ditches, and other features (no. 58) noted as cropmarks which are most likely to be of prehistoric or Roman date.

9.4.23 There is limited evidence of early medieval occupation in the study area, the only two assets within 1 km of the Scoping Boundary being the deserted medieval village of Waterton Hall (1640) 950 m east of the Scoping Boundary and evidence of Anglo-Saxon settlement south of Church Town (19755) 600 m west of the Scoping Boundary.

9.4.24 The study area evidences a rich medieval history highlighting the extensive agricultural use and settlement of the Humber, Trent, Idle and Ouse river valleys. The Scoping Boundary encompasses the scheduled remains of the medieval moated manor of Hall Garth (NHLE 1013190) and its fishponds as well as a small section of the deserted medieval village of Whimpton Moor (NHLE 1017567). Most villages within the study area have medieval origins, Elleker (9580) and Broomfleet (73) are located within the Scoping Boundary. Other settlement sites located within the Scoping Boundary include the deserted medieval village of Staddle Thorpe, Bow Bridge (12609), which was in use as early as 1370, and medieval moated manors (2923, 1348, 1349, 21560). Other features of medieval date include medieval flood banks and drainage (174), and a cemetery with medieval burials at Ragnall (5761). The site of a camera of the Knights Templars is also noted at Temple Bel Wood (906). The HERs report extensive areas of ridge and furrow at various locations (10206, 10141, 5761, 10735, 22607, 15423), although a review of LiDAR imagery suggests that these have been largely truncated by later agricultural activity. Although not recorded in the HER, other areas of well-preserved ridge and furrow were noted in the LiDAR imagery within the Scoping Boundary. The wider study area contains a large number of non-designated medieval assets but there are no particular concentrations in any areas. It is likely that the whole region was settled by this time and largely rural and agricultural.

9.4.25 There are over 118 post-medieval assets within the Scoping Boundary and 651 in the study area. Approximately half of the assets are non-designated built heritage assets, while the remainder are archaeological. Assets within the Scoping Boundary reflect increasingly diverse land-uses throughout the post-medieval period. While much of the landscape remained agricultural and relatively rural, the period also witnessed the emergence of new industries that made extensive use of the transport benefits afforded by the Humber and its tributaries. Aside from the large number of farmhouses and related buildings, both archaeological and extant, the Scoping Boundary encompasses a number of industrial buildings that include mills (13927, 14054, 91, 12898, 12743), brickworks (14501, 14502, 14503, 4943), railways (22552, 7910, 6807) as well as extensive water management features such as drains and canals (170, 171, 151, 14500, 15778, 15417, 19588, 21088, 5857, 5858). Other notable post-medieval assets within the Scoping Boundary include public houses (13931, 12618), poor houses (12243, 2916, 12925, 14486), chapels (19639, 156, 12520, 12481) and other rural village structures (74, 153, 14499, 14488, 14487).

9.4.26 The Scoping Boundary remains largely rural and agricultural today, but notable modern features include a Royal Observers Corps monitoring post (21428) and the site of a Second World War decoy. Other modern features within the HERs are largely associated with modern farmsteads and those relating to 20th century railways.

9.4.27 The Scoping Boundary traverses a large number of diverse landscapes. The National Character Areas Map indicates that it crosses four distinct areas, including Holderness, the Yorkshire Wolds, and the Humberhead Levels in the north and the Trent and Belvoir Vales in the south. Each of these areas contain both local and regional historic

landscapes that are characterised by a wide range of surviving features from the medieval period onwards still recognisable today. It is possible that vestiges of earlier historic landscapes may also survive within the Scoping Boundary which could be considered of particularly high archaeological and historical interest.

9.4.28 The Isle of Axholme is recognised as an area of Special Historic Landscape Interest and is currently being considered by North Lincolnshire Council as part of an extension to the the Lincolnshire Wolds Area of Outstanding Natural Beauty (AONB). This includes areas from Crowle, through Belton and Epworth and the surrounding market towns and villages. The area is home to rare ecological and cultural landscapes, including lowland raised mire and surviving medieval strip field systems; this area also formed the first landscape in Britain to be drained by Dutch engineer Cornelius Vermuyden in the 1620s. Policies to ensure the preservation of its medieval landscapes are in the North Lincolnshire Local Development Framework – Core Strategy (Policy CS6) and the Draft North Lincolnshire Local Plan (Policy HE1).

Future Baseline

9.4.29 The cultural heritage chapter within the Environmental Statement (ES) will include an outline of the likely evolution of the baseline environment without the implementation of the development as far as natural changes from the baseline scenario can be assessed.

9.5 Embedded and Control and Management Measures

Embedded Measures

9.5.1 The Project design will avoid physical impacts to designated assets. As this design develops further and is better refined, additional mitigation measures will endeavour to include further design intervention to avoid physical and indirect impacts on both designated and non-designated heritage assets.

9.5.2 Potentially significant impacts on the setting of assets brought about by the Project may be lessened or avoided through consideration of detailed design and micro-siting of the individual pylons.

Control and Management Measures

9.5.3 Where the Project will bring about physical impacts to heritage assets, these effects will be mitigated through measures to include (but not be limited to) detailed landscape/topographic survey, archaeological excavation and recording and archaeological monitoring/watching brief.

9.5.4 An Outline Code of Construction Practice (CoCP) is provided in **Appendix 4.A Outline Code of Construction Practice**. Measures relevant to the control and management of impacts that could affect the cultural heritage assessment are:

- GG03: A Construction Environmental Management Plan (CEMP), a Landscape and Ecological Management Plan (LEMP), a Construction Traffic Management Plan (CTMP), and a Site Waste Management Plan (SWMP) will be produced prior to construction. These are collectively referred to as ‘the Management Plans’.
- GG05: A suitably experienced Environmental Manager will be appointed for the duration of the construction phase. In addition, a qualified and experienced Environmental Clerk of Works will be available during the construction phase to

advise, supervise and report on the delivery of the mitigation methods and controls outlined in the CEMP. The Environmental Clerk of Works will monitor that the works proceed in accordance with relevant environmental DCO requirements and adhere to the required good practice and mitigation measures. The Environmental Clerk of Works will be supported as necessary by appropriate specialists, including archaeologists, ecologists and arboriculturists.

- H01: Locations of known archaeological interest/value, or areas where archaeological work is planned, will be signposted/fenced off to avoid unintentional damage.
- H02: Where a previously unknown heritage asset is discovered, or a known heritage asset proves to be more significant than foreseen at the time of application, the project will inform the local planning authority and will agree a solution that protects the significance of the new discovery, so far as is practicable, within the project parameters.
- H03: Where practicable, maintain elements within the landscape such as vegetation and hedgerows (including re-instating hedgerow, fences, and wells).
- LV04: Construction lighting will be directional and minimised where possible.
- NV01: Construction working will be undertaken within the agreed working hours set out within the DCO. Best practicable means to reduce construction noise will be set out within the CEMP.

9.6 Potential for Significant Effects

9.6.1 The cultural heritage assessment will consider potential impacts arising as a consequence of the construction, operation, and maintenance of the Project.

9.6.2 Details of each of these stages are set out in **Chapter 4, Description of the Project**.

9.6.3 The proposed scope of the cultural heritage assessment is set out below and has been determined using the approach described in **Chapter 5, EIA Approach and Methodology**.

9.6.4 The potential for the Project to result in the likely significant effects identified in **Table 9.4** considers the embedded and control and management measures described in section 9.5.

Sources and Impacts (Step 1)

9.6.5 This section identifies the sources and impacts that would occur as a result of the construction, operation, and maintenance of the Project.

Potential sources of impacts

Sources of construction impacts

- Activities relating to the construction of the Project (detailed in **Chapter 4, Description of the Project**, section 4.3), such as the installation of new infrastructure, the excavation of trenches for cables or foundations, and the establishment of construction compounds resulting in the truncation and/or removal of heritage assets.

- Presence of machinery and traffic as well as noise, dust, and light, resulting in temporary changes to the setting of heritage assets.

Sources of operational impacts

- Presence of the Project in the landscape resulting in permanent changes to the historic landscape and to the setting of heritage assets.
- Presence of new infrastructure resulting in permanent changes to the viability of heritage assets.

Sources of maintenance impacts

- Presence of machinery and traffic as well as noise, dust, and light, resulting in temporary changes to the setting of heritage assets.

Potential impacts

9.6.6 There will be no physical impacts on the designated assets within the Scoping Boundary as they will be avoided by the construction works. There is, however, the potential for impacts to the setting of designated assets as a result of change to their setting.

9.6.7 There is the potential for the Project to give rise to significant effects on those non-designated assets that remain extant within the Scoping Boundary. A full list of non-designated assets within the Scoping Boundary is provided as **Appendix 9.A**.

9.6.8 The presence of the Project in the landscape could lead to significant effects through changes to our understanding and appreciation of the historic landscape.

9.6.9 **Table 9.4** identifies the potential impacts that could result from the sources identified above. Where **Table 9.4** identifies the potential for an impact to result in a significant effect the impact is taken through to Step 2. Where no potential for an impact to result in a significant effect is identified, that impact is proposed to be scoped out.

Table 9.4: Impacts and the potential for significant effects

Project phase	Source	Impact	Potential for significant effects
Construction	Intrusive construction activities	Physical impacts on cultural heritage assets.	**Yes** – the Project has the potential to result in a physical impact on cultural heritage assets through their truncation, removal, or alteration.
Construction	Machinery, noise, dust, and light	Temporary impacts to heritage assets as a result of changes to their setting.	**Yes** – the Project has the potential to result in significant effects on designated and non-designated heritage assets.
Operation	Presence of the Project in the landscape	Impacts to heritage assets as a result of	**Yes** – the Project has the potential to result in significant effects on designated and non-designated

Project phase	Source	Impact	Potential for significant effects
		changes to their setting.	heritage assets and the historic landscape.
Operation	New infrastructure altering access	Impacts to the access of heritage assets.	**No** – given the scale and size of the footprint of individual pylons, there is limited potential for significant effects to occur due to changes to access to heritage assets.
Maintenance	Vehicular traffic and maintenance activities	Physical Impacts to heritage assets or impacts to heritage assets as a result of changes to their setting.	**No** – the Project's planned frequency of maintenance visits, one per year, would not constitute an impact of sufficient magnitude to cause significant effects to either designated or non-designated heritage assets.

Impact Pathways with Receptors (Step 2)

9.6.10 This section identifies whether there are any impact pathways from the impacts identified above that could give rise to potentially significant effects on receptors identified within the study area.

9.6.11 **Table 9.5** provides a summary of the impact pathways identified and those proposed to be scoped into or out of the cultural heritage assessment for the Project.

Table 9.5: Impact pathways with receptors

Project Phase	Impact	Receptor	Potential for significant effects	Proposed to be scoped in/out
Construction	Physical impacts on cultural heritage assets.	Designated assets.	**No** – the Project will avoid all physical impacts to designated assets during construction works.	**Scoped out**
		Non-designated assets.	**Yes** – the Project's construction activities have a potential to result in a significant effect on non-designated assets.	**Scoped in**
		Historic landscape.	**Yes** – the Project's construction activities have a potential to result in the removal of key characteristics and features of the historic landscape.	**Scoped in**

Project Phase	Impact	Receptor	Potential for significant effects	Proposed to be scoped in/out
Construction	Temporary impacts to heritage assets as a result of changes to their setting.	Designated assets.	**Yes** – the Project's construction activities have a potential for significant effects as a result of changes to the setting of heritage assets leading to a loss of significance.	**Scoped in**
		Non-designated assets.	**Yes** – the Project's construction activities have a potential for significant effects as a result of changes to the setting of heritage assets leading to a loss of significance.	**Scoped in**
		Historic landscape.	**No** – the Project's temporary construction activities are unlikely to result in significant effects to the historic landscape.	**Scoped out**
Operation	Impacts to heritage assets as a result of changes to their setting.	Designated assets.	**Yes** – the presence of the Project in the landscape has a potential for significant effects as a result of changes to the setting of designated heritage assets leading to a loss of significance.	**Scoped in**
		Non-designated assets.	**Yes** – the presence of the Project in the landscape has a potential for significant effects as a result of changes to the setting of non-designated assets leading to a loss of significance.	**Scoped in**
		Historic landscape.	**Yes** – the presence of the Project in the landscape has a potential for significant effects as a result of changes to the character and legibility of the historic landscape.	**Scoped in**

9.7 Proposed Assessment Methodology

Study area

9.7.1 The study area has been defined according to the sensitivity of the receiving environment and the potential impacts of the project.

9.7.2 As a minimum, the study area for all designated and non-designated cultural heritage assets will extend to 1 km from the Project. This is considered sufficient to inform on the likelihood of encountering previously unknown archaeology within the Order limits. It also considers the likelihood of impacts to the setting of heritage assets, considering the character of the surrounding landscape and the asset type. While there may be a change within the visual influence of assets outside this area, it is considered unlikely that the ability to understand and appreciate their heritage significance would be affected.

9.7.3 For higher graded assets (i.e. World Heritage Sites, Grade I and II* listed buildings, Registered Battlefields, RPGs and scheduled monuments), there is a greater potential for their setting to extend over a larger area. The 1 km distance will therefore be selectively extended to capture assets of the highest significance where the wider landscape forms a key contributing factor to that significance. The extent of this area will be informed by the Zone of Theoretical Visibility (ZTV) which will be developed in conjunction with the Landscape and Visual assessment. This ZTV will define the theoretical visibility of the Project and present a theoretical zone of visual influence. This may not reflect what is visible on the ground nor can it be used to define the extent of setting of heritage assets. Assets which do not have intervisibility with the Project could still be impacted.

9.7.4 Those heritage assets within this extended area will be identified and assessed for their potential to be affected by the Project. Those assets that are identified to be potentially impacted will then be assessed further in the ES. Assessment will consider the significance of the asset, its setting and sensitivity to change. Through such an assessment, assets having a greater influence over the wider landscape may be taken through to assessment, whilst those having a lesser influence may be omitted. This staged approach is consistent with current Historic England guidance (Good Practice Planning Note 3).

Proposed Data Sources

9.7.5 The following data sources are proposed to be used to inform the cultural heritage assessment:

- Humber Historic Environment Record (HER);
- North Lincolnshire HER;
- Nottinghamshire HER;
- The National Heritage List for England (NHLE), held by Historic England, for designated assets;
- Local authority conservation area appraisal and management documents and their mapping;
- Historic landscape characterisation (HLC) mapping undertaken by local planning authorities;

- Aerial photographs held by Historic England, local authorities and other appropriate repositories and other readily available remote sensing results such as LiDAR data;
- Geological mapping and borehole information as held by the British Geological Survey;
- Documentary, cartographic and other resources as deposited within local studies libraries, county libraries and archives, including historic Ordnance Survey maps, tithe, estate and other maps, and other relevant primary sources held at East Riding Archives, Nottinghamshire Archives and Lincolnshire Archives, together with local studies library information; and
- Historic Ordnance Survey maps held by the National Library of Scotland.

9.7.6 A walkover survey to assess known sites, assess their setting and to determine the potential for previously unrecorded heritage assets will also be undertaken. This survey will focus on the final alignment as well as any associated compounds, laydown areas, and above ground infrastructure.

Technical Guidance

9.7.7 The cultural heritage assessment will be carried out in accordance with the following good practice and guidance documents:

- Planning Practice Guidance: Historic Environment (Ref 9.5);
- Historic Environment Good Practice Advice in Planning Note 2. Managing Significance in Decision Taking in the Historic Environment. Historic England (Ref 9.7);
- Historic Environment Good Practice Advice in Planning Note 3. The Setting of Heritage Assets. Historic England (2nd edition, 2017) (Ref 9.8);
- Historic Environment Statement of Heritage Significance: Analysing Significance in Heritage Assets. Historic England Advice Note 12. Historic England (Ref 9.9);
- Chartered Institute for Archaeologists (CifA) Standard and Guidance for Historic Environment Desk-Based Assessment (Ref 9.10);
- CIfA Code of Conduct (Ref 9.11); and
- Institute of Environmental Management and Assessment (IEMA), the Institute of Historic Building Conservation (IHBC) and the Chartered Institute for Archaeologists (CIfA), Principles of Cultural Heritage Impact Assessment in the UK (Ref 9.12).

Proposed Assessment Methodology

9.7.8 The following section summarises the methodology proposed to be used for the cultural heritage assessment which builds on the general assessment methodology presented in **Chapter 5, EIA Approach and Methodology**.

Sensitivity

9.7.9 The value of a heritage asset (its heritage significance) is guided by its designated status but is derived also from its heritage interest which may be archaeological, architectural, artistic, or historic (NPPF Annex 2, Glossary) (Ref 2.6). Each identified heritage asset can be assigned a value in accordance with the criteria set out in **Table 9.6**.

9.7.10 Using professional judgement and the results of consultation, heritage assets are also assessed on an individual basis and regional variations and individual qualities are considered where applicable.

Table 9.6: Criteria for assessing the value of heritage assets

Asset value	Asset categories
High	World Heritage Sites. Scheduled Monuments. Grade I and II* listed buildings. Registered battlefields. Grade I and II* registered parks and gardens. Conservation areas of demonstrable high value. Non-designated heritage assets (archaeological sites, historic buildings, monuments, parks, gardens, or landscapes), or Grade II listed buildings, that can be shown to have demonstrable national or international importance. Well preserved historic landscape character areas, exhibiting considerable coherence, time-depth, or other critical factor(s).
Medium	Grade II listed buildings. Conservation areas. Grade II registered parks and gardens. Conservation areas. Non-designated heritage assets (archaeological sites, historic buildings, monuments, park, gardens, or landscapes), or locally listed buildings, that can be shown to have demonstrable regional importance. Averagely preserved historic landscape character areas, exhibiting reasonable coherence, time-depth, or other critical factor(s). Historic townscapes with historic integrity in that the assets that constitute their make-up are clearly legible.
Low	Locally listed buildings. Non-designated heritage assets (archaeological sites, historic buildings, monuments, park, gardens, or landscapes) that can be shown to have demonstrable local importance. Assets whose values are compromised by poor preservation or survival of contextual associations to justify inclusion into a higher grade. Historic landscape character areas whose value is limited by poor preservation and/or poor survival of contextual associations.
Negligible	Assets identified on national or regional databases, but which have no archaeological, architectural, artistic, or historic value. Assets whose values are compromised by poor preservation or survival of contextual associations to justify inclusion into a higher grade. Landscape with no or little significant historical merit.

Magnitude

9.7.11 Having identified the value of the heritage asset, the next stage in the assessment is to identify the level and degree of impact to an asset arising from the development. Impacts may arise during construction, operation or decommissioning and can be temporary or permanent. Impacts can affect the physical fabric of the asset or affect its setting.

9.7.12 The level and degree of impact (impact rating) is assigned with reference to a four-point scale as set out in **Table 9.7**. In respect of cultural heritage an assessment of the level and degree of impact is made in consideration of any scheme design mitigation (embedded mitigation). If no impact on value is identified, no impact rating is given and no resulting effect reported.

Table 9.7: Factors influencing the assessment of magnitude of impacts

Magnitude of Impact rating	Description of Impact
Large	Changes such that the heritage value of the asset is totally altered or destroyed. Comprehensive change to elements of setting that would result in harm to the asset and our ability to understand and appreciate its heritage significance.
Medium	Change such that the heritage value of the asset is significantly altered or modified. Changes such that the setting of the asset is noticeably different, affecting significance and resulting in changes in our ability to understand and appreciate the heritage value of the asset.
Small	Changes such that the heritage value of the asset is slightly affected. Changes to the setting that have a slight impact on significance resulting in changes in our ability to understand and appreciate the heritage value of the asset.
Negligible	Changes to the asset that hardly affect heritage value. Changes to the setting of an asset that have little effect on significance and no real change in our ability to understand and appreciate the heritage value of the asset.

Significance of effects

9.7.13 An assessment to classify the effect, having taken into consideration any embedded mitigation, is determined using the matrix at **Table 9.8**, which takes account of the value of the asset (**Table 9.6**) and the magnitude of impact (**Table 9.7**). Effects can be neutral, adverse, or beneficial.

Table 9.8: Assessment of Effect

Heritage Value	High	Medium	Low	Negligible
Large	Major	Major	Moderate	Negligible/Minor

Heritage Value	High	Medium	Low	Negligible
Medium	Major	Moderate	Minor	Negligible
Small	Moderate	Minor	Negligible	Negligible
Negligible	Negligible/ Minor	Negligible	Negligible	Negligible

9.7.14 The ES reports on the significance of effect in accordance with EIA methodology. Major and moderate effects are considered to be significant. Within the NPPF, impacts affecting the value of heritage assets are considered in terms of harm and there is a requirement for the decision maker to determine whether the level of harm amounts to 'substantial harm' or 'less than substantial harm'. This is also supported by the Overarching National Policy Statement for Energy (EN-1) which also notes that there should always be a presumption in favour of the conservation of an asset as, once lost, assets cannot be replaced (Ref 2.2). Draft EN-1 (Ref 2.4) states that proposals that preserve the elements of the setting that make a positive contribution to the asset (or which better reveal its significance) should be treated favourably. There is no direct correlation between the significance of effect as reported in the final ES and the level of harm caused to heritage significance. A major (significant) effect on a heritage asset would, however, more often be the basis by which a decision maker would determine that the level of harm to the significance of the asset would be substantial. A moderate (significant) effect is unlikely to meet the test of substantial harm and would therefore more often be the basis by which a decision maker would determine that the level of harm to the significance of the asset would be less than substantial. A minor or negligible (not significant) effect would still amount to a less than substantial harm, which triggers the statutory presumptions against development within s.66 of the Planning (Listed Buildings and Conservation Areas) Act 1990 (Ref 9.13); however, a neutral effect is classified as no harm. In all cases determining the level of harm to the significance of the asset arising from development impact is one of professional judgement.

Limitations of assessment

9.7.15 This Scoping Report includes a high-level review of available data and presents a brief overview of the historic environment baseline. Given the scale of the Project, this assessment is only intended to identify potential pathways to significant effects for the purpose of defining a scope for the future assessment. It does not present all known or previously unrecorded cultural heritage receptors which will be presented in subsequent assessments.

9.7.16 Data supporting this report was obtained from third party sources and may include errors or omissions. All efforts were made to identify and rectify any such issues.

9.8 Conclusion

9.8.1 From the review of data undertaken as part of the scoping exercise, a number of designated and non-designated assets as well as sensitive historic landscapes have been identified within and immediately adjacent to the Project and its associated study area.

9.8.2 Project construction and operation activities have a potential to impact on designated and non-designated assets and to alter their setting as well as key characteristics and features of the historic landscape.

9.8.3 As a result, a cultural heritage (archaeology, built heritage and historic landscape) chapter will be submitted as part of the EIA.

Proposed Scope of the Assessment

9.8.4 A summary of the proposed scope of the cultural heritage assessment is provided in **Table 9.9**.

Table 9.9: Proposed scope of the assessment

Receptor	Potential for significant effect	Project phase(s)	Proposed to be scoped in/out
Designated assets	Potential for significant permanent adverse and beneficial effects from changes to setting resulting from any above ground infrastructure as well as construction activities.	Construction Operation	**Scoped in**
Non-designated assets	Potential for significant permanent adverse effects resulting from impacts derived from construction activities.	Construction	**Scoped in**
	Potential for significant permanent adverse and beneficial effects from changes to setting resulting from any above ground infrastructure as well as construction/decommissioning activities.	Construction Operation	**Scoped in**
Historic Landscape	Potential for significant effects from the removal of key features of the historic landscape during construction and decommissioning and from the presence of above ground infrastructure during operation.	Construction Operation	**Scoped in**

10. Water Environment

10.1 Introduction

10.1.1 This chapter presents how the water environment assessment will consider the potentially significant effects on water environment receptors that may arise from the construction, operation and maintenance of the Project (as described in **Chapter 4, Description of the Project**). It describes the methodology and datasets to be used within the water environment assessment, presents an overview of the baseline conditions, and identifies the potential likely significant effects to be considered within the assessment and how these will be assessed for the purpose of an Environmental Impact Assessment (EIA). As detailed in **Chapter 4, Description of the Project**, the decommissioning has been scoped out of the environmental assessment.

10.1.2 The Project Scoping Boundary is illustrated on **Figure 1.1 Project Scoping Boundary**.

10.1.3 This chapter should be read in conjunction with:

- **Chapter 4, Description of the Project**;
- **Chapter 5, EIA Approach and Methodology**;
- **Chapter 8, Ecology and Biodiversity**; and
- **Chapter 11, Geology and Hydrogeology**.

10.1.4 This chapter is supported by the following figures:

- **Figure 10.1 Water Environment Receptors and Study Area**; and
- **Figure 10.2 Floodplains and Flood Defences**.

10.1.5 The assessment of potentially significant effects on groundwater receptors is presented in **Chapter 11, Geology and Hydrogeology**.

10.1.6 The water environment assessment will be supported by a Flood Risk Assessment (FRA) and a Water Framework Directive (WFD) Screening Assessment. The scopes of these are not discussed in detail herein but will be agreed with the relevant stakeholders.

10.2 Regulatory and Planning Context

10.2.1 **Chapter 2, Regulatory and Planning Context** describes the overall regulatory and planning policy context for the Project. Key legislation, policy and planning guidance relevant to the assessment of potential effects on the water environment associated with the construction, operation and maintenance of the Project is presented below.

Legislation

10.2.2 The assessment will be undertaken in accordance with and with reference to the following legislation that is enacted to protect and manage water resources and the water environment:

- The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (Ref 10.1) consolidate, revoke and replace the Water Environment (Water Framework Directive) (England and Wales) Regulations 2003. The 2017 Regulations place a general duty on the Secretary of State (SoS), the Welsh Ministers, the Environment Agency, and Natural Resources Wales (NRW) to exercise their 'relevant functions' so as to secure compliance with the WFD (Regulation 3);
- Part 5 of the Environment Act 2021 (Ref 8.10), brings together measures to strengthen and update the existing regulatory and long-term planning framework for water, helping to reduce environmental risks, including to water quality and land drainage. It also strengthens the regulation of water and sewerage undertakers by the newly established Office for Environmental Protection; and
- The Land Drainage Act 1991 (Ref 10.2) together with the Water Resources Act 1991 (Ref 10.3) provide for the Environment Agency to prevent the obstruction of any main river through the construction of flow control structures, culverts or any other structure in a main river. Where culverting or other works have a potential to affect the flow regime on ordinary watercourses, consent is required from the Lead Local Flood Authority (LLFA) under the Flood and Water Management Act 2010 (Ref 10.4) which provides a more comprehensive flood risk management framework for people, homes and businesses.

Planning Policy

National Planning Policy

National Policy Statements

10.2.3 As detailed in **Chapter 2, Regulatory and Planning Policy Context**, National Policy Statements (NPSs) set out the primary policy tests against which the application for a Development Consent Order (DCO) for the Project would be considered. The two relevant NPSs are Overarching National Policy Statement for Energy (EN-1) (Ref 2.2) and National Policy Statement for Electricity Networks Infrastructure (EN-5) (Ref 2.3). **Table 10.1** sets out how both the current and draft NPSs (Ref 2.4 and Ref 2.5 respectively) for electricity networks infrastructure are relevant to the water environment assessment.

Table 10.1: Relevant sections of the relevant National Policy Statements

National Policy Statement	NPS section	How it will be considered
EN-1	*5.7.4 (part) "Applications for energy projects of 1 hectare or greater in Flood Zone 1 in England or Zone A in Wales and all proposals for energy projects located in Flood Zones 2 and 3 in*	An overview of baseline flood risk within the Project Scoping Boundary is described in section 10.4,

National Policy Statement	NPS section	How it will be considered
	England or Zones B and C in Wales should be accompanied by a flood risk assessment (FRA). This should identify and assess the risks of all forms of flooding to and from the project and demonstrate how these flood risks will be managed, taking climate change into account".	and the application will be supported by a FRA that will inform the project design and the findings of the Environmental Statement (ES).
EN-1	*5.7.7 "Applicants for projects which may be affected by, or may add to, flood risk should arrange pre-application discussions with the Environment Agency, and, where relevant, other bodies such as Internal Drainage Boards, sewerage undertakers, navigation authorities, highways authorities and reservoir owners and operators. Such discussions should identify the likelihood and possible extent and nature of the flood risk, help scope the FRA, and identify the information that will be required by the IPC to reach a decision on the application when it is submitted. The IPC should advise applicants to undertake these steps where they appear necessary but have not yet been addressed".*	Discussions will be held with the Environment Agency, the LLFAs and Internal Drainage Boards (IDBs) to agree the FRA scope and to request baseline flood risk data. Engagement will continue throughout the environmental impact assessment.
EN-1	*5.15.1 "Infrastructure development can have adverse effects on the water environment, including groundwater, inland surface water, transitional waters and coastal waters. During the construction, operation and decommissioning phases, it can lead to increased demand for water, involve discharges to water and cause adverse ecological effects resulting from physical modifications to the water environment. There may also be an increased risk of spills and leaks of pollutants to the water environment. These effects could lead to adverse impacts on health or on protected species and habitats (see Section 4.3 and Section 4.18) and could, in particular, result in surface waters, groundwaters or protected areas failing to meet environmental objectives established under the Water Framework Directive".*	The water environment assessment will consider the potential for likely significant effects on surface water quality, water resources and flood risk receptors during the construction, operation, and maintenance of the Project. The proposed scope of the assessment is provided in section 10.6. The assessment will be based on the current and future baseline, accounting for climate change, as presented in this chapter. Effects on protected habitats and species and groundwaters are assessed in **Chapter 8, Ecology and Biodiversity** and **Chapter 11, Geology and Hydrogeology** respectively.
EN-1	*Section 5.15.2 "Where the project is likely to have effects on the water environment, the applicant should undertake an assessment of*	Current understanding of the existing status of these aspects of the water

National Policy Statement	NPS section	How it will be considered
	the existing status of, and impacts of the proposed project on, water quality, water resources and physical characteristics of the water environment as part of the ES or equivalent. (See Section 4.2.)"	environment is presented in section 10.4. The potential for likely significant effects on water quality, water resources and the physical characteristics of the water environment is discussed in section 10.6.
EN-1	*Section 5.15.6 "The IPC should satisfy itself that a proposal has regard to the River Basin Management Plans and meets the requirements of the Water Framework Directive (including Article 4.7) and its daughter directives, including those on priority substances and groundwater. The specific objectives for particular river basins are set out in River Basin Management Plans. The IPC should also consider the interactions of the proposed project with other plans such as Water Resources Management Plans and Shoreline/Estuary Management Plans".*	Section 10.4 presents data from the relevant River Basin Management Plan, A Water Framework Directive Screening Assessment will be prepared to inform the ES, that will be informed by relevant Water Resource and Humber Estuary Management Plans.
EN-1	*Section 5.15.7 "The IPC should consider whether appropriate requirements should be attached to any development consent and/or planning obligations entered into to mitigate adverse effects on the water environment".*	Measures to mitigate adverse effects on the water environment are described in section 10.5. These will be further developed throughout the EIA process and secured within the application.
EN-1 (Draft)	*5.8.13 "A site-specific flood risk assessment should be provided for all energy projects in Flood Zones 2 and 3 in England or Zones B and C in Wales. In Flood Zone 1 in England or Zone A in Wales, an assessment should accompany all proposals involving:* *• sites of 1 hectare or more* *• land which has been identified by the Environment Agency or NRW as having critical drainage problems* *• land identified (for example in a local authority strategic flood risk assessment) as being at increased flood risk in future* *• land that may be subject to other sources of flooding (for example surface water)* *• where the Environment Agency or NRW, Lead Local Flood Authority, Internal Drainage Board or other body have indicated that there may be drainage problems".*	An FRA will be prepared in accordance with a scope agreed with the Environment Agency, LLFAs and IDBs, and informed by data provided by these flood risk management authorities.

National Policy Statement	NPS section	How it will be considered
EN-1 (Draft)	*5.8.14 "This assessment should identify and assess the risks of all forms of flooding to and from the project and demonstrate how these flood risks will be managed, taking climate change into account".*	The FRA will assess all applicable sources of flooding to and arising from the Project and identify any mitigation measures required to ensure flood resilience, taking climate change into account, and to prevent any off-site impacts.
EN-1 (Draft)	*Section 5.16.14 "The Secretary of State should be satisfied that a proposal has regard to current River Basin Management Plans and meets the requirements of the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (including regulation 19). The specific objectives for particular river basins are set out in River Basin Management Plans. The Secretary of State must refuse development consent where a project is likely to cause deterioration of a water body or its failure to achieve good status or good potential, unless the requirements set out in Regulation 19 are met. A project may be approved in the absence of a qualifying Overriding Public Interest test only if there is sufficient certainty that it will not cause deterioration or compromise the achievement of good status or good potential".*	The Project will prepare a Water Framework Directive Screening Assessment with reference to the relevant River Basin Management Plan. The assessment will appraise the potential for the Project to cause waterbody status deterioration or limit future achievement of good status/potential and will describe measures to avoid or reduce these risks.
EN-5	*2.4.1 "Applicants should set out to what extent the proposed development is expected to be vulnerable, and, as appropriate, how it would be resilient to: flooding, particularly for substations that are vital for the electricity transmission and distribution network; effects of wind and storms on overhead lines; higher average temperatures leading to increased transmission losses; and earth movement or subsidence caused by flooding or drought (for underground cables)".*	A FRA will be prepared that assesses all applicable sources of flooding to the Project and identifies any mitigation measures required to ensure flood resilience, taking climate change into account.
EN-5	*2.6.2 "Section 4.9 of EN-1 advises that the resilience of the project to the effects of climate change should be assessed in the Environmental Statement (ES) accompanying an application. For example, future increased risk of flooding would be covered in any flood risk assessment (see Section 5.8 in EN-1)".*	As noted above, the FRA prepared for the Project will examine future flood risk over the development lifetime, and identify mitigation measures required to ensure flood resilience, taking climate change into account.

National Policy Statement	NPS section	How it will be considered
EN-5 (Draft)	There are no new or materially different policy considerations for the water environment within the Draft EN-5, when compared to the current EN-5.	N/A

National Planning Policy Framework

10.2.4 The assessment will be undertaken in accordance with and with reference to the National Planning Policy Framework (Ref 2.6) and its accompanying Flood Risk and Coastal Change; and Water Quality and Supply planning practice guidance.

10.2.5 In particular, the Flood Risk and Coastal Change guidance provides recommended allowances for climate change effects on future peak river flows, sea levels and rainfall intensities. These allowances will be taken forward to the FRA.

Local Planning Policy

10.2.6 The Project lies within the jurisdiction of East Riding of Yorkshire, North Lincolnshire and Bassetlaw District (Nottinghamshire). A summary of the local planning policy and emerging policy which is relevant to a study of water environment matters and will inform the water environment assessment is provided in **Table 10.2**.

Table 10.2: Relevant Local Planning Policies

Local Plan	Policy ref	Policy context	How it will be considered
East Riding Local Plan 2012-2029 Strategy Document, Adopted 2016 (Ref 2.7)	ENV6	Environmental hazards, such as flood risk, coastal change, and pollution, will be managed to ensure that development does not result in unacceptable consequences to its users, the wider community, and the environment.	These environmental hazards are included within the scope of the water environment assessment, described in section 10.6. Mitigation measures (described in section 10.5) will be secured to avoid unacceptable effects.
North Lincolnshire Local Development Framework – Core Strategy (2011) (Ref 2.11)	CS18	Promotes development that utilises natural resources as efficiently and sustainably as possible, e.g. utilising Sustainable Drainage Systems (SuDs) and meeting water use efficiency standards.	The Project will secure SuDS based drainage design for operational infrastructure and will set out good practice for water use efficiency during construction (see section 10.5).

Local Plan	Policy ref	Policy context	How it will be considered
	CS19	Promotes development that avoids areas of current or future flood risk, and which does not increase the risk of flooding elsewhere.	These aspects will be covered within the FRA that will be produced to inform Project design and the ES assessment.
Nottinghamshire County Council Minerals Local Plan, Adopted 2021 (Ref 2.18)	SP3	Advocates development avoiding areas of vulnerability to climate change and flood risk. Where avoidance is not possible, impacts should be fully mitigated.	An FRA will be produced to inform Project design and the ES assessment, and the Project will secure mitigation measures to manage flood risk impacts.
Bassetlaw District Local Development Framework – Core Strategy and Development Management Policies DPD (2011) (Ref 2.15)	DM12	Site specific Flood Risk Assessments will be required for all developments in flood risk areas, even where flood defences exist. All new development will be required to incorporate SuDS and provide details of adoption, ongoing maintenance and management.	An FRA will be produced to inform Project design and the ES assessment, and the Project will secure SuDS based drainage design for operational infrastructure.

Consultation and Engagement

10.2.7 The environmental assessment will be informed by consultation and engagement with stakeholders, including East Riding of Yorkshire Council, North Lincolnshire Council, Bassetlaw District Council, Nottinghamshire County Council, Environment Agency, Lead Local Flood Authorities (LLFA), and Internal Drainage Boards.

10.3 Study Area

10.3.1 The study area for the water environment assessment is proposed to include all land within the Scoping Boundary, and in addition, a buffer of 500 m from this boundary. The study area, illustrated in **Figure 10.1 Water Environment Receptors and Study Area**, is considered appropriate based on technical knowledge of similar schemes and has been set following consideration of the distance over which likely significant effects can reasonably be expected to occur.

10.3.2 The FRA that will be prepared to inform the EIA may cover a larger study area where necessary, for example assessing the potential for changes to baseline flood risk at the local catchment scale or within a floodplain cell which may cover areas up to several km^2. The Water Framework Directive Screening Assessment will include a study area that is set at the water body scale and include all those WFD waterbodies with the potential to be affected.

10.4 Baseline Conditions

Data Sources

10.4.1 The known or predicated current and future baseline environment described in this section has been informed by the following data sources:

- Statutory Main River map for England (Ref 10.5);
- Catchment data explorer database (Ref 10.6) of Cycle 2 and 3 Water Framework Directive information;
- Flood Map for Planning (Ref 10.7);
- Magic Maps (Ref 8.21).

10.4.2 In addition, data requests have been made to the Environment Agency, LLFAs and IDBs to provide information on the following to support the future assessment:

- baseline flood risk data, including available modelled flood data for main rivers, and local flood risk data from commissioned studies; and
- data on consented discharges to surface waters and licenced and exempted (private) abstractions from surface waters.

10.4.3 All of the further information received from stakeholders will be incorporated into future stages of the assessment.

Baseline

Surface water features

10.4.4 The study area crosses the catchment of numerous watercourses and is located within the Humber River Basin District (RBD). Key Environment Agency main rivers that are regionally important include the River Thorne, the North and South Soak Drains, and the River Idle. These watercourses all drain to the Humber Estuary via the River Trent. The River Ouse is also within the study area and drains to the Humber Estuary, which is tidally dominated. These water features have several attributes that could be affected, including water quality and flow conveyance. They also support several services, including water supply, receipt and dilution of wastewater discharges, navigation and amenity.

10.4.5 Many small watercourses and drainage ditches, that function at a local scale, are located throughout the study area. In specific areas these features are managed to facilitate land drainage and control flood risk. The Scoping Boundary also crosses the Chesterfield Canal.

10.4.6 Other water features within the study area include numerous ponds and other waterbodies. Sites designated for their nature conservation interest, where surface water plays a role in sustaining the designated interest features, are also important receptors. Assessments of effects on such sites would be undertaken in collaboration with ecology and groundwater specialists.

10.4.7 These features of the water environment are illustrated in **Figure 10.1 Water Environment Receptors and Study Area**.

Water quality and water interests

10.4.8 Within the Humber RBD the study area passes through several management catchments and four operational catchments: Trent and Trib, Isle of Axholme, Foulness and Hull Lower. Waterbodies within these operational catchments current generally achieve moderate ecological status and many have heavily modified hydromorphological designations. Reasons for not achieving good status are shared by many of the waterbodies and include pollution from rural areas and from wastewater discharges. Biological quality and poor physico-chemical quality are also limiting factors to good ecological status. The waterbodies generally share a chemical status of 'fail' due to exceedance of priority hazardous substances, in particular mercury and its compounds, as well as Polybrominated diphenyl ethers (PBDE).

10.4.9 Many of the watercourses within the Humber RBD receive discharges of wastewater, for example from sewage treatment works, and several support abstractions, for example, to supply agriculture water uses. Further details of consented discharges to surface waters and licenced and private surface water abstractions will be collected to inform the PEIR and ES assessments. The study area is not located within a Drinking Water Safeguard Zone (surface water).

Flood risk and land drainage

10.4.10 Based on the online Flood Maps (Ref 10.7) large parts of the northern and central sections of the study area are at high risk of flooding, the Project Scoping Boundary crossing large extents of fluvial and coastal floodplain (initially defined by the extents of Environment Agency Flood Zone 2 in Flood Zone 3), as shown on **Figure 10.2 Floodplains and Flood Defences**.

10.4.11 In some areas, flood defences, in the form of natural high ground and engineered embankments, provide protection against routine inundation of the land.

10.4.12 Given the rural land use in the majority of the study area, the land drainage regime is governed by the topography and the permeability of underlying soils and geology. Formal drainage systems include those serving existing roads and areas of urban development. Agricultural land is also expected to be served by piped and open drainage systems.

Hydromorphology

10.4.13 Many of the watercourses in the study area have been subject to modifications for the purposes of land drainage and flood defence and have hydromorphological designations as 'Heavily Modified' waterbodies (HMWB). The ordinary watercourses in the study area, particularly those within IDB districts, also serve a land drainage function and have a relatively low hydromorphological diversity.

Future Baseline

10.4.14 The future baseline relates to known or anticipated changes to the current baseline in the future which should be assessed as part of the project.

10.4.15 With regard to flood risk and land drainage, future baseline conditions would be forecast, drawing on current best practice guidelines (Ref 10.8) taking into account the likely impacts of climate change on rainfall intensities, and where applicable peak river flows and sea level rise. These future conditions would be considered to factor in climate change resilience into the Project design.

10.4.16 It is expected that the WFD legislation will drive future improvements in the ecological and chemical quality of water bodies. The effects of the implementation of future cycles of river basin management plans would therefore also be considered when assigning value to hydrology and land drainage resources.

10.4.17 The effects of known future development that share the same hydrological catchments as the study area would also be considered, in terms of the potential for these developments to impact on the status of water receptors.

10.5 Embedded and Control and Management Measures

Embedded Measures

10.5.1 The Project has been routed to avoid designated sites and sensitive receptors as far as possible. This includes avoiding international sites designated for nature conservation, including those with a supporting water interest, avoiding as far as practicable reservoirs and large ponds, minimising disruption to small watercourses and ditches, and where necessary crossing rivers and their floodplains at the narrowest point to reduce changes to hydromorphology. Further embedded design measures would be developed as the Project design evolves.

Control and Management Measures

10.5.2 An Outline Code of Construction (CoCP) is provided in **Appendix 4.A Outline Code of Construction Practice**. Measures relevant to the control and management of impacts that could affect the water environment are:

- GG04: The Construction Environmental Management Plan shall include measures to manage dust, waste, water, noise, vibration and soil during construction. The contractor(s) shall undertake daily site inspections to check conformance to the Management Plans.
- GG06: Construction workers will undergo training to increase their awareness of environmental issues as applicable to their role on the project. Topics will include but not be limited to….pollution prevention and pollution incident response and flood risk response actions.
- GG08: Land used temporarily will be reinstated where practicable to its pre-construction condition and use. Hedgerows, fences and walls (including associated earthworks and boundary features) will be reinstated to a similar style and quality to those that were removed, unless otherwise agreed.
- GG15: Fuels, oils and chemicals will be stored responsibly, away from sensitive water receptors. Where practicable, they will be stored >15 m from watercourses, ponds and groundwater dependent terrestrial ecosystems. Where it is not practicable to maintain a >15 m distance, additional measures will be identified. All refuelling, oiling and greasing of construction plant and equipment will take place above drip trays and also away from drains as far as is reasonably practicable. Vehicles and plant will not be left unattended during refuelling. Appropriate spill kits will be made easily accessible for these activities. Potentially hazardous materials used during construction will be safely and securely stored including use of secondary containment where appropriate. Stored flammable liquids such as diesel will be protected either by double walled tanks or stored in a bunded area with a capacity of 110% of the maximum stored volume. Spill kits will be located nearby.

- GG16: Runoff across the site will be controlled through a variety of methods including header drains, buffer zones around watercourses, on-site ditches, silt traps and bunding. There will be no intentional discharge of site runoff to ditches, watercourses, drains or sewers without appropriate treatment and agreement of the appropriate authority (except in the case of an emergency).
- GG17: Wash down of vehicles and equipment will take place in designated areas within construction compounds. Wash water will be prevented from passing untreated into watercourses and groundwater. Appropriate measures will include use of sediment traps.
- GG23: An Emergency Action Plan will be developed for the construction phase which will outline procedures to be implemented in case of unplanned events, including but not limited to site flooding and pollution incidents.
- W01: All works within main rivers or ordinary watercourses will be in accordance with a method approved under environmental permits issued under the Environmental Permitting Regulations or the protective provisions of the DCO for the benefit of the Environment Agency and the Lead Local Flood Authorities.
- W02: For open cut watercourse crossings and installation of vehicle crossing points, good practice measures will include but not be limited to, where practicable:
  - reducing the working width for open cut crossings of a main or ordinary watercourse whilst still providing safe working;
  - installation of a pollution boom downstream of open cut works;
  - the use and maintenance of temporary lagoons, tanks, bunds, silt fences or silt screens as required;
  - have spill kits and straw bales readily available at all crossing points for downstream emergency use in the event of a pollution incident;
  - the use of all static plant such as pumps in appropriately sized spill trays;
  - prevent refuelling of any plant or vehicle within 15 m of a watercourse;
  - prevent storing of soil stockpiles within 15 m of a main river;
  - inspect all plant prior to work adjacent to watercourses for leaks of fuel or hydraulic fluids; and
  - reinstating the riparian vegetation and natural bed of the watercourse, using the material removed when appropriate, on completion of the works and compacting as necessary. If additional material is required, appropriately sized material of similar composition will be used.
- W03: Riverbank and in-channel vegetation will be retained where not directly affected by installation works. Natural substrate will be provided through temporary watercourse crossings box culverts.
- W04: Where watercourses are to be crossed by construction traffic, measures to be applied include the use of temporary culverts or temporary spanned bridges. Once the temporary culvert is installed, the area above the temporary culvert will be backfilled and construction mats placed over the backfilled area to permit the passage of plant, equipment, materials and people. Temporary culverts will be sized to reflect the span width and the estimated flow characteristics of the watercourse under peak flow conditions and kept free from debris. Where used, temporary

bridges will be designed specifically to consider the span length and the weight and size of plant and equipment that will cross the bridge.

- W06: Where new or additional surfacing is required on any access tracks and compound areas, these will be permeable surfaces where ground conditions allow. The project will incorporate appropriate surface water drainage measures into its final design for the any access tracks so that they do not lead to a significant increase in flood risk. Temporary haul routes within Flood Zone 3 and areas of high and medium risk of flooding from surface water will be removed at the end of the construction phase and the ground surface will be reinstated to pre-project levels.
- W07: The contractor(s) will subscribe to the Environment Agency's Floodline service, which provides advance warning of potential local flooding events, and subscribe to the Met Office's Weather Warnings email alerts system and any other relevant flood warning information. The contractor(s) will implement a suitable flood risk action plan, which will include appropriate evacuation procedures should a flood occur or be forecast.
- W10: severance of existing land drainage routes, including agricultural field drainage systems would be managed during construction through provision of temporary alternative drainage routes, and these drainage systems would be permanently reinstated to ensure their existing function is maintained.

10.6 Potential for Significant Effects

10.6.1 The water environment assessment will consider the construction, operation, and maintenance of the Project. Details of each of these stages are set out in **Chapter 4, Description of the Project.**

10.6.2 The proposed scope of the water environment assessment is set out below and has been determined using the approach described in **Chapter 5, EIA Approach and Methodology.**

10.6.3 The potential for the Project to result in the likely significant effects identified in **Table 10.3** takes into account the embedded and control and management measures described in section 5.

Sources and Impacts (Step 1)

10.6.4 This section identifies the sources and impacts that would occur as a result of the construction, operation and maintenance of the Project.

Potential sources of impacts

Sources of construction impacts

- Construction activities as detailed in **Chapter 4, Description of the Project**, section 4.3
  - Soil stripping, earthworks and excavations.
  - Use and refuelling of plant and vehicles.
  - Watercourse crossings for access and underground cables (trenched).

- Watercourse crossings for potential underground cables (trenchless).
- Temporary works e.g. spoil storage, on the floodplain.

Sources of operational impacts

- Operational runoff from any impermeable surfaces, such as cable sealing end compounds (CSECs).
- Loss of floodplain storage/disruption of flow paths.

Sources of maintenance impacts

- Use of machinery and vehicles for non-intrusive inspections and localised repairs.

Potential impacts

10.6.5 The control and management measures, described in section 10.5, would reduce the risk of pollution of the water environment during construction by removing pathways between sources and receptors for many construction activities. However, potential for specific construction works to cause localised and temporary pollution effects would remain.

10.6.6 At open cut (trenched) watercourse crossings there would be temporary physical disturbance and temporary changes to watercourse flow regimes may also occur, for example, where over pumping is required during construction of any underground cable section, and access route watercourse crossings. Impacts would range in duration, but access crossings may be in place in some locations for several months. Whilst crossing watercourses via trenchless techniques reduces physical disturbance and flow regime effects, the technique is not entirely without pollution risk, which is associated with the potential for break out of drilling muds. Trenchless techniques also have a water demand.

10.6.7 During construction there would be potential for impacts on land drainage regimes and associated surface water flood risk, due to changes in land surface permeabilities or local topography, for example where vegetation cover is stripped and earthworks are undertaken, or where there is disruption to or severance of existing land drainage infrastructure.

10.6.8 At work sites located in the floodplain there would be potential for localised impacts associated with storage of spoil reducing available floodplain storage or interrupting key floodplain flow paths.

10.6.9 Effects on springs and groundwater resources are addressed in **Chapter 11, Geology and Hydrogeology.**

10.6.10 Land within the construction working width would be reinstated following completion of the construction works.

10.6.11 There would be no operational discharges to surface watercourses and rainfall runoff from the CSECs would be sustainably attenuated (and if required treated) prior to discharge to the receiving water environment. Physio-chemical elements supporting WFD waterbody status would therefore be safeguarded. No likely significant effects are therefore anticipated in relation to water quality, and it is proposed that water quality effects during operation of the Project are scoped out of the assessment.

10.6.12 Given the nature of the Project, there would be no permanent impacts on watercourse flow regimes or floodplains. There would be no new consumptive water uses, and the water quality of water receptors would not be degraded. Therefore, the potential for likely

significant effects on existing water interests (surface water abstractions and discharges) and hydromorphology is negligible.

10.6.13 Regarding flood risk and land drainage, situating pylons and CSECs at a minimum 9 m set back distance from the banks of watercourses, where practicable, avoiding the floodplains of watercourses and incorporating appropriate post construction surface water management and land drainage systems would result in negligible effects.

10.6.14 Maintenance activities would generally be limited to non-intrusive inspections. Where repairs are necessary, the activities involved would be similar to those for construction albeit over a much smaller area and scale. Maintenance would be undertaken in line with the Applicant's operational management procedures and given the nature of the Project; maintenance activities are considered to pose a low risk of causing likely significant effects on water environment receptors. It is proposed that all maintenance effects are scoped out.

10.6.15 **Table 10.3** identifies the potential impacts that could result from the sources identified above.

10.6.16 Where **Table 10.3** identifies the potential for an impact to result in a significant effect, the impact is taken through to Step 2. Where **Table 10.3** identifies no potential for an impact to result in a significant effect, that impact is proposed to be scoped out.

Table 10.3: Impacts and the potential for significant effects

Project phase	Source	Impact	Potential for significant effects
Construction	Soil stripping, earthworks and excavations, use and refuelling of plant.	Pollution from silt, hydrocarbons and other construction materials.	No – measures outlined in section 10.5 would act to manage work site runoff to ensure watercourses are not polluted, nor their flow capacities reduced, and the function of existing land drainage routes and systems are retained.
		Increased rates and volumes of rainfall runoff, reduced channel flow capacity due to siltation and disruption to the land drainage regime.	
	Watercourse crossings for access and potential underground cables (trenched).	Physical disturbance and change to flow regime.	**Yes** – the Project will cross numerous watercourses, with potential for temporary physical disturbance and impacts on flow regimes.

Project phase	Source	Impact	Potential for significant effects
	Watercourse crossing for potential underground cables (trenchless).	Pollution risks (bentonite breakout) and water consumption.	**Yes** – the Project has the potential to cross some watercourses using trenchless techniques, so this impact is scoped in for future assessment.
	Temporary works, e.g. spoil storage, in the floodplain.	Increased flood risk to people, existing property and infrastructure.	**Yes** – due to the large swathes of floodplain within the study area, temporary works in floodplain cannot be avoided.
Operation	Operational runoff from impermeable surfaces, such as CSECs.	Increased surface water flood risk.	No – measures outlined in section 10.5 would act to sustainably manage operation drainage from CSECs to prevent increases in surface water flood risk.
	Loss of floodplain storage/disruption to flow paths	Increased flood risk from rivers.	No – nature and footprint of operational above ground infrastructure (pylons and CSECs) would not cause significant floodplain storage losses or disruption to floodplain flow paths.
Maintenance	Use of machinery and vehicles for non-intrusive inspections and localised repairs.	Pollution of watercourses and physical disturbance.	No – the nature and scale of the maintenance activities would not cause pollution of the water environment and any physical disturbance would be highly localised.

Impact Pathways with Receptors (Step 2)

10.6.17 This section identifies whether there are any impact pathways from the impacts identified above that could give rise to potentially significant effects on receptors identified within the study area.

10.6.18 **Table 10.4** provides a summary of the impact pathways identified and those proposed to be scoped into and or out of the water environment assessment for the Project.

Table 10.4: Impact pathways with receptors

Project Phase	Impact	Receptor	Potential for significant effects	Proposed to be scoped in/out
Construction	Physical disturbance and change to flow regime.	Main rivers and ordinary watercourses, existing water interests.	**Yes** – the Project will cross numerous watercourses, with potential for temporary physical disturbance	**Scoped in**

Project Phase	Impact	Receptor	Potential for significant effects	Proposed to be scoped in/out
			and impacts on flow regimes.	
	Pollution risks (bentonite breakout) and water consumption.	Main rivers and existing water interests.	**Yes** – the Project is likely to cross some watercourses using trenchless techniques, so this impact is scoped in for future assessment	**Scoped in**
	Increased flood risk.	People, existing property, and infrastructure	**Yes** – due to the large swathes of floodplain within the study area, temporary works in floodplain cannot be avoided.	**Scoped in**

10.7 Proposed Assessment Methodology

Proposed Data Sources

10.7.1 In addition to the data sources used to inform this Scoping Report (section 10.4), the following data sources are proposed to be used to inform the water environment assessment:

- long term flood risk map for England (Ref 10.9);
- data from Environment Agency flood models;
- drainage and flood data from Local Authority Surface Water Management Plans and Strategic Flood Risk Assessments;
- land drainage data and information from relevant IDBs;
- Humber River Basin Management Plan (Ref 10.10);
- Humber 2100+ Strategy (Ref 10.11); and
- data defining surface water catchment areas and hydrological properties (e.g. rainfall, slopes, and soil permeability) from the Flood Estimation Handbook webservice (CEH, 2008).

Technical Guidance

10.7.2 The assessment will be carried out in accordance with the following good practice and guidance documents:

- Planning Inspectorate Advice Note 18: The Water Framework Directive;
- National Highways Design Manual for Roads and Bridges LA113;
- Local flood risk management guidelines published by the LLFAs (various dates);

- Construction Industry Research and Information Association (CIRIA) publications (various dates); and
- Guidance for Pollution Prevention series.

Proposed Assessment Methodology

10.7.3 The following section summarises the methodology proposed to be used for the assessment which builds on the general assessment methodology presented in **Chapter 5, EIA Approach and Methodology.**

10.7.4 The assessment will be based on guidance set out in LA113 from the Design Manual for Roads and Bridges (DMRB) (Ref 10.12). Whilst primarily intended for use in assessing the impacts of highways projects on the water environment, the methodology is widely accepted as suitable for assessing the effects of other types of linear infrastructure. This promotes assessment that is proportionate to the scale and nature of the proposals and that considers the sensitivity of the local water environment to change.

10.7.5 Given the size of the Project and the presence of areas of Flood Zone 3 within the study area, an FRA of the Project will be produced in accordance with the requirements of the Energy National Policy Statement EN-1 and EN-5 and local flood risk management guidelines published by the LLFAs. The FRA will consider flood risk from all relevant sources during both construction and operation, incorporating allowance for climate change in accordance with published guidance where applicable (Ref 10.13). It will also include details of the measures proposed to adhere to local drainage and flood risk planning policies. A WFD Screening Assessment will also be produced for the Project guided by Planning Inspectorate Advice Note 18: The Water Framework Directive (Ref 10.1). The effects of the Project on the Humber River Basin Management Plan (Ref 10.10) and the waterbodies therein will be described, and the assessment will set out how the Project design has been developed to align with the requirements of the Regulations. A qualitative approach is proposed, and the assessment will identify how the Project design will avoid waterbody deterioration, as well as any other mitigation necessary.

Sensitivity

10.7.6 The method set out in the DMRB provides guidance on assigning value (sensitivity) to receptors (for example watercourses and floodplains) **Table 10.5** presents the receptor value criteria.

Table 10.5 Criteria for assigning value (sensitivity) to water environment receptors

Value of resource or receptor	Criteria	Typical examples
Very high	Nationally significant attribute of high importance	Site protected/designated under European Commission (EC) or UK legislation (Special Area of Conservation, Special Protection Area, Site of Special Scientific Interest, Ramsar site). Watercourse having a Water Framework Directive (WFD) classification shown in a River Basin Management Plan (RBMP) and a Q95 > 1.0 m^3/s. Watercourse in natural equilibrium exhibiting a range of morphological features (e.g. pools,

Value of resource or receptor	Criteria	Typical examples
		riffles) that is free from any modification or human influence. Essential infrastructure or highly vulnerable development.
High	Locally significant attribute of high importance	Watercourse having a WFD classification shown in a RBMP and a Q95 <1.0 m^3/s. Very limited signs of modification or other human influences on morphology. More vulnerable development.
Medium	Of moderate quality and rarity	Watercourses not having a WFD classification shown in a RBMP and Q95 > 0.001 m^3/s. Watercourse showing signs of modifications and having a limited range of morphological features. Less vulnerable development.
Low	Lower quality, common place	Watercourses not having a WFD classification in a RBMP and a Q95 flow <0.001 m^3/s. A highly modified watercourse, changed by human pressures. No morphological diversity. Water compatible development.

Magnitude

10.7.7 The method also provides criteria for assigning impact magnitude. The criteria consider the scale/extent of the predicted change and the nature and duration of the impact and are summarised in **Table 10.6**.

Table 10.6 Criteria for assigning impact magnitude

Magnitude of impact*	Criteria	Typical examples
Large adverse	Results in loss of attribute and/or quality and integrity of the attribute	Loss or extensive change to a fishery. Loss or extensive change to a designated nature conservation site. Reduction in waterbody WFD classification. Pollution of a public water supply or loss of a major commercial/industrial/agricultural supply. Extensive change to channel planform, replacement of large extent of natural bed/bans with artificial material. Increase in peak flood level (1% annual exceedance probability) of >100 mm.
Medium adverse	Results in effect on integrity of	Partial loss in productivity if a fishery. Pollution of a non-potential source of abstraction.

Magnitude of impact*	Criteria	Typical examples
	attribute, or loss of part of attribute	Contribution to reduction in waterbody WFD classification. Degradation (quality or reliability) of a potable, commercial or agricultural water supply. Replacement of natural bed material or banks with artificial material over more than 3% of the water body's total length. Increase in peak flood level (1% annual exceedance probability) of >50 mm.
Small adverse	Results in some measurable change in attribute quality or vulnerability	Minor effects on water supplies. Slight change from baseline conditions of channel bed/banks. Increase in peak flood level >10 mm.
Negligible	Results in effect on attribute of insufficient magnitude to affect the use or integrity	Negligible change in peak flood level (<10 mm). No measurable impact on WFD waterbodies or river channel planform.
Small beneficial	Results in some positive effect on an attribute or a reduced risk of negative effect occurring	Creation of flood storage and reduction in peak flood level (1% AEP) >10 mm.
Medium beneficial	Results in moderate improvement of attribute quality	Contribution to improvement waterbody WFD classification. Improvements to morphological diversity at the local scale. Creation of flood storage and reduction in peak flood level (1% AEP) >50 mm.
Large beneficial	Results in major improvement of attribute quality	Removal of existing polluting discharge or removing likelihood of polluting discharges to a watercourse. Major improvement to morphological diversity at reach scale e.g. through culvert removal. Improvement in waterbody WFD classification. Creation of flood storage and reduction in peak flood level (1% AEP) >100 mm.
No change	No change, either beneficial or detrimental, to attribute quality	

*Terminology has been adapted from that used in LA113, DMRB (National Highways, 2020)

Significance of effects

10.7.8 The significance of an effect is then derived using the matrix set out in **Chapter 5, EIA Approach and Methodology.**

Limitations of assessment

10.7.9 To ensure transparency within the assessment, the following limitations and assumptions have been identified:

- it is assumed there is sufficient data from the Environment Agency, LLFAs and IDBs to inform a site-specific FRA and that no new flood risk models will need to be developed;
- it is assumed there is sufficient data from the Environment Agency to define the current condition and standards of protection provided by existing flood defences, and that no baseline condition surveys will be required; and
- no water quality sampling and analysis is proposed as it is considered that sufficient baseline data is available to generally characterise the water quality of surface water receptors.

10.8 Conclusion

Summary

10.8.1 Water environment receptors within the Project Scoping Boundary include the several, regionally important, main rivers including the River Ouse and tributaries of the River Trent, which all drain to the tidally dominated Humber estuary. These watercourses generally share Water Framework Directive moderate ecological status and fail with regard to chemical status. Within the Project Scoping Boundary and study area there are extensive floodplains, many of which are defended. Higher risk project activities include watercourse crossings for access and in underground cable sections of the Project and disruption to the land drainage regime and risk of pollution associated with soil stripping, earthworks and excavations. However, a suite of embedded, control and management measures, secured through the DCO, would prevent or reduce source pathway linkages and control and manage effects on water quality, hydromorphology and flood risk and drainage.

Proposed Scope of the Assessment

10.8.2 A summary of the proposed scope of the assessment is provided in **Table 10.7**.

Table 10.7: Proposed scope of the assessment

Receptor	Potential for significant effect	Project phase(s)	Proposed to be scoped in/out
Watercourses and water bodies, existing water interest	Pollution from silt, hydrocarbons and other construction materials. Increased rates and volumes of rainfall runoff, reduced channel	Construction	Scoped out

Receptor	Potential for significant effect	Project phase(s)	Proposed to be scoped in/out
	flow capacity due to siltation and disruption to the land drainage regime.		
Watercourses and water bodies, existing water interest	Pollution and changes to flow regime at trenched (open cut) watercourse crossings	Construction	Scoped in
Watercourses and water bodies, existing water interest	Pollution and water consumption at trenchless watercourse crossings	Construction	Scoped in
Floodplains, landowners and infrastructure	Loss of floodplain storage and changes in floodplain flow conveyance routes.	Construction	Scoped in
		Operation	Scoped out
	Increased rates and volumes of rainfall runoff, disruption to the land drainage regime.	Operation	Scoped out
Watercourses and water bodies, existing water interest	Pollution of watercourses and physical disturbance	Maintenance	Scoped out

11. Geology and Hydrogeology

11.1 Introduction

11.1.1 This chapter presents how the geology and hydrogeology assessment will consider the potentially significant effects on land contamination, designated geological sites, minerals, groundwater and land instability receptors that may arise from the construction, operation, and maintenance of the Project (as described in **Chapter 4, Description of the Project**). It describes the methodology and datasets to be used within the geology and hydrogeology assessment, presents an overview of the baseline conditions, and identifies the potential likely significant effects to be considered within the assessment, and how these will be assessed for the purpose of an Environmental Impact Assessment (EIA). As detailed in **Chapter 4, Description of the Project**, the decommissioning has been scoped out of the environmental assessment.

11.1.2 The Project Scoping Boundary is illustrated on **Figure 1.1 Project Scoping Boundary**.

11.1.3 This chapter should be read in conjunction with:

- **Chapter 4, Description of the Project**;
- **Chapter 5, EIA Approach and Methodology**; and
- **Chapter 10, Water Environment**.

11.1.4 This chapter is supported by the following figures and appendices:

- **Figure 11.1 Superficial Geology**;
- **Figure 11.2 Bedrock Geology**;
- **Figure 11.3 Source Protection Zones**;
- **Figure 11.4 Mineral Reserves and Infrastructure**;
- **Figure 11.5 Potentially Contaminative Land Uses**;
- **Appendix 11.A Preliminary Contamination Risk Assessment**; and
- **Appendix 11.B Preliminary Qualitative Minerals Resource Assessment**.

11.1.5 The assessment of effects on surface water and groundwater in terms of the Water Framework Directive (WFD) are considered in **Chapter 10, Water Environment**.

11.1.6 Ecological aspects including potential significant effects on Groundwater Dependant Terrestrial Ecosystems (GWDTE) are considered in **Chapter 8, Ecology and Biodiversity**. However, this chapter will identify where ground conditions and/or groundwater within the Scoping Boundary may impact the groundwater supporting these ecosystems in relation to groundwater quality, levels and flow.

11.1.7 Effects on agricultural soil resources and soil quality are considered within **Chapter 12, Agriculture and Soils**.

11.1.8 For geology, the assessment will include potential effects relating to geologically designated sites, mineral resources, and ground conditions (contamination and instability).

11.1.9 For hydrogeology the assessment will include potential effects relating to changes in groundwater levels or flow, or potential effects relating to contamination and changes in quality.

11.2 Regulatory and Planning Context

11.2.1 **Chapter 2, Regulatory and Planning Context** describes the overall regulatory and planning policy context for the Project. Key legislation, policy and planning guidance relevant to the assessment of potential effects on geology and hydrogeology associated with the construction, operation, and maintenance of the Project is presented below.

Legislation

11.2.2 Legislation relevant to the geology and hydrogeology assessment is listed below:

- Environmental Protection Act (1990) (Ref 11.1) and associated statutory guidance on contaminated land (Contaminated Land Statutory Guidance, 2012) (Ref 11.2);
- The Contaminated Land (England) Regulations (2006) (Ref 11.3) as amended by The Contaminated Land (England) (Amendment) Regulations (2012) (Ref 11.4);
- Environmental Damage (Prevention and Remediation) Regulations (2015) (Ref 11.5);
- Environmental Permitting (England and Wales) Regulations (2016) (Ref 11.6);
- Landfill Directive (Ref 11.7);
- Water Resources Act (1991) (Ref 11.8);
- The Water Environment (Water Framework Directive) Regulations (2017) (Ref 11.9);
- The Water Supply (Water Quality) Regulations (2016) (Ref 11.10); and
- Environment Agency (EA) Groundwater Position Statements (2018) (Ref 11.11).

Planning Policy

National Planning Policy

National Policy Statements

11.2.3 As detailed in **Chapter 2, Regulatory and Planning Policy Context**, National Policy Statements (NPSs) set out the primary policy tests against which the application for a Development Consent Order (DCO) for the Project would be considered. The two relevant NPSs are Overarching National Policy Statement for Energy (EN-1) and National Policy Statement for Electricity Networks Infrastructure (EN-5). **Table 11.1** sets out how both the current and draft NPSs relevant to electricity networks infrastructure are relevant to the geology and hydrogeology assessment.

Table 11.1: Relevant sections of the relevant National Policy Statements

National Policy Statement	NPS section	How it will be considered
EN-1	*5.3.3 (part) "Where the development is subject to EIA the applicant should ensure that the ES clearly sets out any effects on internationally, nationally and locally designated sites of … geological conservation importance".*	Sites designated for their geological conservation importance have been identified within section 11.4 of this chapter and any potential for adverse effects on these features has been assessed.
EN-1	*5.3.4 "The applicant should show how the Project has taken advantage of opportunities to conserve and enhance geological conservation interests".*	Sites designated for their geological conservation importance are identified within section 11.4 of this chapter and any potential for significant effects on these features has been assessed.
EN-1	*5.3.7 "As a general principle, and subject to the specific policies below, development should aim to avoid significant harm to biodiversity and geological conservation interests, including through mitigation and consideration of reasonable alternatives (as set out in Section 4.4 above); where significant harm cannot be avoided, then appropriate compensation measures should be sought".*	Sites designated for their geological conservation importance have been identified within section 11.4 of this chapter and any potential for significant effects on these features has been assessed.
EN-1	*5.10.8 (part) "For developments on previously developed land, applicants should ensure that they have considered the risk posed by land contamination".*	Potential sources of contamination have been identified within section 11.4 of this chapter and the potential effects of these identified. A preliminary Contamination Risk Assessment supports the baseline (**Appendix 11A Preliminary Contamination Risk Assessment**)
EN-1	*5.10.9 "Applicants should safeguard any mineral resources on the proposed site as far as possible, taking into account the long-term potential of the land use after any future decommissioning has taken place".*	Mineral resources crossed by the Scoping Boundary have been identified within section 11.4 and any potential significant effects identified. A preliminary qualitative Minerals Resource Assessment supports the assessment (**Appendix 11B Preliminary Qualitative Minerals Resource Assessment**)
EN-1	*5.10.22 "Where a proposed development has an impact upon a Mineral Safeguarding Area, the IPC should ensure that appropriate*	Mineral resources crossed by the Scoping Boundary have been identified within section 11.4, the potential for significant effects

National Policy Statement	NPS section	How it will be considered
	mitigation measures have been put in place to safeguard mineral resources".	identified, and appropriate mitigation measures presented if appropriate. A preliminary qualitative Minerals Resource Assessment supports the assessment (**Appendix 11B Preliminary Qualitative Minerals Resource Assessment**)
EN-1	*5.15.3 (part) "any impacts of the proposed Project on… source protection zones (SPZs) around potable groundwater abstractions".*	Groundwater Source Protection Zones (SPZ) crossed by the scoping boundary have been identified within section 11.4 of this chapter and the potential impacts identified.
EN-5	*2.2.5 (part) "developers will be influenced by Schedule 9 to the Electricity Act 1989, which places a duty on all transmission and distribution licence holders, in formulating proposals for new electricity networks infrastructure, to "have regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest..."*.	Sites designated for their geological conservation importance have been identified within section 11.4 of this chapter and any potential for significant effects on these features has been assessed.
EN-5	2.8.9 states *"The impacts and costs of both overhead and underground options vary considerably between individual Projects (both in absolute and relative terms). Therefore, each Project should be assessed individually on the basis of its specific circumstances and taking account of the fact that Government has not laid down any general rule about when an overhead line should be considered unacceptable. The IPC should, however, only refuse consent for overhead line proposals in favour of an underground or sub-sea line if it is satisfied that the benefits from the non-overhead line alternative will clearly outweigh any extra economic, social and environmental impacts and the technical difficulties are surmountable. In this context it should consider 'the environmental and archaeological consequences (undergrounding a 400kV line may mean disturbing a*	Impacts on geology have been considered within section 11.6 of this chapter and any potential for significant effects on these features has been assessed.

National Policy Statement	NPS section	How it will be considered
	swathe of ground up to 40 metres across, which can disturb sensitive habitats, have an impact on soils and geology, and damage heritage assets, in many cases more than an overhead line would)".	

National Planning Policy Framework

11.2.4 The National Planning Policy Framework (Ref 2.6) (NPPF) (paragraphs 174, 183, 179, 210) relates to conserving and enhancing the natural and local environment and helping the sustainable use of minerals.

11.2.5 The NPPF is supported by associated Planning Practice Guidance, including Land Affected by Contamination, June 2014 (updated July 2019) (Ref 11.12); Land Stability, March 2014 (updated July 2019) (Ref 11.13); Natural Environment, January 2016 (updated July 2019) (Ref 11.14).

Local Planning Policy

11.2.6 The Project lies within the jurisdictions of East Riding of Yorkshire, North Lincolnshire and Bassetlaw District (Nottinghamshire). A summary of the local planning policy and emerging policy which is relevant to a study of geology and hydrogeology matters and will inform the geology and hydrogeology assessment in the ES is provided in **Table 11.2**.

Table 11.2: Relevant Local Planning Policies

Local Plan	Policy ref	Policy context	How it will be considered
East Riding Local Plan 2012-2029 Strategy Document, Adopted 2016 (Ref 2.7)	EC5: Supporting the energy sector	The effects of the development on: 1. Disturbance and impact of contamination on geodiversity 2. The land including land stability and contamination	Potential sources of contamination and sites designated for their geological importance have been identified within section 11.4, the potential impacts from contamination have been assessed and the effects on any site of geological importance identified. A preliminary Contamination Risk Assessment supports the baseline (**Appendix 11A Preliminary**

Local Plan	Policy ref	Policy context	How it will be considered
			Contamination Risk Assessment)
	ENV6: Managing Environmental Hazards	Managing groundwater pollution to protect source protection zones (SPZ) and the underlying aquifer.	Sensitive groundwater receptors, including SPZ have been identified within section 11.4 of this chapter and any effects on them identified.
East Riding of Yorkshire and Kingston upon Hull Joint Minerals Local Plan 2016-2033 (2019) (Ref 2.9)	EC6: Protecting Mineral Resources	Mineral Safeguarding Area (MSA) are identified on the Policies Map. Development within or adjacent to a MSA will only be supported by demonstrating the following: *"1. Underlying or adjacent mineral is of limited economic value;* *2. Need for the development outweighs the need to safeguard the mineral deposit;* *3. Non-mineral development can take place without preventing the mineral resource from being extracted in the future;* *4.. Non-mineral development is temporary in nature; or* *5. Underlying or adjacent mineral deposit can be extracted prior to the non-mineral development proceeding, or prior extraction of the deposit is not possible".*	Mineral resources crossed by the Scoping Boundary have been identified within section 11.4, and the potential for significant effects identified. A preliminary qualitative Minerals Resource Assessment supports the assessment (**Appendix 11B Preliminary Qualitative Minerals Resource Assessment**)
North Lincolnshire Local Development	CS17: Biodiversity	Ensuring development retains, protects and enhances features of geological interest.	Sites designated for their geological importance are identified within section

Local Plan	Policy ref	Policy context	How it will be considered
Framework – Core Strategy (2011) (Ref 2.11)			11.4 of this chapter and any potential for significant effects on these features has been assessed.
	CS21: Minerals	Safeguarding mineral resources	Mineral resources crossed by the Scoping Boundary have been identified within section 11.4 and the potential for significant effects identified. A preliminary qualitative Minerals Resource Assessment supports the assessment (**Appendix 11B Preliminary Qualitative Minerals Resource Assessment**)
North Lincolnshire Local Plan (Draft Submission) 2022 (Ref 2.12)	DQE3p: Biodiversity and Geodiversity	Sets out an approach for the protection, enhancement and management of geodiversity sites.	Sites designated for their geological importance are identified within section 11.4 of this chapter and any potential for significant effects on these features has been assessed.
	MIN2p: Mineral Safeguarding	To ensure the long-term conservation of nationally and locally important minerals	Mineral resources crossed by the Scoping Boundary have been identified within section 11.4 and the potential for significant effects identified. A preliminary qualitative Minerals Resource Assessment supports the assessment (**Appendix 11B Preliminary Qualitative Minerals Resource Assessment**)
Emerging Bassetlaw Local Plan 2020-2037 (2021) (Ref	Policy 49: Contaminated and Unstable land	Appropriate risk assessment on potentially	Potential sources of contamination have been identified within section 11.4 of this

Local Plan	Policy ref	Policy context	How it will be considered
2.19) and Addendum (2022)		contaminated and/or unstable land	chapter and the potential effects of these identified. A preliminary Contamination Risk Assessment supports the baseline (**Appendix 11A Preliminary Contamination Risk Assessment**). Unstable land is considered in section 11.5, and the CoCP measures.
	ST40: Biodiversity and Geodiversity	To protect and enhance the geodiversity of Bassetlaw	Sites designated for their geological importance are identified within section 11.4 of this chapter and any potential for significant effects on these features has been assessed.
	ST53: Protecting Water Quality and Management	Protecting the quantity and quality of groundwater bodies	Sensitive groundwater receptors, including SPZ have been identified within section 11.4 of this chapter and any potential effects on them assessed.
Bassetlaw District Local Development Framework – Core Strategy and Development Management Policies DPD (2011) (Ref 2.15)	DM9: Green Infrastructure, Biodiversity & Geodiversity; Landscape, Open Space and Sports Facilities	To protect the geodiversity of Bassetlaw	Sites designated for their geological importance are identified within section 11.4 of this chapter and any potential for significant effects on these features has been assessed.
	DM14: Ground Conditions & Land Stability	Protection of new development within former coal mining areas	Coal mining has been considered within the baseline section of this chapter and any impacts from Land Stability will be considered as part of

Local Plan	Policy ref	Policy context	How it will be considered
			the engineering design of the Project.
Nottinghamshire Minerals Local Plan (2021) (Ref 2.18)	SP7: Minerals Safeguarding, Consultation Areas and Associated Minerals Infrastructure	How developments should assess the impacts on mineral deposits, consultation areas and minerals infrastructure	Mineral resources crossed by the Scoping Boundary have been identified within section 11.4 and the potential for significant effects identified. A preliminary qualitative Minerals Resource Assessment supports the assessment (**Appendix 11B Preliminary Qualitative Minerals Resource Assessment**).

Guidance

11.2.7 The following core guidance documents provide the technical framework for applying a risk management process when dealing with land affected by contamination in a way that is consistent with government policies and legislation within the UK:

- Land Contamination: Risk Management (LCRM) (Ref 11.15);
- CIRIA 552: Contaminated Land Risk Assessment, A guide to good practice (Ref 11.16);
- CIRIA 665: Assessing risks posed by hazardous ground gases to buildings (Ref 11.17);
- BS 10175:2011+A2:2017 Investigation of potentially contaminated sites. Code of Practice (Ref 11.18);
- The EA Guiding Principles for Managing and Reducing Land Contamination (GPLC2) (Ref 11.19);
- Design Manual for Roads and Bridges (DMRB), LA 109: Geology and soils (Ref 11.20); and
- DMRB, LA 113: Road drainage and the water environment (Ref 10.12).

Consultation and Engagement

11.2.8 The environmental assessment will be informed by consultation and engagement with stakeholders, including East Riding of Yorkshire Council, North Lincolnshire Council, Bassetlaw District Council, Nottinghamshire County Council, and the Environment Agency as required.

11.3 Study Area

11.3.1 For the purpose of establishing the baseline conditions, a study area encompassing the Scoping Boundary plus a 250 m buffer has been defined for geology and contaminated land, as shown on **Figures 11.1 Superficial Geology** and **11.2 Bedrock Geology**. The study area for hydrogeological baseline information (e.g. SPZ, water abstractions etc.) has been defined as the Scoping Boundary plus a 500 m buffer, due to the mobile nature of groundwater and the corresponding potential for the Project to affect receptors at a greater distance. Given the scale and nature of the Project, this is generally considered a robust yet proportionate approach. The study area is also based on professional judgement, knowledge of similar Projects and the DMRB LA 109 (Ref 11.20) and LA 113 (Ref 10.12). Although not directly relevant for this Project development type, the proposed study areas accord with the study area recommended in Guidance for the Safe Development of Housing on Land Affected by Contamination (Ref 11.21).

11.3.2 The study area will be refined throughout the development of the Project; ultimately comprising the land contained within the Order Limits defined in the DCO application, plus the buffer zones defined above.

11.4 Baseline Conditions

11.4.1 The following section provides a summary of the baseline environmental conditions within the study area.

Data Sources

11.4.2 The baseline assessment has been informed by a desk-based study which has drawn on the following information sources:

- Britain from Above, historical aerial imagery archive (Ref 11.22);
- British Geological Survey (BGS) 1:50,000 scale geological mapping;
- BGS GeoIndex Viewer (Ref 11.23);
- BGS Hydrogeological Maps of the UK;
- Coal Authority Interactive Map (Ref 11.24);
- EA, Catchment Data Explorer (Ref 11.25);
- EA Report SC040016/R, New Groundwater Vulnerability Mapping Methodology in England and Wales (Ref 11.26);
- Natural England, Designated Sites View (Ref 8.22);
- Multi-Agency Geographic Information for the Countryside (MAGIC) interactive map (Ref 8.21); and
- National Library of Scotland, georeferenced historical maps for the period 1885–1970 (Ref 11.27).

Baseline

11.4.3 For ease of reference, and to help make the baseline information more relevant to local communities the study area has been divided by local authority sections as follows:

- East Riding of Yorkshire;
- North Lincolnshire; and
- Bassetlaw District (Nottinghamshire).

Published geology

East Riding of Yorkshire

11.4.4 Superficial deposits are indicated to be present across the majority of the 250 m study area in the East Riding of Yorkshire, with the exception of the area around Riplingham where superficial deposits are indicated to be absent. The superficial deposits identified are highly variable, as shown on **Figure 11.1 Superficial Geology**. Other superficial geological strata encountered within the 250 m study area include:

- sand and gravel of uncertain age and origin – sand and gravel with rare lenses of clay;
- Till (Devensian) – diamicton;
- Head deposits – indicated locally within riverbeds and described as *"gravel, sand and clay … locally with lenses of silt, clay or peat and organic material"* (Ref 11.28);
- Bielby Sand Member – described as *"slightly clayey to slight silty sand with local fine-grained gravels…with thin beds of clayey sandy peat"* (Ref 11.28);
- blown sand – indicated locally within the Bielby Sand Member and described as '*sand*';
- alluvium – associated with the River Humber described as *"normally soft to firm consolidated, compressible silty clay, but can contain layers of silt, sand, peat and basal gravel"* (Ref 11.28) and Warp which is described as artificially induced alluvium; and
- Hemingbrough Glaciolacustrine Formation – described as *"laminated clays, silts and sands with rare dropstones"* (Ref 11.28).

11.4.5 The bedrock geology is shown on **Figure 11.2 Bedrock Geology**, and generally comprises the Burnham Chalk Formation to the north-east, described as *"white thinly-bedded chalk with common…flint bands; sporadic marl seams"* (Ref 11.28); and the Mercia Mudstone Group to the west and south-west, described as *"…mudstones and subordinate siltstone with thick halite-bearing units…thin beds of gypsum/anhydrite are widespread; thin sandstones are also present"* (Ref 11.28). Between these two units a number of chalk and mudstone dominated strata outcrop, with some limestone and sandstone. The formations identified are as follows:

- Welton Chalk Formation;
- Ferriby Chalk Formation;
- Hunstanton Formation – chalk;
- Ancholme Group – mudstone;
- Brantingham Member – sandstone;
- Kellaways Sand Member – sandstones and siltstones;

- Thorncroft Sand Member – sandstone, siltstone and mudstone;
- Upper Lincolnshire Limestone Member – ooidal limestone;
- Lower Lincolnshire Limestone Member – limestone;
- Kirton Cementstone Beds – mudstone and limestone;
- Whitby Mudstone Formation;
- Marlstone Rock Formation – ferruginous limestone and sandstone;
- Charmouth Mudstone Formation;
- Pecten Ironstone;
- Frodingham Ironstone;
- Scunthorpe Mudstone Formation – mudstone and limestone; and
- Penarth Group – mudstone.

North Lincolnshire

11.4.6 Superficial deposits are indicated to be present beneath the majority of the 250 m study area in North Lincolnshire, with only small areas where they are indicated to be absent, as shown on **Figure 11.1 Superficial Geology**. The superficial deposits predominately comprise alluvium, described by the BGS (Ref 11.28) as *"normally soft to firm consolidated, compressible silty clay, but can contain layers of silt, sand, peat and basal gravel"* and Warp, which is described as artificially induced alluvium.

11.4.7 The other superficial strata encountered throughout the North Lincolnshire section of the 250 m study area are described below:

- Sutton Sand Formation – limited to small outcrops throughout the section, described as *"fine-grained silty sand"* (Ref 11.28);
- Glaciofluvial deposits (Devensian) – limited to very small outcrops throughout the section, described as *"sands and gravels"* (Ref 11.28);
- Till (Mid Pleistocene) – indicated in a small outcrop in the central part of the section described as *"a heterogenous mixture of clay, sand, gravel, and boulders varying widely in size and shape"* (Ref 11.28) commonly referred to as boulder clay;
- peat – indicated to be present in the alluvium to limited extents; however, it is considered likely to also be present elsewhere within the alluvium, and is described as *"partially decomposed mass of semi-carbonized vegetation which has grown under waterlogged, anaerobic conditions, usually in bogs or swamps"* (Ref 11.28);
- Hemingbrough Glaciolacustrine Formation – limited to a circular outcrop in the centre on the section, described as *"laminated clays, silts and sands with rare dropstones"* (Ref 11.28); and
- Head deposits – indicated locally within riverbeds in the south of the section and described as *"gravel, sand and clay … locally with lenses of silt, clay or peat and organic material"* (Ref 11.28).

11.4.8 The bedrock geology is shown on **Figure 11.2 Bedrock Geology** and is indicated to comprise predominately the Mercia Mudstone group described as *"…mudstones and subordinate siltstone with thick halite-bearing units…thin beds of gypsum/anhydrite are*

widespread; thin sandstones are also present" (Ref 11.28). In small discrete areas the Clarborough Member is indicated to be present described as *"mudstones…with common veins of satin spar gypsum and indurated beds of reddish brown or greenish grey siltstone and very fine-grained dolomitic sandstone"* (Ref 11.28).

Bassetlaw District

11.4.9 Superficial deposits are generally indicated to be absent throughout this section, as shown on **Figure 11.1 Superficial Geology**. However, the 250 m study area does pass through the following superficial deposits in small discrete areas of the Bassetlaw District section:

- alluvium – indicated locally within valleys associated with watercourses, described as *"normally soft to firm consolidated, compressible silty clay, but can contain layers of silt, sand, peat and basal gravel"* (Ref 11.28)*;*
- Sutton Sand Formation – limited to an outcrop in the northern part of the section, described as *"fine-grained silty sand"* (Ref 11.28)*;*
- peat – in the northern part of the section described as *"partially decomposed mass of semi-carbonized vegetation which has grown under waterlogged, anaerobic conditions, usually in bogs or swamps"* (Ref 11.28);
- Till (Mid Pleistocene) – indicated in a small outcrop in the northern and southern part of the section described as *"a heterogenous mixture of clay, sand, gravel, and boulders varying widely in size and shape"* (Ref 11.28) commonly referred to as boulder clay*.*
- Head deposits – indicated locally mostly within riverbeds within the southern part of the section and described as *"gravel, sand and clay … locally with lenses of silt, clay or peat and organic material"* (Ref 11.28); and
- Holme Pierrepont sand and gravel member – indicated at the most southern point of the 250 m study area, described as *"…poorly sorted and compositionally rather immature matrix supported sandy, trough-cross bedded (braided river) gravels"* (Ref 11.28)*.*

11.4.10 The bedrock geology is shown on **Figure 11.2 Bedrock Geology** and is indicated to comprise predominately the Mercia Mudstone group described as "…*mudstones and subordinate siltstone with thick halite-bearing units…thin beds of gypsum/anhydrite are widespread; thin sandstones are also present"* (Ref 11.28). In small discrete areas the Clarborough Member is indicated to be present and is described as *"mudstones…with common veins of satin spar gypsum and indurated beds of reddish brown and greenish grey siltstone and very fine-grained dolomitic sandstone"* (Ref 11.28).

Minerals

East Riding of Yorkshire

11.4.11 A review of the East Riding of Yorkshire and Kingston upon Hull Joint Minerals Local Plan (Ref 2.9) and the corresponding interactive policy map (Ref 11.29) indicates that large parts of the 250 m study area within the East Riding of Yorkshire are located within a MSA for sands and gravels.

11.4.12 The Wienerberger Ltd company in Broomfleet is identified in the Joint Minerals Local Plan as a mineral extraction site which has been working the brick clay deposits for over 100

years. Brick clay is used in the manufacture of a range of roofing tiles and bricks. The Wienerberger Ltd clay works is located within the Scoping Boundary and is a current consented extraction site which has planning permission to extract mineral (clay) for the next 50 years. The extent of the clay works and permitted extraction is shown on **Figure 11.4 Mineral reserves and infrastructure**.

11.4.13 There are no other consented extraction sites, mineral site allocations or proposed allocation sites within the 250 m study area.

North Lincolnshire

11.4.14 The North Lincolnshire Local Development Plan (Ref 2.11) and the corresponding interactive policy map (Ref 11.30) indicates that much of the 250 m study area within North Lincolnshire is located within sand and gravel MSA. The southern part of the 250 m study area within North Lincolnshire is also safeguarded for brick clay. However, there are no existing consented extraction sites, site allocations or proposed allocation sites identified within the 250 m study area.

Bassetlaw (Nottinghamshire County Council)

11.4.15 The Nottinghamshire Minerals Local Plan (Ref 2.18) indicates that the majority of the 250 m study area within Nottinghamshire is not within a MSA and does not intersect any minerals development. The exception to this is within the northern most part of this section which is within a MSA for sands and gravels.

Coal mining

11.4.16 The Coal Authority's interactive map viewer (Ref 11.24) indicates that small discrete parts of the 250 m study area are located within a Coal Mining Reporting Area, with a very small section of the Scoping Boundary also within a Coal Mining Reporting Area. The interactive map indicates that there are no recorded mine entries, fissures or break lines, areas of historical recorded shallow mining, coal outcrops, coal mine abandonment plans, Surface Coal Resource Area or Development High Risk Areas within the 250 m study area.

11.4.17 Whilst small parts of the 250 m study area are noted to be within a Coal Mining Reporting Area, ground instability effects from historical coal mining are considered unlikely as the 250 m study area is not within a Development High Risk Area and there are no recorded mine entries within the 250 m study area. In addition, available information from the geological maps suggests that the coal is likely to be relatively deep with substantial bedrock cover.

Geo-conservation

11.4.18 A review of the East Riding of Yorkshire (Ref 11.29), North Lincolnshire (Ref 11.30) and Bassetlaw (Ref 11.31) policy maps indicates that the following Local Geological Sites are located within the 250 m study area:

- dismantled Railway Line, Little Weighton (chalk exposure) located within the East Riding of Yorkshire;
- Brantingham Dale Plantation (dry valley landscape) located within the East Riding of Yorkshire; and
- Melwood Park, located within North Lincolnshire.

11.4.19 The Humber Estuary SSSI and Ramsar is present within the Scoping Boundary. The SSSI is designated (Ref 8.22) partly for its geological value, however both areas referred to in the geological part of the designation (South Ferriby Cliffs and Spurn) are located approximately 9 km and 35 km south-west respectively from the Scoping Boundary.

Radon

11.4.20 Based on the UK Radon maps (Ref 11.32) the radon potential for the majority of the 250 m study area is less than 1% or where between 1% and 3% of homes are above the action level. It is therefore considered there is generally a low risk to the Project from Radon – particularly in the context of the end use.

11.4.21 A small discrete section of the study area located within the East Riding of Yorkshire section around the town of Ellerker, is identified to be within an area of radon potential where between 10-30% of homes are above the action level.

Hydrogeology

Aquifer designation

11.4.22 DEFRA's MAGIC map (Ref 8.21) indicates that the aquifers within the superficial deposits are classified as follows:

- Hemingbrough Glaciolacustrine Formation and Peat = Unproductive Strata;
- Till (Devensian and Mid Pleistocene) and Head Deposits = Secondary Undifferentiated Aquifer; and
- Bielby Sand Member, Alluvium, Warp, Blown sand, Sutton Sand Formation, Glaciofluvial deposits, Holme Pierrepont sand and gravel member = Secondary A Aquifer.

11.4.23 DEFRA's MAGIC map (Ref 8.21) indicates that the aquifers within the bedrock formations are classified as follows:

- Burnham Chalk Formation, Welton Chalk Formation, Ferriby Chalk Formation, Hunstanton Formation, Brantingham Member, Upper Lincolnshire Limestone Member, Lower Lincolnshire Limestone Member = Principal Aquifer;
- Kellaways Sand Member, Thorncroft Sand Member, Frodingham Ironstone = Secondary A;
- Mercia Mudstone, Scunthorpe Mudstone Formation = Secondary B Aquifer;
- Clarborough Member, Charmouth Mudstone Formation, Penarth Group = Secondary Undifferentiated; and
- Ancholme Group, Whitby Mudstone Formation = Unproductive Strata.

11.4.24 Principal Aquifers are defined by the EA as rock layers that *"provide significant quantities of drinking water, and water for business needs. They may also support rivers, lakes and wetlands"* (Ref 11.33).

11.4.25 Secondary A Aquifers are described by the EA as *"permeable layers that can support local water supplies, and may form an important source of base flow to rivers"*. Secondary B Aquifers are described by the EA as *"mainly lower permeability layers that may store and yield limited amounts of groundwater through characteristics like thin cracks (called fissures) and openings or eroded layers"*. The Secondary Undifferentiated Aquifer

classification is applied by the EA *"where it is not possible to apply either a Secondary A or B definition because of the variable characteristics of the rock type. These have only a minor value"* (Ref 11.33).

11.4.26 Unproductive Strata are described by the EA as *"largely unable to provide usable water supplies and are unlikely to have surface water and wetland ecosystems dependent on them"* (Ref 11.33).

Groundwater vulnerability

11.4.27 DEFRA's MAGIC map (Ref 8.21) indicates that the groundwater within the majority of the 500 m study area is classified as 'high' or 'medium-high' vulnerability. Within small discrete sections of the Scoping Boundary the groundwater is classified as 'medium' or 'low', and these are coincidental with areas where clay rich, low permeability, superficial deposits are located overlying the bedrock deposits or where the bedrock is identified as being Unproductive Strata or a Secondary Undifferentiated Aquifer.

11.4.28 The EA define High vulnerability as *"Areas able to easily transmit pollution to groundwater. They are likely to be characterised by high leaching soils and the absence of low permeability superficial deposits"*, and areas of Low vulnerability as *"Areas that provide the greatest protection to groundwater from pollution. They are likely to be characterised by low leaching soils and/or the presence of superficial deposits characterised by a low permeability"*. Medium vulnerability is described as intermediate between Low and High vulnerability.

Groundwater source protection zones

11.4.29 DEFRA's MAGIC map (Ref 8.21) indicates that the majority of the 500 m study area is not within a groundwater Source Protection Zone (SPZ). However, the exception to this is a small part of the 500 m study area within the East Riding of Yorkshire where there are two abstractions with separate SPZ 1's but one associated SPZ 2 and SPZ 3 for both abstractions. The 500 m study area crosses all of the associated SPZ's for the two abstractions. The SPZ's crossed by the 500 m study area is shown on **Figure 11.3 Source Protection Zone**.

11.4.30 A SPZ1 is defined as the inner zone which is a 50-day travel time of a pollutant to the abstraction point. A SPZ2 Outer Zone is defined as a 400-day travel time of a pollutant to an abstraction point. A SPZ3 is defined as the total catchment, which is the area around an abstraction within which all the groundwater ends at the abstraction point (Ref 11.34).

11.4.31 The DEFRA MAGIC map also shows that the majority of the Scoping Boundary and 500 m study area are not located within a groundwater Drinking Water Safeguard Zone (DWSZ), with the exception of the groundwater SPZ's discussed in section 11.4.26.

Groundwater body

11.4.32 The EA's Catchment Data Explorer (Ref 11.25) indicates that groundwater beneath the Scoping Boundary and within the 500 m study area is part of the following groundwater bodies:

- Hull and East Riding Chalk (ref: GB40401G700700);
- East Riding Mercia Mudstone (GB40402G990200);
- Lower Trent Erewash – Secondary Combined (GB40402G990300); and

- Idle Torne – Secondary Mudrocks (GB40402G992200).

11.4.33 The Hull and East Riding Chalk and the East Riding Mercia Mudstone are both located to the north of the River Humber and they both received an overall Water Framework Directive (WFD) status of 'Poor' in 2019. This was indicated to comprise a 'Poor' status for both chemical quality and quantitative status.

11.4.34 The Lower Trent Erewash-Secondary Combined and Idle Torne-Secondary Mudrocks groundwater bodies are both located on the south side of the River Humber and they both received an overall WFD status of 'Good' in 2019. This was indicated to comprise a 'Good' status for both chemical quality and quantitative status.

Potentially contaminative land uses

11.4.35 The majority of the Scoping Boundary and the 250 m study area appears to have remained as undeveloped/agricultural land and farm buildings since the earliest available historical mapping (from the National Library of Scotland), dated 1885 (Ref 11.27). In these areas it is considered that there is a very low risk of significant sources of potential contamination.

11.4.36 However, there are discrete areas within the Scoping Boundary and wider 250 m study area that have a history of potentially contaminative land use or where the current land use is potentially contaminative. Where these areas are identified, readily available information relating to the Potential Sources of Contamination (PSC) has been gathered and an initial assessment has been undertaken to provide a classification score for their potential for generating contamination. This assessment is presented **in Appendix 11.A Preliminary Contamination Risk Assessment**.

11.4.37 Where the initial classification score is moderate or above within the 250 m study area these sites are taken forward for further assessment in relation to the risk to sensitive receptors. These site-specific assessments are also presented in **Appendix 11.A Preliminary Contamination Risk Assessment**.

11.4.38 Based on the assessment presented in **Appendix 11.A Preliminary Contamination Risk Assessment**, following the Tier 1 assessment the following sites are assessed as presenting a potential Moderate or above risk to sensitive receptors from existing contamination:

- PSC 1 – Walk Farm Site B;
- PSC 2 – Walk Farm Site C;
- PSC 3 – Walk Farm Site D;
- PSC 6 – Raywell Road Historical Landfill;
- PSC 7 – Land adjacent to former A63 Ellerker – Borough Road historical landfill;
- PSC 17 – Refuse tip off Caves Lane historical landfill;
- PSC 18 – High Marnham power station historical landfill;
- PSC 20 – Former High Marnham power station and current substation; and
- PSC 21 – High Marnham Power Station Landfill.

Future Baseline

11.4.39 There are no foreseeable significant changes anticipated in relation to geology, hydrogeology or land contamination either prior to, or during, the construction and operational phases. It is assumed that any man-made changes (e.g. due to new developments) would be appropriately permitted and operated to prevent or limit adverse impacts to ground conditions or controlled waters.

11.5 Embedded and Control and Management Measures

Embedded Measures

11.5.1 The Scoping Boundary has, where possible, been routed to avoid potentially contaminated land, geologically designated sites and sensitive receptors.

11.5.2 For the purpose of assessing the effects of the Project it has been assumed that the design of the Project will incorporate suitable consideration of the ground conditions based on data from site specific ground investigation and assessment, and therefore that any risks from ground instability, historical coal mining (including obtaining reports from the coal authority if required), chemical aggressivity of the ground, radon reports and protection measures (if required and where appropriate) would be considered within the engineering design of the new infrastructure in accordance with best practice. This will mean that the Project will be built with any required design and construction mitigation in place. As this is a fundamental engineering requirement it is considered to be equivalent to an embedded measure.

Control and Management Measures

11.5.3 An Outline Code of Construction (CoCP) is provided in **Appendix 4.A Outline Code of Construction Practice**. Measures relevant to the control and management of impacts that could affect the Geology and Hydrogeology assessment are:

- W06: Where new or additional surfacing is required on any access tracks and compound areas, these will be permeable surfaces where ground conditions allow. The project will incorporate appropriate surface water drainage measures into its final design for the any access tracks so that they do not lead to a significant increase in flood risk. Temporary haul routes within Flood Zone 3 and areas of high and medium risk of flooding from surface water will be removed at the end of the construction phase and the ground surface will be reinstated to pre-project levels;
- GH01: Intrusive ground investigations and assessment will be undertaken prior to construction which will inform appropriate geotechnical design in relation to the site/structure specific ground conditions including, where appropriate, ground instability/adverse ground conditions/ground gas;
- GH02: Construction methods such as appropriate piling techniques (if required) to minimise the risk of mixing of aquifer bodies through the creation of new pathways. This includes the provision of a risk assessment, which would be undertaken once the proposed foundation solutions are known, in accordance with EA guidance ‘Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination’ (Ref 11.35);
- GH03: Use of appropriate occupational health and safety measures e.g., Personal Protective Equipment (PPE), and statutory health and safety compliance (e.g.,

compliance with the Confined Spaces Regulations, 1997 in relation to ground gas from working in confined spaces/trenches) to minimise the risks associated with anticipated/unexpected contamination. Based on risk assessment informed by site specific information;

- GH04: Appropriate training of construction and maintenance workers in the handling and use of potentially hazardous substances and the associated risks;
- GH05: All use and storage of chemicals and fuels are to be undertaken in accordance with EA guidance (Ref 11.36, 11.33) and the Control of Pollution (Oil Storage) Regulations (Ref 11.37). The use and storage of chemicals and fuels will also be controlled and monitored under the Construction and Environmental Management Plan (CEMP) which will include, for example, procedures for good general construction site practices, environmental and waste management procedures, regular vehicle checks, use of spill kits, correct waste storage and disposal, use of oil-water separators as necessary (for example, for drainage from refuelling areas), collection of process water from the washout/cleaning of ready-mix concrete vehicles and equipment for treatment/disposal;
- GH06: The control of earthworks or materials movement (including any re-use of materials) under appropriate Environmental Permits, exemptions or CL:AIRE The definition of Waste: The Development Industry Code of Practice (2011) (Ref 11.38);
- GH07: Any temporary dewatering activities during construction will be undertaken in accordance with appropriate EA guidance (Ref 11.39, 11.40, 11.41) (including appropriate assessment undertaken as required by the guidance (Ref 11.42)), and if required, an Abstraction Licence and Environmental Permit (for the discharge) (Ref 11.5, 11.7) and will be limited to the depth and time required to facilitate construction activities;
- GH08: A protocol for dealing with any unexpected contamination will be included within the CEMP;

11.5.4 Where specific sites have been identified in the study area with a moderate (or above) risk to sensitive receptors from potential contamination – these sites will initially be reviewed against the Order Limits. Where the Order Limits and proposed construction activities do not interact with these sites, no further assessment will be required. However, where there is potential for any interaction of the Order Limits or proposed construction activities with these sites, each site will be individually investigated and assessed (in accordance with guidance described in 11.2.7) to determine any mitigation measures or remediation requirements required. The nature and scope of any mitigation or remediation will be agreed with the EA and LA (as appropriate).

11.5.5 For the purpose of assessing the effects of the Project, it has been assumed that best practice health and safety and environmental controls will be in place during construction, in accordance with standard good practice across the construction industry.

11.6 Potential for Significant Effects

11.6.1 The geology and hydrogeology assessment will consider the construction, operation, and maintenance of the Project. Details of each of these stages are set out in **Chapter 4, Description of the Project.**

11.6.2 The proposed scope of the geology and hydrogeology assessment is set out below and has been determined using the approach described in **Chapter 5, EIA Approach and Methodology.**

11.6.3 The potential for the Project to result in the likely significant effects identified in **Table 11.3** and **Table 11.4** takes into account the embedded and control and management measures described in section 11.5.

Sources and Impacts (Step 1)

11.6.4 This section identifies the sources and impacts that would occur as a result of the construction, operation, and maintenance of the Project.

Potential sources of impacts

Sources of construction impacts

- Construction activities as detailed in **Chapter 4, Description of the Project**, section 4.3.
- Ground disturbance from construction activities.
- Piling.
- Dewatering activities.
- Discharges of water from dewatering.
- Excavation of trenchless crossings.

Sources of operational impacts

- Operational activities as detailed in **Chapter 4, Description of the Project**, section 4.4.
- Permanent presence of OHL.
- Permanent presence of impermeable surfaces, such as any cable sealing end compounds or permanent accesses.

Sources of maintenance impacts

- Maintenance activities as detailed in **Chapter 4, Description of the Project**, section 4.5).

Potential impacts

11.6.5 **Table 11.3** identifies the potential impacts that could result from the sources identified above.

11.6.6 Where **Table 11.3** identifies the potential for an impact to result in a significant effect the impact is taken through to Step 2. Where **Table 11.3** identifies no potential for an impact to result in a significant effect, that impact is proposed to be scoped out.

Table 11.3: Impacts and the potential for significant effects

Project phase	Source	Impact	Potential for significant effects
Construction	Ground disturbance from construction activities.	Exposure to existing contamination.	No – the baseline has identified a generally very low/low risk of existing significant contamination within the study area. Where specific sites are identified, a targeted investigation and appropriate risk assessment will be undertaken to identify any mitigation measures required. In addition – there will be a commitment to use appropriate PPE for construction workers to prevent exposure (GH03).
		Mobilisation of existing contamination.	No – the baseline has identified a generally very low/low risk of existing significant contamination within the study area. Where specific sites are identified, a targeted investigation and appropriate risk assessment will be undertaken to identify any mitigation measures required.
		Impact on geological designated sites.	**Yes** – as Local Geological Sites have been identified within the study area.
	Piling.	Creation of pathways mixing of aquifers.	No – the baseline has identified a generally very low/low risk of existing significant contamination within the study area. Therefore, significant effects related to piling are unlikely. The CoCP contains a commitment (GH02) to undertake a risk assessment in accordance with EA guidance.
	Dewatering activities (to lower the groundwater table around an excavation).	Reducing groundwater levels and impacts on groundwater quality and flows.	No – for OHL because dewatering is not required. **Yes** – for potential trenchless crossings.

Project phase	Source	Impact	Potential for significant effects
	Discharges of groundwater from dewatering.	Physical and chemical changes to groundwater.	No – if discharges of groundwater are required – an environmental permit will be obtained, and impacts/effects will be controlled by the permit (in accordance with commitment GH07 in the CoCP).
	General construction activities.	Ground Instability including coal mining.	No – both embedded and control measures relating to best practice engineering design are included.
		Introduction of new contamination.	No – see commitments GH04 and GH05 in the CoCP.
		Exposure of unexpected contamination	No – see commitment GH08 in the CoCP.
		Accumulation of ground gas and radon in confined spaces resulting in explosion/asphyxiation/ exposure.	No – both embedded and control measures included (see GH01 and GH03 in the CoCP). For radon the majority of the Scoping Boundary is in a radon low risk area where radon protection measures wouldn't be required. For the small area where the radon potential is slightly higher consideration will be given to the need to obtain radon reports in accordance with the embedded and control measures.
	Excavation of trenchless crossings.	Connection of aquifer units creating potential pathways.	**Yes** – within areas of proposed trenchless crossings.
Operation	Permanent presence of OHL.	Impact on geological designated sites.	No – as the potential effects on Sites of Geological Importance are considered during the construction phase.
		Sterilisation of safeguarded minerals.	No – see preliminary qualitative minerals resource assessment
	General operational activities.	Accumulation of ground gas and radon in confined spaces resulting in explosion/asphyxiation/ exposure.	No – as any existing contamination is considered during the construction phase. In addition, confined spaces and the need to enter them is considered unlikely during the operation phase. However, if

Project phase	Source	Impact	Potential for significant effects
			required, entry to confined spaces would be undertaken in accordance with appropriate Health and Safety guidance and National Grid's health and safety working procedures.
	General operational activities.	Introduction of new potential contaminants to the environment from leaks, spills, fuels and oils during the operational phase.	No – end use not considered to be contaminative and in consideration of best practice measures and maintenance.
	Permanent presence of impermeable surfaces.	Changes to groundwater levels and/or recharge rates.	No – due to the small surface area of the permanent footprint of the Project. Where new or additional surfacing is required, they will utilise permeable surfacing and would be designed to meet current drainage standards (W06).
Maintenance	General maintenance activities.	Introduction of new potential contaminants to the environment from leaks, spills, fuels and oils during the operational phase.	No – not likely to result in a significant effect given the nature of the Project and in consideration of best practice measures and maintenance.
		Ingress and accumulation of ground gas in buildings resulting in explosion/asphyxiation/ exposure.	No – as any existing contamination is considered during the construction phase. In addition, confined spaces entry during the operation phase is unlikely and where required appropriate Health and Safety requirements will be followed and the general National Grid health and safety working procedures.

Impact Pathways with Receptors (Step 2)

11.6.7 This section identifies whether there are any impact pathways from the impacts identified above that could give rise to potentially significant effects on receptors identified within the study area.

11.6.8 **Table 11.4** provides a summary of the impact pathways identified and those proposed to be scoped into the geology and hydrogeology assessment for the Project.

Table 11.4: Impact pathways with receptors

Project Phase	Impact	Receptor	Potential for significant effects	Proposed to be scoped in/out
Construction	Impact on geological designated sites caused by ground disturbance from construction activities.	Local Geological Sites	**Yes** – as Local Geological Sites are located within the study area.	**Scoped in**
	Reducing groundwater levels and impacts on groundwater quality and flows (due to potential dewatering at trenchless crossings).	Groundwater abstractions.	**Yes** – as locations of trenchless crossings are not yet known or assessed.	**Scoped in** within areas of proposed trenchless crossing.
	Connection of aquifer units creating potential pathways through the excavation of trenchless crossings.	Groundwater	**Yes** – as locations of trenchless crossings are not yet known or assessed.	**Scoped in** within areas of proposed trenchless crossing.

11.7 Proposed Assessment Methodology

Proposed Assessment Methodology

11.7.1 The following section summarises the methodology that has been and will continue to be used for the geology and hydrogeology assessment, which builds on the general assessment methodology presented in **Chapter 5 EIA Approach and Methodology.**

11.7.2 The methodology which has been followed for the work undertaken to date, and which will be developed during the EIA process if required, builds on the guidance set out earlier in this chapter for environmental effects assessed as likely to be significant.

11.7.3 The assessment methodology for assessing contaminated land which has been used is presented within **Appendix 11.A Preliminary Contamination Risk Assessment**. There is no equivalent published assessment methodology that relates to impacts relating to geology (e.g. geo-conservation). For consistency, a similar approach will be adopted to assess these effects (i.e. combination of receptor identification and associated sensitivity and magnitude of potential impacts) as stated in **Appendix 11.A Preliminary Contamination Risk Assessment**.

11.7.4 The methodology used for the preliminary qualitative Minerals Resource Assessment is presented within **Appendix 11.B Preliminary Qualitative Minerals Resource Assessment**.

11.7.5 The methodology adopted in this assessment is qualitative with a progression from published and readily available factual information (stated with reasonable certainty)

regarding the baseline conditions, to appraisal informed by professional judgement and expression of opinions on the relative significance.

11.7.6 The risk assessment approach proposed in this methodology will be transposed into EIA classification as follows, which integrates the topic specific requirement for effects to be assessed via a risk-based approach into the EIA methodology. For each potential effect the receptor sensitivity and impact magnitude will be assigned using the **Tables 11.5** and **11.6** below, which will then be combined to give a significance of effect using the matrix provided in **Table 11.7**.

11.7.7 If further hydrogeological assessment is required as the Project design evolves (e.g. to include undergrounding/trenchless crossings), a hydrogeological risk assessment (for each separate location) will be undertaken to identify impacts and effects in relation to the trenchless crossing and any associated dewatering. This will utilise a source-pathway-receptor linkage approach to assess the potential effects on groundwater which relate to the specific geological/hydrogeological settings between the Order Limits and identified groundwater abstractions and receptors, in accordance with the policy guidance outlined at the start of this chapter. Assessment of the impacts on groundwater receptors will be undertaken based on the approach and methodology described in Environment Agency, Hydrogeological Impact Appraisal for dewatering abstractions guidance (Ref 11.42).

Sensitivity

11.7.8 The criteria used to determine the value and sensitivity of receptors specific to geology and hydrogeology are set out in **Table 11.5**. These values are based on **Table 3.70** of DMRB LA 113: Road drainage and the water environment (Ref 10.12), **Table 3.11** of DMRB LA 109: Geology and soils (Ref 11.20) and professional judgement.

Table 11.5: Value/sensitivity criteria

Value/Sensitivity	General Criteria
Very High	Very high importance and rarity. International scale and limited potential for substitution. **Geology**: Very rare and of international importance with no potential for replacement (e.g. UNESCO World Heritage Sites, UNESCO Global Geoparks, Site of Special Scientific Interest (SSSI) and Geological Conservation Review (GCR) where citations indicate features of international importance). Geology meeting international designation citation criteria which is not designated as such. **Minerals:** Existing Mineral sites. **Contamination:** 1) Human health: very high sensitivity land use such as residential or allotments. 2) Surface water: Watercourse having a Water Framework Directive (WFD) classification shown in a River Basin Management Plan (RBMP)

	and Q95 ≥ 1.0 m^3/s. Site protected/designated under EC or UK legislation (Special Areas of Conservation (SAC), Special Protection Areas (SPA), Sites of Special Scientific Interest (SSSI), Ramsar site). 3) Groundwater: Principal aquifer providing a regionally important resource and regionally important public water supplies, SPZ 1. **Hydrogeology:** Principal aquifer providing a regionally important source and regionally important public water supplies. Groundwater quality associated with SPZ 1 associated with licensed abstractions. Water supplying GWDTEs with a high groundwater dependence with a high environmental importance and international or national value, such as Ramsar sites, SACs, SPAs and SSSIs.
High	High importance and rarity. National scale and limited potential for substitution. **Geology:** Rare and of national importance with little potential for replacement (e.g. geological SSSI, Area of Special Scientific Interest (ASSI), National Nature Reserves (NNR)). Geology meeting national designation citation criteria which is not designated as such. **Minerals:** Mineral preferred areas **Contamination:** 1) Human health: high sensitivity land use such as public open space, and construction workers. 2) Surface water: Watercourse having a WFD classification shown in a RBMP and Q95 <1.0 m^3/s. 3) Groundwater: Principal aquifer providing locally important resource or supporting a river ecosystem, SPZ2. **Hydrogeology:** Principal aquifer providing a locally important source and locally important public water supplies, SPZ2. Water supplying GWDTEs with a moderate groundwater dependence with high environmental importance and international or national value, such as Ramsar sites, SACs, SPAs and SSSIs; or water feeding highly groundwater dependent GWDTE with a national non-statutory UK Biodiversity Action Plan (BAP) priority.
Medium	Medium or high importance and rarity, regional scale, limited potential for substitution **Geology:**

	Regional importance with limited potential for replacement (e.g. Regionally Important Geological Sites). Geology meeting regional designation citation criteria which is not designated as such. **Minerals:** Mineral Safeguarded Areas and Mineral Consultation Area **Contamination**: 1) Human health: medium sensitivity land use such as commercial or industrial; 2) Surface water: Watercourses not having a WFD classification shown in a RBMP and Q95 >0.001 m^3/s. 3) Groundwater: Secondary A Aquifers. Extensive non-licensed private water abstractions (i.e. supplying ten or more properties or supplying large farming/animal estates). SPZ3. **Hydrogeology:** Secondary A aquifer. Groundwater flow and yield and quality associated with extensive non-licensed private water abstractions (i.e. supplying ten or more properties or supplying large farming/animal estates). Groundwater quality associated with SPZ2 (Outer Protection Zone) associated with licensed abstractions. Residential and commercial properties. Water supplying GWDTEs of low groundwater dependence with a high environmental importance and international or national value, such as Ramsar sites, SACs, SPAs and SSSIs; or water feeding moderately groundwater dependent GWDTE with a national non-statutory UK Biodiversity Action Plan (BAP) priority
Low	Low or medium importance and rarity, local scale **Geology:** Local importance/interest with potential for replacement (e.g. non designated geological exposures, former quarries/mining sites). **Minerals:** Mineral present but outside of any MPS/MSA/MCA **Contamination:** 1) Human health: low sensitivity land use such as highways and rail; 2) Surface water: Watercourses not having a WFD classification shown in a RBMP and Q95 ≤0.001 m^3/s. 3) Groundwater: Secondary B or Secondary Undifferentiated aquifer. Small scale private water abstractions (i.e. supplying fewer than ten properties). **Hydrogeology:**

	Secondary B or Secondary Undifferentiated aquifer. Groundwater flow and yield and quality associated with small scale private water abstractions (i.e. feeding fewer than ten properties). Groundwater quality associated with SPZ3 (Source Catchment Protection Zone) associated with licensed abstractions and with licensed abstractions for which no SPZ is defined. Water supplying GWDTEs of low groundwater dependence with a national non-statutory UK BAP priority; or water supplying highly or moderately groundwater dependent GWDTE sites with no conservation designation.
Negligible	Very low importance and rarity, local scale. **Geology:** No geological exposures, little/no local interest. **Mineral:** No mineral identified. **Contamination:** 1) Human health: undeveloped surplus land/no sensitive land use proposed. 2) Surface water: not present. 3) Groundwater: Unproductive strata. **Hydrogeology:** Very poor groundwater quality and/or very low permeability make exploitation of groundwater unfeasible. No active groundwater supply. Water supplying GWDTEs of low groundwater dependence with no designation or groundwater that supports a wetland not classified as a GWDTE, although may receive some minor contribution from groundwater.

Magnitude

11.7.9 The criteria used to determine the magnitude of change for geology and hydrogeology are set out in **Table 11.6**. These values are based on Table 3.71 of DMRB LA 113 (Ref 10.12), Table 3.12 of DMRB LA 109 (Ref 11.20) and professional judgement. No beneficial changes are expected for geology receptors and therefore no such criteria is provided.

Table 11.6: Magnitude Criteria

Magnitude	General Criteria

Large	**Geology Adverse**: Permanent loss of geological feature/designation and/or quality and integrity, severe damage to key characteristics, features or elements.
	Contamination Adverse: Significant contamination identified, and contamination level significantly exceed human health and environmental assessment criteria with the potential for significant harm to be caused. Contamination heavily restricts future use of land. **Contamination Beneficial**: Substantial betterment of ground or groundwater quality/contamination conditions through remediation and/or mitigation.
	Hydrogeology Adverse: Major or irreversible change to groundwater aquifer(s) flow, water level, quality or available yield which endangers the resources currently available. Groundwater resource use/abstraction is irreparably impacted upon, with a major or total loss of an existing supply or supplies. Changes to water table level or quality would result in a major or total change in, or loss of, a groundwater dependent area, where the value of a site would be severely affected. Changes to groundwater aquifer(s) flow, water level and quality would result in major changes to groundwater baseflow contributions to surface water and/or alterations in surface water quality. **Hydrogeology Beneficial**: Major increase in groundwater resource availability. Results in the achievement of Good Status for a WFD groundwater body or GWDTE which is currently failing its WFD objectives. Removal of existing or potential polluting discharge to groundwater
Medium	**Geology Adverse**: partial loss of geological feature/designation, potentially adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements.
	Contamination Adverse: Contamination levels marginally exceed human health and environment assessment criteria. Control/remediation measures are required to reduce risks to human health/make land suitable for intended use. **Contamination Beneficial** Moderate betterment of ground or groundwater quality/contamination conditions through remediation and/or mitigation.
	Hydrogeology Adverse: Moderate long term or temporary significant changes to groundwater aquifer(s) flow, water level, quality or available yield which results in moderate long term or temporarily significant decrease in resource availability. Groundwater resource use/abstraction is impacted slightly, but existing supplies remain sustainable. Changes to water table level or groundwater quality would result in partial change in or loss of a groundwater dependent area, where the value of the site would be affected, but not to a major degree. Changes to groundwater aquifer(s) flow, water level and quality would result in moderate changes to groundwater baseflow contributions to surface water and/or alterations in surface water quality, resulting in a moderate shift from baseline conditions. **Hydrogeology Beneficial**: Moderate increase in groundwater resource availability. Contributes, in combination with other effects, to the achievement of Good Status for a WFD groundwater body or GWDTE which is currently failing

	its WFD objectives. Significant reduction of existing or potential polluting discharge to groundwater.
Small	**Geology Adverse**: minor measurable change in geological feature/designation attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements.
	Contamination Adverse: Contamination levels below human health and environment assessment criteria and remediation is not required. Significant contamination is unlikely with a low risk to human health. Best practice measures can be required to minimise risks to human health. **Contamination Beneficial**: Slight betterment of ground or groundwater quality/contamination conditions through remediation and/or mitigation.
	Hydrogeology Adverse: Minor changes to groundwater aquifer(s) flow, water level, quality or available yield leading to a noticeable change, confined largely to the Project area. Changes to water table level, groundwater quality and yield result in little discernible change to existing resource use. Changes to water table level or groundwater quality would result in minor change to groundwater dependent areas, but where the value of the site would not be affected. Changes to groundwater aquifer(s) flow, water level and quality would result in minor changes to groundwater baseflow contributions to surface water and/or alterations in surface water quality, resulting in a minor shift from baseline conditions. **Hydrogeology Beneficial**: Minor increase in groundwater resource availability. Leads to improvement of a WFD groundwater body which is currently failing its WFD objectives but insufficient effect to achieve Good Status. Minor reduction of existing or potential polluting discharge to groundwater.
Negligible	**Geology**: Very minor change to one or more characteristics, features or elements of geological feature/designation. Overall integrity of resource not affected.
	Contamination: Contamination levels substantially below human health and environment assessment criteria and remediation is not required. No requirement for control measures to reduce risks to human health/make land suitable for intended use.
	Hydrogeology: Very slight change from groundwater baseline conditions, approximating to ‘no change’ conditions. Dewatering effects create no or no noticeable effects.

Significance of effects

11.7.10 Significance would be derived using the matrix set out in **Table 11.7**. This may be supplemented/informed by professional judgement, which, where used, would be explained to give the rationale behind the values assigned. Significant effects, in the context of the EIA Regulations 2017 would be effects of moderate or greater significance.

Table 11.7: Significance Matrix

		Value/Sensitivity of Receptor				
		Very High	**High**	**Medium**	**Low**	**Negligible**
Magnitude	**Large**	Major	Major/Moderate	Major/Moderate /Minor	Moderate/Minor	Minor/Negligible
	Medium	Major/Moderate	Major/Moderate	Moderate/Minor	Minor/Negligible	Negligible
	Small	Major/Moderate	Moderate/Minor	Moderate/Minor	Minor/Negligible	Negligible
	Negligible	Minor/Negligible	Minor/Negligible	Minor/Negligible	Negligible	Negligible

Limitations of assessment

11.7.11 The proposed assessment approach in this chapter is based on published and readily available information, in accordance with a proportionate yet robust approach. 'Reasonable worst case' assumptions regarding the likely ground conditions have been made when assessing effects, determined from the information collated and reviewed. It is not proposed to undertake ground investigation to inform the EIA unless specific high-risk circumstances are identified that warrant this.

11.7.12 The scope of assessment and likely significant effects described in this chapter are based on the current study area and the Project description provided in **Chapter 4**, **Description of the Project** of this Scoping Report. It is anticipated that these details of the development will be subject to refinement as the Project progresses. The approach to data gathering and assessment provided within this chapter is intended to be flexible and is expected to remain applicable as the design evolves.

11.8 Conclusion

Summary

11.8.1 Based on the information reviewed and assessed for the baseline (including the supporting appendices) and described in this report, it is proposed that the majority of the geology and hydrogeology topic can be scoped out on the basis of the evidence that significant effects are unlikely with the embedded mitigation and control/management measures proposed. However, there are elements of the topic where significant effects cannot be determined as likely or unlikely at this stage, due to the potential for design evolution, and therefore these elements of the topic will be scoped into the assessment.

11.8.2 An example of this is trenchless crossings, which at the current time are not proposed. However, to allow the design to respond to non-statutory and statutory consultation, and for the eventuality that trenchless crossings become a requirement – any trenchless crossings are scoped into the assessment and will be assessed in the ES (at which time the locations will be known, and site-specific conditions understood).

11.8.3 In addition to trenchless crossings, the baseline information indicates that the study area crosses three Local Geological Sites and therefore these specific sites are scoped into the assessment. This does not necessarily mean that significant effects are likely,

because the Order Limits (once defined) may not intersect the sites – but the sites will be assessed in the ES.

Proposed Scope of the Assessment

11.8.4 A summary of the proposed scope of the assessment is provided in **Table 11.8**.

Table 11.8: Proposed scope of the assessment

Receptor	Potential for significant effect	Project phase(s)	Proposed to be scoped in/out
Groundwater Abstraction	**Yes** – the location of any abstractions and dewatering are not currently known (specifically related to trenchless crossings, if required)	Construction	**Scoped in** within areas of proposed trenchless crossing
Groundwater	**Yes** – because locations of trenchless crossing not yet known or assessed	Construction	**Scoped in** within areas of proposed trenchless crossing
Specified Local Geological Sites (see section 11.4.16)	**Yes** – because the nature of the interaction with the order limits is unknown at this stage	Construction	**Scoped in**

12. Agriculture and Soils

12.1 Introduction

12.1.1 This chapter presents how the agriculture and soil assessment will consider the potentially significant effects on agriculture and soil receptors that may arise from the construction, operation, and maintenance of the Project (as described in **Chapter 4, Description of the Project**). These receptors broadly comprise the best agricultural land (referred to as best and most versatile (BMV)) land, soils and agricultural operations. It describes the methodology and datasets to be used within the agriculture and soil assessment, presents an overview of the baseline conditions, and identifies the potential likely significant effects to be considered within the assessment, and how these will be assessed for the purpose of an Environmental Impact Assessment (EIA). As detailed in **Chapter 4, Description of the Project**, the decommissioning has been scoped out of the environmental assessment.

12.1.2 The Project Scoping Boundary is illustrated on **Figure 1.1 Project Scoping Boundary**.

12.1.3 This chapter should be read in conjunction with:

- **Chapter 4, Description of the Project**;
- **Chapter 5, EIA Approach and Methodology**;
- **Chapter 8, Ecology and Biodiversity**;
- **Chapter 10, Water Environment**;
- **Chapter 11, Geology and Hydrogeology**; and
- **Chapter 17, Health and Wellbeing**.

12.1.4 This chapter is supported by the following figures:

- **Figure 12.1 Soilscapes**;
- **Figure 12.2 Provisional Agricultural Land Classification**;
- **Figure 12.3 Detailed Agricultural Land Classification**;
- **Figure 12.4 Agri-environment Schemes**; and
- **Figure 12.5 Forestry and Woodland Schemes**.

12.2 Regulatory and Planning Context

12.2.1 **Chapter 2, Regulatory and Planning Context** describes the overall regulatory and planning policy context for the Project. Key legislation, policy and planning guidance relevant to the assessment of potential effects on agriculture and soil associated with the construction, operation and maintenance of the Project is presented below.

Legislation

12.2.2 There is no legislation associated with the assessment of effects on agriculture and soils.

Planning Policy

National Planning Policy

National Policy Statements

12.2.3 As detailed in **Chapter 2, Regulatory and Planning Policy Context**, National Policy Statements (NPSs) set out the primary policy tests against which the application for a Development Consent Order (DCO) for the Project would be considered. The two relevant NPSs are Overarching National Policy Statement for Energy (EN-1) (Ref 2.2) and National Policy Statement for Electricity Networks Infrastructure (EN-5) (Ref 2.3). **Table 12.1** sets out how both the current and draft NPSs (March 2023) relevant to electricity networks infrastructure are relevant to the assessment.

Table 12.1: Relevant sections of the relevant National Policy Statements

National Policy Statement	NPS section	How it will be considered
EN-1	*5.10.8 "Applicants should seek to minimise impacts on the best and most versatile* [BMV] *agricultural land (defined as land in grades 1, 2 and 3a of the Agricultural Land Classification) and preferably use land in areas of poorer quality (grades 3b, 4 and 5) except where this would be inconsistent with other sustainability considerations. Applicants should also identify any effects and seek to minimise impacts on soil quality taking into account any mitigation measures proposed. For developments on previously developed land, applicants should ensure that they have considered the risk posed by land contamination".*	The extent of BMV land within the Scoping Boundary will be assessed in the baseline. The Project will have regard to the location of BMV land, and the extent affected will be minimised through the evolution of the design. The likely impacts on BMV land will be assessed as part of the Agriculture and Soils chapter of the Environmental Statement (ES), with mitigation measures set out to minimise the effects. Risks posed by land contamination is assessed in **Chapter 11, Geology and Hydrogeology**.
EN-1	5.10.15 *"The Infrastructure Planning Commission (IPC) should ensure that applicants do not site their scheme on the best and most versatile agricultural land without justification. It should give little weight to the loss of poorer quality agricultural land (in grades 3b, 4 and 5), except in areas (such as uplands) where particular agricultural practices may themselves contribute to the quality and*	The extent of BMV land within the Scoping Boundary will be assessed in the baseline. The likely impacts on BMV land will be assessed as part of the Agriculture and Soils chapter of the ES, with mitigation measures set out to minimise the effects.

National Policy Statement	NPS section	How it will be considered
	character of the environment or the local economy".	
EN-1 (Draft)	The draft EN-1 also includes the following: *"Applicants are encouraged to develop and implement a Soil Management Plan which could help minimise potential land contamination".*	The mitigation measures will include the requirement for a Soil Management Plan as part of the Construction Environmental Management Plan (CEMP) in line with published guidance.
EN-5	Paragraph 1.7.5 states that, in relation to a presumption that electricity lines should be put underground, *"effects on soil, water, ecology and archaeology are likely to be negative, at least in the short term, requiring significant mitigation, but there is uncertainty around long term effects depending on the specific location and sensitivity of the receiving environment"*. This is reiterated in paragraph 2.8.9 (third bullet point).	The potential effects or opportunities for undergrounding will be assessed in the Agriculture and Soils chapter of the ES.
EN-5	*2.13.8 "There is little evidence that exposure of crops, farm animals or natural ecosystems to transmission line EMFs [Electro-Magnetic Fields] has any agriculturally significant consequences".*	The potential effects of EMFs will be scoped out of the assessment. Where indirect effects to sensitive land uses (such as riding manèges) are identified, additional conductor clearances will be applied.
EN-5 (Draft)	2.11.14 *"…the developer's commitment, as set out in their ES, to mitigate the potential detrimental effects of undergrounding works on any relevant agricultural land and soils, particularly regarding Best and Most Versatile land. Such a commitment must guarantee appropriate handling of soil, backfilling, and return of the land to the baseline Agricultural Land Classification (ALC), thus ensuring no loss or degradation of agricultural land. Such a commitment should be based on soil and ALC surveys in line with the 1988 ALC criteria and due consideration of the Defra Construction Code".*	The extent of BMV land within the Scoping Boundary will be assessed in the baseline. The Project will have regard to the location of BMV land, and the extent affected will be minimised through the evolution of the design. The likely impacts on BMV land from undergrounding will be assessed as part of the agriculture and soils chapter of the ES, with mitigation measures aligned to published guidance to ensure handling methodologies are appropriate to the soil type, that soils are, where practicable, double handling is avoided and where soils are being reinstated the correct profile is recreated

National Policy Statement	NPS section	How it will be considered
		which is suitable for the proposed end land use. The mitigation measures will include the requirement for a Soil Management Plan to be included within the CEMP in line with published guidance.

National Planning Policy Framework

12.2.4 The National Planning Policy Framework (NPPF) (Ref 2.6) requires (paragraph 174) that *"Planning policies and decisions should contribute to an enhance the natural and local environment by … recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of best and most versatile agricultural land, and of trees and woodland"*.

12.2.5 Paragraph 175 includes a footnote which states *"where significant development of agricultural land is demonstrated to be necessary, areas of poorer quality land should be preferred to those of a higher quality*".

12.2.6 This is supported by further advice provided under the Natural Environment Planning Practice Guidance (Ref 11.14). Agricultural land, soil and brownfield land of environmental value covers the quality of agricultural land as defined by the ALC system. The guidance states the importance of soil as an essential natural capital asset and refers to the Defra Code of Practice for the sustainable use of soils on construction sites as a useful source of advice in soil handling.

12.2.7 The extent of BMV land within the Scoping Boundary will be assessed in the baseline. The Project will have regard to the location of BMV land and the extent affected will be minimised through the evolution of the design. The likely impacts on BMV land will be assessed as part of the Agriculture and Soils chapter of the ES, with mitigation measures in line with the Defra Code set out to minimise the effects.

Local planning policy

12.2.8 The Project lies within the jurisdiction of East Riding of Yorkshire, North Lincolnshire and Bassetlaw District Councils. A summary of the relevant local planning policy and emerging policy which is relevant to a study of agriculture and soil matters and will inform the assessment is provided in **Table 12.2**.

Table 12.2: Relevant Local Planning Policies

Local Plan	Policy ref	Policy context	How it will be considered
East Riding Local Plan 2012-2029 Strategy	Policy EC5: Supporting the energy sector	*"Developments and their associated infrastructure should be acceptable in terms of: the land, including land*	The extent of BMV land within the Scoping Boundary will be assessed in the baseline, including

Local Plan	Policy ref	Policy context	How it will be considered
Document, Adopted 2016 (Ref 2.7)		*stability, contamination and soil resources".*	the nature of the soil resources which underpin this. The mitigation measures will include the requirement for a Soil Management Plan in line with published guidance.
North Lincolnshire Local Development Framework – Core Strategy (2011) (Ref 2.11)	Spatial Objective 7: Efficient Use and Management of Resources	*"To ensure the efficient use of resources, maximising recycling of minerals and waste products, minimising pollution, maintaining and improving air, soil and water quality, and employing sustainable building practices in new development".*	The extent of BMV land within the Scoping Boundary will be assessed in the baseline. The Project will have regard to the location of BMV land and the extent affected will be minimised through the evolution of the design. The likely impacts on BMV land from undergrounding will be assessed as part of the Agriculture and Soils chapter of the ES, with mitigation measures set out to minimise the effects. The mitigation measures will include the requirement for a Soil Management Plan as part of the CEMP in line with published guidance.
	CS2: Delivering More Sustainable Development	*"All future development in North Lincolnshire will be required to contribute towards achieving sustainable development … Take account of local environmental capacity and to improve air, water and soil quality and minimise the risk and hazards associated with flooding".*	Soil and ALC surveys will be undertaken to assess the characteristics of the soils present and the functions they provide. The mitigation measures will include the requirement for a Soil Management Plan as part of the CEMP in line with published guidance.
Draft North Lincolnshire Local Plan (2022) (Ref 2.12)	Spatial Objective 12: Efficient Use of Our Resources	*"To encourage the effective and prudent use of North Lincolnshire's resources including energy, water, soils, minerals and waste, by supporting the efficient use of land and buildings, including sustainable construction techniques within new developments, reducing the*	The extent of BMV land within the Order Limits will be assessed in the baseline. The Project will have regard to the location of BMV land and the extent affected will be minimised through the evolution of the design. The likely impacts on BMV land from

Local Plan	Policy ref	Policy context	How it will be considered
		level of waste produced and promoting the use of renewable and low carbon energy, subject to its impact on the area's landscapes and communities. *Measures to minimise pollution and improve air, soil and water quality will also be employed as part of creating a cleaner, greener and safer area".*	undergrounding will be assessed as part of the Agriculture and Soils chapter of the ES, with mitigation measures set out to minimise the effects which will be in line with the Defra Code and will include the requirement for a Soil Management Plan.
	Policy SS3: Development Principles	*"Plan positively and enhance local landscape characteristics, natural capital, geological conservation interests and soils, and avoid, remedy or mitigate any impacts on natural capital features and open spaces".*	
	Policy RD1: Supporting sustainable development in the countryside	*"All development proposals should demonstrate that soil resources will be managed and conserved in a viable condition and used sustainably in line with accepted best practice and only permitted where it safeguards and enhances the natural environment and considers biodiversity through the provision of measurable net gains to biodiversity and links to coherent ecological networks".*	
Bassetlaw Local Plan 2020 – 2037 (Ref 2.19)	4.15 (Strategic Objectives)	*The vision will be achieved by meeting the following objectives … To locate new development in sustainable locations … that respect the environmental capacity of the District, … and* *minimise the loss of the District's highest quality agricultural land.*	
	Policy ST1: Bassetlaw's	*Managed sustainable development and growth, …* *will be achieved by:*	

Local Plan	Policy ref	Policy context	How it will be considered
	Spatial Strategy	*a) promoting the efficient and effective use of land and the re-use of previously developed land in sustainable locations, unless there are overriding amenity, biodiversity or heritage matters that preclude such use; and minimise the use of the most versatile Grade 1-3 agricultural land, where practicable.*	

Guidance

12.2.9 Relevant guidance, specific to agriculture and soils, that has informed this Scoping Report and would inform the assessment within the ES, comprises:

- Department for Environment, Food and Rural Affairs Safeguarding our Soils: A Strategy for England (Ref 12.1);
- Technical Information Note 049. Agricultural Land Classification. Protecting the Best and Most Versatile Agricultural Land (Ref 12.2);
- Guide to Assessing Development Proposals on Agricultural Land (Ref 12.3);
- Guidance Note: Working with Soil Guidance Note on Benefitting from Soil Management in Development and Construction (Ref 12.4);
- British Standard Specification for Topsoil and Requirements for Use (Ref 12.5);
- Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (Ref 12.6);
- Good Practice Guide for Handling Soils. Cambridge: The Farming and Rural Conservation Agency (Ref 12.7);
- Agricultural Land Classification of England and Wales. Revised Guidelines and Criteria for Grading the Quality of Agricultural Land (Ref 12.8); and
- A New Perspective on Land and Soil in Environmental Impact Assessment (Ref 12.9).

Consultation and Engagement

12.2.10 The environmental assessment will be informed by consultation and engagement with stakeholders, including, but not limited to, East Riding of Yorkshire Council, North Lincolnshire Council, Bassetlaw District Council, Nottinghamshire County Council, and Natural England.

12.3 Study Area

12.3.1 The study area for agriculture and soils comprises the area within which agriculture and soil resources may experience effects as a result of the Project. For the purpose of this Scoping Report, the study area has been defined as the Scoping Boundary. A 'wider study area' is also considered, which extends to 1 km around the Scoping Boundary in order to provide environmental context and identify potential receptors (where the extent of a farm business goes beyond the Scoping Boundary), and also identify field drainage systems that extend beyond the Scoping Boundary. This is considered an appropriate study area based on professional judgement and knowledge of similar projects.

12.3.2 The study area is presented on **Figures 12.1** to **12.5**. As the iterative design process continues, the Scoping Boundary will be refined to comprise the proposed Order Limits within the ES.

12.4 Baseline Conditions

Data Sources

12.4.1 The known or predicated current and future baseline environment described in this section has been informed by the following data sources:

- British Geological Survey (BGS) Online Mapping for Bedrock and Superficial Geology (Ref 12.10);
- OS mapping and aerial photography to establish land use and settlement patterns;
- Soilscape mapping showing the distribution of main soil types was assessed on the Land Information System website (Ref 12.11);
- ALC mapping, including provisional and (where available) detailed ALC mapping (developed from surveys) from the MAGIC website (Ref 8.21); and
- Extent of agri-environmental, and woodland and forestry schemes from the MAGIC website (Ref 8.21).

Baseline

Geology

12.4.2 The solid geology underlying the northern section of the study area, to the west of Hull and north of the Humber estuary, is described as predominately comprising Burnham Chalk Formation, sedimentary bedrock formed between 93.9 and 83.6 million years ago during the Cretaceous period. As the route turns to the south, the majority of the remaining route is described as being underlain with Mercia Mudstone Group, sedimentary bedrock formed between 252.2 and 201.3 million years ago during the Triassic period.

12.4.3 Within this northern section (west of Hull and north of the Humber estuary) superficial deposits are present, comprising alluvial and till deposits. South of the Humber estuary extensive areas of alluvium and Warp silt and clay are present within the floodplains of the River Trent and its tributaries.

Soils

12.4.4 The soil types which have formed in this geology vary across the study area, as shown in **Figure 12.1 Soilscapes**. The predominant soil types are identified as loamy and clayey soils of coastal flats with naturally high groundwater in the areas surrounding the River Humber. The soil types across the rest of the study area are primarily described as slightly acidic loamy and clayey soils with impeded drainage.

12.4.5 There are also possible locations comprising fen peat and raised bog peat soils to the west of Scunthorpe.

12.4.6 The Soil Associations present within the Scoping Boundary (from north to south) are presented in **Table 12.3**.

Table 12.3: Soil Associations present within Scoping Boundary (from north to south)

Soil Association	Description
Holderness	Slowly permeable seasonally waterlogged fine loamy soils and similar soils with only slight waterlogging. Some narrow strips of clayey alluvial soils. Parent material: chalky till.
Burlingham 2	Deep fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging. Some slowly permeable seasonally waterlogged fine loamy soils. Some well drained fine and coarse loamy soils. Parent material: chalky till.
Hunstanton	Deep well drained often reddish fine loamy and course loamy soils. Some similar calcareous soils over chalk. Parent material: Till and glaciofluvial drift over chalk.
Panholes	Well drained calcareous fine silty soils over chalk. Associated similar shallow soils and deeper non-calcareous fine silty soils. Parent material: chalk.
Andover 1	Shallow well drained calcareous silty soils over chalk on slopes and crests. Deep calcareous and non-calcareous fine silty soils in valley bottoms. Striped soil patterns locally Parent material: chalk.
Newchurch 2	Deep stoneless mainly calcareous clayey soils. Groundwater controlled by ditches and pumps. Flat land. Risk of flooding in places. Parent material: marine alluvium.
Blacktoft	Deep stoneless permeable calcareous fine and course silty soils. Some calcareous clayey soils. Groundwater controlled by ditches and pumps. Flat land. Parent material: marine alluvium.
Romney	Deep stoneless permeable calcareous course and fine silty soils. Flat land. Groundwater controlled by ditches and pumps.

Soil Association	Description
	Parent material: marine alluvium.
Brockhurst 2	Slowly permeable seasonally waterlogged reddish fine loamy over clayey and clayey soils. Some reddish clayey alluvial soils affected by groundwater. Parent material: Permo-Triassic reddish mudstone and alluvium.
Worcester	Slowly permeable non-calcareous and calcareous reddish clayey soils over mudstone, shallow on steeper slopes. Associated with similar non-calcareous fine loamy over clayey soils. Slight risk of water erosion. Parent material: Permo-Triassic reddish mudstone.
Whimple 3	Reddish fine loamy or fine silty over clayey soils with slowly permeable subsoils and slight seasonal waterlogging. Some similar clayey soils on brows. Slowly permeable seasonally waterlogged fine loamy and fine silty over clayey soils on lower slopes. Parent material: Drift over Permo-Triassic and Carboniferous reddish mudstone.

Agricultural Land Classification

12.4.7 **Figure 12.2 Provisional Agricultural Land Classification** shows that the study area comprises extensive areas of Grade 2 land, as well as some Grade 1 land along the route corridor from Hull to the River Idle. South of the River Idle the land is predominantly mapped as Grade 3 land.

12.4.8 The mapping, at a scale of 1:250,000, does not distinguish between Grades 3a and 3b (and cannot be used to inform site specific assessments) but provides an indication of the most likely land classification. The provisional ALC information available suggests that a large portion of the study area may comprise BMV land.

12.4.9 Based on the Provisional ALC mapping, the extent of each land grade present within the Scoping Boundary is as follows:

- Grade 1: 638 ha;
- Grade 2: 5,182 ha;
- Grade 3: 4,452 ha; and
- Grade 4: 86 ha.

12.4.10 This shows the likely predominance of Grade 2 land and therefore the potential for the project to affect BMV land.

12.4.11 There are several locations within the study area for which detailed ALC mapping is available (**Figure 12.3 Detailed Agricultural Land Classification**). These small areas of surveyed land show ALC grades ranging from Grade 1 through to Grade 3b, again indicating the likelihood of BMV land being present within the study area.

Land Use

12.4.12 A desk-based assessment using aerial photography and Ordnance Survey Mapping has shown that the land use across the study area appears to be a combination of arable and pasture land. The study area also passes close by areas of urban infrastructure including large cities such as Hull.

12.4.13 Across the study area there are numerous areas of land under Countryside Stewardship Agreements (Middle and Higher Tier), as well as areas designated under various Environmental Stewardship Agreement Levels (**Figure 12.4 Agri-environment Schemes**). There are also parcels of land across the study area which are also under Woodland Grant Schemes (**Figure 12.5 Forestry and Woodland Schemes**).

Future Baseline

12.4.14 The future baseline relates to known or anticipated changes to the current baseline in the future that are predicted to occur in the absence of the Project.

12.4.15 It is considered that the baseline in relation to soils and ALC grades would not change from that described within the timeframe for the construction of the Project. While there may be potential changes in relation to climate change, including greater rainfall intensity and droughts, that could affect soil conditions, land grade, and farming practices, it is likely that these would only be visible over longer time frames.

12.4.16 There could potentially be changes to land management practices and business approaches across the landowners/land mangers over the construction and operation of the Project.

12.5 Embedded and Control & Management Measures

Embedded Measures

12.5.1 The Project has been designed to avoid, as far as practicable, sensitive agriculture and soils features as set out in the Corridor and Preliminary Routeing and Siting Study (Ref 3.5).

12.5.2 The extent of land required temporarily and permanently to construct and operate the Project is being evaluated as part of the design-development process; this is seeking to minimise overall impacts on BMV land, soils and agricultural operations, where practicable.

12.5.3 Further embedded measures will be developed as the Project design evolves.

Control and Management Measures

12.5.4 An Outline Code of Construction (CoCP) is provided in **Appendix 4.A Outline Code of Construction Practice**. Measures relevant to the control and management of impacts that could affect the agriculture and soil receptors are:

- GG01: The Project will be run in compliance with all relevant legislation, consents and permits.
- GG02: The Project design will be compliant with the guidelines and policies relating to electromagnetic fields stated in National Policy Statement EN-5, including the International Commission on Non-Ionizing Radiation Protection guidelines (1998).

- GG03: A Construction Environmental Management Plan (CEMP), a Landscape and Ecological Management Plan (LEMP), a Construction Traffic Management Plan (CTMP), and a Site Waste Management Plan (SWMP) will be produced prior to construction. These are collectively referred to as 'the Management Plans'.
- GG04: The CEMP shall include measures to manage dust, waste, water, noise, vibration and soil during construction. The contractor(s) shall undertake daily site inspections to check conformance to the Management Plans.
- GG05: A suitably experienced Environmental Manager will be appointed for the duration of the construction phase. In addition, a qualified and experienced Environmental Clerk of Works will be available during the construction phase to advise, supervise and report on the delivery of the mitigation methods and controls outlined in the CEMP. The Environmental Clerk of Works will monitor that the works proceed in accordance with relevant environmental DCO requirements and adhere to the required good practice and mitigation measures. The Environmental Clerk of Works will be supported as necessary by appropriate specialists, including ecologists and arboriculturists.
- GG19: Earthworks and stockpiled soil will be protected by covering, seeding or using water suppression where appropriate.
- GG24: Stone pads will be installed in areas where heavy equipment, such as cranes and piling rigs, are to be used. The stone pads will provide stable working areas and will reduce disturbance to the ground. The stone pad area will be stripped of the topsoil, which will be stored and reinstated in accordance with the soil management measures contained in the CEMP.
- AS01: Soil management measures will be included within the CEMP. Measures will include but not be limited to the following:
  - the soil resources present;
  - how topsoil and subsoil will be stripped and stockpiled;
  - suitable conditions for when handling soil will be undertaken, for example avoiding handling of waterlogged soil;
  - indicative soil storage locations;
  - how soil stockpiles will be designed taking into consideration site conditions and the nature/composition of the soil;
  - specific measures for managing sensitive soils;
  - suitable protective surfacing where soil stripping can be avoided, based on sensitivity of the environment and proposed works;
  - approach to reinstating soil that has been compacted, where required; and
  - details of measures required for soil restoration.
- AS02: Where land is being returned to agricultural use, the appropriate soil conditions (for example through the replacement of stripped layers and the removal of any compaction) will be recreated. This will be achieved to a depth of 1.2 m (or the maximum natural soil depth if this is shallower).
- AS03: Access to and from residential, commercial, community and agricultural land uses will be maintained throughout the construction period or as agreed through the

landowner discussions. This may require signed diversions or temporary restrictions to access. The means of access to affected properties, facilities and land parcels will be communicated to affected parties at the start of the Project, with any changes communicated in advance of the change being implemented. Where field-to-field access points require alteration as a result of construction, alternative field access will be provided in consultation with the landowner/occupier.

- AS04: Existing water supplies for livestock will be identified pre-construction. Where supplies will be lost or access compromised by construction works, temporary alternative supplies will be provided. Water supplies will be reinstated following construction.
- AS05: Consultation with affected landowners will be carried out to investigate the current extent of land drainage. A scheme of pre-construction land drainage will be designed with the intent of maintaining the efficiency of the existing land drainage system and to assist in maintaining the integrity of the working area during construction. The Project may include a system of 'cut-off' drains which feed into a new header drain and the project will also take into account surface water runoff measures.
- AS06: Should animal bones be discovered during construction, which may indicate a potential burial site, works will cease, and advice will be sought from the Animal Health Regional Office on how to proceed, relevant to the origin and age of the materials found.
- AS07: All movement of plant and vehicles between fields will cease in the event of a notification by the Department for Environment, Food and Rural Affairs (Defra) of a disease outbreak in the vicinity of the site that requires the cessation of activities. Advice will be sought from Defra in order to develop suitable working methods required to reduce the biosecurity risk associated with the continuation of works.
- AS08: Clay bungs or other vertical barriers will be constructed within trench excavations where deemed necessary by a suitably experienced person, to prevent the creation of preferential drainage pathways.
- AS09: Stone pads will be installed in areas where heavy equipment, such as cranes and piling rigs, are to be used. The stone pads will provide stable working areas and will reduce disturbance to the ground. The stone pad area will be stripped of the topsoil, which will be stored and reinstated in accordance with the soil management measures.

12.6 Potential for Significant Effects

12.6.1 The agriculture and soil assessment will consider the construction, operation, and maintenance of the Project. Details of each of these phases are set out in **Chapter 4, Description of the Project**.

12.6.2 The proposed scope of the agriculture and soil assessment is set out below and has been determined using the approach described in **Chapter 5, EIA Approach and Methodology**.

12.6.3 The potential for the Project to result in the likely significant effects identified in **Table 12.4** takes into account the embedded and control and management measures described in section 12.5.

12.6.4 The majority of any financial consequences on individual landowners and farmers will be temporary, as most of the land will be reinstated by the end of the construction phase and any claims regarding compensation will be addressed outside of the EIA process. As such, potential economic effects on individual landowners and farmers are scoped out of the ES.

Sources and Impacts (Step 1)

12.6.5 This section identifies the sources and impacts that would occur as a result of the construction, operation, and maintenance of the Project.

Potential sources of impacts

Sources of construction impacts

- Temporary acquisition of land to accommodate construction activities.
- Temporary construction activities (as detailed in **Chapter 4, Description of the Project**) which disturb soils (including stripping and stockpiling).

Sources of operational impacts

- Permanent acquisition of land to accommodate operational project.
- EMF effects.

Sources of maintenance impacts

- Temporary acquisition of land to accommodate maintenance activities.
- Temporary maintenance activities (as detailed in **Chapter 4, Description of the Project**) which disturb soils (including stripping and stockpiling).

Potential impacts

12.6.6 **Table 12.4** identifies the potential impacts that could result from the sources identified above.

12.6.7 Where **Table 12.4** identifies the potential for an impact to result in a significant effect the impact is taken through to Step 2. Where **Table 12.4** identifies no potential for an impact to result in a significant effect, that impact is proposed to be scoped out.

Table 12.4: Impacts and the potential for significant effects

Project phase	Source	Impact	Potential for significant effects
Construction	Temporary acquisition of land to accommodate construction activities.	Temporary loss of agricultural land (including BMV land) and reduction in the extent of the most productive agricultural land.	**Yes** – potential for areas of BMV land to be temporarily affected. This will be confirmed through detailed ALC surveys.

Project phase	Source	Impact	Potential for significant effects
		Temporary disruption to landholdings resulting in reduction in the operational capacity of farm businesses.	No – the measures outlined in section 12.5 would reduce the potential for temporary disruption.
		Loss of income to farm businesses.	No – the measures outlined in section 12.6 would reduce the potential for disruption and any residual disruption would be dealt with through compensation agreements (which lie outside the scope of the EIA process).
	Temporary construction activities which disturb soils	Temporary soil disturbance (including stripping and stockpiling) resulting in a reduction in the ability of soil to function and provide ecosystem services (including the Grade of land).	**Yes** – the measures outlined in section 12.5 would minimise the risk of long-term damage to soil health and function, but the sensitivity of the soils will be confirmed through soil surveys.
Operation	Permanent acquisition of land to accommodate operational project.	Reduction in the extent of the most productive agricultural land.	**Yes** – potential for areas of BMV land to be permanently lost. This will be confirmed through detailed ALC surveys.
		Reduction in the operational capacity of farm businesses.	No – the measures outlined in section 12.6 would reduce the potential for disruption and any residual disruption would be dealt with through compensation agreements (which lie outside the scope of the EIA process).
		Loss of income to farm businesses	No – the measures outlined in section 12.6 would reduce the potential for disruption and any residual disruption would be dealt with through compensation agreements (which lie outside the scope of the EIA process).

Project phase	Source	Impact	Potential for significant effects
	EMF effects.	Possible impacts to sensitive land uses, where indirect EMF effects may be an issue, such as manèges.	No – as noted in **Table 12.1**, there is little evidence that exposure of crops, farm animals or natural ecosystems to transmission line EMFs has any agriculturally significant consequences.
Maintenance	Temporary acquisition of land to accommodate maintenance activities.	Temporary loss of agricultural land (including BMV land) and reduction in the extent of the most productive agricultural land.	No – potential for only small areas of BMV land to be temporarily affected.
		Temporary disruption to landholdings resulting in reduction in the operational capacity of farm businesses	No – the measures outlined in section 12.5 would reduce the potential for disruption.
		Loss of income to farm businesses	No – the measures outlined in section 12.5 would reduce the potential for disruption and any residual disruption would be dealt with through compensation agreements (which lie outside the scope of the EIA process).
	Temporary maintenance activities which disturb soils.	Temporary soil disturbance (including stripping and stockpiling) resulting in a reduction in the ability of soil to function and provide ecosystem services.	No – the measures outlined in section 12.5 would minimise the risk of damage to soil health and function which prevents short-term damage and subsequent long-term damage.

Impact Pathways with Receptors (Step 2)

12.6.8 This section identifies whether there are any impact pathways from the impacts identified above that could give rise to potentially significant effects on receptors identified within the study area.

12.6.9 **Table 12.5** provides a summary of the impact pathways identified and those proposed to be scoped into the agriculture and soil assessment for the Project.

Table 12.5: Impact pathways with receptors

Project Phase	Impact	Receptor	Potential for significant effects	Proposed to be scoped in/out
Construction	Temporary loss of agricultural land (including BMV land) and reduction in the extent of the most productive agricultural land.	BMV land	**Yes** – soil and ALC surveys will be undertaken in relation to areas of construction infrastructure to include sections of the access routes through particularly sensitive soils (such as heavy soils prone to compaction) and soil stripping for cable installation. The assessment will detail, as standard mitigation, the requirements for soil handling and reinstatement. Land required temporarily will be fully reinstated to its pre-construction condition.	**Scoped in**
	Temporary soil disturbance (including stripping and stockpiling) resulting in a reduction in the ability of soil to function and provide ecosystem services (including the Grade of land).	Soil function	**Yes** – soil and ALC surveys will be undertaken in relation to areas of permanent infrastructure, to include sections of the access routes through particularly sensitive soils (such as heavy soils prone to compaction) and soil stripping for cable installation. The assessment will detail, as embedded mitigation, the requirements for soil handling and reinstatement. Land required temporarily will be fully reinstated to its pre-construction condition.	**Scoped in**
Operation	Reduction in the extent of the most productive	BMV land	**Yes** – soil and ALC surveys will be undertaken in relation to	**Scoped in**

Project Phase	Impact	Receptor	Potential for significant effects	Proposed to be scoped in/out
	agricultural land.		all areas of permanent infrastructure.	

12.7 Proposed Assessment Methodology

Proposed Data Sources

12.7.1 In addition to the data sources listed in section 12.4, the following data sources are also proposed to be used to inform the agriculture and soil assessment:

- Detailed ALC surveys of relevant areas. These would be undertaken in accordance with the published guidance (Ref 12.8) at a survey density of 1 auger per hectare in areas where there will be disturbance to the soils, for example where permanent infrastructure is proposed, sections of the access routes and construction compound locations through particularly sensitive soils (such as heavy soils prone to compaction) and where undergrounding is proposed. Surveys will also be undertaken where land use change would remove land from agricultural production, for example where new woodland planting is required to achieve Biodiversity Net Gain (BNG) requirements (**Chapter 8, Ecology and Biodiversity**).
- Climatic data, purchased from the National Soil Resources Institute, will be used in the calculation of ALC grades.
- Land Information System Soil Site Report, purchased from the National Soil Resources Institute to provide an in-depth insight into the relevant Soil Associations and properties within the study area.

Technical Guidance

12.7.2 The agriculture and soil assessment will be carried out in accordance with the good practice and guidance documents set out in paragraph 12.2.9 of this chapter.

Proposed Assessment Methodology

12.7.3 This section sets out the proposed methodology for the soils and agriculture assessment of the ES. The assessment would be based on guidance set out by IEMA on how land and soil should be assessed in EIA (Ref 12.9).

12.7.4 The IEMA guidance advocates an approach to assessing the soil functions, ecosystem services and the natural capital provided by land and soils.

Sensitivity

12.7.5 The criteria used to determine the value and sensitivity of receptors specific to agriculture and soils are set out in **Table 12.6**, as set out in the IEMA guidance (Ref 12.9).

Table 12.6: Sensitivity criteria

Receptor sensitivity	Soil resource and soil functions
Very High	**Biomass production**: ALC Grades 1 and 2. **Ecological habitat, soil biodiversity and platform for landscape**: soils supporting protected features within a European site (e.g., Special Area of Conservation (SAC), Special Protection Area (SPA), Ramsar); peat soils; soils supporting a National Park, or ancient woodland. **Soil carbon**: peat soils; soils with potential for ecological/landscape restoration. **Soil hydrology**: very important catchment pathway for water flows and flood risk management. **Archaeology, cultural heritage, community benefits and geodiversity**: scheduled monuments and adjacent areas; World Heritage and European designated sites; soils with known archaeological interest; soils supporting community/recreational/educational access to land covered by National Park designation. **Source of materials**: important surface mineral reserves that would be sterilised (i.e., without future access).
High	**Biomass production**: ALC Grade 3a. **Ecological habitat, soil biodiversity and platform for landscape**: soils supporting protected features within a UK designated site (e.g. United Nations Educational, Scientific and Cultural Organization (UNESCO) Geoparks, Site of Special Scientific Interest (SSSI) or Areas of Outstanding Natural Beauty (AONB), Special Landscape Area (SLA) and Geological Conservation Review sites); native forest and woodland soils; unaltered soils supporting semi-natural vegetation. **Soil carbon**: organo-mineral soils (e.g. peaty soils). **Soil hydrology**: important catchment pathway for water flows and flood risk management. **Archaeology, cultural heritage, community benefits and geodiversity**: soils with probable (e.g. where an archaeological site is likely to exist based on previous research/assessment) but as yet unproven (prior to being revealed by construction) archaeological interest; historic parks and gardens; Regionally Important Geological Site (RIGS); soils supporting community/recreational/educational access to RIGS and AONBs. **Source of materials**: surface mineral reserves that would be sterilised (i.e., without future access).
Medium	**Biomass production**: ALC Grade 3b. **Ecological habitat, soil biodiversity and platform for landscape**: soils supporting protected or valued features within non-statutory designated sites (e.g. Local Nature Reserves (LNR), Local Geological Sites (LGSs), Sites of Nature Conservation Importance (SNCIs), SLA; non-native forest and woodland soils. **Soil carbon**: mineral soils with elevated soil carbon resulting from land management practices such as addition of organic amendments or minimisation of soil disturbance (for example under long-term pasture).

Receptor sensitivity	Soil resource and soil functions
	Soil hydrology: important minor catchment pathway for water flows and flood risk management. **Archaeology, cultural heritage, community benefits and geodiversity**: soils with possible (e.g. where professional judgement suggests an archaeological site may exist based on soil type, aspect, adjacent features etc.) but as yet unproven (prior to being revealed by construction) archaeological interest; soils supporting community/recreational/educational access to land. **Source of materials**: surface mineral reserves that would remain accessible for extraction.
Low	**Biomass production**: ALC Grade 4 and 5. **Ecological habitat, soil biodiversity and platform for landscape**: soils supporting valued features within non-designated notable or priority habitats/landscapes. Agricultural soils. **Soil carbon**: mineral soils. **Soil hydrology**: pathway for local water flows and flood risk management. **Archaeology, cultural heritage, community benefits and geodiversity**: soils supporting no notable cultural heritage, geodiversity nor community benefits; soils supporting limited community/recreational/educational access to land. **Source of materials**: surface mineral reserves that would remain accessible for extraction.
Negligible	As for low sensitivity, but with only indirect, tenuous, and unproven links between sources of impact and soil functions.

Magnitude

12.7.6 The criteria used to determine the magnitude of impact for soils and agriculture are set out in **Table 12.7**, as set out in the IEMA guidance (Ref 12.9).

Table 12.7: Magnitude of impact criteria

Magnitude of impact (change)	Description of impacts restricting proposed land use
Large	Permanent, irreversible loss of one or more soil functions or soil volumes (including permanent sealing or land quality downgrading), over an area of more than 20 ha or loss of soil-related features set out in **Table 12.5** (including effects from 'temporary developments'). or Potential for permanent improvement in one or more soil functions or soil volumes due to remediation or restoration over an area of more than 20 ha or gain in soil-related features set out in **Table 12.5**, as advised by other topic specialists (including effects from 'temporary developments').
Medium	Permanent, irreversible loss of one or more soil functions or soil volumes, over an area of between 5 and 20 ha or loss of soil-related features set out in **Table**

Magnitude of impact (change)	Description of impacts restricting proposed land use
	12.5, as advised by other topic specialists (including effects from 'temporary developments'). or Potential for improvement in one or more soil functions or soil volumes due to remediation or restoration over an area of between 5 and 20 ha or gain in soil-related features set out in **Table 12.5**, as advised by other topic specialists.
Small	Permanent, irreversible loss over less than 5 ha or a temporary, reversible loss of one or more soil functions or soil volumes), or temporary, reversible loss of soil-related features set out in **Table 12.5**, as advised by other topic specialists. or Potential for permanent improvement in one or more soil functions or soil volumes due to remediation or restoration over an area of less than 5 ha or a temporary improvement in one or more soil functions due to remediation or restoration or off-site improvement, or temporary gain in soil-related features, as advised by other topic specialists.
Negligible	No discernible loss or reduction or improvement of soil functions or soil volumes that restrict current or proposed land use.

Significance of effects

12.7.7 The significance of an effect is then derived using the matrix set out in **Chapter 5, EIA Approach and Methodology.** An effect determined to be moderate or above would be deemed significant.

Limitations of assessment

12.7.8 No limitations have currently been identified. The full assessment will be reliant on land access to enable focused soil and ALC surveys; the extent of surveys undertaken will be fully detailed in the assessment reported in the ES.

12.8 Conclusion

Summary

12.8.1 The potential for temporary and permanent effects on agricultural land (including BMV land) and on soils have been identified through the scoping exercise. Whilst the measures included within the Outline CoCP will reduce effects as far as practicable the full assessment will be undertaken based on a more detailed understanding of the extent of BMV land and sensitive soils which would be affected.

12.8.2 Impacts on agricultural operations will be minimised through embedded mitigation measures, as well as through compensation agreements.

Proposed Scope of the Assessment

12.8.3 A summary of the proposed scope of the assessment is provided in **Table 12.8**.

Table 12.8: Proposed scope of the assessment

Receptor	Potential for significant effect	Project phase(s)	Proposed to be scoped in/out
Agricultural land, including BMV land	Potential for significant effect from reduction in the extent of the most productive agricultural land.	Construction and operation	**Scoped in**
Soil function	Potential for significant effect.	Construction	**Scoped in**

13. Traffic and Transport

13.1 Introduction

13.1.1 This chapter presents how the traffic and transport assessment will consider the potentially significant effects on traffic and transport receptors that may arise from the construction, operation, and maintenance of the Project (as described in **Chapter 4, Description of the Project**). It describes the methodology and datasets to be used within the traffic and transport assessment, presents an overview of the baseline conditions, and identifies the potential likely significant effects to be considered within the assessment, and how these will be assessed as part of the Environmental Impact Assessment (EIA). As detailed in **Chapter 4, Description of the Project**, the decommissioning has been scoped out of the environmental assessment.

13.1.2 The Project Scoping Boundary is illustrated on **Figure 1.1 Project Scoping Boundary**.

13.1.3 This chapter should be read in conjunction with:

- **Chapter 2, Regulatory and Planning Policy Context**;
- **Chapter 4, Description of the Project**; and
- **Chapter 5, EIA Approach and Methodology**.

13.1.4 This chapter is supported by **Figure 13.1 Proposed Traffic Study Area**.

13.2 Regulatory and Planning Context

13.2.1 **Chapter 2, Regulatory and Planning Context** describes the overall regulatory and planning policy context for the Project. Key legislation, policy and planning guidance relevant to the assessment of potential effects on traffic and transport associated with the construction, operation, and maintenance of the Project is presented below.

Legislation

13.2.2 The legislation relating to traffic and transport includes the Transport Act 2000 (Ref 13.1), which aims to bring about changes and improvements to the transportation sector in the United Kingdom by addressing various aspects of the country's transport infrastructure and services.

Planning Policy

National Planning Policy

National Policy Statements

13.2.3 As detailed in **Chapter 2, Regulatory and Planning Policy Context**, National Policy Statements (NPSs) set out the primary policy tests against which the application for a Development Consent Order (DCO) for the Project would be considered. The two relevant NPSs for the Project are Overarching National Policy Statement for Energy (EN-1) (Ref

2.2) and National Policy Statement for Electricity Networks Infrastructure (EN-5), although it is acknowledged that only EN-1 is of specific relevance to Transport. **Table 13.1** sets out how both the current and draft EN-1 (Ref 2.4) are relevant to the traffic and transport assessment.

Table 13.1: Relevant sections of the relevant National Policy Statements

National Policy Statement	NPS section	How it will be considered
EN-1	*5.13.2 "The consideration and mitigation of transport impacts is an essential part of Government's wider policy objectives for sustainable development as set out in Section 2.2 of this NPS".*	The Project's transport impacts shall be fully assessed and set out within an Environment Statement (ES) and Transport Assessment (TA)
EN-1	*5.13.3 "If a project is likely to have significant transport implications, the applicant's ES (see Section 4.2) should include a transport assessment, using the NATA/WebTAG methodology stipulated in Department for Transport guidance, or any successor to such methodology. Applicants should consult the Highways Agency and Highways Authorities as appropriate on the assessment and mitigation".*	The Project shall be subject to the production of a TA.
EN-1	*5.13.4 "Where appropriate, the applicant should prepare a travel plan including demand management measures to mitigate transport impacts. The applicant should also provide details of proposed measures to improve access by public transport, walking and cycling, to reduce the need for parking associated with the proposal and to mitigate transport impacts".*	The Project shall be subject to the production of a Construction Traffic Management Plan (CTMP) and a Construction Worker Travel Plan (CWTP) in accordance with this section of EN-1. The appropriate. Highways Authorities will be consulted throughout the design process.
EN-1	5*.13.6 "A new energy NSIP may give rise to substantial impacts on the surrounding transport infrastructure and the IPC should therefore ensure that the applicant has sought to mitigate these impacts, including during the construction phase of the development. Where the proposed mitigation measures are insufficient to reduce the impact on the transport infrastructure to acceptable*	Impacts shall be considered and mitigated through the following documents – CTMP, CWTP, Traffic Assessment, Travel

National Policy Statement	NPS section	How it will be considered
	levels, the IPC should consider requirements to mitigate adverse impacts on transport networks arising from the development, as set out below. Applicants may also be willing to enter into planning obligations for funding infrastructure and otherwise mitigating adverse impacts".	Plan, Construction Environmental Management Plan (CEMP), Public Rights of Way (PRoW) Management Plan.
EN-1	Section 5.13.11 *"The IPC may attach requirements to a consent where there is likely to be substantial HGV traffic that:* • *control numbers of HGV movements to and from the site in a specified period during its construction and possibly on the routing of such movements;* • *make sufficient provision for HGV parking, either on the site or at dedicated facilities elsewhere, to avoid 'overspill' parking on public roads, prolonged queuing on approach roads and uncontrolled on-street HGV parking in normal operating conditions; and* *ensure satisfactory arrangements for reasonably foreseeable abnormal disruption, in consultation with network providers and the responsible police force"*.	Controls on timings of HGV movements as well as routeing to be implemented and sufficient parking for HGVs to be supplied. Covered within the CTMP and CWTP.
Draft NPS EN-1	5.14.5 "*If a project is likely to have significant transport implications, the applicant's ES (see Section 4.2) should include a transport appraisal. The DfT's Transport Analysis Overarching National Policy Statement for Energy (EN-1) provides guidance on modelling and assessing the impacts of transport schemes"*	The Project shall be subject to the production of a TA in accordance with all relevant guidance and policy.
Draft NPS EN-1	Section 5.14.7 "*The applicant should prepare a travel plan including demand management and monitoring measures to mitigate transport impacts. The applicant should also provide details of proposed measures to improve access by active, public and shared transport to:* • *reduce the need for parking associated with the proposal;* • *contribute to decarbonisation of the transport network;* • *reduce the need to travel; and* • *secure behavioural change and modal shift through an offer of genuine modal choice and to mitigate transport impacts"*	Impacts shall be considered and mitigated through the following documents - CTMP, CWTP, Traffic Assessment, Travel Plan, CEMP, PRoW Management Plan.

National Policy Statement	NPS section	How it will be considered
Draft NPS EN-1	*The Secretary of State should only consider refusing development on highways grounds if there would be an unacceptable impact on highway safety, residual cumulative impacts on the road network would be severe, or it does not show how consideration has been given to the provision of adequate active public or shared transport access and provision.*	The Project impact shall be fully assessed and set out within an ES and TA.

National Planning Policy Framework

13.2.4 The National Planning Policy Framework (NPPF) (Ref 2.6) sets out the government's planning policies for England and how these are expected to be applied. The most relevant section is set out in **Table 13.2**.

Table 13.2: Relevant National Planning Policies

National Planning Policy Framework	NPPF Section	How it will be considered
NPPF	Paragraph 111 *"Development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe".*	The Project impact shall be fully assessed and set out within an ES and TA.
NPPF	Paragraph 113 *"All developments that will generate significant amounts of movement should be required to provide a travel plan, and the application should be supported by a transport statement or transport assessment so that the likely impacts of the proposal can be assessed".*	Mitigation measures will be put in place through the CTMP and CWTP to reduce impacts on the transport network.

13.2.5 The National Planning Practice Guidance (NPPG) includes guidance relating to travel plans, TA's and statements (Ref 13.2). This includes the scope and level of detail to be included in a TA or statement (**Table 13.4**).

Local planning policy

13.2.6 The Project lies within the jurisdiction of East Riding of Yorkshire, North Lincolnshire and Bassetlaw District (Nottinghamshire County) Councils but is also close to the boundaries with both Hull County Council and Lincolnshire County Council and as such traffic from the Project may use roads under the jurisdiction of these highway authorities that will need to be quantified and discussed.

13.2.7 A summary of the relevant local highway authority planning policy which is relevant to a study of traffic and transport matters and will inform thje traffic and transport assessment in the ES is provided in **Table 13.3**.

Table 13.3: Relevant Local Planning Policies

Local Plan	Policy ref	Policy context	How it will be considered
East Riding of Yorkshire Council's Local Transport Plan Network Management Plan (2021-2039)	Section 3.8.3 Responsibility to direct HGV drivers along most appropriate routes.	The council has developed a preferred HGV route network that is signed and included on a freight map of the East Riding.	The map will be adhered to wherever possible, with any deviations discussed and agreed with the Local Highway Authority.
East Riding Local Plan 2012-2029 Strategy Document, Adopted 2016 (Ref 2.7)	Policy EC4: Enhancing sustainable transport	Sets out how they will support a reduction in the need to travel through promoting sustainable travel needs.	The promotion of more sustainable travel will be set out with an accompanying CTMP and CWTP.
North Lincolnshire Local Development Framework – Core Strategy (2011) (Ref 2.11)	Policy CS25: Promoting Sustainable Transport	Sets out how the council will promote sustainable transport to offer a choice of transport modes. Through Transport Demand Management it seeks to: "*introduce appropriate demand management measures, to reduce car based travel by ensuring highway safety, improving and encouraging walking and cycling and integrate such measures with a high quality public transport network"*	The promotion of more sustainable travel will be set out with an accompanying CTMP and CWTP.
Nottinghamshire Local Transport Plan 2011-2026	Policy 7.2 Education on Lower Carbon Transport Issues	As part of the development of the County Council's Freight Strategy, the Council will consider how it can promote the Freight Best Practice programme. The programme is a government funded initiative that offers free resources, tools and guides to help organisations with large or small fleets save money, reduce CO_2 emissions and improve efficiency throughout an organisation's freight operations.	The County Council's Freight Strategy, as well as resources related to reducing CO_2 emissions, will be reviewed to ensure HGV movement is efficient.
	Policy 4.1.8 Freight	The County Council seek to work in partnership with freight operators to help make best use of the existing transport network	Nottinghamshire County Council (NCC) will be consulted to assess the optimal

Local Plan	Policy ref	Policy context	How it will be considered
		through the provision of a network that serves both commercial traffic, as well as the local public's requirements. Further information on freight is detailed throughout this document relating to parking (Section 4.1.4); signing (Section 4.1.7); encouraging the transfer of freight to lower carbon vehicles – including rail and water (Section 7.2.4); education on lower carbon transport issues (Section 7.2.5); and noise (Section 7.5 and 7.5.4).	route to make use of the existing transport network.
Hull City Council Local Transport Plan (2020-2026)	Priority 3: Strategic Connectivity	Good transport links are essential in ensuring that we can make the most of the opportunities provided by the Energy City, Port of Hull and the visitor economy through Destination Hull. Transport by inland waterway, short-sea, and coastal shipping is taking on an increasingly important role in the development of intermodal freight operations. These modes offer great potential for transferring freight traffic away from overcrowded road networks. Waterways are currently under-utilised and offer the potential for an environmentally beneficial transport alternative (Section 5.23).	Consideration will be given to using rail and/or water transport if feasible.
Lincolnshire County Council Local Plan (Freight Strategy)	Road Freight	Transport links are less developed in Lincolnshire compared with many other parts of the United Kingdom. The road network in the county is mainly single carriageway A-roads and local roads (B-roads) as opposed to motorways and dual carriageways. Journey times can be unpredictable if HGVs are stuck behind agricultural farm tractors and trailers, which	Optimal routes will be identified to avoid road with existing congestion issues and road prone to agricultural activity where feasible.

Local Plan	Policy ref	Policy context	How it will be considered
		can be particularly pronounced around key harvesting periods.	

Technical Guidance

13.2.8 The following guidance set out in **Table 13.4** is relevant to the Project.

Table 13.4: Relevant Guidance Documents

Guidance	Guidance details
Planning Practice Guidance: Travel Plans, Transport Assessments and Statements (Ref 13.2)	Ways of assessing and mitigating the negative transport impacts of developments that generate significant amounts of movement, in order to promote sustainable development.
The Institute of Environmental Management and Assessment (IEMA) Guidelines for the Environmental Assessment of Road Traffic (GEART) (Ref 13.3)	Guidance on examining the environmental impacts of developments in terms of traffic and transportation. This Guidance has been used to outline the scope of the assessment.
Department for Transport (DfT) Strategic Road Network and the Delivery of Sustainable Development, Circular 01/2022 (Ref 13.4)	Guidance explaining how National Highways will engage with the planning system and fulfil its remit to be a partner for sustainable economic growth, whilst maintaining, managing and operating a safe and efficient strategic road network, with an emphasis on encouraging measures to reduce the impact of traffic.
Future of Freight: A Long-Term Plan (Ref 13.5)	Guidance that sets out the government's long-term vision for the UK freight sector. Includes five priority areas (National Freight Network (NFN), enabling transition to net zero, planning, people and skills, data and technology.
DMRB: LA103 Scoping for Environmental Assessment (Ref 13.6)	Covers the requirements and procedures that should be followed when scoping a project, to reach a reasoned conclusion on the likely effects of a project on the environment in line with the requirements of the 2014/52/EU.
DMRB: LA104 Environmental Assessment Monitoring (Ref 13.7)	Covers the requirements and procedures that should be followed when assessing, reporting and monitoring the environmental effects of projects in line with the requirements of the EIA Directive 2014/52/EU.

Engagement with Local Authorities

13.2.9 The environmental assessment will be informed by consultation and engagement with stakeholders, including East Riding of Yorkshire Council, North Lincolnshire Council, Bassetlaw District Council, Nottinghamshire County Council, which has been ongoing throughout the early development stages of the Project.

13.2.10 A summary of the proposed survey and assessment methodology for traffic and transportation was shared with East Riding of Yorkshire Council, North Lincolnshire Council, Bassetlaw District Council and Nottinghamshire County Council. The feedback received from this pre-scoping consultation is included in **Table 13.5**, along with a response on how the comments has been considered in this Scoping Report, where applicable.

Table 13.5 Engagement with local authorities

Local Planning Authority	Summary of Response	Consideration in the Scoping Report
North Lincolnshire Council	The proposed methodology is acceptable, although I would advise that NLC no longer provides collision data and now directs people to use CrashMap. A Transport Assessment, Construction Phase TMP and Construction Workers Travel Plan should be submitted as part of the application. Once further work has been undertaken to refine access points and preferred construction routes, we would welcome the opportunity to discuss these in more detail with the applicant. This will help with identifying any potential issues and mitigation measures at an early stage.	Comments noted and will be incorporated into the traffic and transport assessment, with a Framework Construction Phase TMP and Framework Construction Workers Travel Plan being prepared.
Nottinghamshire County Council	The proposed methodology principally relates to the assessment of the environmental impacts of the project as a result of construction traffic. The EIA should also include a TA/TS prepared in accordance with Planning Practice Guidance to assess the potential impacts on the transport network during construction in terms of sustainable transport, highway network capacity, congestion, and highway safety, and which should be discrete from the Environmental Assessment of Road Traffic. The TA/TS will need to consider; lorry routeing proposals, the suitability of the route to accommodate abnormal indivisible loads if likely and include an assessment of the impact of any temporary road closures and diversions during the works. The TA/TS	A TA/CTMP will be prepared. Once more detailed construction traffic data is available the detailed methodology will be discussed and agreed with all relevant local authorities.

Local Planning Authority	Summary of Response	Consideration in the Scoping Report
	should then inform the Construction Traffic Management Plan. It would be useful for expediency if the TA/TS could be split into local authority areas.	

13.3 Study Area

13.3.1 An initial study area for traffic and transport is shown in **Figure 13.1** based upon the extent of the Scoping Boundary. The main settlements within or adjacent to the Scoping Boundary include Skidby, Little Weighton, Ellerker, Broomfleet, Yokefleet, Ousefleet, Luddington, Eastoft, Ealand, Beltoft, East Lound, Misterton, Walkeringham, South and North Wheatley, and East Drayton.

13.3.2 The roads crossed by the Scoping Boundary include the A164, A63, B1392, A18, M180, A159, A161, B1403, A631, A620, and the A57, along with many 'C' and unclassified roads. The proposed Scoping Boundary also crosses four railways. The Scoping Boundary also includes National Cycle Network 65, the towpath alongside the Stainforth and Keadby Canal, and the Yorkshire Wolds Way, along with several PRoW, cycle paths and bridleways.

13.3.3 The study area for the environmental assessment of traffic and transport will be agreed in response to the identification of any additional impact pathways, estimates of construction traffic levels, identification of working and laydown areas and in response to feedback from consultation, and will be defined by the following:

- roads providing access for construction and operational traffic generated by the Project and points on the transport network that will be crossed by any element of the Project. Temporary construction working areas and laydown areas will be required throughout the Project and will be located within the study area; and
- the key routes outside of the Scoping Boundary that construction and operational traffic will take to access the construction areas and permanent infrastructure of the Project.

13.3.4 The Applicant will liaise with the relevant Local Highway Authorities to agree the study area and the location of any Automatic Traffic Counts (ATCs) (para 13.9.3).

13.3.5 The study area for the assessment would likely include the following highway authorities:

- East Riding of Yorkshire Council (ERYC);
- North Lincolnshire County Council (NL);
- Nottinghamshire County Council (NCC);
- National Highways (NH);
- Hull City Council (HCC); and
- Lincolnshire County Council (LCC).

13.4 Baseline Conditions

Data Sources

13.4.1 The construction vehicle routes for the Project are not available at this stage and therefore baseline data collection has been limited to a desk-based study drawing on publicly available mapping and aerial imagery from Google Maps and constraints information held within the Project WebGIS platform.

Baseline

13.4.2 The traffic and transport study area will include the anticipated works routes serving the Project. As a minimum, it is anticipated that the roads stated in section 13.3.2 will likely be used by works vehicles to access the Project.

13.4.3 The M180, M62 and A63 both form part of the strategic road network, with the A63 forming an extension of the M62 into Hull. They are all subject to the national speed limit with the M62 and the M189 in the vicinity of the Project having three lanes and the A63 being a dual carriageway.

13.4.4 The M62 provides a link to the much wider network with Hull in the east and Leeds in the west, with the M180 providing a more local link to Immingham in the east and Doncaster in the west, with both the M62 and M180 both forming junctions with the A1 and M180 providing north-south linkages. These then provide a strategic highway link within the northern section of the Project.

13.4.5 The A161 is a largely rural single carriageway A road with varying speed limits passing through several villages between Goole in the north and Gainsborough in the south. It then provides a strategic link for the Project providing a north-south link along part of its length.

13.4.6 The A159 is largely rural single carriageway A road with varying speed limit passing through several villages between Scunthorpe in the north and Gainsborough in the south, where it joins with the A631, which is a key east-west link running between Doncaster in the west and the A15 in the east from where routes to Lincoln in the south can be taken. The A631 is single carriageway and is subject to the national speed limit in the vicinity of the Project.

13.4.7 The A57 and A638 provide a key east-west route at the south of the Project running from Lincoln in the east and Worksop and the A1 in the west, they are single carriageway A road passing through several villages with a varying speed limit.

13.4.8 The A620 is a single carriageway running from the A631 around Gainsborough in the north to Retford and the A1 in the west and is a single carriageway with a varying speed limit.

13.5 Surveys

13.5.1 Once the locations have been agreed, ATCs will be undertaken for a period of one week during a neutral month in 2023 and will provide two-way daily traffic flows, classified by vehicle type, including HGVs. In line with Transport Analysis Guidance (TAG) M1.2 Data Sources and Surveys (Ref 13.8), neutral periods are defined as Monday to Thursday from March through to November (excluding August) and avoiding the weeks before/after

Easter. Surveys may be undertaken outside of these months if the conditions being surveyed are representative.

13.6 Future Baseline

13.6.1 The future baseline will be established by growthing the 2023 ATC data to the required future year using appropriate factors (based on the local MSOA) using the industry standard software TEMPro. This will provide a robust estimate as to the future baseline traffic levels during the three phases of works.

13.6.2 A consideration of any committed and cumulative developments within the area will also be included in the assessment.

13.7 Embedded and Control and Management Measures

Embedded Measures

13.7.1 The Scoping Boundary has been designed to avoid, as far as practicable, sensitive traffic and transport features through the Corridor Preliminary Routing and Siting Study (further information provided in **Chapter 3, Main Alternatives Considered**). As part of the Project design process, a number of embedded measures will be proposed to reduce the potential for impacts on transport. These will evolve over the development process as the EIA progresses and in response to consultation and will be fed iteratively into the assessment process. These measures typically include those that have been identified as good or standard practice and include actions that would be undertaken to meet existing legislative requirements.

Control and Management Measures

13.7.2 An Outline Code of Construction (CoCP) is provided in **Appendix 4.A Outline Code of Construction Practice**. Measures relevant to the control and management of impacts that could affect the Traffic and transport assessment are:

- TT01: The CTMP will set out measures to reduce route and journey mileage to and from and around site, and prevent nuisance to the residents, businesses and the wider community caused by parking, vehicle movements and access restrictions. It will also provide suitable control for the means of access and egress to the public highway and set out measures for the maintenance and upkeep of the public highway. The plan will also identify access for emergency vehicles. It will also set out measures to reduce safety risks through construction vehicle and driver quality standards and measures to manage abnormal loads.
- TT02: The contractor(s) will implement a monitoring and reporting system to check compliance with the measures set out within the CTMP. The contractor(s) will also be expected to monitor the number of construction vehicles between the site and the strategic road network. Deviations from the authorised routes or changes to traffic levels that are higher than the CTMP assumptions will require discussion of the need for additional mitigation measures with highways authorities.
- TT03: All designated PRoWs will be identified, and any potential temporary closures applied for/detailed in the DCO. All designated PRoWs crossing the working area will be managed with potential for access only closures for short periods while construction activities occur. Any required temporary diversions will be clearly

marked at both ends with signage explaining the diversion, the duration of the diversion and a contact number for any concerns.

- GG03: A Construction Environmental Management Plan (CEMP), a Landscape and Ecological Management Plan (LEMP), a Construction Traffic Management Plan (CTMP), and a Site Waste Management Plan (SWMP) will be produced prior to construction. These are collectively referred to as 'the Management Plans'.
- GG13: Vehicles will be correctly maintained and operated in accordance with manufacturer's recommendations and in a responsible manner. All plant and vehicles will be required to switch off their engines when not in use and when it is safe to do so. Electric, or other low carbon plant and equipment should be used where available and where practicable.
- GG14: Materials and equipment will not be moved or handled unnecessarily. When loading and unloading materials from vehicles, including excavated materials, drop heights will be limited.
- GG17: Wash down of vehicles and equipment will take place in designated areas within construction compounds. Wash water will be prevented from passing untreated into watercourses and groundwater. Appropriate measures will include use of sediment traps.
- GG18: Wheel washing facilities will be provided at each main compound, where appropriate. Road sweepers will be deployed on public roads where necessary to prevent excessive dust or mud deposits.
- S02: PRoWs crossing the working areas will be managed in discussion with the relevant local authorities and any potential temporary closures that might be required will be discussed and agreed. Access disruption would be reduced while construction activities occur. Any required temporary diversions will be clearly marked at both ends with signage explaining the diversion, the duration of the diversion and a contact number for any concerns.

13.8 Potential for Significant Effects

13.8.1 The traffic and transport assessment will consider the construction, operation, and maintenance phases of the Project. Details of each of these stages are set out in **Chapter 4, Description of the Project**.

13.8.2 The proposed scope of the traffic and transport assessment is set out below and has been determined using the approach described in **Chapter 5, EIA Approach and Methodology**.

13.8.3 The potential for the Project to result in the likely significant effects identified in **Table 13.6** takes into account the embedded and control and management measures described in section 13.7.

Sources and Impacts (Step 1)

13.8.4 The potential for the Project to result in the potential significant effects described in this section takes into account the embedded and control and management measures described in section 13.7.

Potential sources of impacts

Sources of construction impacts

- Construction works e.g. where these require temporary traffic management, or result in temporary diversions and/or closures to the highway network or pedestrian/cycle/bridleway routes, including PRoW.
- Construction routes e.g. where these interact with the existing transport networks (road/rail/pedestrian/cycle/bridleways) such as at vehicle crossing points.
- Construction vehicles:
  - HGVs;
  - Construction staff vehicles; and
  - Abnormal loads.

Sources of operational impacts

- Operational staff vehicles.

Sources of maintenance impacts

- Maintenance staff vehicles relating to routine visual inspection, and maintenance cycles.
- Repair staff vehicles (including LGVs) relating to maintenance activities as detailed in Chapter 4, Description of the Project, including the transportation of materials for such works.

Potential impacts

13.8.5 **Table 13.6** identifies the potential impacts that could result from the sources identified above.

13.8.6 Where **Table 13.6** identifies the potential for an impact to result in a significant effect the impact is taken through to Step 2. Where **Table 13.6** identifies no potential for an impact to result in a significant effect, that impact is proposed to be scoped out.

Table 13.6: Impacts and the potential for significant effects

Project phase	Source	Impact	Potential for significant effects
Construction	Construction works, routes and vehicles	Increased severance to pedestrians, cyclists and bridleway users.	**Yes** – increase in vehicles used to transport materials and workforce for construction phase has the potential to result in a significant effect.
		Increased driver delay.	**Yes** – increase in vehicles used to transport materials and workforce for construction phase has the potential to result in a significant effect.

Project phase	Source	Impact	Potential for significant effects
		Increased pedestrians, cyclists and bridleway user delay.	**Yes** – increase in vehicles used to transport materials and workforce for construction phase has the potential to result in a significant effect.
		Decline in highway safety.	**Yes** – an increased traffic flow associated with the construction of the Project has the potential to result in a significant effect.
		Fear and intimidation and reduction in pedestrian, cyclist, and equestrian amenity.	**Yes** – higher number of HGVs used to transport materials has the potential to result in a significant effect.
		Increased pedestrian, cyclist and equestrian journey length.	**Yes** – closure and/or diversion of PRoW/cycle routes/bridleways to open construction routes has the potential to result in a significant effect.
		Increased risk of accidents caused by hazardous load.	**Yes** – there is an increased possibility of collision involving a hazardous load.
Operation	Operation staff vehicles	As stated above for the construction phase.	No – traffic generated would be associated with infrequent inspection activities, and a small number of operational staff. The impact of operational traffic from OHL projects would be expected to be substantially lower than 30% of existing traffic and movements are not anticipated to have a material effect on the transport network and receptors, therefore classed as negligible.
Maintenance	Maintenance/ repair staff vehicles	As stated above for the construction phase.	No – traffic generated would be associated with infrequent repair for routine maintenance. The impact of operational traffic from OHL projects would be expected to be substantially lower than 30% of existing traffic and movements are not anticipated to have a material effect on the transport network and receptors, therefore classed as negligible.

Impact Pathways with Receptors (Step 2)

13.8.7 This section identifies whether there are any impact pathways from the impacts identified above that could give rise to potentially significant effects on receptors identified within the study area.

13.8.8 **Table 13.7** provides a summary of the impact pathways identified and those proposed to be scoped into and or out of the traffic and transport assessment for the Project.

Table 13.7: Impact pathways with receptors

Project Phase	Impact	Receptor	Potential for significant effects	Proposed to be scoped in/out
Construction	Increased severance to pedestrians, cyclists and bridleway users.	Road links	**Yes**	**Scoped in**
		Road junctions	**Yes**	**Scoped in**
		PRoW	**Yes**	**Scoped in**
		National/regional walking/cycling and bridleway routes	**Yes**	**Scoped in**
	Increased driver delay.	Road links	**Yes**	**Scoped in**
		Road junctions	**Yes**	**Scoped in**
		PRoW	No – PRoW not utilised by drivers so no impact pathway	Scoped out
		National/regional walking/cycling and bridleway routes	No – walking and cycling routes not utilised by drivers so no impact pathway	Scoped out
	Increased pedestrians, cyclists and bridleway user delay.	Road links	**Yes**	**Scoped in**
		Road junctions	**Yes**	**Scoped in**
		PRoW	**Yes**	**Scoped in**
		National/regional walking/cycling and bridleway routes	**Yes**	**Scoped in**
	Decline in highway safety.	Road links	**Yes**	**Scoped in**
		Road junctions	**Yes**	**Scoped in**
		PRoW	No – data only relates to collisions	Scoped out

Project Phase	Impact	Receptor	Potential for significant effects	Proposed to be scoped in/out
			on the highway	
		National/regional walking/cycling and bridleway routes	No – data only relates to collisions on the highway	Scoped out
	Fear and intimidation and reduction in pedestrian, cyclist, and equestrian amenity.	Road links	**Yes**	**Scoped in**
		Road junctions	**Yes**	**Scoped in**
		PRoW	**Yes**	**Scoped in**
		National/regional walking/cycling and bridleway routes	**Yes**	**Scoped in**
	Increased pedestrian, cyclist and equestrian journey length.	Road links	No – relates to PRoW	Scoped out
		Road junctions	No – relates to PRoW	Scoped out
		PRoW	**Yes**	**Scoped in**
		National/regional walking/cycling and bridleway routes	**Yes**	**Scoped in**
	Increased risk of accidents caused by hazardous load.	Road links	**Yes**	**Scoped in**
		Road junctions	**Yes**	**Scoped in**
		PRoW	No – hazardous loads do not use PRoW	Scoped out
		National/regional walking/cycling and bridleway routes	No – hazardous loads do not use these routes.	Scoped out

13.9 Proposed Assessment Methodology

13.9.1 The following section summarises the methodology proposed to be used for the traffic and transport assessment which builds on the general assessment methodology presented in **Chapter 5, EIA Approach and Methodology.**

Proposed Data Sources

Desk based assessment

13.9.2 An initial desk-based baseline assessment will be undertaken to gather information on highway infrastructure, construction routes and restrictions. Bing Maps, Google Maps UK and Google Street View will be used to provide an overview of the study area and the highway network and connections. The known or predicated current and future baseline will be informed by the following data sources:

- review of any available and relevant traffic count data, to determine the levels of base traffic on the network under consideration;
- Personal Injury Accident (PIA) data for the most recent five-year period will be obtained from the relevant Highway Authority for all roads that form the proposed construction traffic routes to the Project on the strategic road network (SRN). This will provide information on each collision including severity as well as factors which attributed to the collision, which will help to identify principal areas of concern;
- local travel information will be gathered from various sources including local bus operators, the local rail network, PRoW, and the relevant LPA where appropriate;
- OS/Architectural Base Mapping will be used to ascertain an accurate geographical representation of the areas in the vicinity of the Project;
- highway boundary information from the relevant highway authorities;
- travel mode share data from the 2011 Census; and
- various traffic count and speed survey data where required.

Site based assessment

13.9.3 There will be two elements of site-based work required to inform the baseline:

- ATCs will be undertaken at a number of locations in the vicinity of the Project where existing data is not available, to determine the baseline traffic conditions of the surrounding highway network. Average Annual Daily Traffic (AADT) flows will be derived from the ATC data to enable the baseline traffic flows to be established at the required design years. The extent of the traffic data and scope for any traffic surveys that may be required will be agreed with the relevant local planning authority (LPA); and
- site visit assessment – a site visit will be required to inform the assessment and clarify the high-level desktop based assessments. Detailed notes and a photographic record will be undertaken on the site visit and consideration will be given to the identification of receptor locations.

Sensitivity

13.9.4 The methodology for assessing the impact of Project generated traffic will be based on that outlined in the GEART guidelines (Ref 13.3). The general criteria for defining the importance or sensitivity of receptors are set out in **Table 13.8**.

Table 13.8: Receptor sensitivity criteria

Sensitivity	Description
Very High	Highway links and junctions: more than two sensitive users present (e.g. schools, play areas, care/retirement homes, disabled parking bays, hospitals, places of worship, historic buildings). Walk/cycle links including PRoW: heavily trafficked highway with on-road pedestrian/bridleway/cycle route.
High	Highway links and junctions: two sensitive users present (e.g. schools, play areas, care/retirement homes, disabled parking bays, hospitals, places of worship, historic buildings). Walk/cycle links including PRoW: lightly trafficked highway with on-road pedestrian/bridleway/cycle route.
Medium	Highway links and junctions (at least one of the following): • one sensitive user present (e.g. schools, play areas, care/retirement homes, disabled parking bays, hospitals, places of worship, historic buildings); • many residential properties with direct frontage to highway link being used as construction route; • pedestrians using footways, PRoW and/or crossings on highway link; and • cyclists using on-road designated cycle routes along highway link. Walk/cycle links including PRoW: heavily trafficked highway with off-road pedestrian/bridleway/cycle route.
Low	Highway links and junctions (at least one of the following): • few residential properties with direct frontage to the highway link being used as a construction traffic route; • workplaces with direct frontage to highway link being used as construction route; and • cyclists using off-road designated cycle routes along highway link. Walk/cycle links including PRoW: lightly trafficked highway with off-road pedestrian/bridleway/cycle route.
Negligible	Highway links and junctions: no receptors along link. Walk/cycle links including PRoW: pedestrian/bridleway/cycle route not running alongside highway.

13.9.5 The link sensitivity will be based upon an average sensitivity of the whole link with a separate assessment of high/very high receptors. Some links will be broken down into sensible sections where appropriate i.e. between two main junctions or villages etc.

13.9.6 An assessment of the railway network is proposed to be scoped out from the traffic and transport assessment given that crossing methods will be employed to avoid any potential

impacts on the railway, and that any vehicle crossing points of the railway (if required) will be managed to ensure operational rail safety.

Magnitude

13.9.7 General criteria for defining the magnitude of an impact are set out in **Table 13.9**. Key factors influencing this include:

- the physical or geographical scale of the impact, (note that this will be relative to the scale of the receptor or resource affected);
- the duration of the impact – will it be short term, lasting for a few days or weeks, or long term, lasting for several years;
- the frequency of the impact – will it occur hourly, daily, monthly or will it be permanent lasting for the duration of the development; and
- the reversibility of the effect – can it be reversed following completion of the development works.

13.9.8 The IEMA guidelines state in paragraph 2.2 that the magnitude of each impact should be determined as the predicted deviation from the baseline conditions. This will be done for the first phase of the works.

13.9.9 The two broad rules of thumb provided within the assessment relating to the geographical scope required are:

- Rule 1: include highway links where traffic flows will increase by more than 30% (or HGV flows increase by more than 30%); and
- Rule 2: include any other particularly sensitive areas where traffic flows have increased by 10% or more.

13.9.10 The IEMA guidelines sets out a number of criteria by which the magnitude of impact can be measured. These are outlined below. Many of the criteria do not provide specific thresholds by which such impacts can be measured, and as a result will be measured qualitatively where necessary.

13.9.11 **Severance** is defined in the IEMA guidelines as the *"perceived division that can occur with a community when it becomes separated by a major traffic artery"*. The term is used to describe a complex series of factors that separate people from places and other people. Severance may result from the difficulty of crossing a heavily trafficked road or a physical barrier created by the road itself. It can also relate to quite minor traffic flows if they impede pedestrian access to essential facilities. The assessment will consider both total traffic and the proportion of HGVs. The guidance for thresholds of magnitude is taken from GEART which states that changes in traffic flow of 30%, 60% and 90% are regarded as producing 'slight', 'moderate' and 'substantial' changes in severance respectively.

13.9.12 **Pedestrian delay** is considered to be affected by the changes in volume, composition or speed of traffic, in terms of their respective impacts on the ability of pedestrians to cross roads. In general, increases in traffic levels and/or traffic speeds are likely to lead to greater increases in pedestrian delay. Effects are only likely to be realised when the total two-way traffic on the carriageway exceeds 1,400 vehicles per hour (GEART).

13.9.13 **Pedestrian and cyclist amenity** is broadly defined as *"the relative pleasantness of a journey and is considered to be affected by traffic flow, traffic composition and pavement width/separation from traffic".* The guidance suggests that a tentative threshold for judging

the significance of changes in pedestrian and cycle amenity would be where the traffic flow is halved or doubled.

13.9.14 **Fear and intimidation** occur through a combination of traffic flow, speed, proportion of HGVs and the proximity of the above to people or receptors on highway links. These indicators are often heightened by a perceived lack of protection or buffers from the highway or through narrow or non-existent footways. The assessment will consider each road on a case-by-case basis, however there are indicative thresholds provided in the GEART which are presented in **Table 13.8**.

13.9.15 **Driver delay** is an effect cited in GEART and relates to incremental increases in traffic (as outlined in **Table 13.8**). As a further consideration, where any temporary road closures or traffic management is likely to be in place to enable the construction of the Project, any additional potential delay caused by these resultant diversion routes will be reported.

13.9.16 **Highway safety** considers PIC data obtained for the most recent five-year period available at junctions and links along the proposed construction traffic routes. These will be used to assess whether the additional traffic during construction of the Project would be likely to have a detrimental effect of road safety.

13.9.17 **PRoW diversions and closures** will be considered on the basis of the type of impact i.e. whether a temporary PRoW closure or diversion is proposed, as well as any increases in pedestrian journey length following a closure/diversion and how long any potential disruption to an existing route would occur for. The assessment will consider the indicative thresholds presented in **Table 13.9** below which have been derived based on professional judgement.

13.9.18 With regard to **hazardous and dangerous loads**, the guidance indicates that *"the Statement should include a risk or catastrophe analysis to illustrate the potential for an accident to happen and the likely effect of such an event"*. There may be a requirement to transport hazardous loads during the construction of the Project (such as gas and oil). This will be identified as the Project progresses.

13.9.19 In view of the above, the impacts of hazardous and dangerous loads will be considered within the ES, in the form of a qualitative risk assessment to establish the likelihood and extent of such effects. The projected impacts of the Project will be measured separately, dependent upon the receptor, for the construction period. CTMP, CWTP and the ES will include details of measures that will be employed to ensure the safe vehicular transport of components to and from the Project.

13.9.20 **Table 13.9** and **Table 13.10** summarise the criteria that will be used to assess the magnitude of impact), along with the thresholds that will be used to determine whether impacts are considered large, medium, small and negligible. Depending on the baseline information available, the various thresholds identified for the proportional increases in traffic flow relate to peak hour flows and daily flows (whichever is highest). Within these tables, neither the sensitivity of receptors, nor the duration of effects, is taken into consideration. These tables are formed using GEART and professional judgement.

Table 13.9: Impact Magnitude Criteria

Impact	Negligible	Small	Medium	Large
Severance	Increase in total traffic flows of 29% or under (or	Increase in total traffic flows of 30-59% (or increase in HGV flows of	Increase in total traffic flows of 60%-89% (or increase in HGV	Increase in total traffic flows or HGV

Impact	Negligible	Small	Medium	Large
	increase in HGV flows under 10%).	between 20%-39%).	flows between 40%-89%).	flows of 90% and above.
Pedestrians, cyclists and bridleway user delay	Total traffic flows under 1,400 per hour.	Where traffic flows exceed 1,400 vehicles per hour the severity of the impact will be determined based on the thresholds identified above for severance.		
Pedestrian and cycle amenity	Increase in total traffic flows of 49% or under.	Increase in total traffic flows of 50-69%.	Increase in total traffic flows of 70%-99%.	Increase in total traffic flows of 100% or above.
Fear and intimidation	Increase in total traffic flows or HGV flows of 29% or under (or increase in HGV flows under 10%).	Increase in total traffic flows of 30-59% (or increase in HGV flows of between 10%-39%).	Increase in total traffic flows of 60%-89% (or increase in HGV flows between 40%-89%).	Increase in total traffic flows or HGV flows of 90% and above.
Driver delay	Increase in total traffic flow of less than 29%.	Increase in total traffic flow of between 30% and 59%.	Increase in total traffic flow of between 60% and 89%.	Increase in traffic flow of 90% and above.
Highway safety	Increase in total traffic flows of 30% or under (or increase in HGV flows under 10%).	All links estimated to experience increases in total traffic flows above 30% or increases in HGV flows above 10% are analysed further on a case-by-case basis.		
Hazardous loads	Based on the probability of a personal injury collision, categorised as fatal or serious, involving a hazardous load occurring.			

13.9.21 An assessment of national/regional walking and cycling routes, as well as PRoW will also be carried out where these are directly affected by construction works or intersected by a construction route (for example), including in terms of severance, pedestrian delay, pedestrian and cycle amenity and for fear and intimidation, by reviewing the thresholds as identified in **Table 13.9** where relevant. In terms of PRoW diversions and/or closures, the following thresholds are proposed to identify magnitude of impact based on professional judgement.

Table 13.10: Categorising the overall magnitude of effect of a PRoW diversion and/or closure

Impact	Negligible	Small	Medium	Large
PRoW Diversions and/or Closures	A temporary PRoW diversion (no closure) with either no increase in pedestrian journey length or an increase in pedestrian journey	A temporary PRoW diversion (no closure) with an increase in pedestrian journey length for one to four weeks.	A short-term PRoW closure (for less than four weeks in any 12-month period) without a diversion route; or	A short-term PRoW closure (for more than four weeks in any 12-month period) without a diversion route.

Impact	Negligible	Small	Medium	Large
	length for one to five days.		A temporary PRoW diversion (no closure) with an increase in pedestrian journey length for more than four weeks.	

13.9.22 **Table 13.9** and **Table 13.10** above set out the proposed magnitude thresholds for the respective environmental impacts that will be considered in the assessment. With the exception of PRoW diversion and closure effects, all effects have a proposed magnitude that does not, initially, consider the duration over which an effect is likely to be experienced.

13.9.23 Duration is considered when assessing the overall significance of residual effects, noting that LA 104 Environmental assessment and monitoring states in section 3.9 that:

"The assessment of the significance of environmental effects shall cover the following factors:

1) the receptors/resources (natural and human) which would be affected and the pathways for such effects;

2) the geographic importance, sensitivity or value of receptors/resources;

3) the duration (long or short term); permanence (permanent or temporary) and changes in significance (increase or decrease);

4) reversibility - e.g. is the change reversible or irreversible, permanent or temporary;

5) environmental and health standards (e.g. local air quality standards) being threatened; and

6) feasibility and mechanisms for delivering mitigating measures, e.g. Is there evidence of the ability to legally deliver the environmental assumptions which are the basis for the assessment?".

13.9.24 All of the traffic and transport effects associated with the construction of the Project would be temporary effects. Some temporary effects would be likely to last longer than others, and these will be clearly reported in the ES. Following the quantified assessment, residual effects will be reported taking into account professional judgement on the duration over which effects are likely to be experienced.

Significance of effects

13.9.25 The general approach adopted for evaluating the significance of effects considering the sensitivity of the receptor and the magnitude of impact is outlined in **Table 13.11.** Effects predicted to be 'major' or 'moderate' are considered significant whilst effects predicted to be 'minor' or 'neutral' are considered not significant.

Table 13.11: Significance of Effects Matrix (Traffic and Transport)

Magnitude of effect	Receptor sensitivity				
	Very High	High	Medium	Low	Neutral
Large	**Major**	**Major/ Moderate**	**Major/ Moderate/ Minor**	**Moderate**/ Minor	Minor/ Negligible
Medium	**Major/ Moderate**	**Major/ Moderate**	**Moderate**/ Minor	Minor/ Negligible	Negligible
Small	**Major/ Moderate/ Minor**	**Moderate**/ Minor	**Moderate**/ Minor	Minor/ Negligible	Negligible
Negligible	Minor/ Negligible	Minor/ Negligible	Minor/ Negligible	Negligible	Negligible

Limitations of assessment

13.9.26 At this stage the exact extent of the study area cannot be confirmed in terms of traffic and transport as detailed discussions have not yet taken place with National Highways or the local authorities as highway authorities for the SRN and LRN respectively.

13.9.27 Base traffic surveys are representative of normal traffic conditions and works traffic flows will be based upon a best estimate of likely requirements.

13.9.28 The construction flows proposed within the assessment will be the best estimation.

13.10 Conclusion

Summary

13.10.1 This scoping chapter has outlined to relevant legislation, policy, and guidance in relation to the traffic and transport assessment for the Project. The data sources that will be used to predicate current and future baselines have been presented, before stating the management measures that will be adhere to. The potential for significant effects has been identified, as well as the associated source, impact and receptors.

13.10.2 A summary of the proposed scope of the assessment is provided in **Table 13.12**.

Table 13.12: Proposed scope of the assessment

Receptor	Potential for significant effect	Project phase(s)	Proposed to be scoped in/out
Road links	Increased severance to pedestrians, cyclists and bridleway users.	Construction	**Scoped in**
	Increased driver delay.		**Scoped in**

Receptor	Potential for significant effect	Project phase(s)	Proposed to be scoped in/out
	Increased pedestrians, cyclists and bridleway user delay.		**Scoped in**
	Decline in highway safety.		**Scoped in**
	Fear and intimidation and reduction in pedestrian, cyclist, and equestrian amenity.		**Scoped in**
	Increased pedestrian, cyclist and equestrian journey length.		Scoped out
	Increased risk of accidents caused by hazardous load.		**Scoped in**
Road junctions	Increased severance to pedestrians, cyclists and bridleway users.	Construction	**Scoped in**
	Increased driver delay.		**Scoped in**
	Increased pedestrian cyclists and bridleway user delay.		**Scoped in**
	Decline in highway safety.		**Scoped in**
	Fear and intimidation and reduction in pedestrian, cyclist, and equestrian amenity.		**Scoped in**
	Increased pedestrian, cyclist and equestrian journey length.		Scoped out
	Increased risk of accidents caused by hazardous load.		**Scoped in**
PRoW	Increased severance to pedestrians, cyclists and bridleway users.	Construction	**Scoped in**

Receptor	Potential for significant effect	Project phase(s)	Proposed to be scoped in/out
	Increased driver delay.		**Scoped in**
	Increased pedestrians, cyclists and bridleway user delay.		**Scoped in**
	Decline in highway safety.		Scoped out
	Fear and intimidation and reduction in pedestrian, cyclist, and equestrian amenity.		**Scoped in**
	Increased pedestrian, cyclist and equestrian journey length.		**Scoped in**
	Increased risk of accidents caused by hazardous load.		Scoped out
National/regional walking/cycling and bridleway routes	Increased severance to pedestrians, cyclists and bridleway users.	Construction	**Scoped in**
	Increased driver delay.		Scoped out
	Increased pedestrians, cyclists and bridleway user delay.		**Scoped in**
	Decline in highway safety.		Scoped out
	Fear and intimidation and reduction in pedestrian, cyclist, and equestrian amenity.		**Scoped in**
	Increased pedestrian, cyclist and equestrian journey length.		**Scoped in**
	Increased risk of accidents caused by hazardous load.		Scoped out

14. Air Quality

14.1 Introduction

14.1.1 This chapter presents how the air quality assessment will consider the potentially significant effects on air quality receptors that may arise from the construction, operation, and maintenance of the Project (as described in **Chapter 4, Description of the Project**). This chapter of the Scoping Report describes the methodology to be used within the air quality assessment, the datasets to be used to inform the assessment, the baseline conditions, the potential likely significant effects to be considered within the assessment, and how those effects will be assessed for the purpose of an Environmental Impact Assessment (EIA). As detailed in **Chapter 4, Description of the Project**, the decommissioning has been scoped out of the environmental assessment.

14.1.2 The Project Scoping Boundary is illustrated on **Figure 1.1 Project Scoping Boundary**.

14.1.3 This chapter should be read in conjunction with:

- **Chapter 4, Description of the Project**;
- **Chapter 5, EIA Approach and Methodology**;
- **Chapter 8, Ecology and Biodiversity**; and
- **Chapter 17, Health and Wellbeing**.

14.1.4 This chapter is supported by the following figures:

- **Figure 14.1 Construction Dust Assessment Study Area**; and
- **Figure 14.2 Air Quality Baseline**.

14.2 Regulatory and Planning Context

14.2.1 **Chapter 2, Regulatory and Planning Context** describes the overall regulatory and planning policy context for the Project. Key legislation, policy and planning guidance relevant to the assessment of potential effects on air quality associated with the construction, operation, and maintenance of the Project is presented below.

Legislation

14.2.2 The assessment will be undertaken in accordance with, and with reference to, the following legislation:

- Directive 2008/50/EC on Ambient Air Quality and Cleaner Air for Europe (Ref 14.1). This sets legally binding limits for concentrations of specific air pollutants. It merges, consolidates and replaces the majority of previous EU air quality legislation, and incorporates the Fourth Daughter Directive. While the UK has now left the EU, the Air Quality Standards Regulations 2010 (as amended) (Ref 14.2) which implement the Directive still apply in UK legislation as ‘retained EU law’;

- The Air Quality (Amendment of Domestic Regulations) (EU Exit) Regulations 2019 (Ref 14.3). These regulations amend the Air Quality Standards Regulations 2010 to reflect the UK's departure from the EU;
- Air Quality (England) Regulations 2000/2002. The Air Quality (England) Regulations 2000 (Ref 14.4) and the Air Quality (England) (Amendment) Regulations 2002 (Ref 14.5) set national air quality objective levels for local authorities to meet in England; and
- Part IV of the Environment Act 2021 (Ref 8.10). The Environment Act 2021 requires the UK Government to produce a national Air Quality Strategy (AQS), which contains standards, objectives and measures for improving ambient air quality. Where the air quality standards are not being met, a local authority is required to designate an Air Quality Management Area (AQMA);
- Environmental Protection Act 1990 (Ref 14.6). Part III of the Environmental Protection Act 1990 provides legislation around statutory nuisance, which applies to dust.

Planning Policy

National Planning Policy

National Policy Statements

14.2.3 As detailed in **Chapter 2, Regulatory and Planning Policy Context**, National Policy Statements (NPSs) set out the primary policy tests against which the application for a Development Consent Order (DCO) for the Project would be considered. The two relevant NPSs are Overarching National Policy Statement for Energy (EN-1) (Ref 2.2) and National Policy Statement for Electricity Networks Infrastructure (EN-5) (Ref 2.3). NPS EN-5 (Ref 2.3) and the consultation draft of NPS EN-5 (Ref 2.5) make no specific reference to air quality.

14.2.4 **Table 14.1** sets out how both the current NPS EN-1 (Ref 2.2) and draft NPS EN-1 (Ref 2.4) are relevant to the air quality assessment.

Table 14.1: Relevant sections of the relevant National Policy Statements

National Policy Statement	NPS section	How it will be considered
EN-1	*5.2.1 (part) "Infrastructure development can have adverse effects on air quality. The construction, operation and decommissioning phases can involve emissions to air which could lead to adverse impacts on health, on protected species and habitats, or on the wider countryside".*	The air quality assessment will consider the effects and resulting impacts associated with the construction, operation and maintenance phases as set out in **Table 14.3**.
EN-1	*5.2.3 "A particular effect of air emissions from some energy infrastructure may be eutrophication, which is the excessive enrichment of nutrients in the*	The air quality assessment will quantify changes of nitrogen

National Policy Statement	NPS section	How it will be considered
	environment. Eutrophication from air pollution results mainly from emissions of NOx and ammonia".	deposition at relevant ecologically sensitive receptors, if the Project is predicted to have an impact at such locations.
EN-1	*5.2.4 "Emissions from combustion plants are generally released through exhaust stacks. Design of exhaust stacks, particularly height, is the primary driver for the delivery of optimal dispersion of emissions and is often determined by statutory requirements. The optimal stack height is dependent upon the local terrain and meteorological conditions, in combination with the emission characteristics of the plant".*	The air quality assessment will include an assessment of any combustion processes and Non-Road Mobile Machinery (NRMM) emissions associated with the construction phase, where applicable.
EN-1	*5.2.6 (5.2.7 in draft EN-1) "Where the project is likely to have adverse effects on air quality the applicant should undertake an assessment of the impacts of the proposed project as part of the Environmental Statement (ES)".*	Screening of relevant data will be undertaken to determine where the Project is likely to have adverse impacts on air quality, the effects of which, will be assessed as part of the air quality assessment.
EN-1	*5.2.7 (5.2.8 in draft EN-1) "The ES should describe:* • *any significant air emissions, their mitigation and any residual effects distinguishing between the project stages and taking account of any significant emissions from any road traffic generated by the project;* • *the predicted absolute emission levels of the proposed project, after mitigation methods have been applied;* • *existing air quality levels and the relative change in air quality from existing levels; and* • *any potential eutrophication impacts".*	Should screening of traffic data for any of the project stages indicate detailed assessment is required, then dispersion modelling will be undertaken as part of the air quality assessment to determine the change in pollutant concentrations as a result of the Project at relevant human and ecological receptor locations.
EN-1	*5.2.9 (5.2.14 in draft EN-1) "The IPC should generally give air quality considerations substantial weight where a project would lead to a deterioration in air quality in an area or leads to a new area where air quality breaches any national air quality limits. However, air quality considerations will also be important where substantial changes in air quality levels are expected, even if this does not lead to any breaches of national air quality limits".*	Screening of relevant data will be undertaken to determine where the project is likely to have adverse impacts on air quality, the effects of which, would be assessed as part of the air quality assessment.

National Policy Statement	NPS section	How it will be considered
EN-1	*5.2.11 "The IPC should consider whether mitigation measures are needed both for operational and construction emissions over and above any which may form part of the project application. A construction management plan may help codify mitigation at this stage".*	Construction dust mitigation measures will be incorporated into a Construction Environmental Management Plan (CEMP). Operational/maintenance emissions assessment is proposed to be scoped out (see **Table 14.43**)

National Planning Policy Framework

14.2.5 The National Planning Policy Framework (NPPF) (Ref 2.6) sets out the Government's core policies and principles with respect to land use planning, including air quality. Paragraph 186 of the Framework states:

"Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan".

14.2.6 The National Planning Practice Guidance (NPPG) (Ref 14.7) includes guidance relating to: planning and air quality; the role of Local Plans with regard to air quality; when air quality is likely to be relevant to a planning decision; what should be included within an air quality assessment and how impacts on air quality can be mitigated.

Local planning policy

14.2.7 The Project lies within the jurisdictions of East Riding of Yorkshire, North Lincolnshire and Bassetlaw District (Nottinghamshire). A summary of the relevant local planning policy which is relevant to a study of air quality matters and will inform the air quality assessment in the Environmental Statement (ES) is provided in **Table 14.2**.

Table 14.2: Relevant Local Planning Policies

Local Plan	Policy ref	Policy context	How it will be considered
East Riding Local Plan 2012-2029	Policy EC5 – Supporting the energy sector	Proposals for the development of the energy sector will be	Mitigation measures will be proposed where necessary to ensure

Local Plan	Policy ref	Policy context	How it will be considered
Strategy Document, Adopted 2016 (Ref 2.7)		supported where any significant adverse impacts are addressed satisfactorily, and the residual harm is outweighed by the wider benefits of the proposal. Developments and their associated infrastructure should be acceptable in terms of air quality.	that the overall air quality impacts of the Project are not significant.
North Lincolnshire Local Development Framework – Core Strategy (2011) (Ref 2.11)	Spatial Objective 7: Efficient Use and Management of Resources	To ensure the efficient use of resources, maintaining and improving air and employing sustainable building practices in new development.	The air quality assessment will consider air quality impacts associated with the Project, and measures to mitigate any impacts will be proposed, where required.
North Lincolnshire Local Plan – Draft Submission (Ref 2.12)	Policy DM3: Environmental Protection	Development proposals should demonstrate that environmental impacts on receptors have been evaluated and appropriate measures have been taken to minimise the risks of adverse impacts to air quality.	Air quality impacts will be assessed at sensitive receptors within the air quality study area, where required. Appropriate mitigation measures will be proposed where necessary.
Draft Bassetlaw Local Plan (Ref 2.19)	Policy 48: Protecting Amenity	Proposals should be designed and constructed to avoid and minimise impacts on the amenity of existing and future users, individually and cumulatively, within the development and close to it. Proposals will be expected to not impact air quality which cannot be mitigated to an appropriate standard.	Appropriate mitigation measures will be proposed where necessary.

Consultation and Engagement

14.2.8 The environmental assessment will be informed by consultation and engagement with stakeholders, including, but not limited to, East Riding of Yorkshire Council, North Lincolnshire Council, Bassetlaw District Council, Nottinghamshire County Council, and Public Health England.

14.3 Study Area

14.3.1 In accordance with the IAQM Guidance on the Assessment of Dust from Demolition and Construction v1.1 (Ref 14.8) (hereafter referred to as the 'IAQM construction dust guidance'), the study area for construction phase dust is:

- 350 m from the locations of demolition, construction and earthworks activities for human receptors and up to 50 m for ecological receptors; and
- 50 m of the route(s) used by construction vehicles on the public highway, up to 500m from the Project entrance(s) for large sites, 200 m from medium sites and 50 m from small sites, as measured from the site exit.

14.3.2 The precise location of the components of the Project including temporary working areas are not known at this stage. The Scoping Boundary has therefore been designed to represent the area within which the proposed Project would be located. At this stage, construction activities are assumed to take place anywhere within the Scoping Boundary, therefore as a worst-case approach, the construction dust study area will include up to 350 m from the edge of the Scoping Boundary. The construction phase study area also includes the first 50 m of any road within 500 m from the main site entrance(s) used by the site construction vehicles, assuming the site would be classed as large as a worst case.

14.3.3 The proposed study area for the construction phase fugitive dust emissions assessment is displayed in **Figure 14.1 Construction Dust Assessment Study Area**.

14.3.4 The IAQM Guidance on land-use planning and development control: Planning for air quality v1.2 (Ref 14.9) (hereafter referred to as the 'IAQM development control guidance') details its own indicative criteria that, if met, highlight the need for an assessment, rather than necessarily defining the boundaries of a study area. The screening criteria for vehicle emissions assessment is as follows:

- a change in Light Duty Vehicle (LDV) flows of >100 Annual Average Daily Traffic (AADT) within or adjacent to an AQMA, or >500 AADT elsewhere;
- a change in Heavy Duty Vehicle (HDV) flows of >25 AADT within or adjacent to an AQMA, or >100 AADT elsewhere;
- where a road is realigned by 5 m or more and is within an AQMA;
- where a junction is added or removed close to existing receptors; and
- where there are one or more substantial combustion processes where there is a risk of impacts at relevant receptors.

14.3.5 The number of vehicles associated with the construction, and operation/maintenance phases of the Project is not yet known; however, it is anticipated that detailed assessment of vehicle emissions will be scoped out for all stages of the Project as traffic flows are expected to be below the IAQM screening criteria. This will be confirmed upon receipt and screening of the traffic data.

14.3.6 Should the criteria be exceeded, the study area would comprise an area within 200 m of the roads which exceed the criteria in accordance with the Design Manual for Roads and Bridges (DMRB) LA105 (Ref 14.10).

14.4 Baseline Conditions

Data Sources

14.4.1 The known or predicted current and future baseline environment described in this section has been informed by the following data sources:

- Defra UK Air website (Ref 14.11) – to establish predicted background concentrations for nitrogen dioxide (NO_2), particulate matter less than 10 microns in diameter (PM_{10}) and particulate matter less than 2.5 microns in diameter ($PM_{2.5}$);
- East Riding of Yorkshire Council 2022 Air Quality Annual Status Report (Ref 14.12);
- North Lincolnshire Council 2022 Air Quality Annual Status Report (Ref 14.13); and
- Bassetlaw District Council 2022 Air Quality Annual Status Report (Ref 14.14).

Baseline

14.4.2 As required by the Environment Act (2021) (Ref 8.10), the local authorities covering the Air Quality Study Area have undertaken review and assessment of air quality within their area of jurisdiction. This process has identified the following AQMA due to exceedances of the AQS objectives within the borough:

- Scunthorpe Town AQMA – declared 2005 and amended 2018 by North Lincolnshire Council. An area encompassing the integrated steelworks site and a number of properties to the east of Scunthorpe. Declared for exceeding the 24-hour mean PM_{10} AQS objective.

14.4.3 There are currently no declared AQMAs within Bassetlaw or East Riding of Yorkshire (**Figure 14.2 Air Quality Baseline**).

14.4.4 Local authority monitoring data for the most recently reported year of 2021 did not show any exceedances of the AQS objectives at North Lincolnshire, East Riding or Yorkshire or Bassetlaw.

Future Baseline

14.4.5 Background pollutant concentrations are predicted to decrease in future years, as evidenced by trends observed from local authority monitoring data and future predicted Defra background map concentrations.

14.4.6 Traffic emissions are likely to contribute to baseline air quality concentrations in the vicinity of the Project. Whilst vehicle numbers are likely to increase, emissions (per vehicle) are predicted to decrease over time due to new technology, increasingly stringent emission regulations and cleaner fuel formulations.

14.4.7 Consented developments in the surrounding area may increase traffic flows in the vicinity of the Project. This may therefore result in an increase in local air quality concentrations.

14.4.8 In addition, construction of any consented developments may result in a temporary increase in particulate concentrations as a result of fugitive dust emissions during construction works.

14.5 Embedded and Control and Management Measures

Embedded Measures

14.5.1 The Project has been routed to avoid designated sites and sensitive receptors as far as possible.

Control and Management Measures

14.5.2 An Outline Code of Construction (CoCP) is provided in **Appendix 4.A Outline Code of Construction Practice**. Measures relevant to the control and management of impacts that could affect the air quality assessment are:

- GG04: The CEMP shall include measures to manage dust, waste, water, noise, vibration and soil during construction. The contractor(s) shall undertake daily site inspections to check conformance to the Management Plans.
- GG11: Any activity carried out or equipment located within a construction compound that may produce a noticeable nuisance, including but not limited to dust, noise, vibration and lighting, will be located away from sensitive receptors such as residential properties or ecological sites where practicable.
- GG13: Vehicles will be correctly maintained and operated in accordance with manufacturer's recommendations and in a responsible manner. All plant and vehicles will be required to switch off their engines when not in use and when it is safe to do so. Electric, or other low carbon plant and equipment should be used where available and where practicable.
- GG14: Materials and equipment will not be moved or handled unnecessarily. When loading and unloading materials from vehicles, including cable drums and excavated materials, drop heights will be limited.
- GG18: Wheel washing will be provided at each main compound access point on to the highway. An adequate supply of water will be made available at these locations at all times. Road sweepers will be deployed on public roads where necessary to prevent excessive dust or mud deposits.
- GG19: Earthworks and stockpiled soil will be protected by covering, seeding or using water suppression where appropriate.
- GG20: Bonfires and the burning of waste material will be prohibited.
- TT01: The CTMP will set out measures to reduce route and journey mileage to and from and around site, and prevent nuisance to the residents, businesses and the wider community caused by parking, vehicle movements and access restrictions. It will also provide suitable control for the means of access and egress to the public highway and set out measures for the maintenance and upkeep of the public highway. The plan will also identify access for emergency vehicles. It will also set out measures to reduce safety risks through construction vehicle and driver quality standards and measures to manage abnormal loads.

14.5.3 Additional measures relating to air quality could include the following:

- Re-routing of construction vehicle traffic to avoid sensitive receptors should a significant air quality impact be predicted.

14.6 Potential for Significant Effects

14.6.1 The air quality assessment will consider the construction, operation, and maintenance of the Project. Details of each of these stages are set out in **Chapter 4, Description of the Project.**

14.6.2 The proposed scope of the air quality assessment is set out below and has been determined using the approach described in **Chapter 5, EIA Approach and Methodology.**

14.6.3 The potential for the Project to result in the likely significant effects identified in **Table 14.3** takes into account the embedded and control and management measures described in section 14.5.

Sources and Impacts (Step 1)

14.6.4 This section identifies the sources and impacts that would occur as a result of the construction, operation, and maintenance of the Project.

Potential sources of impacts

Sources of construction impacts

- Fugitive dust emissions associated with demolition, earthworks, construction and trackout (the transport of dust and dirt from the construction site onto the public road network).
- Emissions from NRMM.
- Construction vehicle emissions associated with the movement of materials and waste to and from the site by construction vehicles.

Sources of operation/maintenance impacts

- Dust generating activities associated with maintenance e.g. foundation repairs/upgrades.
- Operation/maintenance vehicle emissions.
- Emissions from NRMM.

Potential impacts

14.6.5 **Table 14.3** identifies the potential impacts that could result from the sources identified above.

14.6.6 Where **Table 14.3** identifies the potential for an impact to result in a significant effect, the impact is taken through to Step 2. Where **Table 14.3** identifies no potential for an impact to result in a significant effect, that impact is proposed to be scoped out.

Table 14.3: Impacts and the potential for significant effects

Project phase	Source	Impact	Potential for significant effects
Construction	Fugitive dust emissions	Dust deposition and health impacts from elevated PM_{10} concentrations.	**Yes** – there is the potential for significant effects in the absence of site-specific mitigation measures.
	Emissions from NRMM	Increase in local air pollutant concentrations	No – due to the temporary and transient nature and incorporation of best practice measures (CoCP) and compliance with NRMM standards. However, this will be confirmed following review of updated information in the air quality assessment.
	Construction vehicle emissions	Increase in local air pollutant concentrations and nitrogen deposition rates.	**Yes** – should screening of construction traffic flows show vehicle trips exceed the IAQM criteria.
Operation/maintenance	Dust generating activities	Dust deposition and health impacts from elevated PM_{10} concentrations.	No – due to infrequent, temporary and transient nature and incorporation of best practice measures (CoCP).
	Operation and maintenance vehicle emissions	Increase in local air pollutant concentrations and nitrogen deposition rates.	No – vehicle trips associated with the operation and maintenance phase are anticipated to be below the IAQM screening criteria and therefore impacts are considered to be not significant. However, this will be confirmed following review of updated information in the air quality assessment.
	Emissions from NRMM	Increase in local air pollutant concentrations	No – due to infrequent, temporary and transient nature and incorporation of best practice measures (CoCP) and compliance with NRMM standards.

Impact Pathways with Receptors (Step 2)

14.6.7 This section identifies whether there are any impact pathways from the impacts identified above that could give rise to potentially significant effects on receptors identified within the study area.

14.6.8 **Table 14.4** provides a summary of the impact pathways identified and those proposed to be scoped into and or out of the air quality assessment for the Project.

Table 14.4: Impact pathways with receptors

Project Phase	Impact	Receptor	Potential for significant effects	Proposed to be scoped in/out
Construction	Dust deposition and health impacts from elevated PM_{10} concentrations.	Sensitive ecological and human receptors within 350 m of the construction boundary.	**Yes** – there is the potential for significant effects in the absence of site-specific mitigation measures.	**Scoped in**
	Increase in local air pollutant concentrations and nitrogen deposition rates from vehicle emissions.	Sensitive ecological and human receptors within 200 m of roads that may be affected by the Project.	**Yes** – should screening of construction traffic flows show vehicle trips exceed the IAQM criteria.	**Scoped in**

14.7 Proposed Assessment Methodology

Proposed Data Sources

14.7.1 In addition to the sources outlined in 14.4.1 The following data sources are proposed to be used to inform the air quality assessment:

- MAGIC website (Ref 8.21) – to identify sensitive ecological sites within the air quality study area; and
- traffic data for the construction, operation and maintenance phases.

14.7.2 Should detailed dispersion modelling of vehicle emissions be required following the screening of construction traffic data then the following data sources would be used:

- meteorological data from a nearby meteorological station for the base year; and
- air Pollution Information System (Ref 14.15) – for ecological site relevant critical loads for ammonia and nitrogen deposition rates.

Technical Guidance

14.7.3 The air quality assessment will be carried out in accordance with the following good practice and guidance documents:

- The IAQM Guidance on the Assessment of Dust from Demolition and Construction (Ref 14.8) – provides a mechanism for the assessor to consider both the magnitude of emissions and sensitivity of an area in order to define the level of risk of dust soiling and human health impacts during the construction phase. Defining the construction dust risk levels allows appropriate mitigation measures to be adopted;
- The IAQM and Environmental Protection UK (EPUK) Land Use Planning and Development Control: Planning for Air Quality guidance (Ref 14.9) – applicable in assessing the effect of changes in exposure of members of the public resulting from developments such as the proposed Development. It provides guidance on how to decide whether an air quality assessment is required, how to undertake a suitable assessment of operational impacts and whether these are to be considered significant or not, and how to identify whether additional mitigation is required;
- Local Air Quality Management Technical Guidance (LAQM.TG(22)) (Ref 14.16) – provides best practice principles for the technical assessment of local air quality including the use of monitoring data, selection of receptors and verification procedure. LAQM.TG(22) also provides guidance for the application of Defra tools and resources used for the technical assessment of air quality; and
- DMRB (LA105) (Ref 14.10) – provides guidance on the assessment of vehicle emissions.

Proposed Assessment Methodology

14.7.4 The following section summarises the methodology proposed to be used for the air quality assessment which builds on the general assessment methodology presented in **Chapter 5 EIA Approach and Methodology.**

Construction dust assessment

Sensitivity

14.7.5 The sensitivity of the area to dust impacts, can be defined as low, medium or high sensitivity, in accordance with IAQM construction dust guidance.

14.7.6 The influencing factors to define receptor sensitivity to dust impacts are as follows:

- High – where human receptors expected to be present continuously for extended periods of time e.g. residential properties, hospitals, schools and care homes. Internationally or nationally designated ecological sites;
- Medium – where users would expect to enjoy a reasonable level of amenity and value could be diminished by dust soiling e.g. parks and places of work. Nationally designated ecological sites; and
- Low – where enjoyment of amenity would not reasonably be expected and exposure would be for limited periods e.g. footpaths, shopping streets and car parks. Locally designated ecological sites.

Magnitude

14.7.7 The scale and nature of the works determines the magnitude of dust arising as small, medium or large.

14.7.8 The relevant criteria to define the potential magnitude of dust emission includes the following factors:

- Small – demolition volume under 20,000 m^3 less than 10 m above ground level, total site area less than 2,500m^2, soil type with large grain size, total material moved less than 20,000 tonnes, construction material with low potential for dust release, less than 10 HDV trips per day, unpaved road length less than 50 m etc;
- Medium – demolition activities 10 m – 20 m above ground level, moderately dusty soil type, potentially dusty construction material, total material moved 20,000-100,000 tonnes, 10 to 50 HDV trips per day, unpaved road length 50 – 100 m etc; and
- Large – on-site crushing and screening demolition, demolition activities greater than 20 m above ground level, total site area greater than 10,000 m^2, more than 10 heavy earth moving vehicles active at any one time, more than 10,000 tonnes of material moved on site concrete batching, sandblasting, more than 50 HDV trips per day, unpaved road length greater than 100 m etc.

Significance of effects

14.7.9 The IAQM construction dust guidance (Ref 14.8) categorises the unmitigated risk of dust impacts on human health and amenity (rather than ascribe a significance of effect) as a means of identifying the level of dust emissions mitigation required to ensure that residual effects are 'not significant'. A higher dust risk rating requires more stringent mitigation measures in order to limit residual effects.

Vehicle emissions assessment

14.7.10 Assessment of vehicle emissions will be undertaken should the screening of traffic data meet the criteria set out by IAQM development control guidance (Ref 14.9). If these criteria are not exceeded, then the guidance considers air quality impacts associated with a project in terms of traffic emissions to be negligible and no further assessment is required.

Sensitivity

14.7.11 Should screening of the relevant data indicate that any of the IAQM criteria are met, then potential impacts at sensitive receptor locations would be assessed by calculating the change in NO_2 and particulate matter concentrations as a result of the Project.

14.7.12 LAQM.TG(22) defines a sensitive receptor as location representative of human (or ecological) exposure to a pollutant, over a time period relevant to the objective that is being assessed against, where the Air Quality Strategy objectives are considered to apply, as detailed in **Table 14.5**.

Table 14.5: Examples of where the AQS objectives apply

Averaging Period	Objectives Should Apply At	Objectives Should Not Apply At
Annual Mean	All locations where members of the public might be regularly exposed. Building façades of residential properties, schools, hospitals, care homes etc.	Building façades of offices or other places of work where members of the public do not have regular access. Hotels, unless people live there as their permanent residence. Gardens of residential properties. Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term.
24-Hour Mean	All locations where the annual mean objective would apply, together with hotels and gardens of residential properties.	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term.
1-Hour Mean	All locations where the annual mean and 24-hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets). Those parts of car parks, bus stations and railway stations etc. which are not fully enclosed, where reasonably be expected to spend one hour or more. Any outdoor locations where members of the public might reasonably be expected to spend one hour or longer.	Kerbside sites where the public would not be expected to have regular access.

Magnitude

14.7.13 Detailed dispersion modelling would be undertaken using Atmospheric Dispersion Modelling Software (ADMS) to predict pollutant concentrations at worst case receptor locations within 200 m of affected vehicle routes. The magnitude of change would be calculated, and total concentrations compared against relevant AQS objectives.

Significance of effects

14.7.14 The significance of effects would be assessed in accordance with the IAQM development control guidance (Ref 14.9) dependent upon the percentage change in concentration between the ‘without and with Project’ scenarios, relative to the relevant air quality objectives, as presented in **Table 14.6**.

Table 14.6: IAQM Impact Descriptors for Individual Receptors

Long Term Average Concentration at Receptor in Assessment Year	% Change in Concentration Relative to Air Quality Assessment Level (AQAL)			
	1	2-5	6-10	>10
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76 – 94% of AQAL	Negligible	Slight	Moderate	Moderate
95 – 102% of AQAL	Slight	Moderate	Moderate	Substantial
103 – 109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial

14.7.15 The IAQM guidance notes that the impact descriptors in **Table 14.6** are for individual receptors only and the overall significance of effect should be determined using professional judgement, taking into the degree of impact and factors such as:

- the existing and future air quality in the absence of the development
- the extent of current and future populations exposure to the impact; and
- the influence and validity of any assumptions adopted when undertaking the prediction of impacts.

Limitations of assessment

14.7.16 There is limited detail available for NRMM during the construction and maintenance phases and regarding the potential use of diesel generators at this stage however it is expected that the use of such equipment will comply with relevant regulations. It is assumed that emissions would be temporary and transient in nature and therefore negligible in terms of air quality impacts and significance, however this will be confirmed in the air quality assessment once further information is available.

14.8 Conclusion

Summary

14.8.1 With regards to air quality impacts associated with the Project, the assessment of dust emissions associated with the construction phase is scoped in. Construction traffic vehicle emissions cannot be scoped out at this stage and so are currently scoped in; screening will be undertaken post-scoping once more detailed information is available. Assessment of NRMM emissions is proposed to be scoped out of the air quality assessment due to the temporary and transient nature of their use. Significant effects of NRMM emissions are considered unlikely with incorporation of best practice measures (CoCP) and compliance with NRMM standards. Air quality impacts associated with the operation/maintenance phase have also been scoped out.

Proposed Scope of the Assessment

14.8.2 A summary of the proposed scope of the assessment is provided in **Table 14.7**.

Table 14.7: Proposed scope of the assessment

Receptor	Potential for significant effect	Project phase(s)	Proposed to be scoped in/out
Nearby Air Quality Sensitive Receptors	Dust deposition and human health dust impacts	Construction	**Scoped in**
Nearby Air Quality Sensitive Receptors	Dust deposition and human health dust impacts	Operation/maintenance	Scoped out
Nearby Air Quality Sensitive Receptors	Increase in vehicle emissions	Construction	**Scoped in** – to be confirmed upon screening of traffic data at post-scoping once information is available.
Nearby Air Quality Sensitive Receptors	Increase in vehicle emissions	Operation/maintenance	Scoped out
Nearby Air Quality Sensitive Receptors	Emissions from NRMM	Construction, operation/maintenance	Scoped out

15. Noise and Vibration

15.1 Introduction

15.1.1 This chapter presents how the noise and vibration assessment will consider the potentially significant effects on noise and vibration sensitive receptors (NSRs) that may arise from the construction, operation, and maintenance of the Project (as described in **Chapter 4, Description of the Project**). It describes the methodology and datasets to be used within the noise and vibration assessment, presents an overview of the baseline conditions, and identifies the potential likely significant effects to be considered within the assessment, and how these will be assessed for the purpose of an Environmental Impact Assessment (EIA). As detailed in **Chapter 4, Description of the Project**, the decommissioning has been scoped out of the environmental assessment.

15.1.2 The Project Scoping Boundary is illustrated on **Figure 1.1 Project Scoping Boundary**.

15.1.3 This chapter should be read in conjunction with:

- **Chapter 4, Description of the Project**; and
- **Chapter 5, EIA Approach and Methodology**.

15.1.4 This chapter is supported by the following figures.

- **Figure 15.1 Noise and Vibration Baseline**.

15.2 Regulatory and Planning Context

15.2.1 **Chapter 2, Regulatory and Planning Context** describes the overall regulatory and planning policy context for the Project. Key legislation, policy and planning guidance relevant to the assessment of potential effects on noise and vibration associated with the construction, operation, maintenance and decommissioning of the Project is presented below.

Legislation

15.2.2 The below legislation will be considered when identifying potential constraints to the Project, design options and mitigation.

- The Control of Pollution Act 1974 (Ref 15.1); and
- Environmental Protection Act 1990 (Ref 11.1).

The Control of Pollution Act 1974

15.2.3 Section 61 sets out the procedures whereby contractors may obtain ‘Prior Consent’ for construction works within agreed noise limits. Applications for such consents would be made to the local authority and would contain a construction method statement and the steps to be taken to minimise noise. The local authority has the power to attach conditions to any consent given.

Environmental Protection Act 1990

15.2.4 Under Part III of the Environmental Protection Act 1990 as amended by the Noise and Statutory Nuisance Act 1993, local authorities have a duty to investigate noise complaints relating to a variety of sources such as construction noise but excluding road traffic noise. If the local authority is satisfied that the noise amounts to a statutory nuisance it shall serve an Abatement Notice which may require that the noise be stopped altogether or limited to certain times.

Planning Policy

National Planning Policy

National Policy Statements

15.2.5 As detailed in **Chapter 2, Regulatory and Planning Policy Context**, National Policy Statements (NPSs) set out the primary policy tests against which the application for a Development Consent Order (DCO) for the Project would be considered. The two relevant NPSs are Overarching National Policy Statement for Energy (EN-1) (Ref 2.2) and National Policy Statement for Electricity Networks Infrastructure (EN-5) (Ref 2.3). **Table 15.1** sets out how both the current and draft NPSs (Ref 2.4 and Ref 2.5 respectively) relevant to electricity networks infrastructure are relevant to the noise and vibration assessment.

Table 15.1: Relevant sections of the relevant National Policy Statements

National Policy Statement	NPS section	How it will be considered
EN-1	*5.11.1 "Excessive noise can have wide-ranging impacts on the quality of human life, health (for example owing to annoyance or sleep disturbance) and use and enjoyment of areas of value such as quiet places and areas with high landscape quality. The Government's policy on noise is set out in the Noise Policy Statement for England. It promotes good health and good quality of life through effective noise management. Similar considerations apply to vibration, which can also cause damage to buildings. In this section, in line with current legislation, references to 'noise' below apply equally to assessment of impacts of vibration".*	The principles in this section will be followed through the Scoping and environmental assessment.
EN-1	*5.11.4 "Where noise impacts are likely to arise from the proposed development, the applicant should include the following in the noise assessment:* • *a description of the noise generating aspects of the development proposal leading to noise impacts, including the identification of any distinctive tonal,*	This policy section is addressed in section 15.5 and 15.7. The details of the noise and vibration impact assessment will be addressed in the noise

National Policy Statement	NPS section	How it will be considered
	impulsive or low frequency characteristics of the noise; • *identification of noise sensitive premises and noise sensitive areas that may be affected;* • *the characteristics of the existing noise environment;* • *a prediction of how the noise environment will change with the proposed development;* – in the shorter term such as during the construction period; – in the longer term during the operating life of the infrastructure; – at particular times of the day, evening and night as appropriate. • *an assessment of the effect of predicted changes in the noise environment on any noise sensitive premises and noise sensitive areas; and* • *measures to be employed in mitigating noise.* *The nature and extent of the noise assessment should be proportionate to the likely noise impact".*	and vibration assessment with appropriate standards.
EN-1	*5.11.5 "The noise impact of ancillary activities associated with the development, such as increased road and rail traffic movements, or other forms of transportation, should also be considered".*	This policy section is addressed in section 15.4 and 15.7.
EN-1	*5.11.6 (part) "Operational noise, with respect to human receptors, should be assessed using the principles of the relevant British Standards and other guidance. Further information on assessment of particular noise sources may be contained in the technology-specific NPSs. In particular, for renewables (EN-3) and electricity networks (EN-5) there is assessment guidance for specific features of those technologies. For the prediction, assessment and management of*	The following guidance will be used within the noise and vibration assessment • BS 5228-1:2009+A1:2014. Code of practice for noise and vibration control on construction and open sites – Part 1: Noise

National Policy Statement	NPS section	How it will be considered
	construction noise, reference should be made to any relevant British Standards and other guidance which also give examples of mitigation strategies".	• BS 5228-1:2009+A1:2014. Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration • Calculation of Road Traffic Noise 1988 • DMRB LA 111: Noise and Vibration (National Highways, (2020))
EN-1 (Draft)	5.12.9 – *"Development must be undertaken in accordance with statutory requirements for noise. Due regard must be given to the relevant sections of the Noise Policy Statement for England, the NPPF, and the government's associated planning guidance on noise".*	
EN-5	*2.12.2 "All high voltage transmission lines have the potential to generate noise under certain conditions".*	This is addressed in section 15.6, Step 1.
EN-5	*2.12.9 "For the assessment of noise from overhead lines, the Applicant must use an appropriate method to determine the sound level produced by the line in both dry and wet weather conditions, in addition to assessing the impact on noise-sensitive receptors. For instance, the Applicant may use an appropriate noise modelling tool or tools for the prediction of overhead line noise and its propagation over distance. When assessing the impact of noise generated by overhead lines in wet weather relative to existing background sound levels, the Applicant should consider the effect of varying background sound levels due to rainfall. The Secretary of State is likely to regard it as acceptable for the Applicant to use a methodology that demonstrably addresses these criteria".*	• This is addressed in section 15.6, Step 1.
EN-5	*2.12.10 "Applicants must consider the following measures:* • *the positioning of lines to help mitigate noise* • *ensuring that the appropriately sized conductor arrangement is used to minimise potential noise*	The principle has been integrated in the selection of the preferred corridor, consideration of the technical details and maintenance.

National Policy Statement	NPS section	How it will be considered
	• *quality assurance through manufacturing and transportation to avoid damage to overhead line conductors which can increase potential noise effects* • *ensuring that conductors are kept clean and free of surface contaminants during stringing/installation* • *the selection of the quietest cost-effective plant available".*	
EN-5	*2.12.11 "In addition, the ES should include information on planned maintenance arrangements. Where detail is not included, the Secretary of State should consider stipulating. For example BS4142. National Policy Statement for Electricity Networks Infrastructure (EN-5) appropriate maintenance arrangements by way of requirements attached to any grant of development consent".*	• This is addressed in section 15.6, Step 1.
EN-5 (Draft)	*Paragraph 2.12.10 – "Selection of the quietest cost-effective plant available must be considered".*	The principle has been integrated in the selection of the equipment.

National Planning Policy Framework

15.2.6 The National Planning Policy Framework (NPPF) (Ref 2.6) was published in 2021. The document defines the national policy toward developments which are sensitive to noise and vibration. Specifically, on the subject of noise, paragraphs 174, 185 and 182 state that:

- *"174. Planning policies and decisions should contribute to and enhance the natural and local environment by:*

  (e) *preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans;*

- *185. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:*

(a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;

(b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason;

- *187. Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed".*

Noise Policy Statement for England

15.2.7 The long-term vision of Government noise policy is set out in the Noise Policy Statement for England (NPSE) published in March 2010. Through effective management and control of environmental noise within the context of Government policy on sustainable development, the NPSE aims to:

- avoid significant adverse impacts on health and quality of life;
- mitigate and minimise other adverse impacts on health and quality of life; and
- contribute to improvements to health and quality of life, where possible.

15.2.8 The Explanatory Note to the NPSE assists in the definition of significant adverse and adverse with reference to No Observed Effect Level (NOEL), Lowest Observed Adverse Effect Level (LOAEL) and Significant Observed Adverse Effect Level (SOAEL) values:

- NOEL: the level of noise exposure below which no effect at all on health or quality of life can be detected.
- LOAEL: the level of noise exposure above which adverse effects on health and quality of life can be detected.
- SOAEL: the level of noise exposure above which significant adverse effects on health and quality of life occur.

15.2.9 The Government policy and guidance do not state values for the NOEL, LOAEL and SOAEL, rather, it considers that they are different for different noise sources, for different receptors and at different times and should be defined on a strategic or project basis taking into account the specific features of that area, source or project.

Planning Practice Guidance: Noise

15.2.10 Planning Practice Guidance (PPG) for Noise (Ref 15.2) was published in March 2014 and updated in July 2019. It provides advice on how planning can manage potential noise impacts related to new development. It states that:

"Noise needs to be considered when development may create additional noise or would be sensitive to the prevailing acoustic environment (including any anticipated changes to that environment from activities that are permitted but not yet commenced)".

15.2.11 It also states that *"...it is important to look at noise in the context of the wider characteristics of a development proposal, its likely users and its surroundings, as these can have an important effect on whether noise is likely to pose a concern".*

15.2.12 The guidance also advises that Plan-making and decision making need to take account of the acoustic environment and in doing so consider:

- whether or not a significant adverse effect is occurring or likely to occur;
- whether or not an adverse effect is occurring or likely to occur; and
- whether or not a good standard of amenity can be achieved.

Guidance

15.2.13 Relevant guidance, specific to noise and vibration, that has informed this Scoping Report and would inform the assessment within the ES, comprises:

- BS 5228-1:2009+A1:2014. Code of practice for noise and vibration control on construction and open sites – Part 1: Noise (Ref 15.3);
- BS 5228-1:2009+A1:2014. Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration (Ref 15.4);
- Calculation of Road Traffic Noise 1988 (Ref 15.5); and
- DMRB LA 111: Noise and Vibration (National Highways, (2020)) (Ref 15.6).

Local planning policy

15.2.14 The Project lies within the jurisdiction of East Riding of Yorkshire, North Lincolnshire and Bassetlaw District (Nottinghamshire) Councils. A summary of the relevant local planning policy which is relevant to a study of noise and vibration matters and will inform the noise and vibration assessment in the ES is provided in **Table 15.2**.

Table 15.2: Relevant Local Planning Policies

Local Plan	Policy ref	Policy context	How it will be considered
East Riding Local Plan 2012-2029 Strategy Document, Adopted 2016; and East Riding Local Plan Update 2020 – 2039 Draft Strategy Document Update	Section 7: A Prosperous Economy Section 8: A High Quality Environment	To ensure a prosperous economy and a high-quality environment.	The requirements of the local plan will be addressed.
Notice of adoption of the East Riding Local Plan Strategy Document 2012 – 2029	The adopted document will form part of the Development Plan for East Riding of Yorkshire and provides the basis for decisions on spatial planning	To inform stakeholders of the latest local plan.	The latest version will be considered.

Local Plan	Policy ref	Policy context	How it will be considered
	within the East Riding up to 2029		
East Riding Local Plan 2012 – 2029: Allocations Document Adopted July 2016; and East Riding Local Plan Update 2020 – 2039 Draft Allocations Document Update 2020 – 2039	Section 12: Cottingham	To inform stakeholders where the local plan applies.	To ensure the allocated areas are considered in the noise and vibration assessment.
North Lincolnshire Local Development Framework Core Strategy, Adopted 2011	CS 23 Sport, Recreation and Open Space	No adverse impact to nearby properties or habitats, by reason of noise.	The requirements of the Local Plan will be addressed.
North Lincolnshire Local Plan (2017 to 2036) Statement of Community Involvement	Section 4: Community Involvement – Planning Applications	Matters that should be taken into account in deciding a planning application, including noise.	The requirements of the Local Plan will be addressed.
Planning for Health and Wellbeing	Policy 3 Well Designed Places	To seek to reduce noise and air pollution through ensuring planning applications include a Noise Impact Assessment.	The requirements of the Local Plan will be addressed.
Bassetlaw District Local Development Framework – Core Strategy and Development Management Policies DPD (2011)	Policy DM10: Renewable & Low Carbon Energy	Proposals for renewable and low carbon energy infrastructure will also need to demonstrate that they will not result in unacceptable impacts in terms of noise.	The requirements of the Local Development Framework will be addressed.
Bassetlaw Local Plan 2020 – 2037 (2021)	Section 9.0 Health Community, Policy 48 Protecting Amenity	Not to generate a level of noise, or vibration which cannot be mitigated to an appropriate standard.	The requirements of the Local Plan will be addressed.

Consultation and Engagement

15.2.15 The environmental assessment will be informed by consultation and engagement with stakeholders including, but not limited to, East Riding of Yorkshire Council, North Lincolnshire Council, Bassetlaw District Council, Nottinghamshire County Council, and the relevant Environmental Health Officers.

15.3 Study Area

15.3.1 At the time of writing this Scoping Report, traffic data and construction traffic routes were not available. For the purpose of defining the baseline for scoping, the Scoping Boundary has been used. This is based on professional judgement and knowledge of similar projects.

15.3.2 For the ES, the study area for noise impacts would comprise NSRs within 300 m from the proposed Scoping Boundary/construction works associated with the Project, excluding traffic on the public highway which is considered separately below. This is based on guidance in British Standard 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise (BS 5228-1) DMRB LA 111: Noise and Vibration (Ref 15.3).

15.3.3 Noise from construction traffic on the existing road network would be assessed for each applicable road affected and defined within the ES. The assessment would consider the change in Basic Noise Level (BNL), calculated in line with the methodology described in technical memorandum Calculation of Road Traffic Noise (CRTN) (Ref 15.5), with a subsequent assessment of the impacts on NSRs along existing routes where potential significant effects are identified in accordance with DMRB LA 111: Noise and Vibration (Ref 15.6).

15.3.4 The proposed study area for vibration impacts, based on guidance from BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration (BS 5228-2) (Ref 15.4) and DMRB LA 111: Noise and Vibration (Ref 15.6), comprises 100 m from the closest construction activity with a potential to generate vibration impacts at NSRs.

15.3.5 The study areas are indicated in **Figure 15.1 Noise and Vibration Baseline**.

15.4 Baseline Conditions

Data Sources

15.4.1 The known or predicated current and future baseline environment described in this section has been informed by the following data sources:

- Defra strategic noise mapping, presented as noise contours within **Figure 15.1 Noise and Vibration Baseline** in **Appendix A**, represents the daytime ambient noise levels from road and rail sources (Defra, 2017) Noise Important Areas (NIAs) (Defra, 2022); and
- current OS mapping.

Baseline

15.4.2 The Scoping Boundary has been designed as far as practicable to avoid NSRs as set out in the Corridor Preliminary Routeing and Siting Study (Ref 3.5). This included avoiding settlements and residential areas, passing predominantly through rural areas, with the majority of NSRs being isolated dwellings and small settlements.

15.4.3 Most of the large built-up areas are not within the study areas except for example (north to south): Skidby, Ellerker, Broomfleet, Ousefleet, Luddington, Ealand, Beltoft, Epworth, Haxey, Beckingham, North Wheatley, South Wheatley, Woodbeck, and East Drayton.

15.4.4 The Scoping Boundary crosses over or close to a number of main transport routes, including the following roads (north to south): A1079, A164, A63, A18, M180, A161, B1403, A631, and A57, and the following railway lines (north to south): Yorkshire Coast Line, Hull Line, South Humberside Main Line, Spalding and Doncaster Line, and Sheffield to Lincoln Line. These features are presented on **Figure 15.1 Noise and Vibration Baseline**.

15.4.5 Noise Impact Areas (NIAs) are determined via strategic noise maps and highlight the residential areas experiencing the highest 1% of noise levels from road and rail sources in England. There is one NIA (ID 11148 associated with A57 road) located on the existing public highway within the 300 m study area (refer to **Figure 15.1 Noise and Vibration Baseline**).

15.4.6 The noise climate is expected to vary along the Scoping Boundary depending on the nature of the area. For example, close to noise sources, such as roads and railways and in built up areas, ambient noise levels are expected to be higher. Further away from road and rail sources and in rural areas, ambient and background noise levels would be expected to be lower. Daytime noise level contours from existing road and railway sources are presented in **Figure 15.1 Noise and Vibration Baseline**, showing how existing noise levels vary along the Scoping Boundary. Areas outside of the contours are generally considered to have low ambient and background noise levels. Areas where the road and rail contours overlap are considered to experience noise effects from both sources.

15.4.7 Ecological and heritage sites that may be affected by noise and vibration would be considered within **Chapter 8, Ecology and Biodiversity** and **Chapter 9, Cultural Heritage** of the ES.

14.6.7 It is assumed that the existing vibration levels within the Scoping Boundary are negligible compared to construction vibration threshold values, which is likely to be the case even close to railways or busy main roads. The assessment will therefore consider potential construction vibration impacts against threshold values assuming no significant existing vibration sources.

Future Baseline

15.4.8 The future baseline relates to known or anticipated changes to the current baseline in the future which should be assessed as part of the Project in the ES.

15.4.9 No significant changes to the future noise and vibration baseline are anticipated owing to the largely rural and agricultural nature of the Scoping Boundary. Should there be any changes, these would be assessed within the ES.

15.5 Embedded and Control and Management Measures

Embedded Measures

15.5.1 The Project has been routed to avoid designated sites and NSRs as far as possible.

15.5.2 Further embedded measures would be developed as the Project design evolves, for example through detailed routeing within the Scoping Boundary.

15.5.3 The proposed overhead line (OHL) system is a 'triple Araucaria' conductor bundle, which is regarded as practically quiet during all weather conditions. In addition, pylon fittings, such as insulators, dampers, spacers and clamps, are designed and procured in accordance with a series of National Grid Technical Specifications and must be type registered (rigorously tested) to ensure the fitting conforms to the specification. These processes reduce the potential for audible noise and tones to occur from all types of fittings, including insulators. Where noise does occur, it is likely to be localised and of short duration. If this is due to a fault, action can be taken to rectify it. Where noise from fittings does occur which results in a complaint, appropriate action can be taken to seek to remedy the cause of the noise, usually through cleaning or replacing the relevant fitting.

Control and Management Measures

15.5.4 An Outline Code of Construction (CoCP) is provided in **Appendix 4.A Outline Code of Construction Practice**. Measures relevant to the control and management of impacts that could affect the Noise and vibration assessment are:

- GG03: A Construction Environmental Management Plan (CEMP), a Landscape and Ecological Management Plan (LEMP), a Construction Traffic Management Plan (CTMP), and a Site Waste Management Plan (SWMP) will be produced prior to construction. These are collectively referred to as 'the Management Plans'.
- GG04: The CEMP shall include measures to manage dust, waste, water, noise, vibration and soil during construction. The contractor(s) shall undertake site inspections to check conformance to the Management Plans.
- GG05: A suitably experienced Environmental Manager(s) will be appointed for the duration of the construction phase. In addition, qualified and experienced Environmental Clerk of Works will be available during the construction phase to advise, supervise and report on the delivery of the mitigation methods and controls outlined in the CEMP. The Environmental Clerk of Work(s) will monitor that the works proceed in accordance with relevant environmental DCO requirements and adhere to the required good practice and mitigation measures. The Environmental Clerk of Works will be supported as necessary by appropriate specialists, including ecologists and arboriculturists.
- GG06: Construction workers will undergo training to increase their awareness of environmental issues as applicable to their role on the project. Topics will include but not be limited to:
  - pollution prevention and pollution incident response;
  - dust management and control measures;
  - location and protection of sensitive environmental sites and features;
  - adherence to protected environmental areas around sensitive features;

  - working hours and noise and vibration reduction measures;
  - working with potentially contaminated materials;
  - waste management and storage;
  - flood risk response actions; and
  - agreed traffic routes, access points, etc.

- GG11: Any activity carried out or equipment located within a construction compound that may produce a noticeable nuisance, including but not limited to dust, noise, vibration and lighting, will be located away from sensitive receptors such as residential properties or ecological sites where practicable.
- GG13: Vehicles will be correctly maintained and operated in accordance with manufacturer's recommendations and in a responsible manner. All plant and vehicles will be required to switch off their engines when not in use and when it is safe to do so. Electric, or other low carbon plant and equipment should be used where available and where practicable.
- GG14: Materials and equipment will not be moved or handled unnecessarily. When loading and unloading materials from vehicles, including cable drums and excavated materials, drop heights will be limited.
- GG25: Working areas will be appropriately fenced. The type of fencing to be installed will be dependent on the area to be fenced and will take into consideration the level of security required in relation to the surrounding land and public access, rural or urban environment and arable or stock farming. For some locations, the fence used may also serve to provide acoustic and visual screening of the work sites and reduce the potential for disturbance of users in the surrounding areas. Fencing will be regularly inspected and maintained and removed as part of the demobilisation unless otherwise specified.
- NV01: Construction working will be undertaken within the agreed working hours set out within the DCO. Best practicable means to reduce construction noise will be set out within the CEMP.
- NV02: Contractors will be required to follow good construction practices (referred to as best practicable means (BPM)) as outlined in BS 5228-1 and BS 5228-2 to control noise and vibration respectively. BS 5228-1 and BS 5228-2 have Approved Code of Practice status (in England) under the powers conferred by Sections 71(1)(b), (2) and (3) of the Control of Pollution Act 1974, as enacted under The Control of Noise (Code of Practice for Construction and Open Sites) (England) Order 2015. Compliance with the good practice noise and vibration requirements stated therein are a statutory obligation under the Act.
- NV03: In certain instances where construction noise and/or vibration may cause a significant adverse effect at nearby NSRs, applications for prior consent under Section 61 of the Control of Pollution Act 1974 (Ref 15.1) may be submitted to the relevant local authority to ensure that BPM are applied to control noise and vibration.

15.6 Potential for Significant Effects

15.6.1 The noise and vibration assessment will consider the construction, operation, and maintenance, of the Project. Details of each of these stages are set out in **Chapter 4, Description of the Project.**

15.6.2 The proposed scope of the noise and vibration assessment is set out below and has been determined using the approach described in **Chapter 5, EIA Approach and Methodology.**

15.6.3 The potential for the Project to result in likely significant effects identified in **Table 15.3** takes into account the embedded measures and control and management measures described in section 5.

Sources and Impacts (Step 1)

15.6.4 This section identifies the sources and impacts that would occur as a result of the construction, operation, and maintenance of the Project.

Potential sources of impacts

Sources of construction impacts

- Construction activities as detailed in **Chapter 4, Description of the Project**, section 4.3.
- Construction traffic.

Sources of operational impacts

- OHL.
- Cable sealing end compounds (CSEC).
- Underground cables.

Sources of maintenance impacts

- Maintenance activities as detailed in **Chapter 4, Description of the Project**, section 4.4.
- Maintenance traffic.

Potential impacts

15.6.5 **Table 15.3** identifies the potential impacts that could result from the sources identified above.

15.6.6 Where Table 15.3 identifies the potential for an impact to result in a significant effect the impact is taken through to Step 2. Where **Table 15.3** identifies no potential for an impact to result in a significant effect, that impact is proposed to be scoped out.

Table 15.3: Impacts and the potential for significant effects

Project phase	Source	Impact	Potential for significant effects
Construction	Construction activities	Noise emissions	**Yes** – there is the potential for effects due to construction noise within the study area. There is a greater likelihood of significant adverse effects from construction noise at static sites, such as construction compounds where the duration of works may be medium to long term. Construction noise hotspots are likely to include in areas where piling may be required and at any trenchless crossing locations where night-time working may be required where certain operations cannot be stopped once started.
	Construction activities	Vibration impact on structures	No – construction vibration would not be expected to cause damage to buildings or structures unless very high levels of vibration are generated within approximately 10 m, although this would be reviewed during the iterative design process and avoided where possible.
	Construction activities	Vibration impact on humans at NSRs	**Yes** – there is the potential for effects on human receptors (i.e. nuisance) due to construction vibration at NSRs within the study area.
	Construction traffic	Noise impact at NSR	**Yes** – there is the potential for significant effects at NSRs close to construction traffic routes.
		Vibration impact at NSR	No – vibration from traffic on the public highway is caused by irregularities in the road surface. Where the road surface is free from irregularities, such as potholes, significant vibration effects would not be expected, even at relatively short distances.
Operation	OHLs	Noise impact at NSRs	No – operational noise from the OHL is not likely to be significant at nearby NSRs under any weather conditions owing to the proposed 'triple Araucaria' conductor bundle (section 15.5) and is therefore proposed to be scoped out of the noise and vibration assessment. Should the iterative design process result in alternative conductor types being used, consideration for this would be assessed within the noise and vibration assessment. Technical information would be submitted as part of the application for development

Project phase	Source	Impact	Potential for significant effects
			consent to support scoping out noise associated with OHLs from the noise and vibration assessment.
	CSEC	Noise impact at NSRs	No – the source of operational noise is the same as that from an OHL (i.e., the conductors) which would be 'practically quiet' during operation.
	Underground cables	Noise impact at NSRs	No – underground cables are practically quiet and therefore not considered likely to cause significant effects.
	Operational vibration	Vibration impact at NSRs	No – there are no sources of operational vibration proposed as part of the Project.
Maintenance	Maintenance for OHL, potential underground cables, cable sealing end compounds, and/or tunnel head houses	Noise or vibration impact at NSRs	No – maintenance of the OHL, underground cables, and substations would be infrequent and localised and short term in duration. Maintenance activities would follow standard measures to reduce noise and vibration where required.

Impact Pathways with Receptors (Step 2)

15.6.7 This section identifies whether there are any impact pathways from the impacts identified above that could give rise to potentially significant effects on receptors identified within the study area.

15.6.8 **Table 15.4** provides a summary of the impact pathways identified and those proposed to be scoped into and or out of the noise and vibration assessment for the Project.

Table 15.4: Impact pathways with receptors

Project Phase	Impact	Receptor	Potential for significant effects	Proposed to be scoped in/out
Construction	Noise impact from construction activities.	NSRs within the study area	**Yes** – **Table 15.4**	**Scoped in**
	Vibration impact from construction activities.	Structures within the study area	No – **Table 15.4**	Scoped out
		Humans within NSR	**Yes** – **Table 15.4**	**Scoped in**

Project Phase	Impact	Receptor	Potential for significant effects	Proposed to be scoped in/out
		in the study area		
	Noise impact from construction traffic.	NSRs within the study area	**Yes** – **Table 15.4**	**Scoped in**
	Vibration impact from construction traffic	NSRs within the study area	No – **Table 15.4**	Scoped out
Operation	Noise impact from OHL, CSEC and/or underground cables	NSRs within the study area	No – **Table 15.4**	Scoped out
	Vibration impact	NSRs within the study area	No – **Table 15.4**	Scoped out
Maintenance	Noise or vibration impact from maintenance activities	NSRs within the study area	No – **Table 15.4**	Scoped out

15.7 Proposed Assessment Methodology

Proposed Data Sources

15.7.1 The following data sources are proposed to be used to inform the noise and vibration assessment:

- Defra strategic noise mapping, presented as noise contours within **Figure 14.1** in **Appendix A**, represents the daytime ambient noise levels from road and rail sources (Defra, 2017) (Ref 15.7);
- Noise Important Areas (NIAs) (Defra, 2022) (Ref 15.8); and
- current OS mapping.

Technical Guidance

15.7.2 The noise and vibration assessment will be carried out in accordance with the following good practice and guidance documents:

- BS 5228-1:2009+A1:2014. Code of practice for noise and vibration control on construction and open sites – Part 1: Noise (Ref 15.3);

- BS 5228-1:2009+A1:2014. Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration (Ref 15.4);
- Calculation of Road Traffic Noise 1988 (Ref 15.5); and
- DMRB LA 111: Noise and Vibration (National Highways, (2020)) (Ref 15.6).

Proposed Assessment Methodology

15.7.3 The following section summarises the methodology proposed to be used for the noise and vibration assessment which builds on the general assessment methodology presented in **Chapter 5, EIA Approach and Methodology.**

Sensitivity

15.7.4 NSRs are determined partly on property type, for example residential properties are of a higher sensitivity than factories and offices. The sensitivity of residential NSRs is factored into the assessment criteria for noise and vibration impacts.

15.7.5 Although all residential NSRs are sensitive to noise and vibration, there are also cases where the sensitivity of an NSR may depend on the pre-existing noise climate. For example, NSRs falling with existing high noise areas (such as NIAs) may be more sensitive to increases in noise than those outside NIAs. Consideration would be given to such instances as part of the assessment of construction impacts.

15.7.6 Although the sensitivity of residential NSRs is factored into the assessment methodologies, additional consideration of sensitivity may be required in certain cases for non-residential NSRs. The criteria used to determine the value and sensitivity of non-residential NSRs specific to noise and vibration are set out in **Table 15.5**. These values are based on standard practice.

Table 15.5: Criteria for determining value/sensitivity – non-residential NSR

Sensitivity/value	Impact
High	Schools and education premises, hospitals, clinics, care homes, places of worship, community centres, libraries.
Medium	Areas primarily used for leisure activities including Public Rights of Way, sports facilities and sites of historic or cultural importance, camp sites, hotels, gardens, parks.
Low	Offices, cafes/bars with external areas.
Negligible	Industrial or retail premises.

Magnitude

Impact magnitude – construction noise

15.7.7 Construction noise impacts will be assessed in accordance with BS 5228-1 and with the guidance of DMRB LA 111: Noise and vibration (Ref 15.6).

15.7.8 Construction noise levels will be calculated at the facades of NSRs within the study area in accordance with the methodology described in Annex F of BS 5228-1. The predicted construction noise levels at NSRs would be compared against the lower noise thresholds

(Category A) as detailed in Section E.3.2 of BS 5228-1 (the 'ABC' method). The Category A construction noise thresholds represent the lowest assessment criteria (typically used to assess impacts in rural areas) and are proposed to be used throughout the Project as a worst-case unless there is a justification for a higher threshold to be set at specific locations.

15.7.9 The Lowest Observed Adverse Effect Level (LOAEL) and the Significant Observed Adverse Effect Level (SOAEL) will be established in accordance with **Table 15.6**.

Table 15.6: Construction noise LOAELs and SOAELs at residential receptors

Time Period	LOAEL	SOAEL
Weekdays 7:00am to 7:00pm, and Saturdays 7:00am to 1:00pm	50 dB $L_{Aeq,T}$	65 dB $L_{Aeq,T}$
Weekdays 7:00pm to 11:00pm, Saturdays 1:00pm to 11:00pm, and Sundays 7:00am to 11:00pm	50 dB $L_{Aeq,T}$	55 dB $L_{Aeq,T}$
Night-time 11:00pm to 7:00am	45 dB $L_{Aeq,T}$	50 dB $L_{Aeq,T}$

15.7.10 The magnitude of impact of construction noise would be determined against the criteria specified by DMRB LA 111: Noise and vibration (Ref 15.6), as detailed in **Table 15.7**.

Table 15.7: Magnitude of impact from construction noise at residential receptors

Magnitude	Construction Noise Level
Major	Above or equal to SOAEL +5 dB
Moderate	Above or equal to SOAEL and below SOAEL +5 dB
Minor	Above or equal to LOAEL and below SOAEL
Negligible	Below LOAEL

Impact magnitude – construction traffic noise

15.7.11 Noise from construction traffic on the public highway would be calculated in accordance with CRTN and assessed against the criteria detailed in DMRB LA 111: Noise and vibration (Ref 15.6). The BNL from roads within the construction traffic study area would be calculated in accordance with CRTN for the 'do-nothing' and 'do-something' scenarios in the construction year. The calculated BNL values would be compared to determine the magnitude of the impact.

15.7.12 The calculated BNL values for the 'do-minimum' and 'do-something' scenarios in the construction year would be compared to determine the magnitude of the impact in accordance with criteria specified by DMRB LA 111: Noise and vibration (Ref 15.6) as detailed in **Table 15.8**.

Table 15.8: Magnitude of impact from construction traffic noise at residential receptors

Magnitude	Increase in BNL of Closest Public Road Used for Construction Traffic (dB)
Major	Greater than or equal to 5.0
Moderate	Greater than or equal to 3.0 and less than 5.0
Minor	Greater than or equal to 1.0 and less than 3.0
Negligible	Less than 1.0

Impact magnitude – construction vibration

15.7.13 Construction vibration levels would be calculated and assessed in accordance with the methodologies described in BS 5228-2. No vibration baseline study is proposed within the assessment and construction vibration levels will be compared against fixed appropriate assessment criteria detailed in BS 5228-2.

15.7.14 Vibration levels from construction activities would be calculated in accordance with the methodology described in Annex E of BS 5228-2. Construction vibration effect threshold levels, including applicable LOAEL and SOAEL, are presented in **Table 15.9**.

Table 15.9: Construction vibration effect magnitudes at residential receptors

Vibration Level mm/s PPV*	Effect
0.14	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.
0.3	Vibration might be just perceptible in residential environments (LOAEL).
1.0	It is likely that vibration of this level in residential environments will cause complaint but can be tolerated if prior warning and explanation has been given to residents (SOAEL).
10	Vibration is likely to be intolerable for any more than a very brief exposure to this level in most building environments

15.7.15 The magnitude of impact of construction vibration would be determined against the criteria specified by DMRB LA 111: Noise and vibration (Ref 15.6), as detailed in **Table 15.10**.

Table 15.10: Magnitude of impact of construction vibration at residential receptors

Magnitude	Construction Vibration Level
Major	Above or equal to 10 mm/s PPV
Moderate	Above or equal to SOAEL and below 10 mm/s PPV
Minor	Above or equal to LOAEL and below SOAEL
Negligible	Below LOAEL

Significance of effects

15.7.16 The significance of effect would be expressed as a result of the sensitivity and magnitude of impact on receptors, experienced as a result of the Project. The significance would be expressed as major, moderate, minor, negligible or neutral and either adverse or beneficial.

Residential NSR

15.7.17 Noise from construction activities, construction traffic noise, and construction vibration would constitute a significant adverse effect at residential NSRs where it is determined that a major or moderate magnitude of impact would occur for a duration exceeding:

- 10 or more days or nights in any 15 consecutive days or nights; and/or
- a total number of days exceeding 40 in any six consecutive months.

Non-residential NSR

15.7.18 With regards to non-residential receptors, the significance of effect would be determined via the matrix shown in **Table 15.11**, taking account of the sensitivity of the NSR and the impact magnitude. For construction impacts, the duration of impact would also be taken into account, as above.

Table 15.11: Significance matrix at non-residential NSRs

Magnitude	NSR sensitivity			
	High	Medium	Low	Negligible
Major	Major	Major	Moderate	Minor
Moderate	Moderate	Moderate	Minor	Negligible
Minor	Moderate	Minor	Negligible	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

15.7.19 Major and moderate effects are typically considered to be significant, whilst minor and negligible effects are not considered to be significant. However, professional judgement would also be applied in reaching conclusions as to the significance of effects at specific non-residential NSRs.

Limitations of assessment

15.7.20 The assessment of noise and vibration will be based on the best available data with regards to proposed construction methods at the time of assessment. Where there is uncertainty in the assessment, this will be stated and precautionary principles will be applied, such as assuming the shortest distance between construction noise sources and NSRs, typical worst-case plant selection, and high percentage ‘on-times’.

15.8 Conclusion

Summary

15.8.1 With regards to noise and vibration impacts associated with the Project, the assessment of construction noise and vibration together with construction traffic noise, are scoped into the assessment. No significant adverse effects are expected from operational noise sources associated with the Project due to the embedded measures applied as part of the project design. Operational and maintenance noise is therefore scoped out of the assessment. However, evidence will be provided as part of the application for development consent to justify scoping out operational noise from OHL.

15.8.2 Based on the desktop study, most of the study area is within the rural area and baseline noise levels are low. The lower construction noise thresholds detailed in BS 5228-1 will therefore be used in the assessment of construction noise.

15.8.3 The matters that are proposed to be scoped into and out of the assessment are summarised in **Table 15.12**.

Proposed Scope of the Assessment

15.8.4 A summary of the proposed scope of the assessment is provided in **Table 15.12**.

Table 15.12: Proposed scope of the assessment

Receptor	Potential for significant effect	Project phase(s)	Proposed to be scoped in/out
NSRs within the study area	Yes	Construction noise	**Scoped in**
	No	Construction vibration on structures	Scoped out
	Yes	Construction vibration on humans	**Scoped in**
	Yes	Construction traffic noise	**Scoped in**
	No	Construction traffic vibration	Scoped out
	No	Operational noise	Scoped out
	No	Operational vibration	Scoped out
	No	Maintenance noise and vibration	Scoped out

16. Socio-economic, recreation and tourism

16.1 Introduction

16.1.1 This chapter presents how the socio-economic, recreation and tourism assessment will consider the potentially significant effects on socio-economic, recreation and tourism receptors that may arise from the construction, maintenance and operation of the Project (as described in **Chapter 4, Description of the Project**). It describes the methodology and datasets to be used within the assessment, presents an overview of the baseline conditions, and identifies the potential likely significant effects to be considered within the assessment, and how these will be assessed for the purpose of an Environmental Impact Assessment (EIA). As detailed in **Chapter 4, Description of the Project**, the decommissioning has been scoped out of the environmental assessment.

16.1.2 The Project Scoping Boundary is illustrated on **Figure 1.1 Project Scoping Boundary**.

16.1.3 The assessment will consider potentially significant socio-economic, recreation and tourism effects on the following receptors:

- employment (including training and apprenticeship opportunities);
- users of recreational routes and Public Rights of Way (PRoW) (including bridleways and cycle paths);
- local communities that could be affected by community severance; and
- residential properties, local businesses, visitor attractions, community facilities, open space and development land.

16.1.4 This chapter should be read in conjunction with:

- **Chapter 4, Description of the Project**; and
- **Chapter 5, EIA Approach and Methodology**.

16.1.5 This chapter is supported by **Figure 16.1 Socio-Economic, Tourism and Recreation Receptors**.

16.2 Regulatory and Planning Context

16.2.1 **Chapter 2, Regulatory and Planning Context** describes the overall regulatory and planning policy context for the Project. Key legislation, policy and planning guidance relevant to the assessment of potential effects on socio-economics, recreation and tourism associated with the construction, maintenance and operation of the Project is presented below.

Legislation

16.2.2 There is no legislative framework for socio-economics, but there is relevant legislation regarding the potential recreation and tourism impacts from the Project.

Countryside and Rights of Way Act

16.2.3 The Countryside and Rights of Way Act (CRoW) 2000 was implemented in November 2000 and focuses on the right to roam and the review of the PRoW within the United Kingdom, including right to create new PRoW where demand necessitates it (Ref 16.1). The Act also states that the prevention of obstructions to PRoW must be enforced and enacts the power to order the removal of obstructions, to ensure that the public can continue to use these routes for recreational purposes.

Equality Act

16.2.4 The Equality Act was established in 2010 and focuses on the protection of the public against discrimination based on a person's nationality and citizenship and extends a person's rights in areas of life including religion or belief, disability, age, sex, sexual orientation and gender reassignment (Ref 16.2). This Act extends to organisations which provide goods and services such as utility companies. The Act states that

"an authority to which this section applies must, when making decisions of a strategic nature about how to exercise its functions, have due regard to the desirability of exercising them in a way that is designed to reduce the inequalities of outcome which result from socio-economic disadvantage".

16.2.5 The Equality Act also states that

"a person concerned with the provision of a service to the public or a section of the public must not discriminate against a person requiring the service by not providing the person with the service".

Planning Policy

National Planning Policy

National Policy Statements

16.2.6 As detailed in **Chapter 2, Regulatory and Planning Policy Context**, National Policy Statements (NPSs) set out the primary policy tests against which the application for a Development Consent Order (DCO) for the Project would be considered. The two relevant NPSs are Overarching National Policy Statement for Energy (EN-1) and National Policy Statement for Electricity Networks Infrastructure (EN-5). **Table 16.1** sets out how both the current and draft NPSs relevant to electricity networks infrastructure are relevant to the socio-economic, recreation and tourism assessment.

Table 16.1: Relevant sections of the relevant National Policy Statements

National Policy Statement	NPS section	How it will be considered
EN-1	*4.2.2 "To consider the potential effects, including benefits, of a proposal for a project, the IPC will find it helpful if the applicant sets out information on the likely significant social and economic effects of the development, and shows how any likely significant negative effects would be avoided or mitigated. This*	The assessment will assess the likely significant effects from the construction, maintenance and operation of the Project. The proposed

National Policy Statement	NPS section	How it will be considered
	information could include matters such as employment, equality, community cohesion and well-being. *4.2.3 (part) For the purposes of this NPS and the technology-specific NPSs the ES should cover the environmental, social and economic effects arising from pre-construction, construction, operation and decommissioning of the project".*	scope of the assessment is provided in section 16.6.
EN-1	*4.4.2 (part) "Applicants are obliged to include in their ES…..an indication of the main reasons for the applicant's choice, taking into account the environmental, social and economic effects and including, where relevant, technical and commercial feasibility".*	An option appraisal process has been undertaken on the route corridor options (including the preferred corridor) and technologies associated with the Project from an early stage. This is summarised in **Chapter 3, Main Alternatives Considered**. Any further Project design evolutions will be summarised within the ES.
EN-1	*5.12.3 "this assessment should consider all relevant socio-economic impacts, which may include:* • *the creation of jobs and training opportunities;* • *the provision of additional local services and improvements to local infrastructure, including the provision of educational and visitor facilities;* • *effects on tourism;* • *the impact of a changing influx of workers during the different construction, operation and decommissioning phases of the energy infrastructure. This could change the local population dynamics and could alter the demand for services and facilities in the settlements nearest to the construction work (including community facilities and physical infrastructure such as energy, water, transport and waste). There could also be effects on social cohesion depending on how populations and service provision change as a result of the development; and* • *cumulative effects – if development consent were to be granted to for [sic] a number of*	The assessment will assess the likely significant effects from the construction, maintenance and operation of the Project. This includes assessing the proposed effects detailed in NPS EN-1. The proposed scope of the assessment is provided in section 16.6.

National Policy Statement	NPS section	How it will be considered
	projects within a region and these were developed in a similar timeframe, there could be some short-term negative effects, for example a potential shortage of construction workers to meet the needs of other industries and major projects within the region".	
EN-1	*5.12.4 "Applicants should describe the existing socio-economic conditions in the areas surrounding the proposed development and should also refer to how the development's socio-economic impacts correlate with local planning policies".*	The assessment will include a baseline section, which is covered in section 16.4 of this chapter. Section 16.2 of this chapter also summarises relevant local planning policies.
EN-1	*5.12.15 "Socio-economic impacts may be linked to other impacts, for example the visual impact of a development is considered in Section 5.9 but may also have an impact on tourism and local businesses".*	This assessment will include assessing the impact of the Project on tourism and local businesses in the study area. Where applicable, the assessment will expand on inputs from other assessments reported within the ES including, but not limited to: air quality, noise and vibration, landscape, visual, traffic and transport and health and wellbeing effects.

National Planning Policy Framework

16.2.7 The National Planning Policy Framework (NPPF) (Ref 2.6) sets out various policies with respect to the social and economic objectives of the planning system.

- Paragraph 8 outlines the economic objective of the planning system *"to help build a strong, responsive, and competitive economy by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity"*.
- Paragraph 100 states *"decisions should protect and enhance public rights of way"*.

National Planning Practice Guidance

16.2.8 The National Planning Practice Guidance (NPPG) (Ref 16.3) provides guidance on planning and the economy and to consider the existing and potential future needs of the population in terms of economic development, jobs and employment opportunities, and

on open space, sports and recreation facilities, public rights of way and local green space. The contents of the NPPG are not materially relevant to the assessment of socio-economic, recreation and tourism effects as the content does not influence the undertaking of the assessment of effects.

Local planning policy

16.2.9 The Project lies within the jurisdiction of East Riding of Yorkshire, North Lincolnshire and Bassetlaw District (Nottinghamshire) Councils. A summary of the relevant local planning policy and emerging policy for socio-economic, recreation and tourism matters that will inform the socio-economic, recreation and tourism assessment in the ES is provided in **Table 16.2**.

Table 16.2: Relevant Local Planning Policies

Local Plan	Policy ref	Policy context	How it will be considered
East Riding Local Plan 2012-2029 Strategy Document, Adopted 2016 (Ref 2.7)	3	East Riding of Yorkshire's Local Plan, adopted in 2016, details 21 objectives to achieve the local plan vision. This includes objectives concerning employment, energy and tourism, including: • EC1: To strengthen and encourage growth of the East Riding economy, employment development will be supported where the proposal is of a scale suitable to the location. • EC2: Tourism developments including attractions, facilities and accommodation, particularly those helping to meet existing deficiencies, will be encouraged to help strengthen and broaden the tourism offer across the East Riding. EC5: Proposals for the development of the energy sector, excluding wind energy but including the other types of development, will be supported where any significant adverse impacts are addressed satisfactorily, and the residual harm is outweighed by the wider benefits of the proposal.	The assessment will take into account the policies of East Riding of Yorkshire Council when assessing the socio-economic and tourism impacts of the scheme. This will be during the construction, maintenance and operation phases.
North Lincolnshire Local Development	1	The North Lincolnshire Core Strategy Local Plan was originally adopted in June 2011 and sets out the long-term spatial planning	The assessment will take into account the policies of North Lincolnshire Council when assessing the socio-economic

Local Plan	Policy ref	Policy context	How it will be considered
Framework – Core Strategy (2011) (Ref 2.11)		framework for the development of North Lincolnshire up to 2026. It details 27 strategic policies, of which three directly target employment and tourism. • CS11: To support development elsewhere within North Lincolnshire that meet local employment needs and maximises other special locations. In considering all development proposals for employment purposes in North Lincolnshire, regard should be given to making all locations accessible by range of transport modes in particular by public transport, cycling and walking. • CS13: The Council will support improvements in education provision to enable everyone to share North Lincolnshire's growing prosperity. • CS15: A balanced and socially inclusive cultural and evening economy will be promoted within North Lincolnshire by supporting uses such as museums, theatres, restaurants, café bars and leisure uses within Scunthorpe town centre and market towns.	and tourism impacts of the Project. This will be during the construction, maintenance and operation phases.
Draft North Lincolnshire Local Plan (2022) (Ref 2.12)	2	North Lincolnshire Council is currently preparing a new Local Plan that will replace the current Local Plan and Core Strategy once formally adopted. The following aspects of the policies in the draft Local Plan are of specific relevance to this chapter: • EC1: Over the period 2020 to 2038, provision will be made to deliver at least 131.7 hectares (Ha) of employment	The assessment will take into account the new local plan policies of North Lincolnshire Council when assessing the socio-economic and tourism impacts of the scheme. This will be during the construction, maintenance and operation phases.

Local Plan	Policy ref	Policy context	How it will be considered
		land across North Lincolnshire. • EC2: Existing employment areas will be safeguarded for employment uses. Proposals which promote development for employment use will be supported subject to other relevant policies in the Plan. • EC7: Development and activities that will deliver high quality sustainable visitor facilities such as culture and leisure facilities, sporting attractions and accommodation, including proposals for temporary permission in support of the promotion of events and festivals, will be supported.	
Bassetlaw District Local Development Framework – Core Strategy and Development Management Policies DPD (2011) (Ref 2.15)	3	The previous Core Strategy for Bassetlaw District Council was adopted in December 2011. The strategy sets out 13 Development Management Policies, including DM1: Rural Economic Development, which states that economic development will be supported where proposals demonstrate, among other factors, that: • the development requires the specific location proposed and there are no other suitable sites in, or close to, settlements covered by policies CS2-CS8 or on brownfield land; • the scale, design and form of the proposal, in terms of both buildings and operation, will be appropriate for its location and setting and be compatible with surrounding land uses; and • they will not create significant or exacerbate existing	The assessment will take into account the policies of the Core Strategy when assessing the socio-economic impacts of the scheme. This will be considered during the construction, maintenance and operation phases.

Local Plan	Policy ref	Policy context	How it will be considered
		environmental or highway safety problems. It also sets out the Strategic objectives of the Strategy, which includes • SO2: To provide a range and choice of employment sites in Worksop, Retford, Harworth Bircotes (including the A1 corridor), Carlton-in-Lindrick/Langold and Tuxford. • SO5 To ensure the continued viability of Bassetlaw's rural settlements through the protection, and enhancement in the levels, of local services and facilities and support for enterprises requiring a rural location. • SO10: To ensure the provision of the essential physical, social and green infrastructure required to support the District's growth.	
Emerging Bassetlaw Local Plan 2020-2037 (2021) (Ref 2.19)	4	Bassetlaw District Council is currently preparing a new Local Plan which is expected to be adopted in Summer 2023. The plan sets out 14 strategic objectives, which includes the following objectives for employment and tourism: • ST6: To ensure an attractive and flexible supply of employment land is available to deliver the Council's strategy for economic prosperity, job growth and inward investment. • ST12: Bassetlaw will be promoted and developed as a destination for visitors. Support will be given to proposals which would provide facilities or accommodation which	The assessment will take into account the policies of Bassetlaw District Council when assessing the socio-economic and tourism impacts of the scheme. This will be during the construction, maintenance and operation phases.

Local Plan	Policy ref	Policy context	How it will be considered
		enhance the offer to visitors to the District.	

Consultation and Engagement

16.2.10 The environmental assessment will be informed by consultation and engagement with stakeholders including, but not limited to, East Riding of Yorkshire Council, North Lincolnshire Council, Bassetlaw District Council, Nottinghamshire County Council, Sustrans, The Canal and River Trust, and the British Horse Society.

16.3 Study Area

16.3.1 The study area for socio-economic, recreation and tourism varies depending on the likely spatial extent of the effect under consideration.

16.3.2 The proposed study area for this Project includes:

- the local authorities of East Riding of Yorkshire, North Lincolnshire, Bassetlaw (Nottinghamshire);
- their corresponding regions of Yorkshire and the Humber (region for North Lincolnshire and East Riding of Yorkshire) and the East Midlands (region for Bassetlaw); and
- the national comparator of England.

16.3.3 The Scoping Report sets out potential effects with respect to the expected impacts of the Project. Effects on the socio-economic, recreation and tourism receptors will be considered within the local authorities of North Lincolnshire, East Riding of Yorkshire, Bassetlaw, and Nottinghamshire, the local authorities that the Scoping Boundary falls within.

16.3.4 Effects on users of recreational routes and PRoW will consider impacts on routes and PRoW likely to be affected by alterations, such as diversions and closures. This will include all routes located within 500 m of the Scoping Boundary, as noted on **Figure 16.1 Socio-Economic, Tourism and Recreation Receptors**. The size of the Scoping Boundary is based on the likely geographical scope of impacts and impacts beyond the Scoping Boundary are expected to be negligible, and not significant. Should there be any receptors that are considered to be impacted by the Project that are located outside of the Scoping Boundary, these will be outlined separately within this Chapter.

16.3.5 The study area for local communities that could be affected by community severance will consider communities that may potentially be directly and indirectly affected by the Project. These will include communities directly connected by recreational routes and PRoW. The communities that could be impacted are within 500 m of the Scoping Boundary.

16.3.6 The study area for residential properties, local businesses, visitor attractions relevant for tourism, community facilities, open space and development land will consider receptors that could be directly or indirectly affected by the Project. The receptors that could be impacted are within 500 m of the Scoping Boundary. Potential significant effects included

within **Chapter 6, Landscape** and **Chapter 7, Visual** will also be reviewed and receptors beyond 500 m will be considered should significant amenity impacts be identified.

16.4 Baseline Conditions

Data Sources

16.4.1 A summary of baseline socio-economic conditions has been collated and presented based upon review of the following datasets:

- Office for National Statistics (ONS), (2021) Mid-year population estimates (Ref 16.4);
- Ministry of Housing, Community and Local Government (MHCLG), (2019), English Indices of Deprivation (Ref 16.5);
- ONS (2020); Regional Gross Value Added (balanced) per head and income components (Ref 16.6);
- ONS, Census 2021(Ref 16.7);
- ONS (2021); UK Business Register and Employment Survey (Ref 16.8); and
- ONS (2018) Population projections (Ref 16.9).

16.4.2 In addition, the baseline for private assets is based on desk-based research locations of residential properties, businesses, community and recreation facilities and development land allocations and publicly available information on planning permissions relative to the Project. This will be set out and mapped in the ES.

16.4.3 The baseline for development land allocations is based on the Local Plans for Bassetlaw District Council, East Riding of Yorkshire Council and North Lincolnshire Council, and will be set out in the ES.

Baseline

16.4.4 The potential impacts arising from the Project (identified in section 16.6) are assessed relative to the baseline conditions and benchmarked against regional and national standards where appropriate. The key indicators and measures of the areas will be established for:

- population and deprivation;
- an overview of the local economies; and
- the local labour markets.

16.4.5 This section will provide the baseline conditions for the following geographical areas:

- the local authorities of East Riding of Yorkshire, North Lincolnshire and Bassetlaw (Nottinghamshire);
- the East Midlands region; and
- England.

Population and deprivation

16.4.6 The estimated population of the East Riding of Yorkshire and North Lincolnshire is 343,143 and 169,940, respectively. East Riding of Yorkshire and North Lincolnshire represent 9% of the Yorkshire and Humber population. Bassetlaw's estimated population was 118,351 in 2021, representing just over 2% of the East Midlands population.

16.4.7 In Bassetlaw and North Lincolnshire, Population estimates for 2021 show that 60% are of working age (16–64). The East Riding of Yorkshire population estimates are slightly lower for this age group (58%). All local districts are marginally below average at the regional level - the cohort's population estimate is 62% for both regions - and national (63%) level. The local authority of Bassetlaw has a relatively larger older population (65 and over, 22%) in comparison to regionally (East Midlands, 20%) and nationally (19%). Similarly, both the East Riding of Yorkshire and North Lincolnshire have larger older populations (65 and over, 27% and 22%, respectively) compared to regional and national averages (19% for both).

16.4.8 The Indices of Multiple Deprivation show that East Riding of Yorkshire ranked 217th out of England's 317 local authority areas in 2019. In the East Riding of Yorkshire, 6% of lower layer super output areas (LSOAs[1]) are within the 10% most deprived. North Lincolnshire ranked 120th in terms of deprivation, with a larger proportion (11% in 2019) of North Lincolnshire LSOAs are in the bottom 10% nationally. Bassetlaw ranked 108th most deprived in 2019, with 7% of Bassetlaw's LSOAs ranking within the 10% most deprived nationally.

Economy and employment

16.4.9 In 2020, Gross Value Added (GVA[2]) per head is £20,532 for the East Riding of Yorkshire and £22,497 in North and Northeast Lincolnshire[3], lower than the regional (£22,855) and national averages (£29,757). The GVA per head for North Nottinghamshire[4] (£19,349) was below regional (£23,057) and national averages.

16.4.10 Census 2021 data shows that the economic activity rate in Bassetlaw, (57%), North Lincolnshire (56%), and the East Riding of Yorkshire (55%) are marginally below regional (East Midlands, 58%; Yorkshire and the Humber, 56%) for the respective local authorities. All local authorities in the study area are below national averages (59%). The unemployment rate shows that both Bassetlaw and East Riding of Yorkshire (2%) are marginally below the national average of 3%, whereas North Lincolnshire (3%) is in line with national levels.

16.4.11 In terms of education, there is a lower population proportion of degree-level qualification or above[5] in Bassetlaw (26%) and North Lincolnshire than their respective regions (East Midlands, 29%; Yorkshire and the Humber, 30%). East Riding of Yorkshire (31%) has a greater proportion of level than regionally, but this is below the national average (34%). The proportion of people without qualifications in East Riding of Yorkshire (18%) is below

[1] LSOAs are small geographic areas with a population of approximately 1,500 people each.

[2] GVA is the measure of the value of goods and services produced in an area, industry or sector of an economy. It differs from GDP, which is a national measure of the country's final goods and services produced.

[3] Smallest geography available for North Lincolnshire.

[4] For this comparison measure, North Nottinghamshire has been used as opposed to Bassetlaw. GVA data is not available for Bassetlaw local authority, however, the sub-region of North Nottinghamshire includes the local authority of Bassetlaw.

[5] National Vocational Qualifications (NVQ) level 4+.

the Yorkshire and the Humber average (21%), whereas the proportion for North Lincolnshire (22%) is marginally higher than its regional average. Bassetlaw (22%) also has a higher proportion of no qualifications than its region, East Midlands (20%). Only East Riding of Yorkshire has a proportion in line with the national average (also 18%) for this measure.

16.4.12 The broad industrial groups that represent the highest proportions of employment for the East Riding of Yorkshire in 2021 are manufacturing (industry C; 16%), health (Q; 14%) and wholesale and retail trade (G; 14%); this also applies for North Lincolnshire; 25% of employment within manufacturing, 13% for health and 13% for wholesale and retail trade. Of these groups, manufacturing represents a higher proportion than for Yorkshire and the Humber (12%) and England (8%). Proportions for the health sector fall below the regional average (15%), but in line with the national average (14%). Wholesale and retail trade is in line with regional and national averages for the sector (both 14%).

16.4.13 The highest proportions of employment in Bassetlaw are in manufacturing (18%), wholesale and retail trade (16%) and health (14%). All three industries are above East Midlands and national averages for proportions of employment.

Tourism and recreation

16.4.14 Tourism in the East Yorkshire sub-region (consisting of East Riding of Yorkshire and Hull) is worth £963 million, with 5.1 million visitor nights, 18.3 million day trips and supporting 21,905 actual jobs in the area (Ref 16.10). East Riding of Yorkshire benefits from access to areas of wildlife and the coastline to the east of the local authority, where the coastal towns of Bridlington, Hornsea and Withernsea are located. The area is a key attraction for walking and hiking, with numerous PRoW within the study area, including the 127 km Yorkshire Wolds Way (Ref 16.11) and European Long Distance Path E2 (a 4,850 km route from Galway to Nice) which both cross the Scoping Boundary to the north of Brantingham. Cycling is also a key tourism activity; National Cycle Network (NCN) Route 65 (which also forms part of the Trans Pennine Trail from North Ferriby to Hessle (Ref 16.12)) traverses the Scoping Boundary at Brantingham, Broomfleet and north of the River Ouse crossing. Cottingham Parks Golf and Leisure Club is located approximately 210 m from the Scoping Boundary.

16.4.15 In North Lincolnshire, the tourism sector contributes £167 million to the economy, supporting over 4,000 people in employment (Ref 16.13). In the local authority, attractions of note include: the monthly Brigg Farmers' Market and Brigg Heritage Centre; the 10 mile Ironstone circular walk; Baysgarth Park; the Trolleybus Museum in Sandtoft; the 7 Lakes Country Park; the canals of Chesterfield, Stainforth and Keadby; and steam rail tours on the Appleby Frodingham Railway. North Lincolnshire Council note that day visits are the main income for tourism sector businesses, due to the area's geographic position within an hour's drive of major centres of population including Leeds, Bradford, Sheffield and Hull.

16.4.16 Tourism in Bassetlaw is centred in the historical towns of Retford, Worksop, alongside the villages of Scrooby, Babworth, Sturton-le-Steeple and Austerfield, which were the home of the Pilgrim Fathers (Ref 16.14). Cycling is popular in the local authority, as a result of the Millennium Cycle Way Route (York to Derby) which enters Bassetlaw via the Chesterfield Canal before crossing into Clumber Park and then passing through the heart of Sherwood Forest on its way to Nottingham. The local authority has also recently hosted the Tour of Britain cycle race in 2022. Bassetlaw is also the gateway to the Dukeries, an area which contains five large country estates, including Clumber Park, Welbeck and Rufford Abbey, which are open to the public, offering a range of outdoor activities and art

and craft studios (Ref 16.15). Other attractions nearby include the Idle Valley Nature Reserve, Creswell Crags, the North Leverton Windmill and the Sherwood Rangers Museum at Thoresby.

Land use

16.4.17 Within the Scoping Boundary and immediately adjacent area, the land is mostly used for agricultural purposes, characterised by large-scale regular arable fields across several landholdings, with numerous farm buildings located within the Scoping Boundary. Within the Scoping Boundary are the towns and villages of Ellerker, Broomfleet and Ousefleet. Immediately adjacent to the Scoping Boundary are the towns of Beltoft, Yokefleet and Riplingham. The Scoping Boundary also lies nearby to other towns and villages, including but not limited to: East Drayton; Darlton; Woodbeck; North Leverton; South Leverton; North Wheatley; South Wheatley; Beckingham; Gringley on the Hill; Miserton; Haxey Owston Ferry; Epworth; Belton; Ealand; Crowle; Eastoft; Luddington; Garthorpe; Adlingfleet; Brantingham; and Skidby.

16.4.18 Wienerberger Broomfleet Factory is located within the Scoping Boundary to the west of Broomfleet. Keadby Power Station and Keadby Wind Farm are located adjacent to the Scoping Boundary. Eight airstrips/airfields are currently engaged in non-statutory consultation for the Project, of which six are located within 500 m of the Scoping Boundary. These are detailed below, alongside the estimated distance to the Scoping Boundary.

- Forwood Farm near Treswell Wood (Nottinghamshire) – 0 m
- West Burton (Nottinghamshire) – 212 m
- Haxey (North Lincolnshire) – 268 m
- Mount Airey (East Riding) – 370 m
- Grove Farm (Nottinghamshire) – 473 m
- Headon Airfield (Nottinghamshire) – 490 m
- Willow Farm (Nottinghamshire) – 1.3 km
- Darlton Gliding Club (Nottinghamshire) – 1.5 km

16.4.19 West End Solar Farm is partly located within the Scoping Boundary to the south-west of Treswell. Ings Lane Nurseries and Windmill View Plant Centre are also located within the Scoping Boundary.

Future Baseline

16.4.20 Population projections data from the ONS provides projections using the year 2018 as a baseline. This shows that the populations of East Riding of Yorkshire and North Lincolnshire are expected to grow 6% and 4% respectively to 2043. This is less than the projected population growth for Yorkshire and the Humber (7%) and nationally (10%). Population growth is driven by the 65+ age cohort, at 40% for East Riding of Yorkshire and 39% for North Lincolnshire, which is projected to experience greater growth than regionally (37%). In both local authorities, the 0-15 and 16-64 age cohorts are expected to shrink in size.

16.4.21 Bassetlaw is projected to increase its population by 14%, in line with the East Midlands but above national rates (10%). The age cohort for 65+ is expected to increase the most,

by 45%, which is in line with the East Midlands (46%) and nationally (45%). The 0-15 age cohort is also projected to increase by 7% in Bassetlaw, above regional (4%) and national rates (-1%). The working age population is also projected to increase in size (4%), in line with national averages but below the projected regional increase (7%).

16.4.22 The future baseline for residential properties, businesses, community facilities, open spaces, visitor attractions and development land over the medium-term is highly uncertain. Due to this uncertainty, it is assumed the future baseline for the study area would be unchanged from the current baseline to the completion of the Project, except where new development is expected to be delivered in line with allocated and planned development sites as set out above.

16.5 Embedded and Control and Management Measures

Embedded Measures

16.5.1 The Scoping Boundary has been designed as far as is practicable to avoid direct effects to sensitive socio-economic, recreational and tourism features as set out in the CPRSS (Ref 3.5). The detailed design, including the selection of the preferred route for the overhead lines, and the precise siting of the infrastructure will also seek to avoid and minimise effects on potential receptors as far as is practicable.

Control and Management Measures

16.5.2 An Outline Code of Construction (CoCP) is provided in **Appendix 4.A Outline Code of Construction Practice**. Embedded and additional mitigation measures are incorporated into the Project as set out in the respective chapters to reduce other construction, maintenance and operational effects. This in turn will mitigate the effects on the local community and existing facilities from a socio-economic perspective. Where there are assessed to be adverse socio-economic impacts in the assessment, the implementation of additional mitigation measures will be considered in order to avoid or minimise the socio-economic impact.

16.5.3 Measures relevant to the control and management of impacts that could specifically affect the socio-economic, recreation and tourism assessment are:

- S01 – Provision of training to construction and maintenance workers, particularly in relation to working hours and the management of emissions (dust, noise, vibration, etc).
- S02 – PRoWs crossing the working areas will be managed in discussion with the relevant local authorities and potential temporary closures applied for discussed with the relevant local authority. Access disruption would be reduced while construction and maintenance activities occur. Any required temporary diversions will be clearly marked at both ends with signage explaining the diversion, the duration of the diversion and a contact number for any concerns.

16.6 Potential for Significant Effects

16.6.1 The assessment will consider the construction, maintenance and operation of the Project. Details of each of these stages are set out in **Chapter 4, Description of the Project.**

16.6.2 The proposed scope of the assessment is set out below and has been determined using the approach described in **Chapter 5, EIA Approach and Methodology.** The potential for the Project to result in the likely significant effects identified in **Table 16.3** takes into account the embedded and control and management measures described in **Chapter 5, EIA Approach and Methodology.**

Sources and Impacts (Step 1)

16.6.3 This section identifies the sources and impacts that would occur as a result of the construction, maintenance and operation of the Project. Construction and maintenance impacts have been considered together in this chapter due to the likely similarities in the potential impacts.

Potential sources of impacts

Sources of construction impacts

- Generation of construction related employment, training and apprenticeship opportunities, both directly at work sites and indirectly in the supply chain.
- Generation of GVA.
- Potential temporary and/or permanent closure or diversions of PRoW and recreational routes.
- Potential temporary and/or permanent severance of access to community facilities.
- Potential temporary and/or permanent adverse land take or amenity impacts.

Sources of operational impacts

- Potential permanent closure and/or diversions to PRoW and recreational routes.
- Potential creation of permanent operational phase employment, training and apprenticeship opportunities, both directly at work sites and indirectly in the supply chain.
- Potential permanent closure of businesses, and subsequent loss of permanent existing employment, training and apprenticeship opportunities.
- Potential generation of GVA during the operational phase.

Sources of maintenance impacts

- Generation of maintenance related employment, training and apprenticeship opportunities, both directly at work sites and indirectly in the supply chain.
- Generation of GVA.
- Potential temporary and/or permanent closure or diversions of PRoW and recreational routes.
- Potential temporary and/or permanent severance of access to community facilities.
- Potential temporary and/or permanent adverse land take or amenity impacts.

Potential impacts

16.6.4 **Table 16.3** identifies the potential impacts that could result from the sources identified above.

16.6.5 Where **Table 16.3** identifies the potential for an impact to result in a significant effect the impact is taken through to Step 2. Where **Table 16.3** identifies no potential for an impact to result in a significant effect, that impact is proposed to be scoped out.

Table 16.3: Impacts and the potential for significant effects

Project phase	Source	Impact	Potential for significant effects
Construction and maintenance	Generation of construction and maintenance related employment, training and apprenticeship opportunities, both directly at work sites and indirectly in the supply chain.	Potential employment and training benefits, leading to subsequent GVA impacts across the supply chain.	**Yes** – the Project will generate direct and indirect temporary employment, training and apprenticeship opportunities both on Site and in the supply chain during the construction and maintenance phase.
	Generation of GVA.	GVA impacts across the North Lincolnshire, East Riding of Yorkshire and Bassetlaw local authority economies.	**Yes** – the employment and wider economic activity created during the construction and maintenance phase will generate GVA within the local economies of the Project.
	Potential temporary and/or permanent closure or diversions to PRoW and recreational routes.	Potential disruption and wellbeing impacts to local users. Potential disruption to local businesses supported along PRoWs.	**Yes** – disruption to PRoW or other recreational routes during the construction and maintenance phases will be avoided as far as possible. Where necessary, suitable diversions would be agreed with relevant council bodies.
	Potential temporary and/or permanent severance of access to community facilities.	Potential disruption to residents using facilities and local businesses supported by them.	**Yes** – disruption to PRoW or other recreational routes affecting access to facilities will be avoided as far as possible. Where necessary, suitable diversions would be agreed with relevant council bodies.

Project phase	Source	Impact	Potential for significant effects
	Potential temporary and permanent adverse land take or amenity impacts.	Potential disruption to recreational and tourism businesses and the subsequent users of these facilities. Potential loss of open space for users. Potential loss of development land.	**Yes** – a number of residential properties, local businesses, visitor attractions, community facilities, open spaces and development land allocations have been identified within the study area which could be impacted by land take or amenity impacts.
	Potential temporary and permanent adverse land take or amenity impacts on agricultural land.	Potential disruption to agricultural businesses and loss of agricultural land for users.	No – all land take from private holdings will be mitigated through mutually agreed financial compensation to landowners and in line with the terms of any tenancy agreements. This precedent has been set on previous National Grid projects, where this impact has been scoped out. Therefore, this proposal mitigates the potential for significant effects.
Operation	Potential permanent closure and/or diversions to PRoW and recreational routes.	Permanent disruption and wellbeing impacts to local users. Permanent disruption to local businesses supported along PRoWs.	**Yes** – disruption to PRoW or other recreational routes during the operation phase would be avoided as far as possible. Where necessary, suitable diversions would be agreed with relevant council bodies.
	Potential creation of permanent operational phase employment, training and apprenticeship opportunities, both directly at work sites and indirectly in the supply chain.	Potential employment and training benefits, leading to subsequent GVA impacts across the supply chain.	No – the scale of operational employment generated is likely to be very limited.

Project phase	Source	Impact	Potential for significant effects
	Potential permanent closure of businesses, and subsequent loss of permanent existing employment, training and apprenticeship opportunities.	Potential reduction in employment and training opportunities through the closure of facilities, leading to subsequent GVA impacts across the supply chain.	**Yes** – disruption to existing businesses, and subsequently, employees, would be avoided as far as possible. Where necessary, solutions will be sought to move or relocate businesses and employees to new sites, where possible.
	Potential generation of GVA during the operational phase.	Permanent GVA impacts across the North Lincolnshire, East Riding of Yorkshire and Bassetlaw local authority economies.	No – the scale of operational employment generated is likely to be very limited and therefore any effect on GVA will be small.

Impact Pathways with Receptors (Step 2)

16.6.6 This section identifies whether there are any impact pathways from the impacts identified above that could give rise to potentially significant effects on receptors identified within the study area.

16.6.7 **Table 16.4** provides a summary of the impact pathways identified and those proposed to be scoped into and or out of the socio-economic, recreation and tourism assessment for the Project.

Table 16.4: Impact pathways with receptors

Project Phase	Impact	Receptor	Potential for significant effects	Proposed to be scoped in/out
Construction and maintenance	Potential employment and training benefits, leading to subsequent GVA impacts across the supply chain.	Employment levels within the study area.	**Yes** – the Project will generate direct and indirect temporary employment, training and apprenticeship opportunities both on Site and in the supply chain during the construction and maintenance phase.	**Scoped in**
	GVA impacts across the North	The local economy	**Yes** – the employment and wider economic activity	**Scoped in**

Project Phase	Impact	Receptor	Potential for significant effects	Proposed to be scoped in/out
	Lincolnshire, East Riding of Yorkshire and Bassetlaw local authority economies.	within the study area.	created during the construction and maintenance phase will generate GVA within the local economies of the Project.	
	Potential disruption and wellbeing impacts to local users. Potential disruption to local businesses supported along PRoWs.	Users of PRoW and recreational routes within 500 m of the Scoping Boundary.	**Yes** – disruption to PRoW or other recreational routes during the construction and maintenance phase would be avoided as far as possible. Where necessary, suitable diversions would be agreed with relevant council bodies.	**Scoped in**
	Potential disruption to residents using facilities and local businesses supported by them.	Local communities within 1 km of the Scoping Boundary.	**Yes** – disruption to PRoW or other recreational routes affecting access to facilities would be avoided as far as possible. Where necessary, suitable diversions would be agreed with relevant council bodies.	**Scoped in**
	Potential disruption to recreational and tourism businesses and the subsequent users of these facilities. Potential loss of open space for users. Potential loss of development land.	Residential properties, businesses, visitor attractions, community facilities, development land and open space within 500 m of the Scoping Boundary.	**Yes** – a number of residential properties, local businesses, visitor attractions, community facilities, open spaces and development land allocations have been identified within the study area which could be impacted by land take or amenity impacts.	**Scoped in**

Project Phase	Impact	Receptor	Potential for significant effects	Proposed to be scoped in/out
Operation	Permanent disruption and wellbeing impacts to local users. Permanent disruption to local businesses supported along PRoWs.	Users of PRoW and recreational routes within 500 m of the Scoping Boundary.	**Yes** – disruption to PRoW or other recreational routes during the operation phase would be avoided as far as possible. Where necessary, suitable diversions would be agreed with relevant council bodies.	**Scoped in**

16.7 Proposed Assessment Methodology

16.7.1 The overall assessment methodology for the EIA is outlined in **Chapter 5, EIA Approach and Methodology**.

Proposed Data Sources

16.7.2 A desk-based baseline assessment will be undertaken using a rage of sources to provide a description of the socio-economic conditions within the geographical areas set out in section 16.4. This will be done using established statistical sources, and in consultation with stakeholders, where relevant. Relevant policy will be reviewed at the local regional and national levels to identify the key issues of relevance to the Project.

16.7.3 The baseline for recreational routes and PRoW will be based on:

- Ordnance Survey data on walking routes, footpaths, bridleways and cycleways;
- Local Plan information from the local authorities that lie within the study area; and
- Sustrans National Cycle Network route map (Ref 16.16).

Technical Guidance

16.7.4 The assessment will be carried out in accordance with the following good practice and guidance documents, which are explained below:

- Additionality Guide (4th Edition), Homes and Communities Agency (HCA), (2014) (Ref 16.17) – This guide explains how to assess the additional impact (known as 'additionality') of local economic and housing interventions.
- Research to Improve the Assessment of Additionality, Department for Business, Innovation and Skills (BIS), (2009) (Ref 16.18) – This report captures research on additionality to define ranges for deadweight, displacement, leakage and multiplier effects.
- The Green Book – Appraisal and Evaluation in Central Government, HM Treasury, 2022) (Ref 16.19) - The Green Book is guidance issued by HM Treasury on how to appraise policies, programmes and projects.

- The Magenta Book – Guidance for Evaluation, HM Treasury (2020) (**Ref** 16.20) – The Magenta Book provides guidance on how to incorporate evaluation through the design, implementation, delivery and review stages of policy making.

Proposed Methodology

16.7.5 The following section summarises the methodology proposed to be used for the assessment which builds on the general assessment methodology presented in **Chapter 5 EIA Approach and Methodology.** The methodology for assessing impacts will follow standard EIA guidance and will entail:

- assessment of the likely scale, permanence and significance of effects associated with socio-economics, recreation and tourism receptors; and
- an assessment of the potential cumulative impacts with other projects within the surrounding area.

16.7.6 The assessment of potential socio-economic impacts will use policy thresholds and expert judgment to assess the scale and nature of the impacts of the Project against baseline conditions. For socio-economics, recreation and tourism there is no accepted definition of what constitutes a significant (or not significant) effect. It is however recognised that effects are categorised based upon the relationship between the scale (or magnitude) of impact and the sensitivity (or value) of the affected resource or receptor.

16.7.7 As such, the socio-economics, recreation and tourism effects will be assessed on the basis of:

- consideration of sensitivity to impact: specific values in terms of sensitivity are not attributed to socio-economic resources/receptors due to their diverse nature and scale; however, the assessment takes account of the qualitative (rather than quantitative) 'sensitivity' of each receptor and, in particular, their ability to respond to change based on recent rates of change and turnover (if appropriate); and
- magnitude of impact: this entails consideration of the size of the impact on people or business in the context of the area in which effects will be experienced.

Sensitivity

16.7.8 The sensitivity of socio-economic receptors is assessed as high, medium, low or very low. Socio-economic receptors generally include economic entities and users of social infrastructure provision. For example, those who will potentially benefit from employment generation (either directly, indirectly or induced).

16.7.9 The criteria for assessing and classifying levels of receptor sensitivity used within the assessment are defined in **Table 16.5**, based on professional judgement.

Table 16.5: Sensitivity classification

Level of Sensitivity	Description
High	There are no comparable and accessible alternatives to the receptor that exist within the relevant catchment area; and/or receptors have very limited ability to absorb the change.

Medium	There are limited comparable and accessible alternatives to the receptor within the relevant catchment area; and/or receptors have limited ability to absorb the change.
Low	Receptors are able to relatively easily absorb the change; and/or there are some comparable and accessible alternatives to the receptor that exist within the relevant catchment area.
Very low	Receptors are able to relatively easily absorb the change; and/or there are many comparable and accessible alternatives to the receptor that exist within the relevant catchment area.

Magnitude

16.7.10 The magnitude of the socio-economic impacts of the scheme are assessed as being high, medium, low or very low, as summarised in **Table 16.6**. This is determined by having regard to:

- extent of change – the absolute number of people affected and the size of area in which the impact will be experienced i.e., the level of change to baseline conditions including the proportion of the existing workforce;
- scale of the impact – the relative magnitude of each impact in its relevant market context (for example, the effects on local employment will be considered in the context of the overall size of the local labour market); and
- duration of impact – more weight is given to long-term, permanent changes than to short-term, temporary ones. Temporary to short-term impacts are considered to be those associated with the construction and maintenance works. Medium to long-term impacts are those associated with the operation of the scheme.

Table 16.6: Magnitude classification

Level of Magnitude	Description
High	An impact that is expected to have considerable adverse or beneficial socio-economics effects. Such impacts will typically affect large numbers of businesses, workers or residents.
Medium	An impact that will typically have a noticeable effect on a moderate number of businesses, workers or residents, and will lead to a small change to the study area's baseline socio-economic conditions.
Low	An impact that is expected to affect a small number of businesses, workers or residents or an impact that may affect a larger number of receptors but does not materially alter the study area's baseline socio-economic conditions.
Very low	An impact which has very little change from baseline conditions where the change is barely distinguishable, approximating to a 'no change' situation.

Significance of effects

16.7.11 Those effects which are found to be moderate or major are considered to be 'significant' and those which are minor or negligible are 'not significant'.

16.7.12 Duration of impact will also be considered, with more weight given to reversible long-term or permanent changes than to temporary ones. Temporary effects are considered to be those associated with the construction and maintenance works. Long-term reversible effects/permanent effects are generally those associated with the operational development.

Limitations of assessment

16.7.13 The commercial agreement for land, including productive land, between the applicant and landowners is beyond the scope of this assessment and the future ES.

16.7.14 A proportion of the construction and maintenance workers are likely to live locally to the site, while a proportion will travel to the site to work. More detail on the average and peak number of workers expected to work across the construction and maintenance period, and the proportion of workers who will be expected to live locally to the site, will be set out in the ES.

16.8 Conclusion

Summary

16.8.1 This chapter of the scoping report has set out the proposed scope and methodology for the assessment of socio-economic effects arising from the construction, maintenance and operation of the Project. The socio-economic, recreation and tourism receptors that have been identified within the respective study areas surrounding the Project include local communities, the local economy within the study area, users of PRoW and open space, residential and business properties, visitor attractions, development land, and community facilities within the respective study areas. The preliminary baseline assessment indicates that there is the potential for significant effects on these receptors.

Proposed Scope of the Assessment

16.8.2 A summary of the proposed scope of the assessment is provided in **Table 16.7**.

Table 16.7: Proposed scope of the assessment

Receptor	Potential for significant effect	Project phase(s)	Proposed to be scoped in/out
Employment levels within the study area.	Generation of employment, training and apprenticeship opportunities, both directly at work sites and indirectly in the supply chain.	Construction and maintenance	**Scoped in**

Receptor	Potential for significant effect	Project phase(s)	Proposed to be scoped in/out
The local economy within the study area.	Generation of GVA.	Construction and maintenance	**Scoped in**
Users of PRoW and recreational routes within 500 m of the study area.	Potential temporary and/or permanent closure or diversions to PRoW and recreational routes.	All	**Scoped in**
Local communities within 1km of the study area.	Potential temporary and/or permanent severance of access to community facilities for residents.	Construction and maintenance	**Scoped in**
Residential properties, Businesses, visitor attractions, community facilities, development land and open space within 500 m of the study area (or otherwise specified).	Potential temporary and/or permanent adverse land take or amenity impacts on residential properties, local businesses, visitor attractions, community facilities, open space, and/or development land.	Construction and maintenance	**Scoped in**

17. Health and Wellbeing

17.1 Introduction

17.1.1 This chapter presents how the health and wellbeing assessment will consider the potentially significant effects on health and wellbeing receptors that may arise from the construction, operation and maintenance of the Project (as described in **Chapter 4, Description of the Project**). It describes the methodology and datasets to be used within the health and wellbeing assessment, presents an overview of the baseline conditions, and identifies the potential likely significant effects to be considered within the assessment and how these will be assessed for the purpose of an Environmental Impact Assessment (EIA). As detailed in **Chapter 4, Description of the Project**, the decommissioning has been scoped out of the environmental assessment.

17.1.2 In November 2022, the Institute of Environmental Management and Assessment (IEMA) published new guidance on assessing human health as part of EIA (Ref 17.1). Previous to this, there was no consolidated methodology or practice for the assessment of effects on human health. The human health assessment will be based on this new IEMA guidance, and it will consider the potential impacts for each phase of the Project. Wherever possible, the impacts identified in the assessment will be appraised against relevant national standards. Where relevant standards do not exist, professional experience and expert judgement will be applied and justified.

17.1.3 The Project Scoping Boundary is illustrated on **Figure 1.1 Project Scoping Boundary**.

17.1.4 This chapter should be read in conjunction with:

- **Chapter 4, Description of the Project**;
- **Chapter 5, EIA Approach and Methodology**;
- **Chapter 6, Landscape**;
- **Chapter 7, Visual**;
- **Chapter 11, Geology and Hydrogeology**;
- **Chapter 13, Traffic and Transport**;
- **Chapter 14, Air Quality**;
- **Chapter 15, Noise and Vibration**; and
- **Chapter 16, Socio-economics, recreation and tourism**.

17.1.5 This chapter is supported by the following figures.

- **Figure 17.1 Determinants of Health**; and
- **Figure 17.2 Determinants of Health in Neighbourhoods**.

Health and Wellbeing

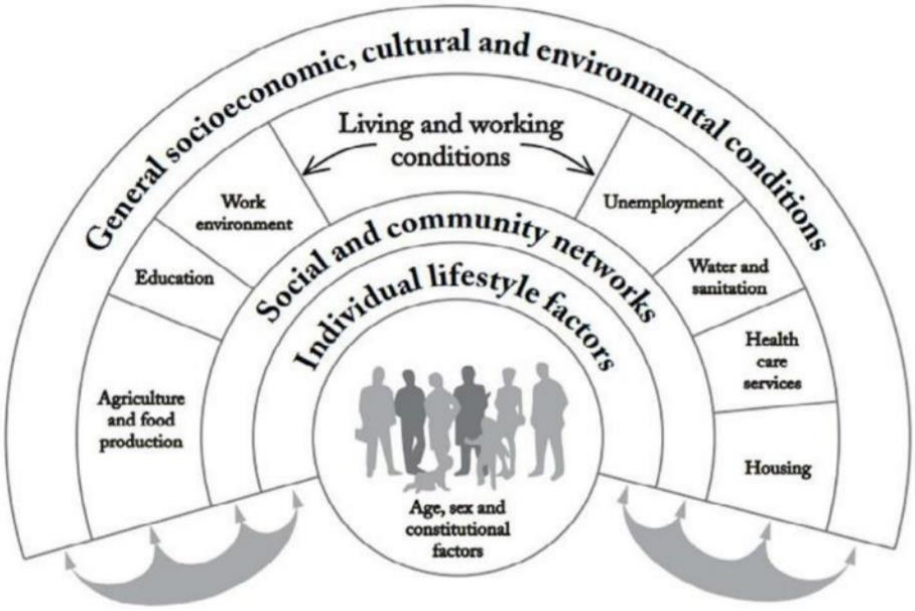
17.1.6 The World Health Organisation (WHO) Europe defines health as *"a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity"*

(Ref 17.2). Public health therefore encompassesgeneral wellbeing, not just the absence of illness.

17.1.7 The health and wellbeing of individuals is determined by a broad range of individual constitutional and behavioural factors, as well as broader environmental, social and economic factors. Some factors are direct and obvious, others are indirect.

17.1.8 Dahlgreen and Whitehead's model of the main determinants of health illustrates the breadth of possible influences on health, as shown in **Image 17.1**. At the centre of the illustration are factors that are largely fixed – including individual age, sex, constitutional and genetic factors. Outside of this are factors generally described as the wider or broader determinants of health. The model emphasises interactions between the layers. Moving outwards from the centre, individual lifestyle choices are embedded in social norms and community networks, and in living and working conditions, which in turn are shaped by and related to the wider socioeconomic and cultural environment.

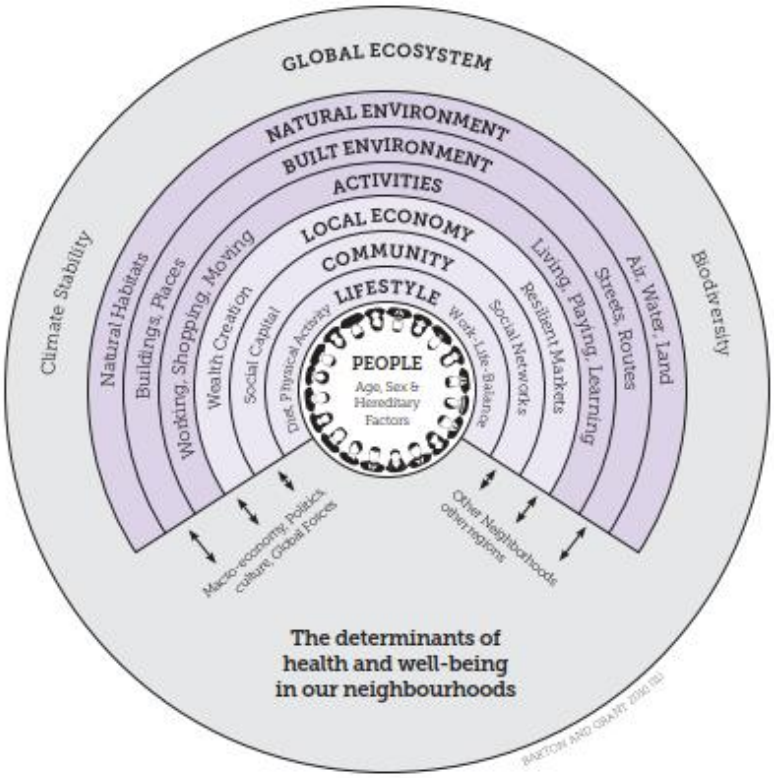
Image 17.1: Determinants of health



Source: Dahlgreen and Whitehead, 1993

17.1.9 This model has been developed to show elements of the built environment and communities that are the key determinants of health, as shown in **Image 17.2**.

Image 17.2: Determinants of health in neighbourhoods



Source: Barton and Grant, 2006

17.1.10 Within a population there can also be health inequalities, defined by the WHO as *"differences in health status or in the distribution of health determinants between different population groups. For example, differences in mobility between elderly people and younger populations or differences in mortality rates between people from different social classes"* (Ref 17.2).

17.1.11 As mentioned within this guidance, health is influenced by a range of factors, termed the *"wider determinants of health"*. Determinants of health span the bio-physical (air quality, water quality and noise), social, behavioural, economic and institutional (health and social care services) factors. This assessment will consider potential health and wellbeing effects on the following health determinants:

- physical activity;
- risk taking behaviour;
- transport modes, access, and connections;
- community safety;
- social participation, interaction and support;
- education and training;
- employment and income;
- climate change mitigation and adaptation;
- air quality;

- water quality or availability;
- land quality;
- noise and vibration;
- health and social care services;
- built environment;
- open space, leisure and play;
- community identity, culture, resilience and influence;
- wider societal infrastructure and resources; and
- radiation.

17.1.12 For this health and wellbeing assessment, the effects of the Project will be considered for the following receptors within the respective study area, defined in section 17.7:

- local communities;
- residents;
- on-site workers;
- visitors to the area;
- users of PROW;
- users of open space; and
- users of community facilities.

17.2 Regulatory and Planning Context

17.2.1 **Chapter 2, Regulatory and Planning Context** describes the overall regulatory and planning policy context for the Project. Key legislation, policy and planning guidance relevant to the assessment of potential effects on health and wellbeing associated with the construction, operation and maintenance of the Project is presented below.

Legislation

17.2.2 The Health and Social Care Act 2022 (Ref 17.3) proposes health reforms in England, removes existing competition rules and formalises Integrated Care Systems (ICS). Each ICS has been established with four strategic purposes:

- improve population health and healthcare;
- tackling unequal outcomes and access;
- enhance productivity and value for money; and
- helping the National Health Service (NHS) to support broader social and economic development.

Planning Policy

National Planning Policy

National Policy Statements

17.2.3 As detailed in **Chapter 2, Regulatory and Planning Policy Context**, National Policy Statements (NPSs) set out the primary policy tests against which the application for a Development Consent Order (DCO) for the Project would be considered. The two relevant NPSs are Overarching National Policy Statement for Energy (EN-1) and National Policy Statement for Electricity Networks Infrastructure (EN-5). **Table 17.1** sets out how both the current and draft NPSs relevant to electricity networks infrastructure are relevant to the health and wellbeing assessment.

Table 17.1: Relevant sections of the relevant National Policy Statements

National Policy Statement	NPS section	How it will be considered
EN-1 (2011)	*4.13.1 "Energy production has the potential to impact on the health and well-being ('health') of the population. Access to energy is clearly beneficial to society and to our health as a whole. However, the production, distribution and use of energy may have negative impacts on some people's health".* *4.13.2 "As described in the relevant sections of this NPS and in the technology specific NPSs, where the proposed project has an effect on human beings, the ES should assess these effects for each element of the project, identifying any adverse health impacts, and identifying measures to avoid, reduce or compensate for these impacts as appropriate. The impacts of more than one development* may affect people simultaneously, *so the applicant and the IPC should consider the cumulative impact on health".* *5.11.9 (part) "The IPC should not grant development consent unless it is satisfied that the proposals will meet the following aims:* • *avoid significant adverse impacts on health and quality of life from noise;* • *mitigate and minimise other adverse impacts on health and quality of life from noise; and* *where possible, contribute to improvements to health and quality of life through the effective management and control of noise".*	The assessment will assess the likely significant effects from the construction, maintenance and operation of the Project. The proposed scope of the assessment is provided in section 17.6. A cumulative effects assessment will be undertaken and presented within the ES, the scope of which is outlined within **Chapter 20, Cumulative Effects** of this Scoping Report. Where adverse impacts are identified, attempts will be made to mitigate the effects on the receptors identified in section 17.7.
EN-1 (2011)	*4.13.3 "The direct impacts on health may include increased traffic, air or water pollution, dust, odour, hazardous waste and substances, noise, exposure to radiation, and increases in pests".*	Generally, those aspects of energy infrastructure which are most likely to have a significantly

National Policy Statement	NPS section	How it will be considered
	5.14.1 "Government policy on hazardous and non-hazardous waste is intended to protect human health and the environment by producing less waste and by using it as a resource wherever possible. Where this is not possible, waste management regulation ensures that waste is disposed of in a way that is least damaging to the environment and to human health".	detrimental impact on health are subject to separate regulation (for example for air pollution) which will constitute effective mitigation of them. A health and wellbeing assessment will be undertaken as part of the ES, the scope of which is outlined in section 17.6.
EN-5 (Draft, 2021)	*2.13.9 (part) "The Applicant should have considered the following factors:* • *that optimal phasing of high voltage overhead power lines is introduced wherever possible and practicable in accordance with the Code of Practice to minimise effects of EMFs* • *any new advice emerging from the Department of Health and Social Care relating to government policy for EMF exposure guidelines".*	As part of the health and wellbeing assessment, there will be an assessment of the impacts of high voltage power lines on the receptors, detailed in section 17.6.

National Planning Policy Framework

17.2.4 The National Planning Policy Framework (NPPF) (Ref 2.6) sets out various policies with respect to the health and wellbeing objectives of the planning system. Section 8 of the NPPF "Promoting healthy and safe communities" states that policies should aim to achieve healthy, inclusive, and safe places which: promote social inclusion; are safe and accessible; and enable and support healthy lifestyles. In order to do this, planning policies and decisions should:

- plan positively for the provision of local services to enhance the sustainability of communities and residential environments;
- take into account and support the delivery of local strategies to improve health, social and cultural well-being for all sections of the community;
- guard against the unnecessary loss of valued facilities and services, particularly where this would reduce the community's ability to meet its day-to-day needs;
- ensure that established shops, facilities, and services are able to develop and modernise, and are retained for the benefit of the community;
- ensure an integrated approach to considering the location of housing, economic uses and community facilities and services; and
- promote public safety and take into account wider security and defence in developing planning policy.

Local planning policy

17.2.5 The Project lies within the jurisdiction of East Riding of Yorkshire, North Lincolnshire and Bassetlaw District Councils. A summary of the relevant local planning policy which is relevant to a study of health and wellbeing matters and will inform the health and wellbeing assessment is provided in **Table 17.2**.

Table 17.2: Relevant Local Planning Policies

Local Plan	Policy ref	Policy context	How it will be considered
North Lincolnshire Local Development Framework – Core Strategy (2011) (Ref 2.11)	1	The North Lincolnshire Core Strategy Local Plan was originally adopted in June 2011 and sets out the long-term spatial planning framework for the development of North Lincolnshire up to 2026. It details 27 strategic policies, of which CS24: Health Care Provision is the most relevant. The strategic policy aims to improve the health of residents through safeguarding and enhancing open space, facilities for sports and recreation and improving walking and cycling routes. The relevant excerpt from the policy states that *"Developers will be expected to make an appropriate contribution towards necessary improvements, additional provision improvements or additional provision for health care services and facilities arising from their development proposals, in accordance with the Planning Obligations policy and Developer Contributions SPD. The implementation of new facilities supported by this policy will be permitted subject to other relevant plan policies".*	The assessment will take account of the policies of North Lincolnshire Council when assessing the health and wellbeing impacts of the Project.
Draft North Lincolnshire Local Plan (2022) (Ref 2.12)	2	North Lincolnshire Council is currently preparing a new Local Plan that will replace the current Local Plan and Core Strategy once formally adopted. The following aspects of the policies in the draft Local Plan are of specific relevance to this chapter: *"Policy CSC1: Health and Wellbeing* • *Make the potential for achieving positive mental and physical health outcomes a priority when considering all development proposals;*	The assessment will take into account the new local plan policies of North Lincolnshire Council when assessing the health and wellbeing impacts of the Project.

Local Plan	Policy ref	Policy context	How it will be considered
		• *Promote improvements and enhancing accessibility to the historic environment, nature, accessible natural greenspaces and green infrastructure corridors and blue and green infrastructure;* • *Recognise the vital role heritage and nature plays in people's lives by safeguarding and enhancing the quality of our surroundings to ensure positive impacts on individuals and communities;* • *Use the ten principles of Active Design to support development in North Lincolnshire;* • *Ensure development does not have an adverse impact on the environment or residential amenity through air, noise, vibration, and water pollution; and* • *Work with relevant stakeholders to reduce geographical inequalities in health through maximising the provision of affordable housing and regenerating poorer neighbourhoods within the area.* *Policy CSC2: Health Care Provision* • *Where appropriate, developers should consult with health care commissioners at an early stage in order to understand the need for new or enhanced health care infrastructure and improved access to primary and mental health care facilities; and* • *That the healthcare infrastructure implications of any relevant proposed development have been considered and addressed".*	
East Riding of Yorkshire Local Plan 2012-2029 (Adopted	3	East Riding of Yorkshire's Local Plan, adopted in 2016, details 21 objectives to achieve the local plan vision. This includes two objectives concerning the Health and Wellbeing of the residents of East Riding of Yorkshire.	The assessment will take into account the policies of East Riding of Yorkshire Council when assessing the health

Local Plan	Policy ref	Policy context	How it will be considered
2016) (Ref 2.8)		• Support the vitality of settlements by seeking to protect and/or enhance community facilities and services, including education, health care, recreation, cultural and sports facilities. • Ensure that new development is appropriately serviced by new or existing infrastructure, community services and facilities, and open space.	and wellbeing impacts of the Project.
Bassetlaw District Local Development Framework – Core Strategy and Development Management Policies DPD (2011) (Ref 2.15)	5	The Core Strategy was adopted by Bassetlaw District Council on 22 December 2011. As part of the vision for the district, Bassetlaw aims to *"establish its reputation as an area that can offer a high quality of life for all of its residents, including a reduction in health inequalities across the District and the development of safer communities".* *Policy DM11: "Developer contributions and infrastructure provision"*, also details the need for new development to support the provision of healthcare infrastructure, where there is expected to be an increase on demand for healthcare following a development.	The assessment will be undertaken with the consideration of the policies of Bassetlaw District Council to assess the health and wellbeing impacts of the Project.
Emerging Bassetlaw Local Plan 2020-2037 (2021) (Ref 2.19)	4	Bassetlaw District Council is currently preparing a new Local Plan which is expected to be adopted in Summer 2023. The plan sets out 14 strategic objectives, which includes the following objective for health: • To ensure new development, places and spaces are of high quality and sustainable design which reflects local character and distinctiveness, respects residential amenity and enables people to live safe, healthy, accessible, green and active lifestyles. Furthermore, the plan details the following relevant policies: • *"Policy ST35: Green and blue infrastructure will be protected, and where appropriate, improved and extended to provide a quality, safe*	The assessment will take into account the policies of Bassetlaw District Council when assessing the health and wellbeing impacts of the Project.

Local Plan	Policy ref	Policy context	How it will be considered
		and accessible network of better connected, multifunctional open spaces for recreation and play and to enhance visual amenity, biodiversity, landscape, productivity and promote healthy lifestyles. • *Policy ST39: The Council will, with its partners, create an environment which supports healthy, active, inclusive and safe communities".*	

National Health Guidance

17.2.6 The National Planning Practice Guidance (NPPG) (Ref 2.6) provides additional guidance to the NPPF. Guidance of particular relevance to health includes Paragraphs 92 to 103 which set out how the design and use of the built and natural environment are major determinants of health and wellbeing, and how in turn positive planning can contribute to healthier communities.

Technical Guidance

17.2.7 Further technical guidance relevant to health and wellbeing includes:

- Design Manual for Roads and Bridges (DMRB) Document LA112 (Ref 17.4);
- NHS Healthy Urban Development Unit (HUDU) (Ref 17.5) Rapid Health Impact Assessment (HIA) Tool;
- Public Health England (PHE) Guidance: Spatial Planning for Health: An evidence resource for designing healthier places (Ref 17.6);
- PHE Strategy 2020 to 2025 (Ref 17.7);
- The Marmot Review: Fair Society Healthy Lives (2010) (Ref 17.8);
- Health Equity in England 10 Years On (2020) (Ref 17.9);
- Build Back Fairer – The Covid-19 Marmot Review (2020) (Ref 17.10);
- International Commission on Non-Ionising Radiation Protection (1998) Guidelines for Limiting Exposure to Time-Varying Electric, Magnetic and Electromagnetic Fields. Health Physics, 74 (4), p.494) (Ref 17.11); and
- Control of Electromagnetic Fields at Work Regulations (2016) (Ref 17.12).

Consultation and Engagement

17.2.8 The environmental assessment will be informed by consultation and engagement with stakeholders including, but not limited to, East Riding of Yorkshire Council, North Lincolnshire Council, Bassetlaw District Council, Nottinghamshire County Council, and Public Health England.

17.3 Study Area

17.3.1 The study area for the assessment will vary by the type of impact being assessed.

- The human health profile baseline study area will comprise a local ward area comprising the wards in which the Project is located, within which there is a high likelihood that effects arising from the construction, operation, and maintenance of the Project could be experienced.
- Where data is not available at the ward level, local authority level data will be provided for East Riding of Yorkshire, North Lincolnshire and Bassetlaw districts. Given the size of the Scoping Boundary, this level of geography has been used to present the baseline for this assessment. This is alongside:
  - the corresponding regions of Yorkshire and the Humber (region for North Lincolnshire and East Riding of Yorkshire) and the East Midlands (region for Bassetlaw); and
  - the national comparator of England.

17.3.2 The study areas for assessing the health and wellbeing impacts of the Project will be influenced by the geographic extent of the relevant technical assessments listed in section 17.1.4. The assessment will refer to the study areas identified by the relevant chapters.

17.4 Baseline Conditions

Data Sources

17.4.1 The known or predicated current and future baseline environment described in this section has been informed by the following data sources:

- ONS, Census 2021 (2021) (Ref 16.7);
- PHE Local Health Data, (2019) (Ref 17.13); and
- Public Health England; Health Profiles (2022) (Ref 17.14).

Baseline

17.4.2 A human health profile of the study area surrounding the Project will be built-up focusing on key indicators identified by Public Health England/UKHSA and Census data at district level, including a comparison of these to regional and national averages.

17.4.3 For the scoping report, the following health profile in **Table 17.3** has been established and relates to the relevant local authorities (East riding of Yorkshire, North Lincolnshire, and Bassetlaw), regions (East Midlands and Yorkshire and the Humber) and national (England) averages. Further information will be collated for the Preliminary Environmental Information Report (PEIR) and Environmental Statement (ES) Health and Wellbeing chapters.

17.4.4 The data in **Table 17.3** shows that the three local authorities in the study area have ageing populations, as their proportion of the population aged 65 and over are all above their respective regional (Yorkshire and the Humber and East Midlands) and national averages (England). The economic activity rate shows that all three local authorities are below

national averages, and the unemployment rate is in line with England, with all three being less than 1% away from the national average.

17.4.5 East Riding of Yorkshire (19.7%), North Lincolnshire (21.2%) and Bassetlaw (21.4%) have higher proportions of the population considered to have “not good” general health than nationally (17.8%). There is also a higher proportion of disability for the three local authorities than nationally. Among reception year children, overweight and obesity proportions are higher for East Riding of Yorkshire (23.8%), North Lincolnshire (24.2%) and Bassetlaw (24.5%) than nationally. In terms of life expectancy, all local authorities in the study area fall within approximately 1 year of the national average for both males and females.

17.4.6 For indicators of disease, the local authorities in the study area differ; East Riding of Yorkshire performs better than the national average for emergency hospital admissions for Chronic Obstructive Pulmonary Disease (COPD) (229 deaths per 100,000, compared to 415 nationally) and Deaths from Respiratory diseases (a rate of 96.7 compared to a national average of 100). Conversely, North Lincolnshire (500) and Bassetlaw (430) have more emergency hospital admissions for COPD than nationally. North Lincolnshire (113.4) and Bassetlaw (101.0) also have a higher rate of deaths from respiratory diseases than nationally.

Table 17.3 Health profile

	East Riding of Yorkshire	North Lincolnshire	Bassetlaw	Yorkshire and the Humber	East Midlands	England
Population (2021)	343,143	169,940	118,351	5,481,431	4,880,094	56,536,419
Population aged under 16 (%) (2021)	15.7	17.7	17.3	18.6	18.1	18.5
Population aged 65 and over (%) (2021)	26.5	22.1	22.2	19.1	19.6	18.5
Economic activity rate (%) (2021)	54.9	55.9	57.3	56.2	57.5	58.6
Unemployment rate (%) (2021)	2.0	2.6	2.1	2.7	2.4	2.9
General Health- Not good (%) (2021)	19.7	21.2	21.4	19.5	18.9	17.8
Disability (% under the Equality Act) (2021)	18.6	19.7	20.4	18.6	18.3	17.3
Overweight and obese children (reception year) (%) (2021/22)	23.8	24.2	24.5	23.7	22.4	22.3
Life expectancy at birth (Male) (2018-20)	80.1	78.7	78.9	78.4	79.2	79.4
Life expectancy at birth (Female) (2018-20)	83.5	82.7	82.0	82.2	82.7	83.1
Emergency hospital admissions for Chronic obstructive pulmonary disease (COPD) (per 100,000) (2019/20)	229	500	430	477	462	415
Deaths from Respiratory diseases, all ages (Standardized Mortality Rate) (SMR) (2016-20)[1]	96.7	113.4	101.0	-	-	100.0

[1] Please note regional data is not available from Public Health Profiles.

Source: Population estimates, ONS, 2021; Census 2021, ONS; Public Health Profiles, Public Health England, various years; Local Health, Office for Health Improvement and Disparities, 2019.

Future Baseline

17.4.7 Population projections data from the ONS provides projections using the year 2018 as a baseline. This shows that the populations of East Riding of Yorkshire and North Lincolnshire are expected to grow 6% and 4% respectively to 2043. This is less than the project population growth for Yorkshire and the Humber (7%) and nationally (10%). Population growth is driven by the 65+ age cohort, at 40% for East Riding of Yorkshire and 39% for North Lincolnshire, which is projected to experience greater growth than regionally (37%). In both local authorities, the 0-15 and 16-64 age cohorts are expected to shrink in size.

17.4.8 Bassetlaw is projected to increase its population by 14%, in line with the East Midlands but above national rates (10%). The age cohort for 65+ is expected to increase the most, by 45%, which is in line with the East Midlands (46%) and nationally (45%). The 0-15 age cohort is also projected to increase by 7% in Bassetlaw, above regional (4%) and national rates (-1%). The working age population is also projected to increase in size (4%), in line with national averages but below the projected regional increase (7%).

17.4.9 Due to the broad range of individual and environmental determinants that can influence physical and mental health outcomes, the future community health baseline over the medium-term is highly uncertain. Due to this uncertainty, and in lieu of other information, it is assumed the future baseline for the study area would be unchanged from the current baseline to the completion of the Project.

17.5 Embedded and Control and Management Measures

Embedded Measures

17.5.1 Health and wellbeing will be taken into consideration as part of the iterative design and development of the Project to avoid adverse effects on sensitive receptors as far as possible, enhance potential beneficial effects, and mitigate any potential significant adverse effects on health and wellbeing. The Scoping Boundary has been located to avoid sensitive health features as far as practicable, such as built-up residential areas as set out in **Chapter 3, Main Alternatives Considered**.

17.5.2 The design of the Project will be compliant with the guidelines and policies relating to Electromagnetic Fields (EMFs) stated in NPS EN-5 (accounting for any future changes from the adoption of the current Draft EN-5), the main component of which are the International Commission on Non-Ionizing Radiation Protection guidelines (1998) (Ref 17.11)

Control and Management Measures

17.5.3 A range of standard measures for the Project will be adopted throughout the duration of the construction phase. Those relevant to health and wellbeing are included in the chapters listed in section 17.1.5. An Outline Code of Construction Practice (CoCP) is also provided in **Appendix 4.A Outline Code of Construction Practice**.

17.6 Potential for Significant Effects

17.6.1 The health and wellbeing assessment will consider the construction, operation, and maintenance of the Project. Details of each of these stages are set out in **Chapter 4, Description of the Project.**

17.6.2 The proposed scope of the health and wellbeing assessment is set out below and has been determined using the approach described in **Chapter 5, EIA Approach and Methodology.**

17.6.3 The potential for the Project to result in the likely significant effects identified in **Table 17.4** considers the embedded and control and management measures described in section 17.5.

Sources and Impacts (Step 1)

17.6.4 This section identifies the sources and impacts that would occur as a result of the construction, operation, and maintenance of the Project.

Potential sources of impacts

Sources of construction and maintenance impacts

- The demands of the construction and maintenance of the Project leading to temporary employment.
- Activities relating to the construction and maintenance of the Project, such as noise, dust, visual and landscape disruption caused by these activities.
- Potential temporary and permanent closure or diversions to Public Rights of Way (PRoW) and recreational routes from construction and maintenance activities.
- Potential temporary and permanent severance of access to open space from the construction and maintenance activities.
- Potential temporary and permanent severance of access to local communities resulting from construction and maintenance activities.

Sources of operational impacts

- The demands of the operational phase of the Project leading to permanent employment.
- Potential permanent closure or diversions to PRoW and recreational routes resulting from operational activities of the Project.
- Potential permanent severance of access to open space resulting from operational activities of the Project.
- Potential permanent severance of access to community services and social infrastructure resulting from operational activities of the Project.
- Potential permanent severance of access to local communities resulting from operational activities of the Project.
- Potential permanent impacts of operational noise resulting from operational activities of the Project.

- Potential permanent impacts of operation associated with the generation of EMFs through the Project.

Health determinants

17.6.5 As per new IEMA guidance, if a change in a wider determinant of health is likely as a result of the impacts of a given project, it will be scoped into the human health assessment. The assessment will therefore present the 'likely significant' human health impacts of the Project. At the scoping stage, there are uncertainties and there is limited insight into significance, so scoping identifies whether health effects are 'potentially significant' or not. Therefore, the anticipated potential health and wellbeing impacts during all Project phases include impacts on the following determinants, which will be assessed for significance:

- physical activity;
- risk taking behaviour;
- transport modes, access, and connections;
- community safety;
- social participation, interaction, and support;
- education and training;
- employment and income;
- climate change mitigation and adaptation;
- air quality;
- water quality or availability;
- land quality;
- noise and vibration;
- health and social care services;
- built environment;
- open space, leisure, and play;
- community identity, culture, resilience, and influence;
- wider societal infrastructure and resources; and
- radiation.

17.6.6 The following determinants have been scoped out of this assessment. These health determinants have been assessed to be neutral or insignificant and have subsequently been scoped out:

- diet and nutrition;
- housing; and
- relocation.

17.6.7 The diet and nutrition determinant refers to opportunities to promote good nutrition, to support healthy food options or to increase learning and skills initiatives for this subject,

which is unlikely to be affected by the Project. Similarly, the Project is unlikely to affect housing need directly or indirectly to justify its inclusion as a determinant for this Project. Finally, as housing need is likely to be unaffected, any Project impacts on relocation are likely to be negligible.

17.6.8 Other relevant EIA technical topics will also inform the health and wellbeing assessment. These are as follows:

- **Chapter 6, Landscape**;
- **Chapter 7, Visual**;
- **Chapter 11, Geology and Hydrogeology**;
- **Chapter 13, Traffic and Transport**;
- **Chapter 14, Air Quality**;
- **Chapter 15, Noise and Vibration**; and
- **Chapter 16, Socio-economics, recreation and tourism**.

Potential impacts

17.6.9 **Table 17.4** identifies the potential impacts that could result from the sources identified above.

17.6.10 Where **Table 17.4** identifies the potential for an impact to result in a significant effect the impact is taken through to Step 2. Where **Table 17.4** identifies no potential for an impact to result in a significant effect, that impact is proposed to be scoped out.

Table 17.4: Impacts and the potential for significant effects

Project phase	Source	Impact	Health Determinant(s) affected	Potential for significant effects
Construction and maintenance	The demands of the construction and maintenance of the Project leading to temporary employment.	Increased employment and income for the construction and maintenance workforce, leading to improved health outcomes.	Education and training; employment and income; health and social care services; community identity, culture, resilience and influence.	**Yes – t**he magnitude and sensitivity of the employment effects will be determined by the assessments from **Chapter 16, Socio-economics, Recreation and Tourism**, which in turn will define the significance of the health effect.
	Activities relating to the construction and maintenance of the Project, such	Quality of life and safety impacts on local residents, workers and visitors leading to	Physical activity; transport modes, access, and connections; community safety;	**Yes** – potential health related effects experienced during construction and maintenance

as noise, dust, visual and landscape disruption caused by these activities.	worsened health outcomes.	social participation, interaction, and support; education and training; employment and income; climate change mitigation and adaptation; air quality; water quality or availability; land quality; noise and vibration; built environment; wider societal infrastructure and resources; radiation.	of the Project would be determined through the topic specific assessments, but are expected to include air quality, noise and vibration, landscape amenity and traffic and transport effects.
Potential temporary and permanent closure or diversions to Public Rights of Way (PRoW) and recreational routes from construction and maintenance activities.	Impact on local residents' access to local community services and social infrastructure within 500 m of the Scoping Boundary, potentially leading to worsened physical and mental health outcomes.	Physical activity; transport modes, access, and connections; community safety; social participation, interaction, and support; wider societal infrastructure and resources.	**Yes** – disruption to PRoW, other recreational routes or roads offering access to community services and social infrastructure during all phases would be avoided as far as possible. Where necessary, suitable diversions would be agreed with relevant council bodies.
Potential temporary and permanent severance of access to open space from the construction and maintenance activities.	Potential temporary and permanent severance of access to open space within 500 m of the Scoping Boundary for local residents, workers and visitors affecting mental and physical health outcomes.	Physical activity; social participation, interaction, and support; land quality; open space, leisure, and play; community identity, culture, resilience, and influence; and wider societal infrastructure and resources.	**Yes** – as above, disruption to PRoW or other recreational routes and access to open space during all phases of the Project would be avoided as far as possible. Where necessary, suitable diversions would be agreed with relevant council bodies.

	Potential temporary and permanent severance of access to local communities.	Deterioration of community cohesion and negative effects on mental health for local residents within 1 km of the Scoping Boundary.	Risk taking behaviour; community safety; built environment; open space, leisure, and play; community identity, culture, resilience, and influence; wider societal infrastructure and resources.	**Yes** – as above, disruption to PRoW or other recreational routes which facilitate community cohesion during construction, and maintenance phases of the Project would be avoided as far as possible. Where necessary, suitable diversions would be agreed with relevant council bodies.
Operation	The demands of the operational phase of the Project leading to permanent employment.	Increased employment and income for the operational workforce, leading to improved health outcomes.	Education and training; employment and income; health and social care services; community identity, culture, resilience and influence.	**Yes** – the magnitude and sensitivity of the employment effects will be determined by the assessments from **Chapter 16, Socio-economics, Recreation and Tourism**, which in turn will define the significance of the health effect.
	Potential permanent closure or diversions to PRoW and recreational routes resulting from operational activities of the Project.	Potential permanent closure or diversions to PRoW within 500 m of the Scoping Boundary leading to worsened physical and mental health outcomes.	Physical activity; transport modes, access, and connections; social participation, interaction, and support; land quality; open space, leisure, and play; community identity, culture, resilience, and influence; wider societal infrastructure and resources.	**Yes** – disruption to PRoW or other recreational routes affecting access to facilities would be avoided as far as possible. Where necessary, suitable diversions would be agreed with relevant council bodies.

	Potential permanent severance of access to open space resulting from operational activities of the Project.	Potential permanent severance of access to open space within 500 m of the Scoping Boundary for local residents, workers and visitors affecting physical and mental health.	Physical activity; risk taking behaviour; community safety; social participation, interaction, and support; open space, leisure, and play; community identity, culture, resilience, and influence; wider societal infrastructure and resources.	**Yes** – disruption to PRoW or other recreational routes affecting access to facilities would be avoided as far as possible. Where necessary, suitable diversions would be agreed with relevant council bodies.
	Potential permanent severance of access to community services and social infrastructure resulting from operational activities of the Project.	Deterioration of social cohesion and negative effect on mental health for local residents within 1 km of the Scoping Boundary.	Transport modes, access, and connections; health and social care services; community identity, culture, resilience, and influence; and wider societal infrastructure and resources.	**Yes** – disruption to PRoW or other recreational routes affecting access to facilities would be avoided as far as possible. Where necessary, suitable diversions would be agreed with relevant council bodies.
	Potential permanent severance of access to local communities resulting from operational activities of the Project.	Deterioration of social cohesion and effect on mental health for local residents within 1 km of the Scoping Boundary.	Transport modes, access, and connections; community safety; social participation, interaction, and support; education and training; employment and income; health and social care services; built environment; open space, leisure, and play; community identity, culture, resilience, and influence; wider societal infrastructure and resources.	**Yes** – disruption to PRoW or other recreational routes affecting access to facilities would be avoided as far as possible. Where necessary, suitable diversions would be agreed with relevant council bodies.
	Potential permanent impacts of operational noise resulting	Potential permanent quality of life impacts on residents and	Community safety; noise and vibration; health and social care services; community identity, culture,	**Yes** – potential health related effects experienced during the operation of the

	from operational activities of the Project.	visitors within 1 km of the Scoping Boundary, leading to worsened physical and mental health outcomes.	resilience, and influence.	Project would be determined through the topic specific assessments but are expected to include noise effects.
	Potential permanent impacts of operation associated with the generation of EMFs through the Project.	Potential permanent impacts on local residents and workers associated with the generation of EMFs.	Risk taking behaviour; community safety; employment and income; health and social care services; built environment; community identity, culture, resilience, and influence.	**No** – the Applicant will ensure that policies and procedures are in place at the design phase to ensure that all equipment will comply with public EMF exposure limits.

Impact Pathways with Receptors (Step 2)

17.6.11 This section identifies whether there are any impact pathways from the impacts identified above that could give rise to potentially significant effects on receptors identified within the study area.

17.6.12 **Table 17.5** provides a summary of the impact pathways identified and those proposed to be scoped into and/or out of the health and wellbeing assessment for the Project.

Table 17.5: Impact pathways with receptors

Impact	Receptor	Potential for significant effects	Proposed to be scoped in/out
Construction and Maintenance Phase Increased employment and income for the construction and maintenance workforce, leading to improved health outcomes.	Local residents and workers	**Yes – t**he magnitude and sensitivity of the employment effects will be determined by the assessments from **Chapter 16, Socio-economics, Recreation and Tourism**, which in turn will define the significance of the health effect.	**Scoped in**
Construction and Maintenance Phase Quality of life and safety impacts on local residents, workers and visitors leading	Local residents, workers and visitors within the relevant technical study areas.	**Yes** – potential health related effects experienced would be determined through the topic specific assessments, but are expected to include air quality, noise and vibration,	**Scoped in**

Impact	Receptor	Potential for significant effects	Proposed to be scoped in/out
to worsened health outcomes.		landscape amenity and traffic and transport effects.	
Construction and Maintenance Phase Impact on local residents' access to local community services and social infrastructure within 500 m of the Scoping Boundary, potentially leading to worsened physical and mental health outcomes.	Users of PRoW and recreational routes within 500 m of Scoping Boundary.	**Yes** – disruption to PRoW or other recreational routes during all phases would be avoided as far as possible. Where necessary, suitable diversions would be agreed with relevant council bodies.	**Scoped in**
Construction and Maintenance Phase Potential temporary and permanent severance of access to open space within 500 m of the Scoping Boundary for local residents, workers and visitors affecting mental and physical health outcomes.	Users of open space within 500 m of Scoping Boundary.	**Yes** – as above, disruption of access for open space would be avoided as far as possible. Where necessary, suitable diversions would be agreed with relevant council bodies.	**Scoped in**
Construction and Maintenance Phase Deterioration of community cohesion and negative effects on mental health for local residents within 1 km of the Scoping Boundary.	Local communities within 1 km of the Scoping Boundary.	**Yes** – disruption to PRoW or other recreational routes during all phases would be avoided as far as possible. Where necessary, suitable diversions would be agreed with relevant council bodies.	**Scoped in**
Operation Phase Increased employment and income for the operational workforce, leading to improved health outcomes.	Local residents and workers	**Yes –** the magnitude and sensitivity of the employment effects will be determined by the assessments from **Chapter 16, Socio-economics, Recreation and Tourism**, which in turn will define the significance of the health effect.	**Scoped in**
Operation Phase Potential permanent closure or diversions to PRoW within 500 m of the Scoping Boundary leading to	Users of open space within 500 m of Scoping Boundary.	**Yes** – disruption to PRoW or other recreational routes affecting access to facilities would be avoided as far as possible. Where necessary, suitable diversions would be	**Scoped in**

Impact	Receptor	Potential for significant effects	Proposed to be scoped in/out
worsened physical and mental health outcomes.		agreed with relevant council bodies.	
Operation Phase Potential permanent severance of access to open space within 500 m of the Scoping Boundary for local residents, workers and visitors affecting physical and mental health.	Users of open space within 500 m of Scoping Boundary.	**Yes** – disruption to PRoW or other recreational routes affecting access to facilities would be avoided as far as possible. Where necessary, suitable diversions would be agreed with relevant council bodies.	**Scoped in**
Operation Phase Deterioration of social cohesion and negative effect on mental health for local residents within 1 km of the Scoping Boundary.	Local residents, workers and visitors to the area within 1 km of Scoping Boundary.	**Yes** – disruption to receptors which could affect mental health, such as recreational routes and PROW, which in turn could affect access to facilities, would be avoided as far as possible. Where necessary, suitable diversions would be agreed with relevant council bodies.	**Scoped in**
Operation Phase Potential permanent quality of life impacts on residents and visitors within 1 km of the Scoping Boundary, leading to worsened physical and mental health outcomes.	Local residents and visitors to the area. within 500 m of Scoping Boundary.	**Yes** – potential health related effects experienced during the operation of the Project would be determined through the topic specific assessments but are expected to include noise effects.	**Scoped in**
Operation Phase Potential permanent impacts on local residents and workers associated with the generation of EMFs.	Local residents within 500 m of Scoping Boundary.	No – the Applicant will ensure that policies and procedures are in place at the design phase to ensure that all equipment will comply with public EMF exposure limits.	Scoped out

17.7 Proposed Assessment Methodology

17.7.1 The following section summarises the methodology proposed to be used for the Health and Wellbeing assessment which builds on the general assessment methodology presented in **Chapter 5, EIA Approach and Methodology** and the new IEMA guidance for the assessment of significance for health effects**.**

17.7.2 Wherever possible, the impacts identified in the assessment will be appraised against relevant national standards. Where relevant standards do not exist, professional experience and expert judgement will be applied and justified. Best practice principles are

also provided in the NHS England's Healthy Urban Development Unit's Rapid Health Impact Assessment (HIA) Toolkit 2019 and this toolkit will assist the approach to assessing the impacts on health arising from the Project. The significance criteria of human health effects will be assessed based on expert judgment and professional experience of the author and relies on the following considerations.

17.7.3 **Sensitivity of human health receptors including general populations and potentially vulnerable sub-populations:** specific values in terms of sensitivity are not attributed to population health due to the diverse range of determinants and indicators that can determine overall health. However, the assessment will take account of the qualitative (rather than quantitative) sensitivity of relevant populations and their likely ability to adapt to change. Sensitivity can be informed by baseline data, including demographic statistics, public health statistics and deprivation mapping. It can also be informed by professional judgements about the characterisation of the relevant population, e.g. in relation to their capacity to adapt and the likely presence of vulnerable groups.

17.7.4 **Magnitude of impact:** this entails consideration of the scale of the exposure of the population to an impact; whether the impact is one-off or continuous; the likely nature of the human health impact; the permanence of the change; and the proportion of the relevant study area population that would be affected. Magnitude can be informed by a full understanding of the Project and the findings of the other technical chapters, including their zones of influence and expected degrees of change.

17.7.5 These factors combine to determine the consequent significance of the effect.

Sensitivity

17.7.6 The sensitivity of health effects is driven by a number of factors which are set out in **Table 17.6** and are based on guidance set out by IEMA guidance and professional judgement of this guidance.

Table 17.6: Sensitivity classification

Level of Sensitivity	Indicative Criteria
High	High levels of deprivation (including pockets of deprivation); reliance on shared resources (between the population and the Project); existing wide inequalities between the most and least healthy; a community whose outlook is predominantly anxiety or concern; people who are prevented from undertaking daily activities; dependents; people with very poor health status; and/or people with a very low capacity to adapt.
Medium	Moderate levels of deprivation; few alternatives to shared resources; existing widening inequalities between the most and least healthy; a community whose outlook is predominantly uncertainty with some concern; people who are highly limited from undertaking daily activities; people providing or requiring a lot of care; people with poor health status; and/or people with a limited capacity to adapt.
Low	Low levels of deprivation; many alternatives to shared resources; existing narrowing inequalities between the most and least healthy; a community whose outlook is predominantly ambivalence with some concern; people who are slightly limited from undertaking daily

	activities; people providing or requiring some care; people with fair health status; and/or people with a high capacity to adapt.
Very low	Very low levels of deprivation; no shared resources; existing narrow inequalities between the most and least healthy; a community whose outlook is predominantly support with some concern; people who are not limited from undertaking daily activities; people who are independent (not a carer or dependent); people with good health status; and/or people with a very high capacity to adapt.

Source: Adapted from IEMA Guide to Determining Significance for Health (Table 7.1)

Magnitude

17.7.7 Magnitude of impact is driven by a number of factors which are set out in **Table 17.7**, based on guidance set out by IEMA guidance.

Table 17.7: Magnitude classification

Level of Sensitivity	Description
High	High exposure or scale; long-term duration; continuous frequency; severity predominantly related to mortality or changes in morbidity (physical or mental health) or very severe illness/injury outcomes; majority of population affected; permanent change; substantial service quality implications.
Medium	Low exposure or medium scale; medium-term duration; frequent events; severity predominantly related to moderate changes in morbidity or moderate change in quality of life; large minority of population affected; gradual reversal; small service quality implications.
Low	Very low exposure or small scale; short-term duration; occasional events; severity predominantly related to minor change in morbidity or moderate change in quality of life; small minority of population affected; rapid reversal; slight service quality implications.
Very low	Negligible exposure or small scale; very short-term duration; one off frequency; severity predominantly relates to minor change in quality of life; very few people affected; immediate reversal once activity complete; no service quality implications.

Source: Adapted from IEMA Guide to Determining Significance for Health (Table 7.2)

Significance of effects

17.7.8 The overall effects of the Project are defined as one of the following:

- **beneficial** – an advantageous or beneficial effect on a receptor;
- **negligible** – an imperceptible effect on a receptor;
- **adverse** – a disadvantageous or negative effect on a receptor; or
- **no effect** – no discernible effects on a receptor.

17.7.9 Duration of effect is also considered, with more weight given to permanent changes than to temporary ones. For the purposes of this assessment, short-term effects are of one

year or less, medium-term effects of one to five years and long-term effects for over five years.

17.7.10 Where an effect is assessed as being beneficial or adverse, the effect will be classified as Major, Moderate, Minor or Negligible. The assessment of significance will be informed by considering the sensitivity of the receptor and the magnitude of impact. For the purposes of this assessment, Moderate and Major effects will be considered to represent significant effects.

Limitations of assessment

17.7.11 The assessment of the significance of effects will be carried out against a benchmark of current human health baseline conditions prevailing around the Project, as far as is possible within the limitations of such a dataset. Baseline data is also subject to a time lag between collection and publication. As with any dataset, these conditions may be subject to change over time which may influence the findings of the assessment.

17.8 Conclusion

Summary

17.8.1 This chapter of the Scoping Report has set out the proposed scope and methodology for the ES assessment of health and wellbeing effects arising from the construction, operation, and maintenance of the Project. The health receptors that have been identified within the respective study areas include:

- local communities;
- residents;
- on-site workers;
- visitors to the area;
- users of PROW;
- users of open space; and
- users of community facilities.

17.8.2 The preliminary baseline assessment indicates that there is the potential for significant effects on these receptors.

Proposed Scope of the Assessment

17.8.3 A summary of the proposed scope of the assessment is provided in **Table 17.8**.

Table 17.8: Proposed scope of the assessment

Receptor	Potential for significant effect	Project phase(s)	Proposed to be scoped in/out
Local residents, workers and visitors	**Yes** – the magnitude and sensitivity of the employment effects on health will be determined by the subsequent employment assessments from **Chapter 16, Socio-economics, Recreation and Tourism**, which in turn will define the significance of the health effect.	Construction, operation and maintenance	**Scoped in**
Quality of life and safety impacts on local residents, workers and visitors.	Yes – potential health related effects experienced would be determined through the topic specific assessments, but are expected to include air quality, noise and vibration, landscape amenity and traffic and transport effects.	Construction, operation and maintenance	**Scoped in**
Users of PRoW and recreational routes within 500 m of the Scoping Boundary	Yes – temporary or permanent disruption to PRoW or other recreational routes during all phases would be avoided as far as possible. Where necessary, suitable diversions would be agreed with relevant council bodies.	Construction, operation and maintenance	**Scoped in**
Access to open space within 500 m of the Scoping Boundary	Yes – disruption of access for open space would be avoided as far as possible. Where necessary, suitable diversions would be agreed with relevant council bodies.	Construction, operation and maintenance	**Scoped in**
Access to community services and social infrastructure.	Yes – disruption to PRoW or other recreational routes during all phases would be avoided as far as possible. Where necessary, suitable diversions would be agreed with relevant council bodies.	Construction, operation and maintenance	**Scoped in**
Severance for residents to local communities within 1 km of the Scoping Boundary	Yes – disruption to PRoW or other recreational routes during all phases would be avoided as far as possible. Where necessary, suitable diversions would be agreed with relevant council bodies.	Construction, operation and maintenance	**Scoped in**
Quality of life impacts, including noise, on residents and visitors	Yes – potential health related effects experienced during the operation of the Project would be determined through the topic specific	Operation	**Scoped in**

Receptor	Potential for significant effect	Project phase(s)	Proposed to be scoped in/out
within 1 km of the Scoping Boundary.	assessments but are expected to include noise effects.		
Impacts of the generation of EMFs on local residents and workers.	No – the Applicant will ensure that policies and procedures are in place at the design phase to ensure that all equipment will comply with public EMF exposure limits.	Operation	Scoped out

18. Climate Change

18.1 Introduction

18.1.1 This chapter presents how the climate change assessment will consider the potentially significant effects on climate change receptors that may arise from the construction, operation, and maintenance of the Project (as described in **Chapter 4, Description of the Project**). It describes the methodology and datasets to be used within the climate change assessment, presents an overview of the baseline conditions, and identifies the potential likely significant effects to be considered within the assessment, and how these will be assessed for the purpose of an Environmental Impact Assessment (EIA). Consideration will also be given to the beneficial effects of the Project in terms of connecting renewable sources of energy and removing constraints to transmission of power from low carbon sources. As detailed in **Chapter 4, Description of the Project**, decommissioning is scoped out of the environmental assessment.

18.1.2 This chapter sets out the proposed scope and methodology for the assessment of effects of the Project on the climate. This has been informed by an overview of the environmental baseline conditions, along with the anticipated key issues likely to be associated with the Project.

18.1.3 To align with the requirements of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended by The Town and Country Planning and Infrastructure Planning Regulations 2018) (Ref 1.2) and the Institute of Environmental Management and Assessment (IEMA)'s Guidance for Assessing Greenhouse Gas Emissions (Ref 18.1) and Adaptation (Ref 18.2) in EIAs, a lifecycle greenhouse gas (GHG) impact assessment will be undertaken.

18.1.4 In terms of the susceptibility of the Project to climate change, overhead lines (OHLs) are designed to withstand extreme weather conditions, such as high winds and ice formation on wires. National Grid has previously investigated whether climate change might require OHLs to be redesigned but found there is more likely to be a reduction in the risk of ice on the wires and intense wind gusts occurring simultaneously. Vulnerability of the Project to climate change in terms of flood risk is considered in **Chapter 10, Water Environment** and in the Flood Risk Assessment (FRA). Due to the nature of the Project no further significant effects are anticipated as a result of future climate change on the Project. On this basis, no further assessment of the Project's vulnerability to climate change is required in the ES, therefore the below aspects of climate change assessments have been scoped out:

- **In–Combination Climate Change Impact (ICCI) Assessment** – combined impact of the Project and future climate change on the receiving environment[1]; and
- **Climate Change Resilience (CCR) Assessment** – the resilience of the Project to the potential impacts of climate change.

[1] In line with IEMA guidance, this is the combined effect of the impacts of the Project and potential climate change impacts on the receiving environment are referred to as 'in–combination impacts' and 'in–combination effects'.

18.1.6 This chapter should be read in conjunction with:

- **Chapter 2, Regulatory and Planning Policy Context**;
- **Chapter 4, Description of the Project**;
- **Chapter 5, EIA Approach and Methodology**; and
- **Chapter 12, Hydrology and Land Drainage**.

18.2 Regulatory and Planning Context

18.2.1 **Chapter 2, Regulatory and Planning Context** describes the overall regulatory and planning policy context for the Project. Key legislation, policy and planning guidance relevant to the assessment of potential effects on the climate associated with the construction, operation, and maintenance of the Project is presented below.

Legislation

18.2.2 The Climate Change Act 2008 (2050 Target Amendment) Order 2019 (Ref 18.3) and the Carbon Budget Order 2021 (Ref 18.4) are two pieces of legislation passed in the United Kingdom with the goal of reducing greenhouse gas emissions and combating climate change. The 2019 Amendment Order sets a legally binding target for the UK to reach net zero greenhouse gas emissions by 2050, while the 2021 Order sets out the carbon budgets for the period 2033–2037 (6th Carbon budget), which provide a roadmap for achieving the 2050 target. Both orders emphasise the importance of reducing emissions in all sectors of the economy, increasing the use of renewable energy sources, and investing in research and development of low–carbon technologies.

Planning Policy

National Planning Policy

National Policy Statements

18.2.3 As detailed in **Chapter 2, Regulatory and Planning Policy Context**, National Policy Statements (NPSs) set out the primary policy tests against which the application for a Development Consent Order (DCO) for the Project would be considered. The relevant NPSs are the Overarching National Policy Statement for Energy (EN-1) (Ref 2.2), the National Policy Statement for Energy (EN–1) Revised (Draft) (Ref 2.4) and the National Policy Statement for Electricity Networks Infrastructure (EN-5) (2.5). **Table 18.1** sets out how both the current and draft NPSs concerning electricity networks infrastructure are relevant to the climate change assessment.

Table 18.1: Relevant sections of the relevant National Policy Statements

National Policy Statement	NPS section	How it will be considered
EN–1	*Paragraph 3.3: "The UK has legally binding targets to reduce greenhouse gas emissions by at least 100% compared to 1990 levels by*	The climate change chapter will assess the Project's greenhouse gas emissions in

National Policy Statement	NPS section	How it will be considered
	2050, with an interim target of reducing emissions by at least 68% by 2030. Meeting these targets requires significant decarbonisation of the energy system".	the context of the legally binding greenhouse gas reduction targets and carbon budgets in line with IEMA GHG assessment guidance (Ref 18.1).
EN–1	*Paragraph 3.9: "The government's overarching priority for energy policy is to ensure security of supply, decarbonisation, and affordability. This involves reducing greenhouse gas emissions, while ensuring that the energy system remains reliable and affordable for consumers".*	The climate change assessment will measure the Project's decarbonisation trajectory in line with IEMA GHG assessment guidance (Ref 18.1).
EN–1	Paragraph 3.19: *"The government is committed to a transition to a low–carbon energy system, which will involve the increased deployment of low–carbon and renewable energy sources, as well as the development of new technologies such as carbon capture and storage".*	The climate change assessment will assess if the Project supports the growth of low–carbon and renewable energy in line with IEMA GHG assessment guidance (Ref 18.1).
EN–1	Paragraph 4.6: *"Energy infrastructure must be developed in a way that is consistent with the UK's climate change goals. This means that developers must consider the potential greenhouse gas emissions associated with their projects and take steps to mitigate or offset these emissions where possible".*	The climate change assessment will assess if the Project develops infrastructure consistent with the UK's climate change goals in line with IEMA GHG assessment guidance (Ref 18.1).
EN–1	Paragraph 4.7: *"The government is committed to supporting the development of low–carbon and renewable energy sources, as well as the development of new technologies such as carbon capture and storage. This will help to reduce greenhouse gas emissions from the energy sector".*	The climate change assessment will assess if the Project supports the growth of low–carbon and renewable energy in line with IEMA GHG assessment guidance (Ref 18.1).
EN–1	Paragraph 5.10: *"The government is committed to reducing the use of fossil fuels in the energy system, as part of its efforts to meet the UK's climate change targets. This will involve the increased deployment of low–carbon and renewable energy sources, as well as the development of new technologies such as carbon capture and storage".*	The climate change assessment will assess if the Project aligns itself with reducing the UK's dependence on fossil fuels in line with IEMA GHG assessment guidance (Ref 18.1).
EN–1	Paragraph 5.11: *"The government recognises that fossil fuels will continue to play a role in meeting the UK's energy needs in the short to medium term. However, the government*	The climate change assessment will assess if the Project assists in helping the transition to low–carbon renewable energy

National Policy Statement	NPS section	How it will be considered
	expects the use of fossil fuels to decline over time, as low–carbon and renewable energy sources become more widely available and cost–effective".	sources in line with IEMA GHG assessment guidance (Ref 18.1).
EN–1	Paragraph 6.13: *"Developers must consider the potential climate change impacts of their projects, including the potential for sea level rise, increased flooding, and extreme weather events. They must take steps to mitigate these impacts and ensure that their projects are resilient to future climate change".*	The vulnerability of the Project to climate change in terms of flood risk will be considered in ES Chapter 10 (Water Environment) and in the Flood Risk Assessment (FRA). Due to the nature of the Project no further significant effects are anticipated as a result of future climate change on the Project.
EN–1	Paragraph 7.5: *"The government is committed to reducing greenhouse gas emissions from the energy sector, while ensuring that the energy system remains secure and affordable. This involves supporting the deployment of low–carbon and renewable energy sources, as well as the development of new technologies such as carbon capture and storage".*	The climate change assessment will assess how the Project supports the deployment of low–carbon and renewable energy sources in line with IEMA GHG assessment guidance (Ref 18.1).
EN–1 (Draft)	Paragraph 2.10: *"The UK is committed to achieving net–zero greenhouse gas emissions by 2050. This requires the transformation of the UK's energy system, and the deployment of low–carbon and renewable energy sources on a significant scale".*	The climate change assessment will assess if the Project is aligned with the UK's net zero trajectory in line with IEMA GHG assessment guidance (Ref 18.1).
EN–1 (Draft)	Paragraph 3.3: *"In order to meet the UK's legally binding climate change targets, it is necessary to reduce greenhouse gas emissions from the energy sector. This will require a significant expansion in low–carbon and renewable energy sources, and a reduction in the use of fossil fuels".*	The climate change assessment will assess if the Project is aligned with the UK's legally binding greenhouse gas reduction targets in line with IEMA GHG assessment guidance (Ref 18.1).
EN–1 (Draft)	Paragraph 4.7: *"The development of new energy infrastructure must be consistent with the UK's climate change goals. This means that developers must consider the potential greenhouse gas emissions associated with their projects and take steps to mitigate or offset these emissions where possible".*	The climate change assessment will assess if the Project is consistent with the UK's climate change goals and net zero trajectory in line with IEMA GHG assessment guidance (Ref 18.1).
EN–1 (Draft)	Paragraph 5.16: *"The government is committed to supporting the development of*	The climate change assessment will assess how the Project

National Policy Statement	NPS section	How it will be considered
	low–carbon and renewable energy sources, including offshore wind, solar power, and nuclear power. These technologies have a key role to play in reducing greenhouse gas emissions from the energy sector".	supports the deployment of low–carbon and renewable energy source in line with IEMA GHG assessment guidance (Ref 18.1).
EN–1 (Draft)	Paragraph 5.18: *"The government recognises that fossil fuels will continue to play a role in meeting the UK's energy needs in the short to medium term. However, the government expects the use of fossil fuels to decline over time, as low–carbon and renewable energy sources become more widely available and cost–effective".*	The climate change assessment will assess if the Project aligns itself with reducing the UK's dependence on fossil fuels in line with IEMA GHG assessment guidance (Ref 18.1).
EN–1 (Draft)	Paragraph 6.1: *"Developers must consider the potential greenhouse gas emissions associated with their projects and take steps to minimise these emissions where possible. This may include using low–carbon or renewable energy sources, improving energy efficiency, or implementing carbon capture and storage technology".*	The climate change assessment will assess the Project's GHG mitigation measures in line with IEMA GHG assessment guidance (Ref 18.1).
EN–1 (Draft)	Paragraph 6.23: *"Developers must consider the potential climate change impacts of their projects, including the potential for sea level rise, increased flooding, and extreme weather events. They must take steps to mitigate these impacts and ensure that their projects are resilient to future climate change".*	Vulnerability of the Project to climate change in terms of flood risk will be considered in ES Chapter 10 (Water Environment) and in the Flood Risk Assessment (FRA). Due to the nature of the Project no further significant effects are anticipated as a result of future climate change on the Project.
EN–1 (Draft)	Paragraph 7.7: *"The government is committed to working with industry to reduce greenhouse gas emissions from the energy sector. This includes supporting the development of new low–carbon and renewable energy technologies, as well as implementing policies to encourage energy efficiency and reduce demand for energy".*	The climate change assessment will assess how the Project supports the deployment of low–carbon and renewable energy source in line with IEMA GHG assessment guidance (Ref 18.1).

National Planning Policy Framework

18.2.4 The following paragraphs from the National Planning Policy Framework (NPPF) are relevant to climate change (Ref 2.6):

- Paragraphs 8, 20 and 149 in relation to adaptation, mitigation and climate change resilience;
- Paragraphs 148 and 157 in relation to flood risk and damage to property and people;
- Paragraphs 150 and 153 in relation to reduction of CO_2 emissions through design and reduced energy consumption; and
- Paragraphs 155 to 165 in relation to climate projections, associated flood risk and adaptation.

Local planning policy

18.2.5 The Project lies within the jurisdiction of East Riding of Yorkshire, North Lincolnshire and Bassetlaw District (Nottinghamshire). A summary of the relevant local planning policy and emerging policy which is relevant to a study of climate change matters and will inform the climate change assessment in the Environmental Statement (ES) is provided in **Table 18.2**.

Table 18.2: Relevant local planning policies

Local Plan	Policy ref	Policy context	How it will be considered
East Riding Local Plan – adopted April 2016 (Ref 2.7)	S2	The Local Plan and development decisions will support a reduction in greenhouse gas emissions and adaptation to the expected impacts of climate change.	The climate change assessment will assess the Project's impact on the climate in accordance with IEMA GHG assessment guidance (Ref 18.1). The vulnerability of the Project to climate change in terms of flood risk will be considered in ES Chapter 10 (Water Environment) and in the Flood Risk Assessment (FRA). Due to the nature of the Project no further significant effects are anticipated as a result of future climate change on the Project.
	S1, S2, S8, EC5, ENV1, ENV5, ENV6, A1–6	Contribute to reducing emissions which cause climate change and ensure that the local impact of climate change, including rising sea levels, increased rates of coastal erosion and more frequent flooding events, are minimised, managed and adapted to.	The vulnerability of the Project to climate change in terms of flood risk will be considered in ES Chapter 10 (Water Environment) and in the Flood Risk Assessment (FRA). Due to the nature of the Project no further significant effects are anticipated as a result of future climate change on the Project.

Draft – East Riding Local Plan Update 2021 (Ref 2.8)	S2	Development proposals will be supported where they contribute to a reduction in greenhouse gas emissions and incorporate adaptation to the expected impacts of climate change.	The climate change assessment will assess the Project's impact on climate change and the Project's resilience to climate change in accordance with IEMA GHG assessment guidance (Ref 18.1) and IEMA climate change resilience and adaption guidance (Ref 18.3).
	S1, S2, S8, EC5, ENV1, ENV5, ENV6, A1–6	Contribute to reducing emissions which cause climate change and ensure that the local impact of climate change, including rising sea levels, increased rates of coastal erosion and more frequent flooding events, are minimised, managed and adapted to.	The climate change assessment will assess the Project's impact on the climate in accordance with IEMA GHG assessment guidance (Ref 18.1). The vulnerability of the Project to climate change in terms of flood risk will be considered in ES Chapter 10 (Water Environment) and in the Flood Risk Assessment (FRA). Due to the nature of the Project no further significant effects are anticipated as a result of future climate change on the Project.
North Lincolnshire Local Development Framework (Ref 2.11)	CS18	The document outlines various measures to promote sustainable development practices in the context of climate change. This includes meeting high water efficiency standards, incorporating new technologies for water conservation, and improving flood defences. The document also mandates the reduction of predicted CO_2 emissions by a specific percentage in 2020 and 2050. To achieve this goal, developers must meet certain energy efficiency standards, use on-site renewable energy, and reduce waste and consumption of minerals. Development proposals should also minimize the need for travel and ensure that building design reduces energy consumption while protecting people and the environment. The document also supports the use of	The climate change assessment will assess the Project's impact on the climate in accordance with IEMA GHG assessment guidance (Ref 18.1).

		renewable energy sources, green infrastructure plans, and carbon capture technology.	
Draft North Lincolnshire Local Plan (Ref 14.16)	DQE7	Policy DQE7: Climate Change and Low Carbon Living sets out how development proposals should contribute to tackling climate change through mitigation and resilience measures, in addition to other policies contained within this plan.	The climate change assessment will assess the Project's impact on the climate in accordance with IEMA GHG assessment guidance (Ref 18.1). The vulnerability of the Project to climate change in terms of flood risk will be considered in ES Chapter 10 (Water Environment) and in the Flood Risk Assessment (FRA). Due to the nature of the Project no further significant effects are anticipated as a result of future climate change on the Project.
Bassetlaw Local Plan 2020–2037 (Ref 2.19)	ST40, ST41 and ST44	Natural vegetation is recognised as a valuable resource, supporting biodiversity, contributing to air quality, mitigating the impacts of climate change and improving the local areas resilience to climate change.	
	ST44	Minimising and mitigating against potential harm from risks such as pollution and other environmental hazards and climate change.	The vulnerability of the Project to climate change in terms of flood risk will be considered in ES Chapter 10 (Water Environment) and in the Flood Risk Assessment (FRA). Due to the nature of the Project no further significant effects are anticipated as a result of future climate change on the Project.
	ST50	Policy ST50 is designed to ensure that the development and use of land in the District will contribute to the 'mitigation' of, and 'adaptation' to, climate change during the design, construction and occupation of any new development.	The climate change assessment will assess the Project's impact on the climate in accordance with IEMA GHG assessment guidance (Ref 18.1) and IEMA climate change resilience and adaption guidance (Ref 18.3). The vulnerability of the Proposed Development to climate change in terms of flood risk will be considered in ES Chapter 10 (Water Environment) and in the Flood Risk Assessment (FRA). Due to the nature of the Project no further significant effects are anticipated as a result of future climate change on the Project.

	ST51	Policy ST51 encourages appropriate renewable and low carbon energy Development.	The climate change assessment will assess how the Project supports the deployment of low–carbon and renewable energy source in line with IEMA GHG assessment guidance (Ref 18.1).
Draft – Bassetlaw Local Plan 2020–2038 – Second Addendum (Ref 18.5)	ST40, ST41 and ST44	The Council will protect existing trees, woodland and hedgerows and secure additional planting that increases canopy cover in the interests of biodiversity, amenity and climate change adaptation.	The climate change assessment will assess the Project's impact on the climate in accordance with IEMA GHG assessment guidance (Ref 18.1). The vulnerability of the Project to climate change in terms of flood risk will be considered in ES Chapter 10 (Water Environment) and in the Flood Risk Assessment (FRA). Due to the nature of the Project no further significant effects are anticipated as a result of future climate change on the Project.
	ST50	Policy ST50 is designed to ensure that the development and use of land in the District will contribute to the 'mitigation' of, and 'adaptation' to, climate change during the design, construction and occupation of any new development.	
	ST51	In accordance with national policy, this Local Plan seeks to reduce greenhouse gases in accordance with the provisions of the Climate Change Act 2008 (Ref 18.3). In 2021, the UK Government committed to cut Greenhouse gas emissions by 78% by 2035 and to achieve net zero by 2050.	
	ST53	Ensure that drainage design take into account an appropriate climate change allowance as agreed with the relevant authority(s).	

Consultation and Engagement

18.2.6 The environmental assessment will be informed by consultation and engagement with stakeholders, including, but not limited to, East Riding of Yorkshire Council, North Lincolnshire Council, Bassetlaw District Council, and Nottinghamshire County Council.

18.3 Study Area

18.3.1 The study area for the lifecycle GHG impact assessment covers all direct GHG emissions arising from activities undertaken within the Project Scoping Boundary during the

construction, operation, and maintenance of the Project. It also includes indirect emissions many of which arise outside the Scoping Boundary. This could include those embedded within the construction materials arising as a result of the energy used for their production, or emissions arising from the transportation of materials, waste and construction workers.

18.3.2 The environmental impact associated with GHG emissions is a national and global issue. Consequently, the potential significance of the proposed Project's lifecycle GHG emissions will be assessed by comparing how the estimated GHG emissions from the Project align with the UK's trajectory to net zero as defined in The Climate Change Act 2008 (2050, Ref 18.4) (Target Amendment) Order 2019 and associated five year, legally binding carbon budgets (Ref 18.4).

18.4 Baseline Conditions

Data Sources

18.4.1 The known or predicated current and future baseline environment described in this section has been informed by the following data sources:

- operational emission data for activities at the existing site; and
- carbon stock information for soil and vegetation for the existing site.

Baseline

18.4.2 For the GHG assessment, the baseline is a 'business as usual' scenario where the proposed Project does not proceed.

18.4.3 The current land use within the Scoping Boundary consists predominately of arable land, managed hedgerows, and trees. Trees are present individually in some areas, as well as rows of trees and small woodland areas. The abundance of vegetation within the Scoping Boundary suggests a relatively high carbon sink potential. Current land use within the Scoping Boundary has minor levels of associated GHG emissions as the land use is largely arable. Baseline agricultural GHG emissions are dependent on soil and types of vegetation present, and fuel use for the operation of vehicles and machinery.

18.4.4 If data is not available the baseline will be considered as zero GHG emissions, being a worst–case analysis as a precautionary approach.

Future baseline

18.4.5 The future baseline for the assessment of the impact of the Project on climate is a projected 'business as usual' scenario without the construction, operation and maintenance of the Project. The future baseline for the GHG assessment will include the GHG emissions associated with any expected future operational emissions from land use activities such as farming. If data is not available the future baseline will be considered as zero GHG emissions, being a worst–case analysis as a precautionary approach.

18.4.6 The future baseline will also consider the increasing capacity restrictions of the existing transmission network, which will be insufficient to accommodate the connection of the proposed renewable power sources. As a result, the Electricity System Operator would ask renewable generators such as offshore windfarms to not generate or transport electricity and pay other generators to generate in other parts of the country. This would

slow progress towards the UK government's Net Zero ambitions as potentially more carbon intensive sources of generation are relied upon resulting in additional GHG emissions.

18.5 Embedded and Control and Management Measures

Embedded Measures

18.5.1 The Project has been routed in accordance with Holford Rule 3 (Ref 2.20) to reduce route length where possible and thereby limiting the quantity of materials required for construction as far as possible.

18.5.2 A number of measures are under consideration subject to the relevant assessments being undertaken and their needs identified. These considerations include:

- the use of materials with a low embodied carbon; and
- the use of low carbon construction techniques.

Control and Management Measures

18.5.3 An Outline Code of Construction (CoCP) is provided in **Appendix 4.A Outline Code of Construction Practice**. Measures relevant to the control and management of impacts that could affect the climate change assessment are:

- GG05: A suitably experienced Environmental Manager will be appointed for the duration of the construction phase. In addition, a qualified and experienced Environmental Clerk of Works will be available during the construction phase to advise, supervise and report on the delivery of the mitigation methods and controls outlined in the Construction Environmental Management Plan (CEMP). The Environmental Clerk of Works will monitor that the works proceed in accordance with relevant environmental DCO requirements and adhere to the required good practice and mitigation measures. The Environmental Clerk of Works will be supported as necessary by appropriate specialists, including ecologists and arboriculturists;
- GG13: Plant and vehicles will conform to relevant applicable standards;
- GG22: A Site Waste Management Plan (SWMP) will be developed prior to construction. The contractor(s) will maintain and monitor the SWMP throughout the construction phase and oversee that any sub–contractor(s) adhere to the SWMP. The SWMP will set out, in an auditable manner, how waste will be reduced, reused, managed and disposed of in accordance with the waste hierarchy. Dedicated areas will be identified on the construction plans to allow materials and wastes to be segregated at source, reducing the risk of damage or contamination;
- GH06: The control of earthworks or materials movement (including any re–use of materials) under appropriate Environmental Permits, exemptions or CL:AIRE 'The definition of Waste: The development industry Code of Practice (2011).

18.6 Potential for Significant Effects

18.6.1 The lifecycle greenhouse gas assessment will consider the construction, operation, and maintenance of the Project. Details of each of these stages are set out in **Chapter 4, Description of the Project.**

18.6.2 The proposed scope of the greenhouse gas assessment is set out below and has been determined using the approach described in **Chapter 5, EIA Approach and Methodology.**

18.6.3 The potential for the Project to result in the likely significant effects takes into account the embedded and control and management measures described in section 5.

Sources and Impacts (Step 1)

18.6.4 This section identifies the sources and impacts that would occur as a result of the construction, operation and maintenance of the Project.

Potential sources of impacts

Sources of construction impacts

- GHG emissions from energy use in extraction of raw materials and manufacture of components and equipment.
- GHG emissions from fuel used for the transportation of products and materials.
- GHG emissions from fuel consumption from construction plant and vehicles, generators on-site, and worker commuting.
- GHG emissions from fuel use for the transportation and disposal of dismantled equipment, earthworks and waste disposal.
- Loss of carbon stock due to construction activities.
- GHG emissions from the provision of clean water, and treatment of wastewater.

Sources of operational impacts

- Transmission losses from operational OHL.
- Reduction in GHG emissions from non-renewable energy generation sources once the Project begins providing additional network capability allowing greater amounts of renewable power to be transmitted across the system.

Sources of maintenance impacts

- Energy use in extraction of raw materials and manufacture of components and equipment required for maintenance.
- Transportation of maintenance products and materials.
- Fuel consumption from maintenance plant and vehicles, generators on-site, and worker commuting

18.6.5 For the purposes of this assessment, it has been considered that any increase in GHG emissions compared to the baseline has the potential to have an impact, due to the high sensitivity of the receptor (global climate) to increases in GHG emissions. This is in line with the IEMA GHG reporting guidance (Ref 18.1), which states that all GHG emissions have the potential to be significant. The application of the standard EIA significance criteria is not considered to be appropriate for climate change mitigation assessments. The GHG effects will be put into context in terms of their impact on the UK's 5-year carbon

budgets, which set legally binding targets for GHG emissions. The GHG impacts will also be put into context for the sub–sectoral budgets for energy generation.

Impact Pathways with Receptors (Step 2)

18.6.6 This section identifies whether there are any impact pathways from the lifecycle GHG impact assessment impacts identified above that could give rise to potentially significant effects on receptors identified within the study area. **Table 18.3** provides a summary of the impact pathways identified and those proposed to be scoped into and or out of the climate change assessment for the Project.

Table 18.3: Impact pathways with receptors

Project Phase	Impact	Receptor	Potential for significant effects	Proposed to be scoped in/out
Construction	GHG emissions from energy use in extraction of raw materials and manufacture of components and equipment. GHG emissions from fuel used for the transportation of products and materials. GHG emissions from fuel consumption from construction plant and vehicles, generators on-site, and worker commuting. GHG emissions from fuel use for the transportation and disposal of dismantled equipment, earthworks and waste disposal. Loss of carbon stock due to construction activities. GHG emissions from the provision of clean water, and treatment of wastewater.	Global climate	**Yes** – for the purposes of this assessment, it has been considered that any increase in GHG emissions compared to the baseline has the potential to have an impact, due to the high sensitivity of the receptor (global climate) to increases in GHG emissions. This is in line with the IEMA Guidance, which states that all GHG emissions have the potential to be significant. Likewise, a Project that causes GHG emissions to be avoided or removed from the atmosphere could have a beneficial effect that is significant.	**Scoped in**
Operation	Transmission losses from OHL Reduction in GHG emissions from non-renewable energy generation sources once the proposed renewable energy generation can connect to the reinforced network.			
Maintenance	Energy use in extraction of raw materials and manufacture of			

Project Phase	Impact	Receptor	Potential for significant effects	Proposed to be scoped in/out
	components and equipment required for maintenance. Transportation of maintenance products and materials. Fuel consumption from maintenance plant and vehicles, generators on-site, and worker commuting.			

18.7 Proposed Assessment Methodology

Proposed Data Sources

18.7.1 The following data sources are proposed to be used to inform the climate change assessment:

- bill of material quantities (breakdown of construction materials by volume);
- construction programme;
- fuel/energy use for construction activities;
- number of construction workers on site per day;
- volumes of earthworks cut/fill;
- volumes of construction waste and method of disposal;
- volume of water use during construction;
- land use change/biodiversity net gain; and
- maintenance regime.
- Generation and demand patterns based on ESO Future Energy Scenarios (Ref 18.6)

Technical Guidance

18.7.2 The climate change assessment will be carried out in accordance with the following good practice and guidance documents:

- IEMA: Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance (Ref 18.1);
- The GHG Protocol (Ref 18.7);
- PAS 2080 (Ref 18.8);
- Inventory of Carbon and Energy (Ref 18.9); and

- Department for Business, Energy & Industrial Strategy (BEIS) Emissions Factors (Ref 18.10).

Proposed Assessment Methodology

18.7.3 The following section summarises the methodology proposed to be used for the climate change assessment.

18.7.4 The aim of the lifecycle GHG impact assessment will be to quantify the GHG emissions from the lifecycle of the Project and to identify the impact of the Project on the climate by putting these emissions into the context of the UK meetings its 2050 net zero.

18.7.5 The assessment will adopt a project lifecycle approach to identify 'hot spots' of GHG emissions (i.e. the project stage(s) likely to generate the largest amount of GHG emissions) and enable priority areas for mitigation to be identified. This approach is consistent with the principles set out in IEMA guidance (Ref 18.1).

18.7.6 In line with the World Business Council for Sustainable Development (WBCSD) and World Resources Institute (WRI) GHG Protocol guidelines, the lifecycle GHG impact assessment will be reported as tonnes of carbon dioxide equivalent (tCO_2e) and will consider the seven Kyoto Protocol gases:

- carbon dioxide (CO_2);
- methane (CH_4);
- nitrous oxide (N_2O);
- sulphur hexafluoride (SF_6);
- hydrofluorocarbons (HFCs);
- perfluorocarbons (PFCs); and
- nitrogen Trifluoride (NF_3).

18.7.7 Expected GHG emissions arising from the preparations for the Project will be quantified using a calculation–based methodology as per the following equation and aligned with the GHG Protocol (Ref 18.7):

Activity data x GHG emissions factor = GHG emissions

18.7.8 The resulting carbon footprint will be compared to the existing baseline conditions.

18.7.9 If relevant GHG activity data are unavailable, the assessment may be more qualitative and/or assumptions and estimations developed. Any assumptions, inclusions and exclusions that inform the GHG emissions calculation will be clearly described.

18.7.10 The Department for Business, Energy and Industry Standards' 2023 emissions factors and embodied carbon data from the Inventory of Carbon and Energy V3.0 (ICE) (Ref 18.9) will be used as the source of emissions factors for calculating GHG emissions.

Sensitivity

18.7.11 The global climate will be identified as the receptor for the purposes of the GHG assessment. The sensitivity of the climate to GHG emissions is 'high'. The rationale is as follows:

- GHG emission impacts could compromise the CCC's sectoral construction and net–zero pathways and therefore the ability to meet its future carbon reduction trajectory;
- GHG emission impacts could compromise the UK's ability to reduce its GHG emissions and therefore the ability to meet its future legally binding carbon budgets;
- the extreme importance of limiting global warming to below 2 °C above industrial levels, while pursuing efforts to limit such warming to 1.5 °C as set out in the Paris Agreement and a recent report by the Intergovernmental Panel on Climate Change (IPCC) highlighted the importance of limiting global warming below 1.5 °C (Ref 18.11); and
- disruption to global climate is already having diverse and wide–ranging impacts to the environment, society, economic and natural resources. Known effects of climate change include increased frequency and duration of extreme weather events, temperature changes, rainfall and flooding, and sea level rise and ocean acidification. These effects are largely accepted to be negative, profound, global, likely, long–term to permanent, and are transboundary and cumulative from many global actions.

Magnitude

18.7.12 To provide perspective, emissions from the Project will be considered in the context of the UK carbon budgets. The UK carbon budgets are in place to restrict the amount of GHG emissions the UK can legally emit in a five–year period. The UK is currently in the 4th carbon budget period, which runs from 2023 to 2027, as detailed in

18.7.13 **Table** 18.4. The 3rd, 4th and 5th Carbon Budgets reflect the previous 80% reduction target by 2050. The 6th carbon budget aligns with the legislated 2050 net zero commitment.

18.7.14 It is noted that the contribution of most individual projects to national–level budgets will be small, so the UK context will have limited value. This GHG emissions assessment, therefore, uses the IEMA guidance to assess the significance of effects with the UK carbon budgets being used to provide context to the GHG emissions

18.7.15 **Table** 18.4.

18.7.16 As noted previously, it is down to the practitioner's professional judgement on how best to contextualise a project's GHG impact. In GHG accounting, it is considered good practice to contextualise emissions against pre–determined carbon budgets. The UK has a defined national carbon budget and budgets set by devolved administrations, which will be determined as being compatible with net zero and international climate commitments. Additionally, indicative sectoral electrical supply and construction carbon budgets are available based on the CCC's balanced net–zero pathway. Hence, if deemed suitable by the practitioner's professional judgement during the environmental assessment these may be used for additional contextualisation.

18.7.17 To assess the impact of GHG emissions from the Project, the UK carbon budgets will be used as a proxy for the climate in

18.7.18 Table 18.4. The UK carbon budgets are in place to restrict the amount of GHG emissions the UK can legally emit in a five–year period.

18.7.19 To illustrate the Project trajectory towards net zero by 2050, it is general practice to utilise the CCC balanced net zero pathway post–2037, in the absence of any nationally legally binding Carbon Budgets after the using the subsequent 6th Carbon Budget. This approach

follows IEMA guidance that it is up to the Practioner to use professional judgment when considering appropriate carbon budgets for undertaking GHG significance assessment.

18.7.20 The CCC balanced net–zero pathway is recommended to be divided into 5-year periods post-2037 to match the previous 1-6 legally binding UK National Carbon Budgets. The proposed Carbon Budget periods derived from the net-zero pathway encompass the 7th, 8th, and 9th indicative budget periods up to 2050 in line with the UK's 1.5-degree trajectory as detailed in

18.7.21 **Table** 18.4.

18.7.22 For additional contextualisation sectoral budgets will be explored such as the electricity supply and construction balanced net–zero pathways from the Committee on Climate Change (CCC), which potentially might be appropriate to apply to the construction and electricity supply emissions associated with the Project.

18.7.23 However, the supplementary Carbon Budgets beyond 2037 have not been formally adopted by the government or ratified by parliament and can only be used as an indicative measure to contextualise the Project's progress toward the national net–zero trajectory.

Table 18.4 UK Carbon Budgets and indicative carbon budgets based upon the CCC's balanced net–zero pathway

Carbon budget	Indicative CCC's Electricity Supply Carbon Budgets based upon the CCC's balanced net–zero pathway for Electricity Supply ($MtCO_2e$)	Indicative CCC's Construction Carbon Budgets based upon the CCC's balanced net–zero pathway for Construction ($MtCO_2e$)	UK Carbon Budget ($MtCO_2e$)	Indicative Carbon Budgets based upon the CCC's balanced net–zero pathway ($MtCO_2e$)
3rd (2018–2022)	–	–	2,544	–
4th (2023–2027)	180	254	1,950	–
5th (2028–2032)	85	183	1,725	–
6th (2033–2037)	29	95	965	–
7th (2038–2042)	17	34	–	526
8th (2043–2047)	9	17	–	195
9th (2048–2050)	3	9		17

Significance of effects

18.7.24 IEMA guidance (18.1) provides criteria for assessing the significance of greenhouse gas emissions effects. Five levels of significance are presented which focus on how the project makes a relative contribution towards achieving a science–based 1.5°C aligned transition towards net zero and the levels of mitigation applied. The different levels of significance are plotted against the UK's net zero compatible trajectory as presented in **Table 18.5**, to determine the scheme's significance.

18.7.25 **Table 18.5** presents the different significance levels as per the latest IEMA guidance. The guidance emphasises that “a project that follows a ‘business–as–usual’ or ‘do minimum’ approach and is not compatible with the UK’s net zero trajectory or accepted aligned practice or area–based transition targets, results in a significant adverse effect. It is down to the practitioner to differentiate between the ‘level’ of significant adverse effects e.g. ‘moderate’ or ‘major’ adverse effects.” Moderate and Major adverse impacts are considered to be significant, while all other significance levels are deemed to be not significant.

18.7.26 A 'minor adverse' or 'negligible' non–significant effect conclusion does not necessarily refer to the magnitude of GHG emissions being carbon neutral (i.e. zero on balance) but refers to the likelihood of avoiding severe climate change, aligning project emissions with a science–based 1.5°C compatible trajectory and achieving net zero by 2050. A project's impact can shift from significant adverse to non–significant effects by incorporating mitigation measures that substantially improve on business–as–usual and meet or exceed the science–based emissions trajectory of ongoing but declining emissions towards net zero.

18.7.27 When evaluating significance, all new GHG emissions contribute to a significant adverse environmental effect. However, for this Project, consideration will also be given to the reduction in GHG levels as a result of the increased network capacity for renewable energy generation. The significance of the Project’s emissions will be based on its net impact, which are expected to be beneficial.

Table 18.5 Definition of levels of significance

Effects	Significance level	Description	Example in the guidance
Significant adverse	Major adverse	A project that follows a 'business–as–usual' or 'do minimum' approach and is not compatible with the UK's net zero trajectory, or accepted aligned practice or area-based transition targets. It is down to the practitioner to differentiate between the 'level' of significant adverse effects e.g. 'moderate' or 'major' adverse effects.	The project's GHG impacts are not mitigated or are only compliant with do–minimum standards set through regulation, and do not provide further reductions required by existing local and national policy for projects of this type. A project with major adverse effects is locking in emissions and does not make a meaningful contribution to the UK's trajectory towards net zero.
	Moderate adverse		The project's GHG impacts are partially mitigated and may partially meet the applicable existing and emerging policy requirements but would not fully contribute to decarbonisation in line with local and national policy goals for projects of this type. A project with moderate adverse effects falls short of fully contributing to the UK's trajectory towards net zero.
	Minor adverse	A project that is compatible with the	The project's GHG impacts would be fully consistent with applicable

Effects	Significance level	Description	Example in the guidance
Not significant		budgeted, science based 1.5°C trajectory (in terms of rate of emissions reduction) and which complies with up–to–date policy and 'good practice' reduction measures to achieve that. It may have residual emissions but is doing enough to align with and contribute to the relevant transition scenario, keeping the UK on track towards net zero by 2050 with at least a 78% reduction by 2035 and thereby potentially avoiding significant adverse effects.	existing and emerging policy requirements and good practice design standards for projects of this type. A project with minor adverse effects is fully in line with measures necessary to achieve the UK's trajectory towards net zero.
	Negligible	A project that achieves emissions mitigation that goes substantially beyond the reduction trajectory, or substantially beyond existing and emerging policy compatible with that trajectory and has minimal residual emissions. This project is playing a part in achieving the rate of transition required by nationally set policy commitments.	The project's GHG impacts would be reduced through measures that go well beyond existing and emerging policy and design standards for projects of this type, such that radical decarbonisation or net zero is achieved well before 2050. A project with negligible effects provides GHG performance that is well 'ahead of the curve' for the trajectory towards net zero and has minimal residual emissions.
	Beneficial	A project that causes GHG emissions to be avoided or removed from the atmosphere. Only projects that actively reverse (rather than only reduce) the risk of severe climate change can be judged as having a beneficial effect.	The project's net GHG impacts are below zero and it causes a reduction in atmospheric GHG concentration, whether directly or indirectly, compared to the without–project baseline. A project with beneficial effects substantially exceeds net zero requirements with a positive climate impact.

18.8 Conclusion

18.8.1 For the purposes of this assessment, it has been considered that any increase in GHG emissions compared to the baseline has the potential to have an impact, due to the high sensitivity of the receptor (global climate) to increases in GHG emissions. This is in line with the IEMA Guidance, which states that all GHG emissions have the potential to be significant. Therefore, it is proposed the GHG emissions are assessed during the construction, operation and maintenance phase of the Project in accordance with the IEMA GHG Assessment Guidance.

Proposed Scope of the Assessment

18.8.2 A summary of the proposed scope of the assessment is provided in **Table 18.6**.

Table 18.6: Proposed scope of the assessment

Receptor	Potential for significant effect	Project phase(s)	Proposed to be scoped in/out
Global Climate	For the purposes of this assessment, it has been considered that any increase in GHG emissions compared to the baseline has the potential to have an impact, due to the high sensitivity of the receptor (global climate) to increases in GHG emissions. This is in line with the IEMA Guidance, which states that all GHG emissions have the potential to be significant. Beneficial effects will also be considered from the increased network capacity, allowing for the connection of future renewable energy generators.	Construction, operation and maintenance	**Scoped in**

19. Major Accidents and Disasters

19.1 Introduction

19.1.1 This chapter considers the potential risk of a major accident or disaster causing a significant environmental effect that may arise relating to the construction, operation, or maintenance of the Project (as described in **Chapter 4, Project Description**). As detailed in **Chapter 4, Description of the Project**, the decommissioning has been scoped out of the environmental assessment.

19.1.2 This assessment for major accidents and disasters is guided by a Primer published by IEMA (2020) called, 'Major Accidents and Disasters in EIA' (Ref 19.1) ('the Primer'). The Primer defines the following:

- **Major accident:** events that threaten immediate or delayed serious environmental effects to human health, welfare and/or the environment and require the use of resources beyond those of the client or its appointed representatives to manage. Whilst malicious intent is not accidental, the outcome (e.g. train derailment) may be the same and therefore many mitigation measures will apply to both deliberate and accidental events.
- **Disaster:** may be a natural hazard (e.g., earthquake) or a man-made/external hazard (e.g. act of terrorism) with the potential to cause an event or situation that meets the definition of a major accident.

19.1.3 This chapter considers two aspects: the vulnerability of the Project to a major accident/disaster, and the potential for the Project to cause a major accident.

19.1.4 This chapter:

- identifies the major accidents and disasters topics and events that are proposed to be scoped into the Environmental Impact Assessment (EIA) and thus reported within the Environmental Statement (ES);
- identifies those major accident and disaster topics and events that are proposed to be scoped out of further assessment, with a justification provided; and
- defines the approach and methodology for identifying potential major accidents and disasters and their assessment, in the context of the Project.

19.2 Regulatory and Planning Context

19.2.1 **Chapter 2, Regulatory and Planning Policy Context** describes the overall regulatory and planning policy context for the Project. National Policy Statement (NPS) EN-1 (Ref 2.2) sets out the assessment principles to which the Secretary of State (SoS) will have regard to in the examination of an energy Nationally Significant Infrastructure Project (NSIP). NPS EN-1 does not set out any principles for the assessment of major accidents and disasters but does include reference to potential generic mitigation measures for environmental impacts for aspects which must be addressed by the ES.

19.2.2 The requirement to consider major accidents and disasters as part of the EIA process is set out in the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (hereafter referred to as 'the EIA Regulations') which state:

"A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned… Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies".

Guidance and Advice Notes

19.2.3 The following core guidance documents provide the technical framework for applying a risk management process when dealing with major accidents and disasters in EIA's, in addition to other useful documents which relate to the assessment of risk:

- The International Standards Organizations ISO 311000: 2018 Risk Management – Principles and Guidelines (Ref 19.2);
- Defra, 2011, 'Guidelines for Environmental Risk Assessment and Management' (Ref 19.3); and
- IEMA, 2020, 'Major Accidents and Disasters in EIA: An IEMA Primer '.

19.3 Study Area

19.3.1 As there is no specific regulatory guidance or standardised methodology, the preliminary Study Area distances are based on professional judgement. All distances are from the Scoping Boundary illustrated in **Figure 1.1 Project Scoping Boundary**:

- manmade features:
  - airports, airfields, airstrips and ports within 5 km;
  - Control of Major Accident Hazard (COMAH) facilities within 3 km;
  - major accident hazard pipelines within 1 km;
  - rail infrastructure within 1 km; and
  - transmission (gas, electrical, oil/fuels) crossing, and within 1 km of, the Scoping Boundary.
- natural features with the potential to create risks within:
  - seismic activity – 5 km; and
  - flood risk and unstable ground conditions – 1 km.

19.4 Baseline Conditions

Baseline Environment

19.4.1 The baseline relevant to major accidents and disasters primarily comprises:

- features external to the Project that present a potential source of hazard to the

Project itself;

- sensitive environmental receptors at risk of significant effect from the Project; and
- identified major accident and disaster risks that currently exist within the local area that could affect the Project or be exacerbated by the Project.

19.4.2 The baseline conditions described for major accidents and disaster events are derived from the following desk study sources:

- technical chapters of this Scoping Report: **(Chapters 6-18)**;
- National Risk Register 2020 (Ref 19.4);
- British Geological Survey 'Onshore GeoIndex' (Ref 11.23);
- The Coal Authority Interactive Map (Ref 11.24);
- Health and Safety Executive's Planning Advice Web App (Ref 19.5);
- COMAH 2015 Public Information Search (Ref 19.6); and
- Google street view maps covering the Scoping Boundary.

19.4.3 The baseline conditions are split into three areas:

- potential environmental receptors: receptors that could be vulnerable to a major accident or disaster as a result of the Project;
- nearby major accident installations: potential linkages with other projects that could increase the risk of a major accident within the study area; and
- natural hazards and disasters: a review of existing baseline data relating to natural hazards/disasters, such as flooding or drought, that inform the likelihood of a natural disaster occurring within the study area.

Accident and Disaster Categories

19.4.4 Within the study area, the potential major accidents and disaster groups and categories considered are those listed in **Table 19.1**.

Table 19.1 Major accidents and disaster groups and categories

Groups	Categories
Natural events	Geophysical
	Hydrological
	Climatological and meteorological
	Biological
Technological or manmade hazards	Industrial and urban accidents
	Transport accidents
	Pollution accidents
	Utility failures
	Engineering accidents and failures

Groups	Categories
	Human error/management failure
	Design error
	Sabotage/arson
	Terrorism
	Explosion (chemical, nuclear or other)

Potential Environmental Receptors

19.4.5 All potential receptors that could be affected by a major accident or disaster have been described and outlined within the specific environmental topic chapters. **Table 19.2** signposts the technical chapters and the potential receptors relevant to major accidents and disasters. No additional receptors have been identified outside those set out within the technical chapters.

Table 19.2 Signpost to chapters with relevant receptors

Chapter	Receptors
Chapter 6 and 7 Landscape and Visual	Designated Sites
Chapter 8 Ecology and Biodiversity	Ecological receptors
	Notable Habitats
	Designated Sites
Chapter 9 Cultural Heritage	Designated heritage assets
	Non-designated heritage assets
Chapter 10 Water Environment	Water resources
	Watercourses and waterbodies
	Flood risk
Chapter 11 Geology and Hydrogeology	Groundwater and aquifers
	Land stability
Chapter 12 Agriculture and Soils	Soil
	BMV Agricultural Land
Chapter 13 Traffic and Transport	Roads
	Cycle routes
	Public rights of way
Chapter 14 Air Quality	Residential receptors Commercial receptors Communities
Chapter 15 Noise and Vibration	
Chapter 16 Socio-economic Recreation and Tourism	
Chapter 17 Health and Wellbeing	

Nearby Major Accident Hazard Installations

19.4.6 There are no sites that fall under the Control of Major Accident Hazard Regulations 2015 within 3 km of the Project.

Natural Hazards and Disasters

19.4.7 The Primer outlines examples of natural hazards in the UK. These have been used to guide the baseline data collection and assist with determining the likelihood of the identified risk. The main natural hazards that can disrupt infrastructure in the UK are outlined below.

Flooding

19.4.8 The Project Scoping Boundary is partly located in Flood Zone 2 and 3.The northern part of the Project is located in the hydrological catchments of the Humber Estuary. The Humber Estuary is the second largest coastal plain estuary in the UK and is a designated Special Area of Conservation (SAC), Special Protection Area (SPA), Site of Special Scientific Interest (SSSI) and Ramsar site.

19.4.9 With regard to flood risk and drainage, future baseline conditions will be forecasted, drawing on current best practice guidelines. These will consider the likely impacts of climate change on river flows, rainfall intensities, and tidal flood levels/storm surges. Further information on the baseline conditions for the Project can be found in **Chapter 10, Water Environment**.

19.4.10 For the assessment of the impact of climate change on the future physical environment, the UK guidance and projection of sea level rise and changing storm conditions are applied to the baseline.

19.4.11 Guidance on changes in future wind and wave conditions has been provided by the Environment Agency (Ref 10.13). The guidance states that wind speeds and wave height should be increased by 5% between 1990 and 2055, then by 10% for 2056 to 2115.

19.4.12 UKCP18 (Ref 18.5) provides the most up-to-date assessment of climate change up to and beyond 2100. Sea level rise data along the UK coastline are available to download from the Met Office UKCP18 website at the grid square. Sea levels are predicted to increase 1.12 m by 2100 which would threaten communities on sea cliffs and coastal plains around much of east and south coast of England.

Climate

19.4.13 Data sourced from the UK Met Office confirm the highest daily maximum temperature in the UK to be 40.3°C, recorded in Coningsby, Lincolnshire in July 2022. The lowest daily minimum temperature on record in the UK is -27.2°C recorded in Altnaharra, Scotland in December 1995.

19.4.14 Further climate information was sourced from the Met Office to help understand the climate of eastern England where this Project is located:

- mean daily maximum temperatures 6°C to 8°C (winter) and 20°C to 23°C (summer); and
- days of air frost per year: Ranges from 30 (coastal areas) to 55 (well inland).

19.4.15 Compared to the Lake District, which receives on average about 3000 mm of rain a year, much of the surrounding areas of East Yorkshire and Lincolnshire receive less than 700 mm per year. Across the region there is, on average, about 30 rain days (rainfall greater than 1 mm) in winter (December to February) and less than 25 days in summer (June to August).

19.4.16 The occurrence of snow is linked closely to temperature, with falls rarely occurring if the temperature is higher than 4°C, and temperatures below this are generally required for snow to lie for any length of time. The Met Office data indicates that snow falls around 20 days per year in low lying areas in north-east England.

19.4.17 The National Risk Register states that the UK is likely to experience a trend towards warmer winters and hotter summers (Ref 19.4). This would also lead to changing rainfall patterns, leading to heavier rainfall. Other extreme weather events such as storms and heavy snowfalls could also be expected as a result of climate change. The National Risk Register expects extreme weather events to become more frequent.

Storms and high winds

19.4.18 Being one of the most sheltered parts of the UK, the east of England usually experiences mean wind speeds of around 10 knots. Gales (a mean windspeed of 34 knots or more over 10 consecutive minutes) only occur on average two days a year in Lincolnshire, though coastal areas of the Humberside experience on average 10 days of gale a year.

19.4.19 Extreme storms are very rare in the UK; however, storms of a lower magnitude occur particularly during winter, cause issues when they do occur. In February 2020, Storms Ciara, Dennis and Jorge brought devastating floods to large swathes of Wales, northern England and the Midlands. In 2022 Storms Dudley, Eunice and Franklin brought strong winds (122 mph as recorded at the needles on the Isle of Wight) and heavy rainfall causing inland flood warnings across northern England and part of Scotland. The Environment Agency estimated that 400 properties were flooded across the country, however mitigation such as temporary flood defences had protected more than 40,000 properties.

Land instability

19.4.20 The Scoping Boundary as described in **Chapter 1, Introduction** lies within three local planning authority areas: the northern part of the Project lies within the East Riding of Yorkshire; the central part of the project lies in North Lincolnshire and the southern part of Bassetlaw District. The Project is located in areas that are predominantly rural, with large parts of the land under arable use.

19.4.21 Earthquakes in the UK are moderately frequent but are unlikely to be powerful enough to inflict severe damage. The BGS acknowledges although the UK is distant from the nearest plate boundary, the Mid-Atlantic Ridge, earthquakes in the UK occur as crustal stresses within the tectonic plates are relieved by movement occurring on pre-existing fault planes. One of the driving forces is regional compression caused by motion of the Earth's tectonic plates and uplift resulting from the melting of the ice sheets that covered many parts of Britain thousands of years ago. The Project Scoping Boundary passes through an area of low seismicity. BGS data indicate that the Project passes through areas with a Peak Ground Acceleration of 0 to 0.02 g. This is the lowest of the nine BGS seismicity categories for the UK (Ref 19.7)

Wildfire

19.4.22 The UK has a temperate climate that is not usually associated with wildfires; however, wildfires do occur annually. Wildfires generally start from human error, such as discarded cigarettes or barbeques, when ground conditions are dry after extended periods of hot, dry weather, when vegetation may have increased susceptibility to fire.

19.5 Scoping Methodology

19.5.1 In order to understand the initial risk with regards to major accidents and disasters an initial scoping screening exercise has been undertaken to identify and review the sources outlined in **Table 19.1** and the results of this scoping exercise are included as **Appendix 19.A Major Accidents and Disasters Scoping Table**. The appendix outlines the potential vulnerability of the Project to the natural, man-made and technological risks and hazards. Each hazard is assessed to identify the risk or interaction that could result in a major accident or disaster.

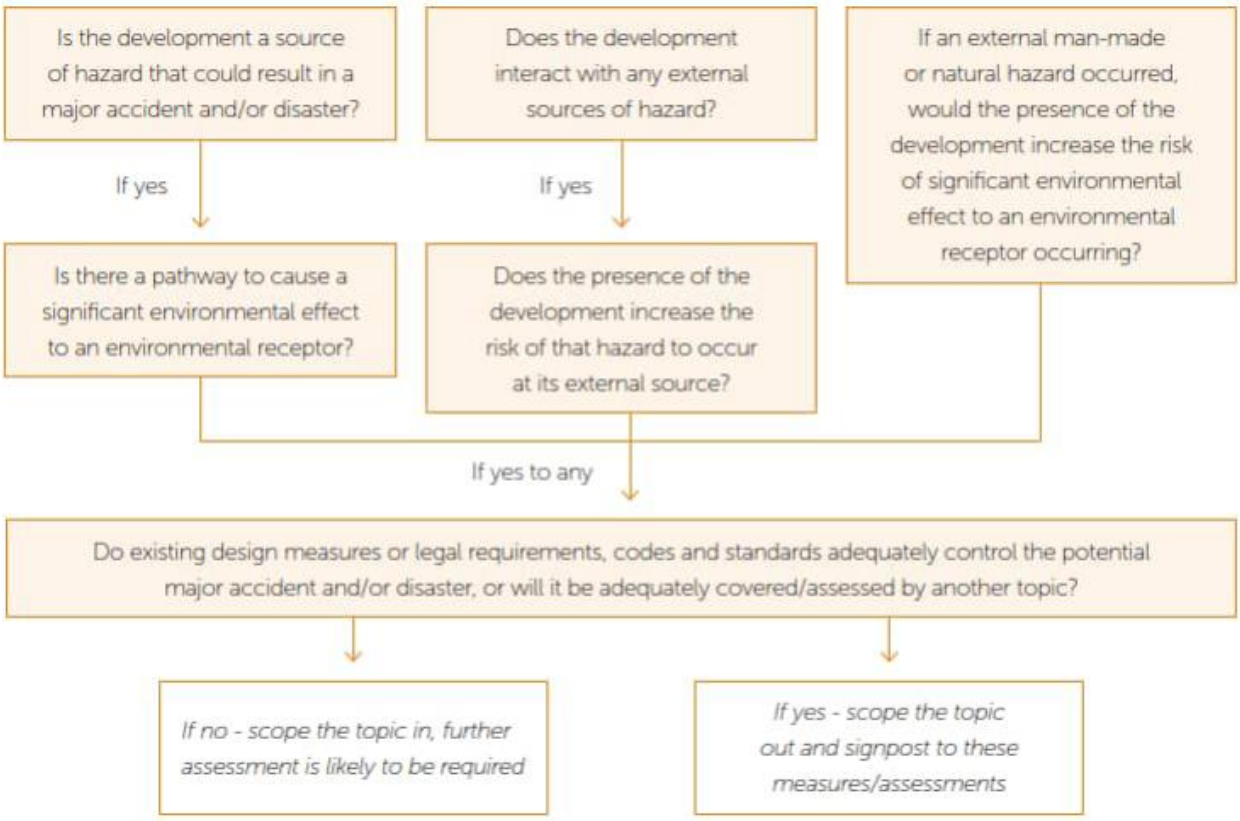
Establishing the proposed scope of assessment

19.5.2 This scoping exercise focuses on identifying the potential impact sources (the Project itself or other existing hazard sources) and the impact pathways that exist between these and potential receptors, that could lead to a significant environmental effect occurring. It then considers whether existing legal requirements and codes and standards are sufficient to control risks.

19.5.3 Each hazard was screened in turn to identify whether the Project is a potential source of hazard that could result in a major accident or disaster, or whether the Project could interact with any external source of hazard. The potential for the Project to result in the potential significant effects described in this section considers the embedded and control and management measures described in the Outline Code of Construction Practice (**Appendix 4.A Outline Code of Construction Practice**).

19.5.4 Details of each of these stages are set out in the methodology set out within the Primer in **Image 19.1**.

Image 19.1 Scoping decision process flow (Ref 19-1)



19.6 Potential for Significant Effects

19.6.1 The scoping exercise presented in **Appendix 19.A Major Accidents and Disasters Scoping Table** has not identified any hazard/events that would have the potential to result in significant effects and that are proposed to be scoped into the ES. The Project is unlikely to cause a major accident or disaster that would result in likely significant effects to the environment, as it will be subject to appropriate design measures and compliance with legislation and best practice, and in most instances, there is no source-pathway-receptor linkage to trigger such effects.

19.7 Proposed Assessment Methodology

19.7.1 **Appendix 19.A Major Accidents and Disasters Scoping Table** does not identify any hazard/events that are proposed to be scoped into the assessment. During the project development new sources of hazards or events could emerge and these would be considered and scoped in at a later stage, if needed, and assessed using a staged approach as set out below:

- identify the potential risk events related to the major event types;
- screen the risk events;
- define the reasonable worst consequence should the event occur;

- identify all cross-disciplinary impacts;
- identify mitigation measures, management and, if possible, prevention;
- assess the likelihood; and
- determine the risk has been mitigated to as low as reasonably practical and identify any residual risks and their significance.

19.7.2 In the event of a hazard needing to be considered the ES would include a detailed methodology for the assessment of all major accidents and disasters, based on the guiding principles outlined above. Any limitations of the assessment of major accidents and disasters would also be clearly presented.

19.8 Conclusion

19.8.1 **Appendix 19.A Major Accidents and Disasters Scoping Table** summarises the hazard/events that are proposed to be scoped out of the assessment. No hazard/event is proposed to be scoped into the ES. The scoping assessment has shown that the vulnerability of the Project to major accidents and disasters can be mitigated or reduced by the processes and standards in place. It also outlines that the Project is unlikely to generate any potential significant effects on the environment if a major accident or disaster were to occur. The potential effects that are proposed to be scoped out of the assessment are summarised in **Table 19.3**.

Table 19.3 Proposed scope of the assessment

Receptor	Potential for significant effect	Project phase(s)	Proposed to be scoped in/out
The Project	No potential vulnerability of the project to a major accident or disaster as set out in **Appendix 19.A**.	Construction, operation and maintenance.	Scoped out
Receptors listed in **Table 19.2**	No potential for the Project to exacerbate existing hazard as set out in **Appendix 19.A**.	Construction, operation and maintenance.	Scoped out

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Glossary

Term	Definition
Abnormal Indivisible Loads (AIL)	Large loads to be delivered to the construction site which by their nature cannot be broken into smaller multiple deliveries.
Above Ordnance Datum (AOD)	An Ordnance Datum or OD is a vertical datum used by an ordnance survey as the basis for deriving altitudes on maps. A spot height may be expressed as AOD. Usually mean sea level is used for the datum.
Acoustic environment	The sound with contribution from all sources, as modified by the current environment and associated conditions. This is related to the ambient sound, which is the totally encompassing sound in a given situation at a given time, usually composed of sound from many sources near and far.
Acute health effect	An adverse health effect that manifests itself immediately or shortly after exposure to a causative factor (e.g., soil contamination). Associated with short-term exposures.
Additional measures	Further measures required in order to achieve the anticipated outcome. These may be implemented as part of the development consent or through inclusion in the ES. These are referred to as ‘secondary measures’ in accordance with Institute of Environmental Management and Assessment (IEMA) guidelines.
Agricultural Land Classification (ALC)	A standardised method for classifying agricultural land according to its versatility, productivity, and workability, based upon inter-related parameters including climate, relief, soil characteristics and drainage. These factors form the basis for classifying agricultural land into one of five grades (with Grade 3 land divided into Subgrades 3a and 3b), ranked from excellent (Grade 1) to very poor (Grade 5). ALC is determined using the MAFF Agricultural Land Classification of England and Wales: Revised guidelines and criteria for grading the quality of agricultural land,1988.
Air Quality Management Areas (AQMAs)	If a local authority finds any places where the Air Quality Objectives (AQO) are not likely to be achieved, it must declare an AQMA there. This area could be just one or two streets, or it could be much bigger. Then the local authority will put together a plan to improve the air quality - a Local Air Quality Action Plan (AQAP).
Air Quality Objectives (AQO)	The AQOs are policy targets often expressed as a maximum ambient concentration not to be exceeded, either without exception or with a permitted number of exceedances, over a specified averaging period.
Air Quality Standards (AQS)	The AQS Regulations report limit values at differing averaging periods for certain pollutants. There are limits provided for the

Term	Definition
	protection of human health for SO_2, NO_2, Benzene, CO and Pb. Target values have been set for the concentration of $PM_{2.5}$.
Annex 1 habitat	Annex 1 Habitat refers to a habitat as defined under the EU Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora.
Archaeological Interest	A heritage asset with value from the potential to hold evidence about the past that can be retrieved though specialist investigation.
Architectural/Artistic Interest	A heritage asset with value from contemporary appreciation of a heritage asset's aesthetics.
Area of Outstanding National Beauty (AONB)	An AONB is land protected by the Countryside and Rights of Way Act 2000 (CRoW Act). It protects the land to conserve and enhance its natural beauty.
Artificial ground	Deposits that have accumulated or been placed through human activity.
Associated development	Development which is associated with a Nationally Significant Infrastructure Project (NSIP), as defined in the Planning Act 2008. It should be subordinate to, and necessary for, the construction and/or the effective operation of the NSIP that is the subject of the Development Consent Order (DCO) application.
Background sound/noise level	The A weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T, measured using time weighting F and quoted to the nearest whole number of decibels. This represents the underlying sound level in the absence of contributions from the sound source under assessment relating to the residual sound level but characterised by LA90,T.
Baseline	The situation prevailing before the Project is commenced (the current baseline), and also to the situation that would prevail in the future without the Project (the projected future baseline).
Best and Most Versatile (BMV) agricultural land	Defined as land of excellent (ALC Grade 1), very good (Grade 2) and good (Subgrade 3a) agricultural quality. BMV agricultural land is afforded a degree of protection against development within planning policy.
Biodiversity Net Gain (BNG)	BNG is an approach to development which aims to leave nature in a better state than it was before the project was completed. National Grid has made a commitment to delivering a BNG target of 10% above baseline on its development projects (as agreed with Ofgem).
Birds of Conservation Concern	Quantitative criteria are used to assess the population status of bird species found in the UK, which are placed on the red, amber or green list. With those on the red list being at most risk.
Bronze Age	-2,600 to -700

Term	Definition
Cable Sealing End Compound (CSEC)	Electrical infrastructure used as the transition point between overhead lines and underground cables. A compound on the ground acts as the principal transition point.
Construction Environmental Management Plan (CEMP)	The purpose of the CEMP is to outline how construction of the Project will avoid, minimise or mitigate effects on the environment and surrounding area. The CEMP will detail the implementation of measures in accordance with environmental commitments outlined in the ES. It is a 'live' document which is to be reviewed and updated at regular intervals throughout the Project life cycle.
Corridor	A broad area, within which a new overhead line could be routed.
Cumulative effects	There are two types of effect, intra-project effects and inter-project effects. The former occurs as a result of two or more impacts acting together (i.e., combined), to result in a new or changed effect on a single receptor. The latter arise as a result of the Project in combination with other large-scale developments or projects.
Decibel (dB)	Noise is conventionally measured in decibels (dB). The ratio between the quietest audible sound and the loudest tolerable sound is a million to one in terms of the change in sound pressure. Due to this wide range, a scale based on logarithms is used in noise level measurement. The scale used is the dB scale which extends from 0 to 140dB corresponding to the intensity of the sound pressure level.
Demographic	Relating to the structure of populations.
Development Consent Order (DCO)	Where the Secretary of State (SoS) proposes to grant consent for a NSIP, this will be through a DCO which is normally made as a statutory instrument – a form of secondary legislation. The DCO not only provides planning consent for the Project but may also incorporate other consents and include authorisation for the compulsory acquisition of land.
Direct effects	Direct effects are those that result directly from the Project.
Double tee	A connection from both circuits on either side of the same structure, creating a third and fourth circuit on another structure.
Driver delay	Traffic delays to non-development traffic.
Dust	Generic term used to describe larger non-respirable airborne particulates (typically those which are deposited rapidly and normally associated with soiling/marking of property, cars, vegetation etc.).
Early Medieval	410 to 1066 CE
Effects	For the purposes of the EIA and this Scoping Report, the term 'effects' are the consequences of changes (e.g., habitat becomes degraded by changes in drainage pattern).
Electricity System Operator (ESO)	Body required to support and guide the future development of the electricity transmission system in Britain.

Term	Definition
Electricity Ten Year Statement (ETYS)	The Electricity Ten Year Statement (ETYS) is the ESO's view of future transmission requirements and the capability of Great Britain's National Electricity Transmission System (NETS) over the next 10 years. Using the data from the Future Energy Scenarios (FES), points on the transmission network are identified where more transfer capacity is needed to continue to deliver electricity reliably from where it is generated to where it is needed.
Electricity transmission system	The electricity transmission system is made up largely of 400 kV, 275 kV and 132 kV assets connecting separately owned generators and interconnectors with the demand for electricity fed directly from the transmission system, and distribution systems. The 'transmission' classification applies to assets at 132 kV or above in Scotland or offshore. In England and Wales, it relates to assets at 275 kV and above. The electricity transmission system is designed to make sure there is sufficient transmission capacity to ensure that the system can be operated in an economic and efficient way by the ESO, ensuring power can be moved from where it is generated to demand centres across Britain. This planning and development of the electricity transmission system is governed by the Security and Quality of Supply Standard (SQSS) which ensure that the network is developed and operated securely and is resilient to any foreseeable network faults and disruption.
Electromagnetic fields (EMF)	Electric fields are created by differences in voltage: the higher the voltage, the stronger will be the resultant field. Magnetic fields are created when electric current flows: the greater the current, the stronger the magnetic field. An electric field will exist even when there is no current flowing. If current does flow, the strength of the magnetic field will vary with power consumption, but the electric field strength will be constant.
Embedded measures	Modifications to the location, design or operation of the development identified during the iterative design process in order to prevent or reduce likely adverse effects, and that are an inherent part of the Project. These are referred to as 'primary measures' in accordance with IEMA guidelines and will be embedded within the design of the Project. In addition, best practice/industry standard measures also form embedded mitigation.
Environmental Gain (EG)	National Grid has defined 'Environmental Gain' with Ofgem as being an amalgam of BNG and the status of Natural Capital (NC). This sees a simple formula being used to calculate overall EG.
Environmental Impact Assessment (EIA)	An EIA is a tool for systematically examining and assessing the impacts and effects of a development on the environment. The objective of the EIA is to identify any likely significant effects which may arise from the Project and identify measures to prevent, reduce or offset any adverse effects.

Term	Definition
Environmental Statement (ES)	The outcome of the EIA process is reported within a document called an ES.
Fear and intimidation	In the context of traffic and transport, these may be experienced by people as a result of an increase in traffic volume and its proximity or the lack of protection caused by such factors as narrow pavement widths.
Flood Risk Assessment (FRA)	The FRA will assess the flood risk both to and from the Project and demonstrate how that flood risk will be managed over the Project's lifetime.
Future baseline	This is the theoretical situation that would exist in the absence of the Project. This is based upon extrapolating the current baseline using technical knowledge of likely changes over the identified period (for example anticipated habitat change over time, climate change projections, traffic and waste volume growth over time, etc.).
Future Energy Scenarios (FES)	Published annually by the ESO the Future Energy Scenarios sets out credible ways that the UK can achieve Net Zero by 2050, as well as the UK Government's commitment to a decarbonised electricity system by 2035. Based on extensive stakeholder engagement, research and modelling, each scenario considers how much energy might be needed; where it could come from; and how we maintain a system that is reliable.
Good practice measures	Actions that would occur with or without input from the EIA feeding into the design process. These include actions that will be undertaken to meet other existing legislative requirements or actions that are considered to be standard practice used to manage commonly occurring environmental effects. These are referred to as 'tertiary measures' in accordance with the IEMA guidelines and would also be embedded within the design of the Project.
Graduated swathe	Indicates the broad areas where the components of the new overhead lines forming part of the Project are more likely to be located.
Ground gas	A general term to include all gases occurring and generated within the ground whether originating from Made Ground or from natural soil or rock. Typically used to mean only potentially hazardous ground gases, such as carbon dioxide, methane, hydrogen sulphide and carbon monoxide.
Habitat of Principal Importance (HPI)	HPI are covered under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. The term is interchangeable with 'UK Priority BAP Habitat', 'Section 41 habitat' and 'NERCs41 habitat'.
Habitats Regulations Assessment (HRA)	A HRA refers to the several distinct stages of Assessment which must be undertaken in accordance with the Conservation of Habitats and Species Regulations 2017 (as amended) and the Conservation of Offshore Marine Habitats and Species Regulations 2017 (as

Term	Definition
	amended) to determine if a plan or project may affect the protected features of a habitats site before deciding whether to undertake, permit or authorise it.
Heavy Duty Vehicle (HDV)	Goods vehicles and buses >3.5 t gross vehicle weight.
Heritage Significance	The significance of a heritage asset is the product of the value it holds for this and future generations as a result of its historic, archaeological, architectural or artistic interests.
Historical Interest	A heritage asset with value from its association with past events or past people; or where a heritage asset is illustrative of a particular asset type, theme, or period.
Impacts	For the purposes of the EIA and this Scoping Report, the term 'impacts' is used to describe the changes that arise as a result of the Project (e.g., changes in drainage pattern).
Index of Multiple Deprivation (IMD)	The IMD is the official measure of relative deprivation for small areas (neighbourhoods) in England. The IMD are calculated based on the following factors: income deprivation, employment, health and disability, education, skills and training, barriers to housing and services, crime and living environment.
Indirect and secondary effects	Indirect and secondary effects are those which are not caused immediately by the Project but arise as a consequence of it. As such they would normally occur later in time or at locations farther away than direct effects. An example would be where water or gas pipes are damaged as a result of the Project, and the consequence of that damage is fire or flood risk to other receptors.
Inter-project effects	Arise as a result of the Project in combination with other large-scale developments or projects.
Intra-project effects	Effects that occur as a result of two or more impacts acting together (i.e., combined, to result in a new or changed effects on a single receptor).
Iron Age	-800 BCE to 43 CE
Kilovolts (kV)	A unit of electromotive force, equal to 1,000 volts.
Landscape Character Area (LCA)	Discrete geographical areas of a particular landscape type with a broadly consistent character, which might include pattern of topography, land use, vegetation cover, geology, cultural and ecological features, pattern of evolution, visual and perceptual qualities and habitats.
Landscape Character Type (LCT)	Generic, typically homogenous types of landscape that may occur in different parts of the country. They have similar geology, topography, drainage patterns, vegetation, land use, patterns of settlement and aesthetic character.

Term	Definition
Light Duty Vehicle (LDV)	Cars and small vans <3.5 t gross vehicle weight.
Listed Building	A building or structure of special historical or architectural/artistic interest. Designated by the Department for Digital, Culture, Media and Sport. All buildings built before 1700 which survive in anything like their original condition are likely to be listed, as are most buildings built between 1700 and 1850.
Local Geological Sites	A non-statutory designation for regionally important geological and geomorphological sites that have been identified as being of importance locally.
Local Wildlife Site (LWS)	Non-statutory nature conservation sites of local value.
Lower Layer Super Output Area (LSOA)	LSOAs are a geographic hierarchy designed to improve the reporting of small area statistics in England and Wales.
Lowest Observed Adverse Effect Level (LOAEL)	This is the level above which adverse effects on health and quality of life can be detected.
Medieval	1066 to 1540 CE
Mesolithic	-10,000 to -4,000 BCE
Modern	1901 to present
National Cycle Network (NCN)	The NCN is a UK-wide network of signed paths and routes for walking, cycling, wheeling and exploring outdoors.
National Grid Electricity Transmission (NGET) ('National Grid')	National Grid operate the national electricity transmission network across Great Britain and own and maintain the network in England and Wales, providing electricity supplies from generating stations to local distribution companies. National Grid does not distribute electricity to individual premises, but its role in the wholesale market is vital to ensuring a reliable, secure and quality supply to all.
Nationally Significant Infrastructure Project (NSIP)	NSIPs are developments (relating to energy, transport, water, or waste) which are identified in the Planning Act 2008 and require a type of consent known as "Development Consent".
National Site Network (NSN)	The national site network includes all existing and future SACs and SPAs following the replacement of the EU Habitats and Wild Birds Directives with UK regulation.
Natural Superficial Deposits	Geologically recent deposits that consist of various sediments (clay, sand, gravel etc.) and sit on top of the bedrock.
Neolithic	-4,000 to -2,200 BCE
Nitrous Dioxide (NO_2)	Reddish brown gas (in high concentrations), respiratory irritant and precursor to photochemical processes which produce other pollutants, photochemical smog and contribute to global warming.
Nitrous Oxide (NO_x)	Inert product of combustion, which does not contribute to local air

Term	Definition
	pollution.
Non-Road Mobile Machinery (NRMM)	A broad category which includes mobile machines, and transportable industrial equipment or vehicles which are fitted with an internal combustion engine and not intended for transporting goods or passengers on roads.
Options appraisal	A robust and transparent process used to compare options and to assess the positive and negative effects they may have across a wide range of criteria including environmental, socio-economic, technical and cost factors. The outcome is to identify a Strategic Proposal for the Project.
Options Identification and Selection	Work undertaken to determine the preferred corridor and preliminary routeing and siting options for the Project. It is intended to demonstrate how National Grid's statutory duties, licence obligations, policy considerations, environmental, socio-economic, technical, cost, and programme issues have been considered and provide information on the approach to the identification and appraisal of route corridors and siting locations.
Overhead line	Conductor (wire) carrying electric current, strung from pylon to pylon.
Palaeolithic	-1,000 000 to -10,000 BCE
Particulate matter (PM_{10} and $PM_{2.5}$)	PM is the term used to describe condensed phase (solid or liquid) particles suspended in the atmosphere. Their potential for causing health problems is directly linked to the size of the particles. PM_{10} is particulate matter with a diameter of 10 microns or less (also referred to as micrometres or $1/1000^{th}$ of a meter). $PM_{2.5}$ is particulate matter 2.5 microns or less in diameter.
Pathway (for contamination)	A route or means by which a receptor could be, or is, exposed to or affected by a contaminant.
Pedestrian amenity	The effect on the relative pleasantness of a pedestrian journey as a result of changes in traffic flow, traffic composition and pavement width/separation from traffic.
Pedestrian delay	The ability of people to crossroads as a result of changes in traffic volume, composition and speed, the level of pedestrian activity, visibility and general physical conditions.
Permanent effects	These are effects that will remain even when the Project is complete, although these effects may be caused by environmental changes that are permanent or temporary.
Phytotoxic	Displaying toxicity towards plants.
Post Medieval	1540 to 1901
Power control devices	Power control devices are designed to increase or decrease the apparent reactance of a line, thereby pushing power away from or pulling more power towards the circuit on which they are installed.

Term	Definition
Project Need Case	Sets out the reasons why the Project is required.
Public Rights of Way (PRoW)	These are designated routes under the CRoW Act 2000, which the public can use at any time.
Pylon	Overhead line structure used to carry overhead electrical conductors, insulators and fittings.
Radon	A naturally occurring radioactive chemical element, which occurs as a gas.
Ramsar sites	Wetlands of international importance designated under the Ramsar Convention.
Rating level	The specific sound level, with the addition of character corrections to consider certain acoustic features that could potentially increase the significance of impact. If no acoustic features are present, then the rating level is equal to the specific sound level.
Receptor	A component of the natural or man-made environment such as water or a building that is affected by an impact.
Reconductoring	The replacement of old conductors (wires), insulators, earthwires, etc on an existing overhead line.
Registered Battlefield	Register of nationally significant military engagements maintained and designated by Historic England.
Registered Park and Garden	Register of historic parks, gardens, grounds, and planned open spaces maintained and designated by Historic England.
Road links	A linear spatial object that describes the geometry and connectivity of a road network between two points in the network.
Rochdale Envelope	The ‘Rochdale Envelope’ or ‘Design Envelope’ approach is employed where the nature of a proposed development means that some details of a project have not been confirmed (for instance, the precise dimensions of structures) when an application is submitted, and flexibility within clearly defined parameters is therefore sought to address uncertainty.
Romano-British	43 to 410 CE
Root Protection Area (RPA)	A notional area of tree root spread (as calculated per BS5837) considered as the minimum volume necessary to ensure tree health and function.
S41 of NERC Act	Section 41 of the NERC Act 2006 lists species of principal importance in England for the purpose of conserving biodiversity.
Schedule 1 Species	Bird species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), for which it is an offence to intentionally or recklessly disturb birds and their young at, on or near an ‘active’ nest.

Term	Definition
Scheduled monument	Nationally important archaeological sites. Designated by the Department for Digital, Culture, Media and Sport. These can be above or below-ground and do not need to be ancient.
Scoping Opinion	A Scoping Opinion is requested from the Planning Inspectorate on behalf of the SoS, to inform the requirements of EIA process and ultimately the ES which will be submitted as part of the application for development consent. Through the scoping process the views of the statutory consultees and other relevant organisations on the proposed scope of the EIA are sought.
Scoping Boundary	A Scoping Boundary has been defined to represent the likely maximum extent of development.
Security and Quality of Supply Standard (SQSS)	The SQSS sets out a coordinated set of criteria and methodologies that the Transmission Licences shall use in the planning and operation of the national electricity transmission system.
Setting	The surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate an asset, or may be neutral.
Severance	The separation of people from places and other people and places or impede pedestrian access to essential facilities.
Significant Observed Adverse Effect Level (SOAEL)	This is the level above which significant adverse effects on health and quality of life occur.
Site of Special Scientific Interest (SSSI)	An area of land designated by Natural England as of special interest by reason of its flora, fauna or geological or physiographical features.
Siting Area	An area of land within which a new cable sealing end compound or substation could be sited.
Source (of contamination)	A substance that is in, on or under the land and that has the potential to cause harm or to cause pollution of Controlled Waters.
Special Areas of Conservation (SACs)	Protected areas in the UK designated under the Conservation of Habitats and Species Regulations 2017 (as amended) in England and Wales.
Special Protection Areas (SPA)	Protected areas for birds in the UK classified under the Wildlife & Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017 (as amended) in England and Wales.
Species of Principal Importance (SPI)	Covered under Section 41 of the NERC Act 2006. The term is interchangeable with ‘UK Priority BAP Species’, ‘Section 41 species’ and ‘NERCs41 species’.

Term	Definition
Specific sound level	The equivalent continuous A-weighted sound pressure level produced by a specific sound source (i.e., the sound source under assessment in accordance with BS 4142:2014) at the assessment location over a given reference time interval, Tr.
Strategic Proposal	The outcome of the strategic options appraisal; the Strategic Proposal is then taken forward to the Options Identification and Selection stage.
Strategic Road Network (SRN)	The SRN is made up of motorways and trunk roads (the most significant 'A' roads).
Substation	Electrical equipment in an electric power system through which electrical energy is passed for transmission, transformation, distribution or switching.
Temporary effects	These are effects that are related to environmental changes associated with a particular activity and that will cease when that activity finishes.
Transboundary effects	Transboundary effects are those effects that would affect the environment in another state within the European Economic Area (EEA).
Tree Preservation Order (TPO)	A statutory designation protecting trees, administered by the relevant local planning authority.
Underground Cable	An insulated conductor carrying electric current designed for underground installation.
Vibration	Vibration is an oscillatory motion. The magnitude of vibration can be defined in terms of displacement, i.e., how far from the equilibrium something moves, velocity (how fast something moves), or acceleration (the rate of change of velocity).
World Heritage Site	A natural or man-made site, area, or structure recognised as being of outstanding international importance and therefore as deserving special protection. Sites are nominated to and designated by the World Heritage Convention.
Zone of Influence (ZoI)	An identified geographical area around the Project where there is a potential for impacts to occur.
Zone of Theoretical Visibility (ZTV)	The likely (or theoretical) extent of visibility of a development, usually shown on a map.

National Grid plc
National Grid House,
Warwick Technology Park,
Gallows Hill, Warwick.
CV34 6DA United Kingdom

Registered in England and Wales
No. 4031152
nationalgrid.com