



Adlingfleet Wind Farm

Environmental Impact Assessment Scoping Report

Vattenfall Wind Power Ltd

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Basis of Report

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Acronyms and Abbreviations

Term	Definition
ACB	Areas that Could Become of Particular Importance for Biodiversity
AGL	Above Ground Level
AILV	Abnormal Indivisible Load Vehicle
AIP	Aeronautical Information Publication
ALC	Agricultural Land Classification
AMSL	Above Mean Sea Level
ANO	Air Navigation Order
ANSP	Air Navigation Service Provider
AOD	Above Ordnance Datum
Aol	Area of Influence
AONB	Area of Outstanding Natural Beauty (National Landscape)
APDO	Approved Procedure Design Organisation
APIB	Areas of Particular Importance for Biodiversity
ARWTN	Assessment and Rating of Wind Turbine Noise
ATC	Automatic Traffic Count
ATS	Air Traffic Service
BESS	Battery Energy Storage System
BGS	British Geological Survey
BMV	Best and Most Versatile
BNG	Biodiversity Net Gain
BoCC	Birds of Conservation Concern
BS	British Standard
BTO	British Trust for Ornithology
CA	Conservation Area
CAA	Civil Aviation Authority
cd	Candela
CEMP	Construction Environmental Management Plan
CIEEM	Chartered Institute of Ecology and Environmental Management
ClfA	Chartered Institute for Archaeologists
CIRIA	Construction Industry Research and Information Association
CNS	Communication, Navigation and Surveillance
CoPA	Control of Pollution Act 1974
CRH	Collision Risk Height
CROW	Countryside and Rights of Way Act 2000
CTMP	Construction Traffic Management Plan



Term	Definition
dB	Decibel
DBW	Daytime Bat Walkover
DCO	Development Consent Order
DECC	Department of Energy and Climate Change
DfT	Department for Transport
DMRB	Design Manual for Roads and Bridges
DNO	Distribution Network Operator
DSA	Doncaster Sheffield Airport
EA	Environment Agency
EC	European Commission / European Community (as applicable to legislation cited)
EclA	Ecological Impact Assessment
ECoW	Ecological Clerk of Works
eDNA	Environmental DNA
EHO	Environmental Health Officer
EIA	Environmental Impact Assessment
ELC	European Landscape Convention
EPA	Environmental Protection Act 1990
ERYC	East Riding of Yorkshire Council
ES	Environmental Statement
ETSU-R-97	The Assessment and Rating of Noise from Wind Farms
FCS	Favourable Conservation Status
FRA	Flood Risk Assessment
GCN	Great Crested Newt
GCR	Geological Conservation Review
GIS	Geographic Information System
GLNP	Greater Lincolnshire Nature Partnership
GLVIA3	Guidelines for Landscape and Visual Impact Assessment: Third Edition
GVA	Gross Value Added
GWD	Groundwater Directive
GWDTE	Groundwater Dependent Terrestrial Ecosystem
HB	Height Band
HER	Historic Environment Record
HGV	Heavy Goods Vehicle
HMP	Habitat Management Plan
HRA	Habitats Regulations Assessment
HSI	Habitat Suitability Index



Term	Definition
IDB	Internal Drainage Board
IEF	Important Ecological Feature
HEMA	Institute of Environmental Management and Assessment (<i>now ISEP</i>)
IfA	Institute of Archaeologists
IFP	Instrument Flight Procedure
IHBC	Institute of Historic Building Conservation
IHS	Inner Horizontal Surface
ILA	Important Landscape Areas
IMD	Index of Multiple Deprivation
INNS	Invasive Non-Native Species
IoA	Institute of Acoustics
IoA GPG	Institute of Acoustics Good Practice Guide
IOF	Important Ornithological Feature
ISEP	Institute of Sustainability and Environmental Professionals
km	kilometre
LA	Local Authority
LA90,T	A-weighted noise level exceeded for 90% of the measurement period T
LCA	Landscape Character Area
LCRM	Land Contamination Risk Management
LDP	Local Development Plan
LGV	Light Goods Vehicle
LHA	Local Highway Authority
LI	Landscape Institute
LiDAR	Light Detection and Ranging
LLFA	Lead Local Flood Authority
LLV	Lower Limiting Value
LNR	Local Nature Reserve
LNRS	Local Nature Recovery Strategy
LPA	Local Planning Authority
LRC	Local Record Centre
LVIA	Landscape Visual Impact Assessment
LWS	Local Wildlife Site
m	metres
MAGIC	Multi-Agency Geographic Information for the Countryside
MOD	Ministry of Defence
MRA	Mining Remediation Authority
MSA	Mineral Safeguarding Area



Term	Definition
MW	megawatts
NBN	National Biodiversity Network
NCN	National Cycle Network
NERC	Natural Environment and Rural Communities Act 2006
NESO	National Energy System Operator
NEYEDC	North and East Yorkshire Ecological Data Centre
NGR	National Grid Reference
NHLE	National Heritage List for England
NLC	North Lincolnshire Council
NLCA	National Landscape Character Area
NM	Nautical Mile
NNR	National Nature Reserve
NPPF	National Planning Policy Framework
NPS	National Policy Statement
NPSE	Noise Policy Statement for England
NRTF	National Road Traffic Forecasts
NSR	Noise Sensitive Receptor
NTS	Non-Technical Summary
OCA	Obstacle Clearance Altitude
OLS	Obstacle Limitation Surfaces
OMP	Operational Management Plan
ONS	Office for National Statistics
OPEMP	Operational Phase Environmental Management Plan
OS	Ordnance Survey
PIA	Personal Injury Accident
PLQRA	Preliminary Land Quality Risk Assessment
PMP	Peat Management Plan
PPEIRP	Pollution Prevention and Emergency Incident Response Plan
PPG	Planning Practice Guidance
PRoW	Public Right of Way
PSR	Primary Surveillance Radar
PWS	Private Water Supply
qPCR	Quantitative Polymerase Chain Reaction
RLoS	Radar Line of Sight
RPG	Register of Parks and Gardens (Historic England)
RPZ	Root Protection Zone
RSPB	Royal Society for the Protection of Birds



Term	Definition
RVAA	Residential Visual Amenity Assessment
SAC	Special Area of Conservation
SEPA	Scottish Environment Protection Agency
SGS	Supplementary Guidance Notes
SLA	Special Landscape Area
SM	Scheduled Monument
SNH	Scottish Natural Heritage
SPA	Special Protection Area
SPG	Supplementary Planning Guidance
SPZ	Source Protection Zone
SQ	Special Quality
SRN	Strategic Road Network
SSEW	Soil Survey of England and Wales
SSNL	Site Specific Noise Limit
SSR	Secondary Surveillance Radar
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Drainage Systems
TCPA	Town and Country Planning Application
TEMPro	Trip End Model Presentation Program
TNAC	Total Noise Assessment Criteria
UK	United Kingdom
UXO	Unexploded Ordnance
VP	Vantage Point
WCA	Wildlife and Countryside Act 1981
WeBS	Wetland Bird Survey
WFD	Water Framework Directive
WHS	World Heritage Site
WTG	Wind Turbine Generator
ZoI	Zone of Influence
ZTV	Zone of Theoretical Visibility



1.0 Introduction

1.1 Background and Context

- 1.1.1 Vattenfall Wind Power Ltd (the 'Applicant') is intending to submit an application under the Town and Country Planning Act 1990 to construct and operate a wind farm and associated infrastructure (the 'Proposed Development') on land located in the Humberhead Levels. The Proposed Development site ('the Site') is located across the administrative boundaries of East Riding of Yorkshire Council (ERYC) and North Lincolnshire Council (NLC). **Figure 1.1** shows the Site location and Site boundary for scoping purposes. The administrative boundaries of ERYC and NLC are also shown for reference. This Scoping Report accompanies a request for a formal Scoping Opinion from ERYC and NLC under Regulation 15 of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017. The Scoping Opinion is sought to inform an Environmental Statement (ES) to accompany a future planning application for the Proposed Development.
- 1.1.2 For the purposes of identifying scope, a maximum of 8 wind turbines has been assumed, each with a maximum blade tip height of 200 metres (m) and an indicative installed capacity for each wind turbine of 7 megawatts (MW). In addition to the proposed wind turbines, it is assumed for this Scoping Report that the Proposed Development would comprise associated works and infrastructure including: crane hardstandings; access tracks; cabling; borrow pits; construction compounds; a substation compound containing electrical infrastructure; control building; welfare facilities; a communications mast; and a battery energy storage system.
- 1.1.3 The parameters presented within this Scoping Report represent a realistic worst-case development envelope for Environmental Impact Assessment (EIA) purposes. The final installed capacity, number, size and layout of turbines, together with the location and design of associated infrastructure, will be refined through an iterative design process informed by environmental constraints, technical considerations, stakeholder engagement and the findings of the EIA. The final layout and design of the Proposed Development will seek to achieve an appropriate balance between environmental, technical and commercial considerations.
- 1.1.4 The applicable legislation is the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended) (hereafter referred to as the 'EIA Regulations'). The Proposed Development falls within Schedule 2, Part 3 (a) of the EIA Regulations. By virtue of the scale and nature of the Proposed Development and its potential to give rise to significant environmental effects, the Applicant has adopted a precautionary approach and determined that the Proposed Development should be subject to EIA. The EIA Regulations make provision for the Applicant to seek a formal opinion from the determining authority, in this case ERYC and NLC, on the content of the EIA and resulting ES.
- 1.1.5 This request for an EIA Scoping Opinion has been submitted by the Applicant in accordance with Regulation 15 of the EIA Regulations and the principal objective of Scoping is to explain the likely significant effects arising as a result of the Proposed Development and the scope of assessments that should be included within the EIA. The EIA Planning Practice Guidance (Ministry of Housing, Communities and Local Government, 2020) notes in paragraph 035 Reference ID: 4-035-20170728 that:

"Whilst every Environmental Statement should provide a full factual description of the development, the emphasis should be on the "main" or "significant" environmental effects to which a development is likely to give rise. The Environmental Statement should be proportionate and not be any longer than is necessary to assess properly those effects. Where, for example, only one environmental factor is likely to be significantly affected, the assessment should focus on that issue only. Impacts which have little or no significance for



the particular development in question will need only very brief treatment to indicate their possible relevance has been considered.”

1.1.6 Where an EIA Scoping Opinion is adopted, the ES must be based on that opinion (Regulation 18(4)(a) of the EIA Regulations) where the project remains materially the same. In the preparation of this Scoping Report, it has been assumed that the EIA will be undertaken in accordance with the requirements of the EIA Regulations, which have informed this Scoping Report, along with the prevailing EIA Planning Practice Guidance. In accordance with Regulation 15(2)(a) of the EIA Regulations, the following information is provided in this Scoping Report:

- a plan sufficient to identify the land;
- a brief description of the nature and purpose of the development, including its location and technical capacity;
- an explanation of the likely significant effects of the development on the environment; and
- such other information or representations that the person making the request may wish to provide or make.

1.1.7 The EIA Regulations require that ERYC and NLC consult on the proposed scope of the EIA with statutory consultation bodies as a minimum and any other bodies that are considered necessary. Responses gathered as part of the consultation process will be reviewed by ERYC and NLC, prior to issue of a formal Scoping Opinion.

1.2 Need for the Development

1.2.1 The UK Government is committed to delivering a secure, affordable and decarbonised energy system, with a legally binding target to achieve net zero greenhouse gas emissions by 2050.

1.2.2 A substantial increase in the deployment of renewable energy generation is required to meet these targets. This is supported through a range of national policy documents, including: the Energy White Paper (Department for Energy Security and Net Zero, 2020); the Net Zero Strategy (Department for Energy Security and Net Zero, 2021); and more recent updates to energy security policy, including the British Energy Security Strategy (Department for Energy Security and Net Zero, 2022); and Powering Up Britain (Department for Energy Security and Net Zero, 2023). These documents emphasise the urgent need to expand domestic renewable energy generation to enhance energy security, reduce reliance on fossil fuels, and support the transition to a low carbon economy.

1.2.3 The National Planning Policy Framework (NPPF) (UK Government, 2026) sets out the Government’s planning policies for England and supports the delivery of renewable and low carbon energy infrastructure. It recognises that planning plays a key role in supporting the transition to a low carbon future and states that the planning system should help to increase the use and supply of renewable and low-carbon energy. The NPPF further states that substantial weight should be given to the benefits associated with renewable and low-carbon energy generation and supporting infrastructure, including improvements to energy security, support for economic growth and the transition to net zero. The NPPF also makes clear that applicants should not be required to demonstrate the overall need for renewable or low-carbon energy development or associated electricity network infrastructure.

1.2.4 The Renewable and Low Carbon Energy Planning Practice Guidance (PPG) (Ministry of Housing, Communities and Local Government, 2023) provides further support, confirming that renewable energy developments are key to meeting legally binding climate targets and that local planning authorities should support appropriately sited renewable energy schemes.



- 1.2.5 Onshore wind is recognised as a mature and cost-effective technology and is expected to play a significant role in meeting the UK's carbon reduction targets. The Clean Power 2030 Action Plan (Department for Energy Security and Net Zero, 2024) and the Onshore Wind Taskforce Strategy (Department for Energy Security and Net Zero, 2025) set out the plan to significantly increase the current installed capacity of onshore wind, approximately 14.8 gigawatts (GW), to up to 29 GW by 2030.
- 1.2.6 The Proposed Development would contribute to meeting this identified need by generating electricity from a renewable source, supporting national policy objectives relating to climate change mitigation, energy security and sustainable development.
- 1.2.7 The Proposed Development therefore in principle accords with national energy and planning policy objectives and represents an important contribution towards the delivery of a low carbon energy system in England.

1.3 Purpose of the Scoping Report

- 1.3.1 Undertaking an EIA scoping study is regarded as good practice and is considered to be an important step in the EIA process, as it allows all parties involved to agree the key environmental issues relevant to the Proposed Development and the methodology for their assessment. Scoping seeks to engage the Local Planning Authority (LPA) (in this case ERYC and NLC) and other stakeholders, at an early stage in the planning process; and ensures that key opinions, based on local understanding, are identified.
- 1.3.2 The specific aims of this Scoping Report are:
- To identify the technical subject areas that may be subject to significant environmental effects, as a result of the Proposed Development proceeding, and therefore require further study.
 - To identify the technical subject areas that are unlikely to be subject to significant environmental effects and can be scoped out of further study.
 - To provide a basis for a consultation process with key consultees to agree the scope and content of the ES.
 - To provide a basis for agreeing the methodologies for undertaking required studies with the LPA, based upon currently available baseline data, Site characteristics and best practice in individual technical disciplines.
 - To provide all statutory consultees, non-statutory consultees, and interested parties, with an opportunity to comment on the Proposed Development and its potential environmental effects at an early stage.
- 1.3.3 Upon receipt of the EIA Scoping Opinion from the LPAs, the Applicant will evolve its design proposals and continue the EIA process that will lead to the preparation of an ES, taking cognisance of the findings and responses received.

1.4 The Applicant

- 1.4.1 Vattenfall is one of Europe's largest producers and retailers of electricity and heat. Vattenfall's main markets are Sweden, Germany, the Netherlands, UK and Denmark, with a total of approximately 21,000 employees across all markets. The parent company, Vattenfall AB, is 100% owned by the Swedish state, and its headquarters are in Solna, Sweden.
- 1.4.2 For over a century, Vattenfall has electrified industries, supplied energy to people's homes and modernised through innovation and cooperation. As part of this, Vattenfall is aiming for net zero by 2040 across its own operations, suppliers and customers. Vattenfall is working for fossil freedom.



- 1.4.3 Vattenfall has been in the UK for over 150 years, and operates 13 battery storage, onshore and offshore wind projects, with an installed capacity of 1.1 GW. Each year, these projects combined can:
- power 800,000 homes;
 - save 1.35 million tonnes of CO₂; and
 - take the equivalent of 680,000 cars off the road.
- 1.4.4 Vattenfall maintains a strong and growing wind portfolio, with over 3 GW of capacity in operation and development.
- 1.4.5 Further information on Vattenfall can be found at <https://group.vattenfall.com/>.

1.5 SLR Consulting Limited

- 1.5.1 SLR is a Registered Environmental Impact Assessor and Member of the Institute of Sustainability and Environmental Professionals (ISEP) and holder of the EIA Quality Mark. SLR is also a Registered Organisation validated by the Institute of Archaeologists (IfA), a member of the Association of Geotechnical and Geoenvironmental Specialists, and a Landscape Institute Registered Practice.
- 1.5.2 These professional accreditations and quality assurance procedures demonstrate the competency of the specialists contributing to the EIA process. They provide assurance that the EIA will be undertaken by suitably qualified and experienced practitioners and support compliance with Regulation 18(5) of the EIA Regulations, which requires that the Environmental Statement is prepared by competent experts.
- 1.5.3 Further information can be found on its corporate website at: <https://www.slrconsulting.com/>.
- 1.5.4 Specialist aviation input to this Scoping Report has been provided by Straten Consulting Services Limited.

1.6 Report Structure

- 1.6.1 Following this introduction, the remainder of this Scoping Report comprises the following chapters:
- **Chapter 2** provides a description of the Site and its surroundings in addition to a description of the Proposed Development.
 - **Chapter 3** describes the proposed approach to EIA and consultation.
 - **Chapters 4 to 13** describe the environmental studies that are proposed to be undertaken to assess the impacts of the Proposed Development on the environment.

1.7 References

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2.0 Description of the Proposed Development

2.1 Site and Surrounds

- 2.1.1 The Site, as shown on **Figure 1.1**, lies within the administrative boundaries of both ERYC and NLC. It is located within the Humberhead Levels, a low-lying and predominantly rural landscape.
- 2.1.2 The Site lies to the approximately 1.2 km west of the village of Adlingfleet and approximately 7.4 km to the east of the town of Goole. It encompasses approximately 428.54 hectares and is centred on National Grid Reference (NGR) SE 82387 20267.
- 2.1.3 The Site comprises open, flat and low-lying agricultural land, characteristic of the surrounding landscape, which is dominated by arable and pastoral farmland.
- 2.1.4 The Site is intersected by a regular network of drainage ditches typical of this managed lowland environment. It sits within a strongly estuarine-influenced setting, with the River Ouse to the north and the River Trent to the east, which converge north-east of the Site to form the Humber Estuary. The Site lies wholly within Flood Zone 3 and reflects a long history of drainage and floodplain management associated with former saltmarsh landscapes.
- 2.1.5 The existing noise environment is predominantly rural, driven largely by agricultural activity, with some influence from the local road network. Residential receptors are present within Adlingfleet and nearby hamlets, as well as dispersed farmsteads within and adjacent to the Site boundary.
- 2.1.6 In landscape and visual terms, the site lies within National Character Area 39 (Humberhead Levels). This is a broad, flat and low-lying landscape located around the western end of the Humber Estuary. The area is characterised by extensive agricultural land, large open fields, straight drainage channels, ditches and canals, reflecting a long history of land drainage and water management. Existing wind farms, overhead lines and industrial infrastructure in the wider area contribute to a strong baseline of energy and industrial infrastructure and activity.

Ecological Designations

- 2.1.7 There are no statutory or non-statutory ecological designations within the Site boundary.
- 2.1.8 The Humber Estuary is located approximately 1.2 km to the north of the Site boundary at its nearest point. It is designated as a Special Area of Conservation (SAC), Ramsar, and Site of Special Scientific Interest (SSSI). The estuary contains a series of important habitats, including intertidal mudflats, sand flats and coastal saltmarsh as well as saline lagoons, sand dunes and standing waters
- 2.1.9 Thorne Moors is located approximately 6.2 km to the west of the Site boundary at its nearest point and is designated as a SAC (Thorne Moors SAC) and a SSSI (Thorne, Crowle and Goole Moors SSSI). It includes degraded and active raised bogs and supports a variety of bog mosses.
- 2.1.10 **Figure 6.1** shows the location of non-avian statutory designated sites within 10 km of the Site, and **Figure 6.2** shows the location of non-avian non-statutory designated within 2 km of the Site. **Technical Appendix 6.1** provides details of these sites.

Ornithological Designations

- 2.1.11 There are no statutory or non-statutory ornithological designations within the Site boundary.
- 2.1.12 There are three SPAs and two Ramsar sites within 20 km of the Site. Additionally, there are seven SSSIs and three National Nature Reserves (NNRs) with named ornithological features within 20 km.



- 2.1.13 The Humber Estuary is located approximately 1.2 km to the north of the Site boundary at its nearest point. It is designated as a Special Protection Area (SPA), Ramsar, and a SSSI for a range of waterbirds and raptors.
- 2.1.14 Thorne Moors is located approximately 6.2 km to the west of the Site boundary at its nearest point and is designated as a SPA (Thorne and Hatfield Moors SPA) and a SSSI (Thorne, Crowle and Goole Moors SSSI) for ornithological interests for aggregations and assemblages of breeding birds including nightjar. Thorne Moor also forms part of the Humberhead Peatlands, which is designated as an NNR.
- 2.1.15 **Figure 7.3** shows the names and locations of other internationally designated sites for birds within 20 km of the Site boundary, and **Figure 7.4** the names and location of other nationally designated sites for birds within 20 km. Further details on the qualifying or notable ornithology features of the sites are provided in **Chapter 7: Ornithology**.

Landscape Designations

- 2.1.16 There are no statutory landscape designations within the Site or its immediate surroundings.
- 2.1.17 The Thorne, Crowle and Goole Moors Important Landscape Area (ILA) is the closest landscape designation to the Site, located approximately 6.8 km west of the Site.
- 2.1.18 The Yorkshire Wolds ILA is located approximately 12.4 km north-east of the Site. It is currently being considered as an Area of Outstanding Natural Beauty (AONB) by Natural England and should a designation order be confirmed by the Secretary of State, the area would become known as the Yorkshire Wolds National Landscape.
- 2.1.19 **Figure 4.7** shows the location of landscape designations within 45 km of the Site.

Cultural Heritage Designations

- 2.1.20 There are no designated heritage assets within the Site. Within the 10 km study area, there are 18 scheduled monuments, 13 Grade I, 16 Grade II* and within 5 km, there are 99 Grade II listed buildings, and four conservation areas. There are no registered parks and gardens, World Heritage Sites, or registered battlefields, within the 10 km study area.
- 2.1.21 Within 5 km of the Site, there are four Conservation Areas. Adlingfleet (approximately 1.7 km east), Burton upon Stather (approximately 3.9 km south-east), Alkborough (approximately 4.7 km east) and Normanby (approximately 5 km south-east)
- 2.1.22 **Figure 5.1** shows the location of designated heritage assets within 10 km of the Site, and **Technical Appendix 5.1** provides details of these assets.

Cumulative Environment

- 2.1.23 There are a number of existing wind energy developments in proximity to the Site. These include:
- Twin Rivers Wind Farm (14 wind turbines approximately 2.2 km to the west of the Site at 110 m to blade tip).
 - The Grange (6 wind turbines approximately 2.8 km south-east at 124.5 m to blade tip).
 - Keadby (34 wind turbines approximately 4.3 km to the south at 126.5 m to blade tip).
 - Sixpenny Wood (10 wind turbines approximately 6.8 km to the north at 125 m to blade tip).
 - Goole Fields I (16 wind turbines approximately 5.7 km to the west at 125 m to blade tip).



- Goole Fields II (17 wind turbines approximately 7.9 km to the west at 126.5 m to blade tip).
- Tween Bridge (22 wind turbines approximately 10.4 km to the south-west at 126.5 m to blade tip).

2.1.24 An indicative plan (**Figure 4.10**) showing the location of other existing and proposed wind farm development within the study area for the landscape and visual impact assessment (LVIA), which extends to 45 km from the Site boundary, is provided to illustrate this context. This figure is based on the publicly available dataset 'Renewable Energy Planning Database' which is produced by the Department of Energy and Net Zero.

2.1.25 More detailed plans showing the locations of other wind energy projects will be prepared as part of the EIA. Other forms of major development with the potential to result in cumulative effects alongside the Proposed Development will also be identified and assessed within the Environmental Statement (ES).

2.2 Proposed Development Description

2.2.1 The Proposed Development would comprise the following main elements:

- up to 8 three-bladed horizontal axis wind turbines with a maximum blade tip height of 200 m;
- hardstanding areas for erection cranes at each wind turbine location;
- a network of new and upgraded access tracks including watercourse crossings, site entrance from the public road network, passing places and turning heads connecting infrastructure elements;
- temporary construction compounds;
- a network of buried electrical and communication cables;
- a substation compound containing electrical infrastructure, control building, welfare facilities and a communications mast;
- borrow pits (depending on availability of stone within the Site); and
- a battery energy storage system (BESS) compound.

2.2.2 An indicative layout has been prepared for the purposes of scoping, which considers known environmental constraints at this early stage in the EIA process. This is set out in Figure 2.1.

2.2.3 This wind turbine and infrastructure layout will be subject to an iterative design process as part of the EIA. The design will therefore evolve as the EIA progresses, taking into account environmental and technical constraints, as well as feedback obtained during consultation with statutory and non-statutory consultees

2.2.4 A micrositing allowance for the wind turbine and associated infrastructure will be sought for the Proposed Development, with specific details to be set out in the ES. Micrositing is a standard approach for wind farm developments and provides flexibility to address localised ground conditions, engineering requirements and environmental constraints that may be identified during detailed design and post-consent surveys. Any micrositing would remain within the defined application boundary and would be subject to compliance with all relevant environmental and technical constraints identified through the EIA process.

Wind Turbines

2.2.5 The Proposed Development would have an installed capacity of less than 100 MW. Based upon the indicative site layout presented in **Figure 2.1** and the use of an indicative 7 MW turbine, the installed capacity is currently anticipated to be approximately 56 MW. A range of



wind turbine models may be suitable for the Proposed Development, with the final selection to be informed by wind analysis and the findings of the technical and environmental assessments to be undertaken as part of the EIA. The choice of wind turbine model will also be influenced by commercial considerations and the availability of suitable technology at the time of procurement.

2.2.6 Each of the wind turbines will consist of the following components:

- blades
- hub
- nacelle
- tower
- external transformer

2.2.7 As the wind turbines will be greater than 150 m in height, lighting will be required on the wind turbines subject to agreement with the relevant aviation consultees and the requirements of the Civil Aviation Authority. Aviation lighting would typically comprise visible red, medium intensity (2,000 candela) lights fitted to the hubs, with low intensity lights on the towers. The details of the aviation lighting would be determined through the aviation assessment and stakeholder consultation process.

2.2.8 **Table 2-2** shows the indicative turbine specifications being considered, as well as the turbine coordinates for the indicative layout shown in **Figure 2.1**.

Table 2-2: Indicative Turbine Coordinates and Indicative Turbine Specifications

Turbine ID	Easting	Northing	Rotor Diameter (m)	Tip Height (m)
T1	482283	421627	163	200
T2	482671	421019	163	200
T3	481740	420647	163	200
T4	482788	419944	163	200
T5	481738	419697	163	200
T6	482733	419203	163	200
T7	483277	418887	163	200
T8	481954	418796	163	200

Ancillary Infrastructure

2.2.9 The turbine foundation design will be finalised during the detailed design stage following selection of the final wind turbine model. For assessment purposes, the ES will identify and assess a worst-case turbine foundation design.

2.2.10 A crane hardstanding will be required adjacent to each wind turbine base, to provide a stable base for construction and crane erection activities. The crane hardstanding may also include a blade laydown and auxiliary crane hardstandings along the access track. These crane hardstanding areas will be permanently retained for maintenance operations.

2.2.11 Turbines will be electrically connected to each and to the onsite substation via underground electrical cables. Cables would be accommodated in cable trenches, which would also include communication cables and the earthing cable network. The layout of the cable trenches within Site would typically run adjacent to the access tracks where possible.



- 2.2.12 An onsite substation would be required to connect the Proposed Development to the national electricity distribution network. The substation would accommodate the infrastructure necessary to export electricity including transformers, switchgear, protection systems, control equipment, control building, parking and ancillary components. In addition to electrical grid equipment, the building would house storage, office and welfare facilities. A small carpark will be constructed outside the substation control building. The substation control building will be located within a larger hardstanding compound.
- 2.2.13 For construction purposes, a temporary construction compound or compounds will be required. The compound(s) will provide space for materials storage, site office cabins and welfare facilities as well as staff and visitor parking. Once the erection and commissioning of the wind turbines is complete, the temporary construction compound(s) would be removed, and the land would be reinstated.
- 2.2.14 Energy storage, such as the use of batteries is being considered for inclusion as part of the Proposed Development. Battery storage would comprise a number of units with ancillary equipment such as inverters. The batteries could store excess power generated by the Proposed Development to release into the grid at a later time. At this stage, the capacity of the BESS has not been determined. However it is anticipated that, for a project of this scale, any BESS could have an indicative capacity in the region of 50 MW.
- 2.2.15 Borrow pits may be included as part of the Proposed Development, dependent on the availability of stone within the Site. A review of suitability of materials on the Site will be undertaken and borrow pit search areas will be identified as part of the borrow pit assessment. If appropriate areas are identified, a description of likely materials, borrow pit size and the ability to supply appropriate materials for the construction of the Proposed Development will be included.
- 2.2.16 Material for the construction of access tracks, hardstands and compounds would, where possible, be won from borrow pits. This approach would minimise transportation movements of stone to Site. The location and design of borrow pits will be defined as part of the EIA process and site design.

Access

- 2.2.17 Wind turbine components are expected to be delivered to the Site from one of the nearest regional ports which include Goole, Immingham, Grimsby and Hull. The final port of origin will be confirmed during the design and procurement process.
- 2.2.18 Construction access is likely to be achieved via the A161, which provides connections west to the M62 Junction 36 via Goole and south to the M180 Junction 2 via Crowle. Access to the Site may be directly from the A161, or from Garthorpe Road via the B1392 and Luddington High Street.
- 2.2.19 Indicative Site access locations have been identified from Common Lane, which joins the A161 on the western boundary of the Site, and from the Haldenby Hall Farm access, which joins Garthorpe Road on the southern boundary of the Site.
- 2.2.20 **Figure 11.1** shows the anticipated construction access routes to Site and indicative Site access locations.

Grid Connection

- 2.2.21 The grid connection point for the Proposed Development is not known at the time of preparing this Scoping Report. Consequently, it is not possible to identify potential grid connection routes between the Site and the eventual point of connection.
- 2.2.22 The grid connection infrastructure would be promoted, designed and consented separately by the relevant National Energy System Operator (NESO) and/or Distribution Network



Operator (DNO). Should the grid connection point be known prior to submission of the application, the Applicant would consider the extent to which those grid connection works might form part of the overall project from an EIA perspective. Dependent upon the outcome of that judgement, such works would either be considered and assessed as part of the overall project, or as a cumulative development to be assessed, in the context of likely significant effects arising from these works. In accordance with the EIA Regulations, any limitations to such assessment would be recorded within the respective technical ES chapters.

2.3 Construction Phase

- 2.3.1 It is anticipated that the construction phase of the Proposed Development would be completed over a period of approximately 18 months.
- 2.3.2 All relevant statutory legislation will be complied with during construction, and best practice guidance published by the Environment Agency, including the Guidance for Pollution Prevention series and other applicable environmental good practice guidance, will be adhered to.
- 2.3.3 Construction mitigation and environmental protection measures would be implemented via a Construction Environmental Management Plan (CEMP). In the event that planning permission for the Proposed Development is approved, the CEMP will be issued to ERYC and NLC for approval in consultation with Natural England, prior to the commencement of construction work. An Outline CEMP will be prepared as part of the ES and will include information on specific environmental requirements and construction good practice that will likely be included in the construction phase.

2.4 Operational Phase

- 2.4.1 The assessments undertaken to inform the EIA will consider the operational phase of the Proposed Development based upon an operational life of 30 years.

2.5 Decommissioning Phase

- 2.5.1 At the end of its operational life, the Proposed Development would be decommissioned. Alternatively, an application may be submitted to extend the life or repower the Proposed Development.
- 2.5.2 An outline Decommissioning, Restoration and Aftercare Strategy will be prepared and submitted for approval to ERYC and NLC, in consultation with relevant consultees, following the grant of planning permission and prior to the commencement of development. The strategy will set out the overarching principles for the decommissioning of the Proposed Development and the restoration and aftercare of the Site. The requirement for an Outline Decommissioning, Restoration and Aftercare Strategy can be secured through a planning condition.
- 2.5.3 A detailed Decommissioning, Restoration and Aftercare Plan will be prepared and submitted for approval to ERYC and NLC, in consultation with the relevant consultees, prior to the commencement of decommissioning. The plan will provide updated and detailed proposals, in accordance with relevant guidance at that time, to ensure the decommissioning and removal of the Proposed Development in an appropriate and environmentally acceptable manner and the restoration and aftercare of the Site, in the interests of safety, amenity and environmental protection. The requirement for a detailed Decommissioning, Restoration and Aftercare Plan can be secured through a planning condition.
- 2.5.4 A high-level assessment of the decommissioning of the Proposed Development will be undertaken as part of the EIA. At this stage, future baseline environmental conditions cannot be predicted with certainty and the future regulatory context, available technologies and any



proposals for life extension, repowering or decommissioning remain unknown. As decommissioning would broadly comprise a reversal of the construction process over a shorter period, the environmental effects of decommissioning are generally anticipated to be no greater than those arising from construction.



3.0 Approach to EIA

3.1 Introduction

- 3.1.1 EIA is an iterative process that identifies the likely significant environmental effects of a proposed development and informs the evolution of its design. Through this process, opportunities are taken to avoid, reduce and, where necessary, offset potential adverse effects through the incorporation of embedded mitigation and additional mitigation measures.
- 3.1.2 The EIA considers effects arising during the construction, operational and decommissioning phases of the Proposed Development. Consultation is a key component of the EIA process and plays an important role in identifying environmental sensitivities, potential effects, and appropriate mitigation measures.
- 3.1.3 The EIA for the Proposed Development will be undertaken in accordance with the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended). The assessment will also have regard to relevant Planning Practice Guidance (PPG) on EIA and other applicable guidance.
- 3.1.4 The EIA will be informed by current best practice, including guidance published by the Institute of Sustainability & Environmental Professionals (ISEP). Topic specific methodologies will draw upon relevant good practice guidance and standards, including those produced by statutory consultees such as Natural England, the Environment Agency, and Historic England.

3.2 Assessment Process

- 3.2.1 The EIA will be undertaken through a structured and iterative process involving:
- establishing the environmental baseline through desk-based studies, consultation, site surveys and technical assessments;
 - identifying potential environmental effects arising from the Proposed Development;
 - developing embedded mitigation through the design process to avoid or reduce effects where practicable;
 - assessing the likely significance of effects;
 - identifying any additional mitigation;
 - identifying any additional enhancement measures where required; and
 - and evaluating residual effects following mitigation.
- 3.2.2 The following sections outline the key stages of the EIA process.

Study Areas

- 3.2.3 The study areas to be assessed vary between environmental topics, reflecting the characteristics of each discipline and the receptors being considered. Details of the proposed study areas are provided within the relevant topic chapters of this Scoping Report.

Baseline Characterisation

- 3.2.4 The existing and likely future environmental conditions in the absence of the Proposed Development are referred to as the baseline conditions. Each topic chapter will describe the current baseline conditions within the relevant study area. These baseline conditions will



form the basis of the assessment, enabling the likely significant effects of the Proposed Development to be identified through comparison with the existing environment.

- 3.2.5 The assessment of environmental effects will primarily be based on conditions present at the time surveys and assessments are undertaken. However, consideration will also be given to any reasonably foreseeable changes to the baseline that may occur before or during the construction and operational phases of the Proposed Development.

Assessment of Likely Significant Effects

- 3.2.6 For those matters scoped into the EIA, each topic chapter of the ES will assess the likely significant effects arising from the Proposed Development using an established EIA methodology. The assessment will consider the sensitivity of affected receptors, the magnitude of change arising from the Proposed Development and any embedded mitigation measures incorporated into the design.
- 3.2.7 Topic-specific definitions of magnitude, sensitivity and significance will be provided within each ES chapter, drawing on relevant guidance, professional judgement and specialist knowledge applicable to the topic under consideration. In determining significance, account will also be taken, where relevant, of factors such as the duration, frequency, extent, reversibility and timing of effects.
- 3.2.8 Embedded mitigation comprises measures incorporated into the design of the Proposed Development as part of the iterative design process. Where the assessment identifies the potential for significant adverse effects, additional mitigation measures will be identified where appropriate to avoid, reduce or offset those effects. At this point the impact will be reassessed, considering the additional mitigation proposed, to determine the residual effect.
- 3.2.9 In addition to measures incorporated into the design to avoid, reduce or offset adverse environmental effects, the Applicant will also seek to deliver environmental enhancements where practicable. Enhancement measures are distinct from mitigation measures, as they are intended to provide additional environmental benefits rather than address identified adverse effects.
- 3.2.10 The specific assessment methodologies proposed to be used for each environmental topic, and the exact definition of terms used to determine significance, are outlined in the relevant topic chapters of this Scoping Report.

Cumulative Effects

- 3.2.11 Cumulative effects arise where the effects of the Proposed Development act in combination with those of other developments, resulting in an additional effect on a shared receptor.
- 3.2.12 Other operational developments will form part of the baseline for assessment. The EIA will also consider relevant developments that are under construction, consented but not yet implemented, or the subject of valid planning applications or consent applications. Other reasonably foreseeable developments for which sufficient information is publicly available may also be included where considered appropriate or following consultation with relevant stakeholders.
- 3.2.13 A schedule of developments with the potential to interact cumulatively with the Proposed Development will be identified during preparation of the ES and will be subject to consultation. A cut-off date for the inclusion of cumulative developments will be agreed with ERYC and NLC. Following this, a final review of relevant developments will be undertaken and an agreed list of projects taken forward for cumulative effects assessment. Any



assumptions and limitations associated with the availability of information for cumulative developments will be clearly stated within the ES.

- 3.2.14 Whilst the focus of this cumulative impact assessment is likely to be on other wind energy developments, consideration will also be given to other forms of major development with the potential to interact cumulatively with the Proposed Development. The assessment will have regard to the Planning Inspectorate's *Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment* (2024). Although this guidance is intended for Nationally Significant Infrastructure Projects and is not directly applicable to applications submitted under the Town and Country Planning Act 1990 (TCPA) regime, it represents relevant best practice for the identification and assessment of cumulative effects.

Assumptions, Limitations and Alternatives

- 3.2.15 The EIA will be based on the best available information at the time of assessment. Any assumptions made during the assessment process, together with any limitations relating to data availability, survey access, seasonal constraints or technical uncertainties, will be clearly described within the relevant topic chapters of the ES. Where limitations are identified, professional judgement and established good practice guidance will be applied to ensure that the assessment remains robust and proportionate.
- 3.2.16 The EIA process is iterative and will inform the evolution of the Proposed Development. The consideration of reasonable alternatives, including site selection, layout development and key design decisions, will be documented within the Site Selection and Design Evolution chapter of the ES. This chapter will explain how environmental, technical, planning and other relevant considerations have influenced the layout and design of the Proposed Development.

The Environmental Statement

- 3.2.17 The structure of the ES will follow the requirements of the EIA Regulations and other relevant good practice guidance.
- 3.2.18 It is anticipated that the ES will comprise the following volumes:
- Volume 1 – Non-Technical Summary (NTS)
 - Volume 2 – Main Text
 - Volume 3 – Figures and Visualisations
 - Volume 4 – Technical Appendices
- 3.2.19 Volume 2 will likely comprise of the following chapters:
- Introduction
 - Description of the Proposed Development
 - Site Selection and Design Evolution
 - Approach to EIA
 - Landscape and Visual
 - Cultural Heritage and Archaeology
 - Ecology
 - Ornithology
 - Hydrology, Hydrogeology and Flood Risk
 - Geology, Soils and Ground Conditions



- Noise and Vibration
- Access, Traffic and Transport
- Other Considerations
- Summary of Mitigation

- 3.2.20 Certain environmental topics are not proposed to be assessed through dedicated ES topic chapters. These matters will either be:
- addressed within other relevant ES topic chapters where potential environmental effects are more appropriately considered;
 - reported through technical appendices to the ES; or
 - scoped out of detailed assessment where, based on available baseline information and the characteristics of the Proposed Development, likely significant environmental effects are not anticipated.
- 3.2.21 Further details and justification for this approach, including the specific matters proposed to be addressed outside of dedicated ES chapters or scoped out of assessment, are provided in **Chapter 14: Other Considerations** of this Scoping Report.
- 3.2.22 As detailed in **Chapter 12: Socio-Economics**, no likely significant effects on socio-economics, tourism or recreation have been identified, and it is therefore proposed to scope this topic out of the ES. A standalone Socio-economic Statement will be submitted as part of the planning application in order to identify the relevant economic information related to the Proposed Development.
- 3.2.23 As detailed in **Chapter 13: Aviation**, aviation matters are not normally assessed through a standalone ES chapter. It is therefore proposed that the aviation assessment be provided as a standalone Technical Appendix to the ES, setting out the findings of the aviation safeguarding, radar and airspace assessments together with any associated mitigation requirements.

3.3 Consultation and Engagement

- 3.3.1 Consultation is an important part of the EIA process and will be reported within the ES and supporting documentation as necessary.
- 3.3.2 The Applicant is committed to constructive dialogue with statutory and non-statutory consultees as well as the local community and others who have an interest in the Proposed Development, in order to consider feedback and inform the design development process.

3.4 ES Format

- 3.4.1 The ES would be made available online, on USB flash drive and hard copy although in the interest of sustainability, the Applicant would encourage take up of online format.

3.5 Planning Policy

- 3.5.1 The ES will provide an overview of relevant legislative and planning policy context within each topic chapter. The assessment will have regard to the adopted Development Plan for ERYC and NLC and other relevant material considerations. However, it is not proposed to include a dedicated chapter on Planning Policy Context in the ES.
- 3.5.2 Instead, it is proposed that a separate Planning Statement will be submitted with the application. The Planning Statement will provide an assessment of the Proposed Development in relation to the Development Plan and other relevant material considerations (including where relevant the NPPF, and National Policy Statements and Guidance etc.),



before weighing up the planning case for the proposals and providing a conclusion on the overall acceptability of the Proposed Development.

3.5.3 At this stage, the key planning policy documents that will be assessed within the Planning Statement are likely to comprise, but not necessarily be limited to the following:

- Adopted and emerging Development Plan policies for East Riding of Yorkshire, including:
 - The East Riding Local Plan Update (East Riding of Yorkshire Council, 2025);
- Adopted and emerging Development Plan policies for North Lincolnshire, including:
 - The North Lincolnshire Core Strategy (North Lincolnshire Council, 2011); and
 - The North Lincolnshire Local Plan 2003 (Saved Policies) (North Lincolnshire Council, 2003).
- National Planning Policy Framework (NPPF) (UK Government, 2026);
- Adopted and emerging National Policy Statements (NPSs) for Energy Infrastructure, including:
 - the Overarching National Policy Statement for Energy (EN-1) (Department for Energy Security and Net Zero, 2026); and
 - the NPS for Renewable Energy Infrastructure (EN-3) (Department for Energy Security and Net Zero (2025).
- Planning Practice Guidance (PPG), including the Renewable and Low Carbon Energy PPG (Ministry of Housing, Communities and Local Government, 2023).

3.5.4 Although this application is made under the TCPA regime, the NPSs for Energy Infrastructure are a material consideration as they set out current Government policy on energy infrastructure needs and assessment principles relevant to the Proposed Development.

3.5.5 Whilst the Planning Statement will not form part of the ES, it will be informed by the conclusions of the ES in assessing the Proposed Development against the provisions of the Development Plan and other relevant material considerations.

3.6 Questions for Consultees

- Q3.1** Do you have any comments on the proposed approach to EIA for the Proposed Development, including the manner in which impacts and effects will be addressed?
- Q3.2** Are consultees in agreement that the Development Plan policies and other relevant material considerations be identified and assessed in the Planning Statement and that there is consequently no need to include a dedicated chapter of Planning Policy Context in the ES?

3.7 References

Department for Energy Security and Net Zero (2026) *Overarching National Policy Statement for Energy* (EN-1), 2025. London: DESNZ. Available at: <https://www.gov.uk/government/publications/overarching-national-policy-statement-for-energy-en-1-2025>.

Department for Energy Security and Net Zero (2025) *National Policy Statement for Renewable Energy Infrastructure* (EN-3). London: DESNZ. Available at: <https://www.gov.uk/government/publications/national-policy-statement-for-renewable-energy-infrastructure-en-3-2025>



East Riding of Yorkshire Council (2025) *East Riding Local Plan Update 2020-2039*.
Beverley: East Riding of Yorkshire Council. Available at: [LPU - Strategy Document Update Adopted 2025.pdf](#)

Ministry of Housing, Communities and Local Government (2023) *Renewable and low carbon energy. Planning Practice Guidance*. Available at: <https://www.gov.uk/guidance/renewable-and-low-carbon-energy>.

North Lincolnshire Council (2003) *North Lincolnshire Local Plan*. Adopted May 2003.
Scunthorpe: North Lincolnshire Council. Available at: <https://www.northlincs.gov.uk/planning-and-environment/planning-policy-the-north-lincolnshire-local-plan/>

North Lincolnshire Council (2011) *Core Strategy*. Adopted June 2011. Scunthorpe: North Lincolnshire Council. Available at: <https://www.northlincs.gov.uk/planning-and-environment/planning-policy-local-development-framework/>

Planning Inspectorate (2024) *Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment*. London: Planning Inspectorate. Available at: <https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-advice-on-cumulative-effects-assessment>

UK Government (2026) *National Planning Policy Framework*. London: MHCLG. Available at: <https://www.gov.uk/guidance/national-planning-policy-framework>



4.0 Landscape and Visual

4.1 Introduction

- 4.1.1 This chapter sets out the proposed methodology and approach of the Landscape and Visual Impact Assessment (LVIA) of the Proposed Development. It presents the suggested scope of the LVIA in terms of those landscape and visual receptors to be scoped in and scoped out of the assessment process based on a preliminary assessment of relevant receptors to the Proposed Development. The LVIA will consider the likely significant effects of the Proposed Development during the construction, operation and maintenance and decommissioning phases, details of which are set out in **Chapter 2: Description of the Proposed Development**.
- 4.1.2 The purpose of the LVIA is to identify and record the likely significant effects that the Proposed Development may have on physical elements of the landscape; landscape character; areas that have been designated for their scenic or landscape-related qualities; and views from various locations such as settlements, routes, hilltops, and other sensitive locations. The potential cumulative effects that may arise from the addition of the Proposed Development to other developments will also be considered.
- 4.1.3 There are interrelationships between the potential effects on landscape and visual receptors and other environmental topics. Therefore, this chapter should be read alongside the following chapters of the Scoping Report:
- **Chapter 5: Cultural Heritage and Archaeology**
 - **Chapter 6: Ecology.**
- 4.1.4 This chapter is supported by the following figures:
- **Figure 4.1: LVIA Study Area**
 - **Figure 4.2: Blade Tip ZTV**
 - **Figure 4.3: Screened Blade Tip ZTV**
 - **Figure 4.4: Screened Blade Tip ZTV (Detailed Area)**
 - **Figure 4.5: Hub Height ZTV**
 - **Figure 4.6: National Landscape Character with Blade Tip ZTV**
 - **Figure 4.7: Landscape Designations with Blade Tip ZTV**
 - **Figure 4.8: Principal Visual Receptors (Transportation) with Blade Tip ZTV**
 - **Figure 4.9: Principal Visual Receptors (Recreational) with Blade Tip ZTV**
 - **Figure 4.10: Cumulative Windfarms**
 - **Figure 4.11: Principal Visual Receptors (PRoW) with Screened Blade Tip ZTV**
 - **Figure 4.12: Residential Properties with Screened Blade Tip ZTV**



4.2 Assessment Methodology

Relevant Legislation, Policy and Guidance

Legislation and Policy

4.2.1 The following legislation, policy and guidance are relevant to the consideration of the potential effects of the Proposed Development on the Landscape and Visual resource of the Study Area within the LVIA. This list is not exhaustive, and other documents may be referred to as appropriate:

- Local Policy
 - East Riding Local Plan Update 2020-2039 (2025). Relevant policies include:
 - Policy ENV2: Promoting a high-quality landscape
 - Policy EC5: Supporting the renewable and low carbon energy sector
 - North Lincolnshire Local Plan 2003 saved policies:
 - Policy LC7: Landscape Protection
 - Policy LC13: Parks, Gardens and Landscapes of Special Historic Interest
 - Policy LC20: South Humber Bank – Landscape Initiative
 - North Lincolnshire Local Development Framework, Core Strategy 2011. Relevant policies include:
 - Spatial Objective 6: Protecting and Enhancing the World Class Environment
 - Policy CS16: North Lincolnshire's Landscape, Greenspace and Waterscape
 - Policy CS18: Sustainable Resource Use and Climate Change
- Legislation
 - Countryside and Rights of Way Act (CROW Act), 2000
 - Environment Act, 1995
 - European Landscape Convention (ELC)
 - Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended)
- National Policy
 - National Planning Policy Framework (NPPF)
 - National Policy Statements (NPS):
 - Overarching National Policy Statement for Energy (EN-1)
 - National Policy Statement for Renewable Energy Infrastructure (EN-3)

Guidance

4.2.2 Whilst some of the guidance documents listed below have been prepared by NatureScot for projects in Scotland, in the absence of alternative guidelines in other jurisdictions these guidance documents have become best practice across the UK.

- Landscape Institute and Institute for Environmental Management and Assessment (2013) 'Guidelines for Landscape and Visual Impact Assessment: Third Edition' ('GLVIA3').



- Landscape Institute, Technical Guidance Note LITGN – 2024-01. GLVIA3 Clarifications.
- Landscape Institute (2019). Technical Guidance Note 2/19 Residential Visual Amenity Assessment.
- Landscape Institute (2021). Technical Guidance Note 2/21 Assessing landscape value outside of national designations.
- Landscape Institute (2019). Visual Representation of Development Proposals: Landscape Institute Technical Guidance Note 06/19.
- Christine Tudor, Natural England (2nd Version March 2018). An Approach to Landscape Character Assessment.
- Civil Aviation Authority (2016) CAP 764: Policy and Guidelines on Wind Turbines.
- NatureScot (2024). Guidance on Aviation Lighting Impact Assessment.
- NatureScot (2025). Guidance for Assessing the Effects on Special Landscape Qualities.
- NatureScot (2021). Assessing the Cumulative Impact of Onshore Wind Energy Developments.
- NatureScot (2017) Siting and Designing Wind Farms in the Landscape Version 3a.
- NatureScot (2017). Visual Representation of Wind Farms, Version 2.2.
- Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment, (2024)¹.

Desk Study

- 4.2.3 The analysis of key receptors (landscape character areas, landscape designations and visual receptors such as residents, road users, recreational routes and visitors) within this Scoping Report has been carried out based on an initial field survey, a good professional working knowledge of the LVIA Study Area and detailed desk study and Geographic Information Systems (GIS) analysis.
- 4.2.4 Desk based analysis of the Proposed Development is carried out for the LVIA Study Area along with mapping of landscape character, landscape related designations and principal visual receptors. The desk study also utilises GIS software to explore the potential visibility of the Proposed Development. The resultant ZTV diagrams provide an indication of which landscape and visual receptors are likely to be key in the assessment.

Planned Surveys

- 4.2.5 To inform the LVIA and layout design, detailed field surveys will be undertaken throughout the LVIA process and Study Area and will be reported in the ES. Field surveys will be concentrated within the areas shown on the ZTV to gain theoretical visibility of the Proposed Development. The field survey work will include visits to viewpoints as well as extensive travel around the LVIA Study Area to consider potential effects (including cumulative) on landscape character and on the experience of views seen from travel routes through the landscape. These visits will allow the landscape character and the visual amenity of the Study Area to be experienced in a range of different conditions and seasonal variation. The

¹ Although this guidance is intended for Nationally Significant Infrastructure Projects and is not directly applicable to applications submitted under the Town and Country Planning Act 1990 (TCPA) regime, it provides a useful reference to support the robust assessment of cumulative effects.



field survey will also allow the assessors to judge the likely scale, distance, extent, and prominence of the Proposed Development directly. Viewpoint photography will be captured during field survey visits in periods of good visibility.

Proposed Assessment Methodology

- 4.2.6 Whilst **Chapter 3: Approach to EIA** provides an indicative EIA assessment method, it also identifies that assessment methodologies may differ in accordance with the prevailing technical area guidance. As such the following sections provide a description of the assessment criteria and assessment methodologies of relevance to the LVIA for the Proposed Development, which are derived from best practice guidance documents applicable to this topic and differ from those presented in the broader methodology chapter. The LVIA methodology will accord with 'Guidelines for Landscape and Visual Impact Assessment: Third Edition' ('GLVIA3'), the key source of guidance for LVIA. Other sources of guidance that will be used and referenced in the LVIA are as listed in an earlier part of this section titled 'Guidance'.
- 4.2.7 This Scoping Report has included a desk study of the Site and 45 km LVIA Study Area, combined with a brief site visit and good professional working knowledge of the LVIA Study Area. Aspects of the landscape and visual resource that will need to be considered in the LVIA, are identified as follows:
- landscape and character typology;
 - landscape related planning designations;
 - properties and settlements;
 - routes (including roads, canals, National Cycle Networks (NCN) and long-distance walking routes); and
 - cumulative developments within the study area.
- 4.2.8 The desk study has also utilised GIS software to explore the potential visibility of the Proposed Development. The resultant ZTV diagrams (**Figures 4.2 to 4.9**, including bare earth and screened ZTVs) have provided an indication of which landscape and visual receptors would potentially be affected by the Proposed Development.
- 4.2.9 The LVIA is intended to determine the likely significant effects that the Proposed Development would have on the landscape and visual resource. For the purpose of assessment, the potential effects on the landscape and visual resource are grouped into the following categories:
- **Physical effects:** physical effects are restricted to the area within the Site and are the direct effects on the existing fabric of the Site. This category of effects is made up of landscape elements, which are the components of the landscape such as rough grassland and moorland that may be directly and physically affected by the Proposed Development.
 - **Effects on landscape character:** landscape character is the distinct and recognisable pattern of elements that occurs consistently in a particular type of landscape and the way that this pattern is perceived. Effects on landscape character arise either through the introduction of new elements that physically alter this pattern of elements or through visibility of the Proposed Development that may alter the way in which the pattern of elements is perceived. This category of effects is made up of landscape character receptors, which fall into two groups - landscape character types and landscape related designated areas.
 - **Effects on views:** the assessment of the effects on views is an assessment of how the introduction of the Proposed Development would affect views throughout the



LVIA Study Area. The assessment of effects on views is carried out in relation to representative viewpoints and principal visual receptors. The visual impact of visible aviation warning lights will be carried out (see section 4.5 below) and a Residential Visual Amenity Assessment (RVAA) will be carried out in line with current guidance.

- **Cumulative effects:** cumulative effects arise where the study areas for two or more developments overlap so that both developments are experienced at a proximity where they may have a greater incremental effect, or where they may combine to have a sequential effect. The LVIA assesses the effect arising from the addition of the Proposed Development to the cumulative situation. This approach is in line with NatureScot cumulative assessment guidance (2021), GLVIA3 and Landscape Institute Technical Guidance Note LITGN – 2024-01, which provides GLVIA3 clarifications.

- 4.2.10 The objective of the assessment of the Proposed Development is to predict the likely significant effects on the landscape and visual resource. In line with the EIA Regulations, the LVIA effects are assessed to be either significant or not significant. The significance of effects is assessed through a combination of two considerations: the sensitivity of the landscape receptor or view and the magnitude of change that would result from the addition of the Proposed Development. The sensitivity of receptors is determined by a combination of their value and susceptibility which will be considered as part of the overall sensitivity applied to each receptor. The degree of effects in the LVIA will be assessed as negligible, minor, moderate-minor, moderate, moderate-major or major. In those instances where the magnitude is assessed as 'no change', the level of effect will be recorded as 'no effect'. An assessment is also made of the geographical extent of the area over which assessed change would occur and the duration and reversibility of such changes. The basis for this assessment is made clear using evidence and professional judgement.
- 4.2.11 Any effects with a significance level of major and moderate-major will be deemed significant. Moderate levels of effect have the potential, subject to the assessor's professional judgement and any relevant guidance, to be considered as significant or not significant, depending on the sensitivity and magnitude of change factors evaluated. GLVIA3 clarification note 3(5) supports this approach and states that '*moderate effects may or may not be significant and justification would be needed in the methodology or receptor assessment as to whether a moderate effect is significant or not*'. The assessments of significance for moderate levels of effect will therefore be explained as part of the assessment, where they occur. Effects assessed as being either moderate-minor, minor or negligible level are deemed as not significant.
- 4.2.12 Significance thresholds can therefore vary depending on the sensitivity and magnitude, however, in all cases, a significant effect is considered more likely to occur where a combination of the variables results in the Proposed Development having a defining effect on the landscape character or view.
- 4.2.13 The nature of effect relates to whether the effects of the Proposed Development are adverse, neutral, or beneficial. A precautionary approach will generally be adopted which assumes that significant landscape and visual effects will be weighed on the negative side of the planning balance, although positive or neutral effects may arise in certain situations.

4.3 Baseline Conditions

Study Area

- 4.3.1 In accordance with NatureScot guidance and with a proposed wind turbine height of up to 200 m, the proposed Study Area for the LVIA of the Proposed Development will cover a radius of 45 km from the nearest proposed wind turbine, as shown in **Figure 4.1**. At distances beyond 45 km, the lateral (or horizontal) spread of the Proposed Development



would occupy a small portion of available views and the apparent height (or ‘vertical angle’) of the wind turbines would also appear very small, therefore significant visual effects are unlikely to arise at greater than this distance, even if the wind turbines are visible. This is therefore considered to be the maximum radius within which a significant effect could occur given the height of the wind turbines that are being considered.

- 4.3.2 Following a review of the Blade Tip Zone of Theoretical Visibility (ZTV) diagram (**Figure 4.2**) alongside the Screened Blade Tip ZTV (**Figures 4.3 & 4.4**) for the Proposed Development, it is proposed that the assessment of landscape character effects focusses within 20 km. As described in **Section 4.4**, the 20 km Study Area reflects the reduced extent of theoretical visibility found beyond 20 km taking into account the conservative estimate of woodland and built screening. 20 km is therefore considered a more appropriate area in which to focus the identification of potentially significant landscape character effects.
- 4.3.3 Residential Visual Amenity Assessment (RVAA) will be carried out for properties within 2 km, in line with Landscape Institute technical guidance. **Figure 4.12** shows the Screened Blade Tip ZTV with residential properties within 2km.

Data Sources

- 4.3.4 The sources used to inform the description of the baseline environment for this chapter of the Scoping Report include those outlined in **Table 4-1**.

Table 4-1: Key data sources

Source	Summary
Digital mapping.	Ordnance Survey (OS) 1: 50,000 scale raster mapping - OS 2026
Digital terrain model.	Ordnance Survey Terrain 50 Metre Digital Terrain Model (DTM) – OS 2026
Long Distance Walking Association	Details of long-distance recreational routes. https://ldwa.org.uk/index.php
National Cycle Network	Mapping of National Cycle Network – Sustrans 2026. https://www.walkwheelcycletrust.org.uk/national-cycle-network/
National Landscape Character	Natural England – National Character Area Profiles. https://nationalcharacterareas.co.uk/

Description of Baseline Environment

- 4.3.5 The proposed location of the Proposed Development is approximately 1 km west of the Adlingfleet settlement, 1.2 km south of Ousefleet and 1 km north of Luddington. The Site is located across the boundaries of the ERYC and NLC administrative areas.
- 4.3.6 There is no discernible landform undulation on the Site and elevation ranges between 0 m and 2 m above ordnance datum (AOD). This is typical of this area of the Humberhead Levels which is maintained by ditches and contained by dykes. The landscape is low lying, large in scale and has an extensive pattern of geometric fields. The fields are often without hedges creating a feeling of vast uninterrupted flat arable landscape. The network of ditches and drains combine with the infrequent hedgerows, emphasising the strong geometric pattern of this landscape. Taller embankments are found along the Humber and Trent which are more sinuous in shape and appearance.
- 4.3.7 There is a strong baseline of energy and industrial infrastructure and activity within the surrounding landscape including: multiple wind farms close to the Site and within the wider landscape context; industrial shipping along the Humber Estuary and Blacktoft Channel connecting to the terminal at Goole; the large industrial estates and docklands at Goole; the



gas fired power stations at Keadby to the south, Drax to the west, with Saltend, Killingholme, Immingham and South Humber Bank to the east; and a multitude of large scale overhead line routes and networks connecting the energy generation infrastructure with large substations creating a complex layering of different sized pylons throughout the landscape.

- 4.3.8 The immediately surrounding landscape context and wider Study Area is well settled. Larger settlements within 20 km include the western edges of the Kingston Upon Hull conurbation to the east and Scunthorpe to the south. Key settlements in the immediate context of the Site include the string of small villages found to the west and north of the Site – from Crowle, Eastoft and Luddington in the south; through Fockerby, Garthorpe, Burton upon Stather and Adlingfleet to the west; and Ousefleet, Reedness, Swinefleet and Goole to the north. The settled landscape is connected by a busy road network that provides key routes north and south of Humber as well as connecting the many smaller towns and villages. The M62 is found to the north of the Site on the north side of the Humber, the M181 is to the south of the Site, with the M18 connecting these busy motorways to the west of Goole. The A161, connecting Crowle with Goole, passes close to the western edges of the Site. Key recreational routes include: the Peatlands Way (south-west) and Trans Pennine Trail (north) within 10 km (alongside NCN65); the Yorkshire Wolds Way on elevated ridges to the north-east; and the Viking Way as it crosses the elevated Saxby Wolds to the west.
- 4.3.9 Baseline information is further described in relation to potential landscape and visual effects in **Section 4.4** of this report.

4.4 Potential Impacts

Zone of Theoretical Visibility (ZTV) Overview

- 4.4.1 The blade tip ZTV is based on the 200 m Proposed Development tip height of the wind turbines and represents the worst-case theoretical visibility considered in the scoping assessment. The blade tip ZTV also illustrates where there would be no visibility, as well as areas where there will be lower or higher numbers of blade tips theoretically visible. The ZTV shows the areas in which the Proposed Development would be theoretically visible, assisting in the identification of viewpoints and providing an understanding of the potential extent of landscape and visual effects within the Study Area. The majority of ZTVs produced for scoping illustrate the 'bare ground' situation based on an Ordnance Survey (OS) terrain model and do not take account of the screening effects of vegetation, buildings, or other local features that may prevent or reduce visibility. By using a bare ground elevation model, the results will be an over-representation of maximum visibility, as from many areas views may, in reality, be blocked by surface features not included in the model. The bare ground blade tip ZTV is shown with proposed viewpoints on **Figures 4.2 & 4.5** and is also shown alongside landscape character, landscape designations and visual receptors on **Figures 4.6 – 4.9**.
- 4.4.2 The landform of the Site and surrounding area is relatively low lying and has very little topographical undulation or elevation. The pattern of bare ground theoretical visibility shown on the blade tip ZTVs is therefore relatively extensive across this landscape - extending to the edges of the Study Area to the north-west towards York at around 40 km; to the west across the A19 road corridor at around 30 km; and to the edges of the Study Area to the south through Doncaster and Gainsborough. To the east the bare ground theoretical visibility is less extensive due to the more elevated landform of the Yorkshire Wolds to the north-east, the Saxby Wolds to the west and the Lincolnshire Wolds to the south-west. A band of theoretical visibility extends east through Hull and along the Humber towards the edges of the Study Area.
- 4.4.3 The bare ground hub height ZTV (as shown on **Figure 4.5**) shares a similar overall pattern of theoretical visibility to the bare ground blade tip ZTV in terms of the affected areas. However, there are some notable reductions of theoretical visibility extents in the areas to



the east, due to the greater effect of landform screening. This indicates that for large parts of the Study Area to the east, only blade visibility would be experienced for many of the Proposed Development's proposed turbines.

- 4.4.4 A screened blade tip ZTV has been produced for scoping on **Figure 4.3** and on more detailed 50k OS mapping on **Figure 4.4** which for greater legibility of the immediate context has been produced for an approximate 20 km area. This is calculated using conservative estimates for buildings (8 m) and woodland (10 m) heights and whilst presenting a more accurate depiction of the Proposed Development visibility, the screened ZTV is limited by the averaged heights applied to it and does not allow for other landscape elements (e.g. individual trees and hedgerows) that may have a screening effect through successive layering. The screened ZTV is therefore still theoretical and is not a substitute for the fieldwork carried out during the course of the LVIA. Whilst only a conservative estimate of tree and building height has been applied to the screened ZTV, the reduction in theoretical visibility extent is notable. Theoretical visibility is becoming broken at the edges of the 10 km buffer and between 10 km and 20 km it appears very patchy with substantial areas (particularly within surrounding settlements) where there is no visibility. Beyond 20 km, theoretical visibility is greatly reduced with the majority of the landscape showing no theoretical visibility with small patches limited to more distant elevated ground to the north, west and south.
- 4.4.5 All of the ZTVs indicate a 'higher' or 'lower' theoretical visibility based on the number of turbines visible (either the hub height or blade tip height), not on the amount of each turbine visible. Therefore, areas indicated with higher visibility (in terms of the number of visible turbines) may have views of very small amounts of these turbines visible.

Landscape Character

- 4.4.6 England's landscape is classified at the national level by National Character Areas (NCAs). The descriptive profiles for the 159 individual NCAs are identified and described by Natural England, they highlight what distinguishes one landscape from another, with reference to their regionally distinct characteristics. The Site sits within NCA 39 Humberhead Levels (see **Figure 4.6**). The key characteristics of this NCA are as follows:
- *"A low-lying, predominantly flat landscape, with large, regular and geometric arable fields without hedges but divided by ditches and dykes, many of which form important habitats and key corridors for species movement.*
 - *Much of the land is at or below mean high-water mark and maintained by drainage, with fertile soils giving rise to one of the most productive areas for root crops and cereals.*
 - *Variations in underlying deposits create differences within the overall flat farmed landscape, including lowland raised mires and lowland heathland, many of which are of international ecological and historical importance.*
 - *Sandy deposits give rise to lowland heath, which in places supports remnant birch and oak woodlands, with some conifer plantations.*
 - *Heavier soils around Fishlake and Sykehouse result in a smaller scale pastoral landscape, with small, thickly hedged fields, ditches and ponds, and a network of small lanes.*
 - *Important historic landscapes include the Isle of Axholme, with evidence of mediaeval open fields, the warps (land enriched by regular silting) near Goole and cables (long thin strip fields) around Thorne.*



- *Widespread evidence of drainage history, in particular the extensive drainage from the 17th century, revealed through canalised rivers, dykes, old river courses, canals, bridges and pumping stations.*
- *Views to distant horizons are often long and unbroken, with big expansive skies, and vertical elements like water towers, power stations and wind turbines are very prominent.*
- *Floodplains, washlands and traditionally grazed alluvial flood meadows (or ings) associated with the major rivers and canals that cross the Levels give rise to important wetland habitats, supporting large numbers of wetland birds and wildfowl, especially over winter.*
- *The waterlogged soils hold internationally important archaeological and paleo-archaeological deposits.*
- *Despite settlements, motorways and main roads, there is still a sense of remoteness to be experienced on the Levels, in particular on Thorne and Hatfield Moors and along the Lower Derwent Valley”.*

4.4.7 An earlier part of this section titled ‘Overview of Proposed Development ZTV’, highlights that the pattern of theoretical visibility is greatly reduced beyond 20 km, as shown on the screened ZTV on **Figure 4.4**. Given that the screened ZTV is based on conservative woodland and building heights, it is considered that the reduction in actual visibility is likely to be greater, particularly within more distant parts of the Study Area, beyond 20 km. It is also considered that beyond 20 km, the visibility reduces as the apparent height of the turbines will form a smaller feature on distant horizons and will only be viewed in very good to excellent visibility conditions. Taking all of this into account, it is considered that the potential for significant landscape character effects may only arise within an area of approximately 20 km radius from the proposed wind turbines. As such it is proposed that the landscape character assessment will focus on this 20 km area.

4.4.8 Local Landscape Character Areas (LCAs) have been identified by the various district councils within the Study Area. It is considered that these local level LCAs represent the most appropriate scale 'reporting units' for the Proposed Development and will therefore be used as the basis for Landscape Character Assessment in the LVIA. In particular, the landscape character assessment will focus on assessing the likely significant effects on the LCAs in which the Proposed Development is located, where the Proposed Development may result in direct effects on the pattern of elements that comprise the landscape character, together with LCAs in the immediately adjacent area where the Proposed Development may result in indirect effects on the perception of the landscape character.

4.4.9 For scoping, the NCAs are shown on **Figure 4.6** alongside the blade tip ZTV. The boundaries of the various local landscape character assessments will be obtained through consultation with the Local Planning Authorities (LPAs) in order that a comprehensive map of landscape character areas can be produced for use in the LVIA. The following local landscape character assessments have been identified within 20 km:

- East Riding of Yorkshire Council - East Riding of Yorkshire Landscape Character Assessment, 2018 (AECOM)
- North Lincolnshire Council - North Lincolnshire Landscape Character Assessment, 2017 (JBA Consulting)
- West Lindsey District Council - West Lindsey Landscape Character Assessment, 1999 (ERM)
- Doncaster District Council - Landscape Character & Capacity Assessment of Doncaster Borough, 2017 (ECUS)



- Selby District Council - Covered by - North Yorkshire and York Landscape Characterisation Project, 2011 Chris Blandford Associates.

4.4.10 Of particular relevance to the Proposed Development are the character assessments and associated LCAs within ERYC and NLC areas, where the Proposed Development will be located. Within the East Riding of Yorkshire Landscape Character Assessment, the Site lies within LCA9 Drained Open Farmland in the Humberhead Levels, the key characteristics are listed as follows:

- *“Low lying flat intensively farmed arable landscape.*
- *Sparse settlement concentrated along the river corridor.*
- *Scattered farmsteads and villages.*
- *Windmill towers are visible in several villages on the south bank of the River Ouse.*
- *Open large scale landscape with very few trees and woodland.*
- *Generally large fields south of the river.*
- *Combination of fragmented hedgerow and ditch field boundaries.*
- *Long linear field pattern unique to Goole Fields reflects past farming method.*
- *Extensive views across the flat open landscape.*
- *Large scale wind development present and visible within the landscape”.*

4.4.11 Within the North Lincolnshire Landscape Character Assessment, the Site lies within LCA4 The Trent Levels, the key characteristics are listed as follows:

- *“In the main, the Landscape is only 1 or 2m AOD and offers expansive views, although woodland blocks, rising ground, infrastructure and settlements create distant enclosure.*
- *Significant areas of arable land are graded as ‘Very High’ and ‘High’ in Natural England’s Agricultural Land Classification system; the highest and second to highest grade. The remainder of the land is graded as, ‘Good to Moderate’.*
- *Contains internationally and nationally important designated areas of ecological conservation.*
- *Contains the Isle of Axholme Historic Landscape Character area, a locally designated Area of Special Historic Landscape Interest. Three LCTs are partially within this designation, Flat Drained Farmland, Flat Drained Treed Farmland and Flat Wooded Farmland. A fourth LCT, Open Island Farmland, is wholly within this designation.*
- *A large open arable field structure defined by well-maintained drainage ditches. Hedgerow planting helps to define boundary areas in places; however, hedges are generally badly maintained and contain gaps.*
- *Farming intensification has led to the loss of hedgerows in places and the consequential breakdown of field structure.*
- *Open arable areas are occasionally punctured by small woodland copses, farmsteads, shelterbelts, overhead electricity pylons, wind turbines and well-treed settlements.*
- *Linear features dominate the area with long narrow local roads flanked by drainage ditches, rectilinear field patterns, shelterbelts, and field drainage systems.*



- *Major infrastructure features include overhead electricity pylons, Wind turbines and primary transport corridors including the M180 and A18 which provide vehicle access over the River Trent.*
- *Industrial features along the river create a chaotic landscape, especially when in close proximity.*
- *The River Trent is the major river within the LCAR (and the county) but there are several other waterways which cut through the area, including the Stainforth and Keadby Canal, River Torne and South Engine Drain.*
- *Larger settlements are found on higher ground or adjacent to the banks of the River Trent. The open floodplains are generally unpopulated with only small farmsteads and associated barns/sheds.*
- *The open floodplain areas illustrate the typical character of this landscape character area with tendencies for a more intimate landscape and enclosure to occur around settlements.*
- *The open floodplain areas illustrate the typical character of this landscape character area with tendencies for a more intimate landscape and enclosure to occur around settlements”.*

Landscape Designations

- 4.4.12 The Site does not lie within any national landscape planning designations as shown on **Figure 4.7**. Within the LVIA Study Area, national landscape planning designations include the Lincolnshire Wolds National Landscape and Howardian Hills National Landscape (previously Areas of Outstanding Natural Beauty (AONB)), and Registered Parks and Gardens (RPG). ERYC also identify a series of local landscape designations, as listed in the East Riding Local Plan Update 2020 – 2039. These are called Important Landscape Areas (ILAs) and generally coincide with the high-quality LCAs identified in the 2005 Landscape Character Assessment. The Yorkshire Wolds ILA is also currently being considered for designation as an AONB by Natural England and should an order be confirmed by the Secretary of State, the area would become known as the Yorkshire Wolds National Landscape.
- 4.4.13 **Table 4.2** below lists the designated areas and provides information about their distance to the Proposed Development and relationship to the ZTV, as shown in **Figure 4.7**. Thereafter, it is assessed in the final column whether or not these designated areas can be scoped out of the assessment, unless changes to the layout during the detailed design process materially alter the potential for significant effects.

Table 4-2: Preliminary Assessment of Landscape Designations

Landscape Designation	Approx. distance to nearest turbine (km)	Bare ground theoretical visibility? Yes / No	Include in detailed assessment within the LVIA?
Lincolnshire Wolds National Landscape	33.3	Yes	No. Distant with limited theoretical visibility extent. No potential for significant effects.
Howardian Hills National Landscape	41.8	Yes	No. Very distant with limited theoretical visibility extent. No potential for significant effects.
The Yorkshire Wolds ILA	12.4	Yes	Yes. Potential for significant effects due to level of theoretical visibility



Landscape Designation	Approx. distance to nearest turbine (km)	Bare ground theoretical visibility? Yes / No	Include in detailed assessment within the LVIA?
			found along the south-west edges of this designated landscape.
River Derwent Corridor ILA	25.6	Yes	No. Distant with no theoretical visibility shown on screened ZTV. No potential for significant effects.
Lower Derwent Valley and Pocklington Canal ILA	14.3	Yes	No. Relatively distant with limited and patchy theoretical visibility shown on screened ZTV. No potential for significant effects.
Thorne, Crowle and Goole Moors ILA	6.8	Yes	Yes. There is limited and patchy theoretical visibility shown on screened ZTV but included due to relatively close proximity.
Houghton Hall RPG	17.8	Yes	No. Distant with no theoretical visibility shown on screened ZTV. No potential for significant effects.
Dalton Hall RPG	25.9	No	No. No theoretical visibility.
Londesborough Park RPG	23.5	Yes	No. Distant with limited theoretical visibility extent. No potential for significant effects.
Sledmere House RPG	42.9	No	No. No theoretical visibility.
Risby Hall RPG	22.7	No	No. No theoretical visibility.
Thwaite Hall RPG	25.4	No	No. No theoretical visibility.
Pearson Park RPG	27.3	No	No. No theoretical visibility.
East Park Hull RPG	30.7	Yes	No. Distant with no theoretical visibility shown on screened ZTV. No potential for significant effects.
Burton Constable RPG	38.1	Yes	No. Very distant with no theoretical visibility shown on screened ZTV. No potential for significant effects.
Brocklesby Park RPG	28.3	Yes	No. Distant with no theoretical visibility shown on screened ZTV. No potential for significant effects.
Peoples Park RPG	44.9	No	No. No theoretical visibility.
Norton Place RPG	31.2	Yes	No. Distant with no theoretical visibility shown on screened ZTV. No potential for significant effects.
Fillingham Castle RPG	34.8	Yes	No. Distant with no theoretical visibility shown on screened ZTV. No potential for significant effects.
Hackthorn Hall RPG	39.4	No	No. No theoretical visibility.
Babworth Hall RPG	39.3	Yes	No. Very distant with no theoretical visibility shown on screened ZTV. No potential for significant effects.



Landscape Designation	Approx. distance to nearest turbine (km)	Bare ground theoretical visibility? Yes / No	Include in detailed assessment within the LVIA?
Clumber Park RPG	44.8	Yes	No. Very distant with no theoretical visibility shown on screened ZTV. No potential for significant effects.
Sandbeck Park and Roche Abbey RPG	37.2	Yes	No. Very distant with very limited theoretical visibility extent. No potential for significant effects.
The Dell, Doncaster RPG	30.8	Yes	No. Distant with no theoretical visibility shown on screened ZTV. No potential for significant effects.
Cusworth Hall RPG	30.4	Yes	No. Distant with limited theoretical visibility extent. No potential for significant effects.
Hickleton Hall RPG	36.0	Yes	No. Distant with very limited theoretical visibility extent. No potential for significant effects.
Brodsworth Hall RPG	32.7	Yes	No. Distant with limited theoretical visibility extent. No potential for significant effects.
Waterton Park, Walton, Wakefield RPG	44.9	No	No. No theoretical visibility.
Nostell Priory RPG	39.8	No	No. No theoretical visibility.
Friarwood Valley Gardens RPG	36.2	No	No. No theoretical visibility.
Ledston Hall and Park RPG	37.5	Yes	No. Very distant with very limited theoretical visibility extent. No potential for significant effects.
Parlington Estate RPG	41.1	Yes	No. Very distant with extremely limited theoretical visibility extent. No potential for significant effects.
Lotherton Hall RPG	39.5	Yes	No. Very distant with very limited theoretical visibility extent. No potential for significant effects.
Bramham Park RPG	43.6	Yes	No. Very distant with no theoretical visibility shown on screened ZTV. No potential for significant effects.
Nun Appleton Hall RPG	31.1	Yes	No. Distant with no theoretical visibility shown on screened ZTV. No potential for significant effects.
Moreby Hall RPG	30.7	Yes	No. Distant with no theoretical visibility shown on screened ZTV. No potential for significant effects.
Rowntree Park RPG	36.2	Yes	No. Distant with no theoretical visibility shown on screened ZTV. No potential for significant effects.



Landscape Designation	Approx. distance to nearest turbine (km)	Bare ground theoretical visibility? Yes / No	Include in detailed assessment within the LVIA?
York Cemetery RPG	35.8	Yes	No. Distant with no theoretical visibility shown on screened ZTV. No potential for significant effects.
Grounds associated with the Retreat RPG	35.4	Yes	No. Distant with very limited theoretical visibility extent. No potential for significant effects.
University of York Campus West designed landscape RPG	34.6	Yes	No. Distant with no theoretical visibility shown on screened ZTV. No potential for significant effects.
Museum Gardens RPG	37.8	No	No. No theoretical visibility.
Aldby Park RPG	37.4	Yes	No. Very distant with very limited theoretical visibility extent. No potential for significant effects.
Howsham Hall RPG	41.8	No	No. No theoretical visibility.

Visual Receptors and Visual Amenity

- 4.4.14 The LVIA will undertake an assessment of the likely visual effects of the Proposed Development through consideration of the specific visual effects at a selection of representative viewpoints and by considering the wider effects on visual amenity with reference to principal visual receptors. The immediately surrounding landscape context and wider Study Area is well settled and includes the larger settlements of Kingston Upon Hull, York, Doncaster, Grimsby, Pontefract, Selby and Scunthorpe, with Leeds, Wakefield, Barnsley and Rotherham found at the western edges of the Study Area. These settlements are connected by a busy road network that provides key routes north and south of Humber as well as connecting the many smaller towns and villages. Key settlements in the immediate context of the Site include the string of small villages found to the west and north of the Site – from Crowle, Eastoft and Luddington in the south; through Fockerby, Garthorpe, Burton upon Stather and Adlingfleet to the west; and Ousefleet, Reedness, Swinefleet and Goole to the north. Principal visual receptors are shown with the blade tip ZTV on **Figure 4.8** (transportation) and on **Figure 4.9** (recreational). The M62 is found to the north of the Site on the north side of the Humber, the M181 is to the south of the Site, with the M18 connecting these busy motorways to the west of Goole. The A161, connecting Crowle with Goole, passes close to the western edges of the Site. Key recreational routes include - the Peatlands Way (south-west) and Trans Pennine Trail (north) within 10 km (alongside NCN65); the Yorkshire Wolds Way on elevated ridges to the north-east; and the Viking Way as it crosses the elevated Saxby Wolds to the west. Normanby Hall Country Park and NCN169 is within 10 km to the south-east. There are also a number of Public Rights of Way (PRoW) intersecting and crossing the Site. These PRoW provide access to the surrounding uplands and connections between closely surrounding communities. PRoWs within 5 km are mapped, in combination with the blade tip ZTV on **Figure 4.11**. In relation to residential properties, a Residential Visual Amenity Assessment (RVAA) will be carried out for properties within 2 km, in line with Landscape Institute technical guidance.

Viewpoint Selection

- 4.4.15 A preliminary viewpoint list is shown in **Table 4-3**. The proposed representative viewpoint locations are shown on **Figures 4.2 to 4.5**. The preliminary viewpoints were selected to represent a range of visual receptors within the LVIA Study Area based on an initial review



of the Site and surrounding landscape and visual resource. They were selected to represent landscape receptors and in consideration of the potential for cumulative effects to arise. Visualisations and figures will be produced to NatureScot standards, as set out in 'Visual Representation of Windfarms: Version 2.2'. NatureScot guidance advises that photomontages should be prepared for viewpoints within a 20 km radius of the proposed wind turbines. All of the proposed viewpoints in **Table 4-3** are within this distance and so will have photomontages produced. The final viewpoint list will be established in agreement with key consultees listed in **Section 4.7**, through further surveys and having regard to the scoping responses.

Table 4-3: Preliminary Representative Viewpoint Locations

Viewpoint Name	Easting	Northing	Distance to nearest turbine (km)	Receptors represented / Landscape Designation
1 - Adlingfleet	484431	420446	1.7	Settlement, road users.
2 - Luddington	483017	417108	1.8	Settlement.
3 - Burton upon Stather	486829	417963	3.7	Settlement.
4 - Blacktoft, Trans Pennine Trail	483855	424226	3.0	Settlement, recreational.
5 - Old Goole	475321	421961	6.6	Settlement.
6 - A1077, Scunthorpe	486911	412743	7.1	Settlement, road users.
7 - Crowle, Peatlands Way	476244	413885	7.5	Settlement, recreational.
8 - B1230, Balkholme Common	479409	428394	7.4	Road users.
9 - Winteringham	492489	421658	9.6	Settlement, road users.
10 - Brough, Trans Pennine Trail	493620	426223	12.1	Settlement, recreational.
11 - Saxby All Saints	498959	417244	15.8	Settlement.
12 - Reedholme Common	466944	417703	14.9	Road users.
13 - Peatlands Way near Epworth	474429	403875	16.7	Recreational.
14 - Newbold Wold, Yorkshire Wolds Way	491753	435791	17.0	Recreational / The Yorkshire Wolds ILA.
15 - Humber Bridge, Yorkshire Wolds Way	502368	425172	20.1	Road users, recreational.

4.5 Potential Effects of Visible Aviation Lighting

4.5.1 A key factor in the development of wind turbines greater than 150 m in height is the requirement for them to have visible red, medium intensity (2,000 candela) lights fitted to the hubs, with low intensity lights on the towers, in accordance with Civil Aviation Authority (CAA) guidance. The details of the lighting requirements for the Proposed Development are currently being defined along with potential mitigation measures. A night-time visual impact assessment and visualisations illustrating wind turbine lighting at night will be prepared for inclusion in the LVIA. A hub height ZTV will be used to identify where there would be direct line of sight of the lights from the surrounding area (an initial hub height ZTV has been prepared for the scoping layout, see **Figure 4.5**).

4.5.2 In order to inform this assessment, photographs will be captured from four of the readily accessible viewpoints at dusk (photographs to be taken after the period of civil twilight) and visualisations will be prepared to represent the effects of lighting on these views. The



assessment approach and night-time visualisations will be in accordance with NatureScot guidance, which recommends a study area of 20 km for the assessment of visible aviation lighting. The Hub Height ZTV shown on **Figure 4.5** has been reviewed to inform relevant representative night-time viewpoints that include a range of receptor types, sensitivities and distance. It is proposed that of the initially proposed viewpoints listed in **Table 4-3** that the following four locations be used for night-time visualisations: Viewpoint 1 – Adlingfleet; Viewpoint 4 – Blacktoft, Trans Pennine Trail; Viewpoint 5 - Old Goole; and Viewpoint 10 - Brough, Trans Pennine Trail.

4.6 Cumulative Effects

- 4.6.1 NatureScot's guidance highlights that "The purpose of a Cumulative Landscape and Visual Impact Assessment (CLVIA) is to describe, visually represent and assess the ways in which a proposed wind farm would have additional impacts when considered with other consented or proposed wind farms. It should identify the significant cumulative impacts arising from the proposed wind farm." GLVIA3, p120 also highlights that 'the focus of the cumulative assessment will be on the additional effect of the project in conjunction with other developments of the same type (as for example, in the case of wind farms)'. The cumulative assessment will be carried out in accordance with NatureScot and GLVIA3 guidance. In line with this guidance, it will focus on the addition of the Proposed Development to other wind farm development scenarios. In addition, (and with reference to the NSIP guidance 'Advice on Cumulative Effects Assessment') other forms of major development will also be considered to determine whether or not they could potentially lead to a significant cumulative effect when considering landscape or visual interaction with the Proposed Development.
- 4.6.2 Given the relevance of the immediate context of wind farm development in the landscape surrounding the Proposed Development, an indicative plan showing the location of cumulative wind farm development within the study area has been included to illustrate this context (see **Figure 4.10**). This figure is based on the publicly available dataset 'Renewable Energy Planning Database' which is produced by the Department of Energy and Net Zero. It illustrates cumulative wind farm development found within the Study Area (as updated April 2026).
- 4.6.3 Key to the cumulative situation are the many existing wind turbines in the immediate context, with several large wind farms in close proximity to the Site, including the largest wind farm in England at Keadby. It is considered that these key existing wind turbine developments for the Proposed Development can be found within approximately 10 km of the Site and include:
- Twin Rivers Wind Farm (14 wind turbines approximately 2.2 km to the west of the Site at 110 m to blade tip);
 - The Grange (6 wind turbines approximately 2.8 km south-east at 124.5 m to blade tip);
 - Keadby (34 wind turbines approximately 4.3 km to the south at 126.5 m to blade tip);
 - Sixpenny Wood (10 wind turbines approximately 6.8 km to the north at 125 m to blade tip);
 - Goole Fields I (16 wind turbines approximately 5.7 km to the west at 125 m to blade tip);
 - Goole Fields II (17 wind turbines approximately 7.9 km to the west at 126.5 m to blade tip); and
 - Tween Bridge (22 wind turbines approximately 10.4 km to the south-west at 126.5 m to blade tip).



- 4.6.4 For the CLVIA, more detailed cumulative plans will be produced showing the locations of cumulative development. The proposed scope of the cumulative search for the CLVIA will include the following search criteria:
- Wind turbine development above 50 m in height to a distance of 45 km from the Proposed Development.
 - Non-wind national infrastructure developments (NSIP) to a distance of 45 km from the Proposed Development.
 - Non wind local developments (Major Applications) to a distance of 10 km from the Proposed Development.
- 4.6.5 It should be noted that this cumulative scope and range of extents represent a precautionary search within which potential significant effects could occur when considering the Proposed Development alongside cumulative developments. This will include developments that are operational, under construction, consented, or which are at application stage. GLVIA3 advocates that scoping stage sites are only considered where a scoping proposal is particularly relevant due to its close proximity. There are currently no such scoping proposals adjacent to the Proposed Development and as such, developments that are at the pre-planning or scoping stage will not be considered in the assessment of cumulative effects.
- 4.6.6 The cumulative situation changes frequently as applications are made or withdrawn, and application details are changed. In order that the most up to date cumulative situation is reflected in the CLVIA, it is proposed that the detailed cumulative development search, based on the above criteria, will be carried out during the later stages of the EIA, closer to the application submission date and will take account of consultation feedback from key consultees.

Potential Effects Summary

- 4.6.7 Based on the initial assessment above, the key sensitivities and potential effects can be summarised as follows:
- potential effects on landscape character, particularly on the host LCAs of East Riding of Yorkshire LCA9 Drained Open Farmland in the Humberhead Levels and North Lincolnshire LCA4 The Trent Levels;
 - potential effects on the locally designated ILAs, including The Yorkshire Wolds ILA and Thorne, Crowle and Goole Moors ILA;
 - potential visual effects from principal visual receptors particularly including from closely surrounding settlements (such as Adlingfleet, Luddington and Goole) and from key routes (such as the Trans Pennine Trail and Peatlands Way);
 - potential cumulative effects of the Proposed Development when seen in combination with the existing wind energy developments, and other proposed cumulative development found in the immediate context of the Site;
 - potential day time visual effects from residential visual receptors within 2 km which includes isolated properties, clusters of rural properties and nearby villages; and
 - visibility of the Proposed Development at night due to visible aviation lighting.

4.7 Mitigation

- 4.7.1 The design and layout of the proposed wind turbines and associated infrastructure is a vital part of the EIA process and is the stage where the biggest contribution can be made to mitigate potential landscape and visual effects. A key design objective will be to create a design which is appropriate for the existing landscape character and visual features of the



area including the relationship with existing wind farm development in the immediate vicinity. The design of the Proposed Development will evolve as part of an iterative process which aims to provide an optimal design in environmental, as well as technical and economic terms, and the mitigation of landscape and visual effects will be a central consideration in this process.

4.8 Consultation

- 4.8.1 Consultation regarding the scope and approach of the LVIA (including via this scoping process), will be undertaken with key consultees including Natural England, NLC and ERYC. The focus of the LVIA consultation is to seek feedback on the locations and number of viewpoints for inclusion in the LVIA (see **Table 4-3**) and sites to be included in the cumulative assessment. A summary of the consultation undertaken will be included within the LVIA chapter of the ES.

4.9 Summary of Scope

Potential Impacts Scoped In

- 4.9.1 A range of potential impacts on landscape and visual receptors have been identified which may occur during construction, operation and maintenance, and decommissioning phases. The impacts that have been scoped into the LVIA chapter of the ES are outlined in **Table 4 4**.

Table 4-4: Impacts proposed to be scoped into the LVIA

Impact	Description	Proposed Approach to Assessment
Construction (and Decommissioning)		
Impact of the construction / decommissioning of the Proposed Development on landscape features.	Potential for short-term, temporary physical impacts on landscape features. Arising as a result of the temporary construction activities and temporary structures that comprise the Proposed Development.	Physical landscape features within the Site area, included in the landscape impact assessment.
Impact of the construction / decommissioning of the Proposed Development on landscape character.	Potential for short-term, temporary impacts on perceived landscape character. Arising as a result of the temporary construction activities and temporary structures that comprise the Proposed Development.	LCAs within 20 km of the Proposed Development, included in the landscape impact assessment.
Impact of the construction / decommissioning of the Proposed Development on designated landscapes.	Potential for short-term, temporary impacts on landscape designations. Arising as a result of the temporary construction activities and temporary structures that comprise the Proposed Development.	Landscape Designations with potential for significant effects, as described in the preliminary assessment in Table 4.2 , included in the landscape impact assessment.
Impact of the construction / decommissioning of the Proposed Development on visual receptors / views.	Potential for short-term, temporary impacts on visual receptors. Arising as a result of the temporary construction activities and	Receptors within the LVIA Study Area included in the visual impact assessment. As represented by the identified viewpoints in Table 4.3 or



Impact	Description	Proposed Approach to Assessment
	temporary structures that comprise the Proposed Development.	assessed as principal visual receptors.
Operation		
Impact of the operation and maintenance of the Proposed Development on landscape fabric.	Potential for long-term, permanent physical impacts as a result of the Proposed Development on the landscape fabric of the Site area.	Physical landscape features within the Site area, included in the landscape impact assessment.
Impact of the operation and maintenance of the Proposed Development on landscape character.	Potential for long-term, reversible impacts as a result of the Proposed Development on perceived landscape character of LCAs.	LCAs within 20 km of the Proposed Development, included in the landscape impact assessment.
Impact of the operation and maintenance of the Proposed Development on designated landscapes.	Potential for long-term, reversible impacts as a result of the Proposed Development on landscape designations.	Landscape designations with potential for significant effects, as described in the preliminary assessment in Table 4.2 , included in the landscape impact assessment.
Impact (daytime) of the operation and maintenance of the Proposed Development on visual receptors / views.	Potential for long-term, reversible impacts as a result of the Proposed Development on visual receptors during daylight hours.	Receptors within the LVIA Study Area included in the visual impact assessment. As represented by the identified viewpoints in Table 4.3 , assessed as principal visual receptors or residential properties assessed within the 2 km RVAA study area.
Impact (night-time) of the operation and maintenance of the Proposed Development on visual receptors / views.	Potential for long term, reversible effects on views and visual amenity experienced by people from principal visual receptors and representative viewpoints arising because of visible aviation lights.	Receptors within 20 km included in the assessment of visible aviation lighting. Including the four night-time visualisation locations identified in Section 4.4 .
Cumulative		
Cumulative effect of the operation and maintenance of the Proposed Development on landscape character, landscape designations and views / visual receptors.	Potential for long term, reversible cumulative effects on perceived landscape character of LCAs, designated landscapes, and views/visual amenity experienced by people. As a result of cumulative effects with other developments as outlined in Section 4.5 .	Included in cumulative landscape and visual impact assessment in line with the scope outlined in Section 4.5 .

Impacts Proposed to be Scoped Out

- 4.9.2 Based on the baseline environment information currently available and the Proposed Development description (outlined in **Chapter 2: Description of the Proposed Development**) a number of impacts are proposed to be scoped out of the LVIA chapter of the ES. The impacts are outlined in **Table 4-5**, together with a justification for scoping them out.



Table 4-5: Impacts proposed to be scoped out of the LVIA

Impact	Justification for scoping out
Construction (and Decommissioning)	
Short term, temporary impact of the construction / decommissioning of the Proposed Development on landscape features outside of the Site area.	Landscape outside the Site area not physically affected by the Proposed Development.
Short term, temporary impact of the construction / decommissioning of the Proposed Development on landscape character LCAs beyond 20 km.	LCAs beyond 20 km are shown on the scoping ZTVs to have distant, limited or no visibility and therefore do not have the potential for likely significant visual effects.
Short term, temporary impact of the construction / decommissioning of the Proposed Development on designated landscapes described in Table 4-2 as having no potential for significant effects.	Justification for each designated landscape is provided in Table 4-2 .
Short term, temporary impact of the construction / decommissioning of the Proposed Development on visual receptors / views with limited or no visibility.	Visual receptors / views with limited or no visibility do not have the potential for significant visual effects.
Operation	
Potential for long-term, reversible impacts of the operation and maintenance of the Proposed Development on landscape fabric outside of the Site area.	Landscape outside the Site area not physically affected by the Proposed Development.
Potential for long-term, reversible impacts of the operation and maintenance of the Proposed Development on landscape character LCAs beyond 20 km.	LCAs beyond 20 km are shown on the scoping ZTVs to have distant, limited or no visibility and therefore do not have the potential for significant visual effects.
Potential for long-term, reversible impacts of the operation and maintenance of the Proposed Development on designated landscapes described in Table 4-2 as having no potential for significant effects.	Justification for each designated landscape is provided in Table 4-2 .
Potential for long-term, reversible impacts (daytime) of the operation and maintenance of the Proposed Development on visual receptors / views with limited or no visibility.	Visual receptors / views with limited or no visibility do not have the potential for significant visual effects.
Potential for long-term, reversible impacts (night-time) of the operation and maintenance of the Proposed Development on visual receptors / views beyond 20 km.	Potential significant effects of visible aviation lighting are considered unlikely beyond 20 km, in line with NatureScot guidance.
Potential for long-term, reversible residential visual amenity impacts (night-time) of the operation and maintenance of the Proposed Development on residential receptors within assessed (day time) 2 km RVAA study area.	It is considered unlikely that the effect of the visible aviation lighting would be of such a scale that a residential visual amenity threshold could be reached.
Cumulative	
Cumulative effects that may arise as a result of cumulative wind farm development below 50 m tip height.	No potential for significant cumulative effects due to a predicted lack of cumulative interaction and/ or influence.



Impact	Justification for scoping out
Non wind local developments (Major Applications) beyond 10 km from the Proposed Development.	

4.10 Questions for Consultees

4.10.1 The following questions are provided to help frame consultee comments on the Scoping Report for Landscape and Visual:

- Q4.1** Do consultees have any comments on the proposed approach and methodology?
- Q4.2** Do consultees agree with the proposed 45 km LVIA Study Area?
- Q4.3** Do consultees agree that the assessment of the effects on landscape character receptors should focus on the area within a 20 km radius of the proposed wind turbines?
- Q4.4** Do consultees agree with the proposal to scope out the Landscape Planning Designations where no further assessment is proposed for the LVIA, as set out in **Table 4-2**?
- Q4.5** Do consultees have any comments or suggestions in relation to the Preliminary Representative Viewpoint Locations shown in **Table 4-3** as illustrated on **Figures 4.2 - 4.5** including the four night-time visualisation locations listed in Section 4.5.
- Q4.6** Do consultees agree with the approach to cumulative assessment or have any further comments or suggestions relating to the cumulative assessment or the preliminary cumulative sites shown on **Figure 4.10**?
- Q4.7** Do consultees agree with the matters in **Table 4.5**, which are proposed to be scoped out of the LVIA?

4.11 References

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5.0 Cultural Heritage and Archaeology

5.1 Introduction

- 5.1.1 This chapter of the Scoping Report sets out the baseline, the proposed scope and methodological approach for the cultural heritage chapter (including both archaeological remains and built heritage assets) of the Environmental Statement (ES). The chapter will assess the potential effects resulting from the construction, operation and maintenance and decommissioning of the Proposed Development on archaeology and cultural heritage assets, which include:
- World Heritage Sites
 - Scheduled Monuments
 - Listed Buildings
 - Registered Parks and Gardens
 - Registered Battlefields
 - Conservation Areas
 - Assets included in the Historic Environment Records (HER), such as locally and regionally important heritage features
- 5.1.2 The cultural heritage impact assessment will:
- identify cultural heritage assets that may be subject to significant effects, both within the limits of the Proposed Development and within defined study areas;
 - establish the potential for currently unknown archaeological assets to survive as buried remains within the Site;
 - assess the predicted effects on these assets; and
 - propose a programme of mitigation where required, and opportunities for enhancement where appropriate.
- 5.1.3 The assessment will consider direct effects (such as physical disturbance), indirect effects (such as changes in water draining patterns or vibrations which can indirectly affect the preservation of heritage materials), setting impacts (such as changes to the surrounding landscape that may alter the cultural significance of an asset) and cumulative effects (where assets affected by the Proposed Development are also likely to be affected by other unrelated development proposals).
- 5.1.4 This chapter is supported by the following figures:
- **Figure 5.1:** Designated Heritage Assets
 - **Figure 5.2:** Historic Environment Record Data
 - **Figure 5.3:** Historic Environment Event Data
- This chapter is also supported by the following Technical Appendix:
- **Technical Appendix 5.1:** Heritage Appraisal Table.



5.2 Baseline Conditions

Study Area

- 5.2.1 For the cultural heritage assessment, a study area (**Figure 5.1**) of up to 10 km from the proposed wind turbine locations (based upon the Scoping layout) has been defined, for Scheduled Monuments, Grade I, Grade II* listed buildings and a 5 km study area for conservation areas and Grade II listed buildings. There is no guidance defining what the extent of an appropriate 'study area' should be for the cultural heritage assessment of wind farms; experience shown in similar landscapes, incorporating turbines of this scale, across the UK determines that a 10 km study area would be appropriate for the Proposed Development.
- 5.2.2 The proposed study area has been defined through the application of professional judgement, taking into account the scale of the Proposed Development, experience from comparable projects, and through the utilisation of a Zone of Theoretical Visibility (ZTV). The extent of the study area will be reviewed and refined to a point of agreement between stakeholders during consultation.
- 5.2.3 With regards to the archaeological potential of the Site, a study area of 1 km from the Site boundary was utilised for the purposes of baseline data collection.

Data Sources

Overview of Available Data Sources

- 5.2.4 The sources to be consulted in the production of the cultural heritage ES chapter include, but are not limited to, those outlined in **Table 5-1**.

Table 5-1 Key sources of information for Archaeology and Cultural Heritage

Subject	Summary	Source
Designated cultural heritage assets	Data available from the database of Historic England.	HE digital data download from the National Heritage List for England.
Non-designated cultural heritage assets (local Historic Environment Record (HER))	HER data obtained from the North Lincolnshire Historic Environment Record and the East Riding of Yorkshire and Hull Historic Environment Record.	Digital data purchased from relevant councils as downloads.
Historic Mapping	Historic Ordnance Survey maps, relevant estate and tithe maps where available.	National Library of Scotland website; local records office.
Unpublished reports	Grey literature, academic articles.	Online; Archaeology Data Service, information from the Client.
Published works of synthesis	Published sources that combine and interpret information from multiple primary or secondary materials to create an integrated overview or broad understanding of a topic.	Online; libraries.
Aerial Photography	Historic England	Aerial Photo Explorer (online).



Subject	Summary	Source
Historic Landscape Characterisation	Historic England, local councils	Historic England or local council digital data download.
LiDAR	Publicly available LiDAR data obtained from the Environment Agency National LiDAR Programme.	Digital data download/Environment Agency website.

Description of Baseline Environment

- 5.2.5 This section provides a summary of HER data for the wider 1 km area to help inform on the potential for additional, as-yet unknown heritage assets surviving within the Site boundary as sub-surface archaeological remains. A full, detailed background will be provided as part of the cultural heritage assessment in the ES.
- 5.2.6 Prehistoric: There are no known heritage assets dating to this period within the Site or the 1 km study area. However, one flint of uncertain date was found amongst some medieval pottery (10902) within the west of the Site, above Haldenby Hall.
- 5.2.7 Evidence for prehistoric settlement, as well as funerary and ritual activity, is known from the wider area generally (beyond the extent of the 1 km study area). Examples include an Iron Age occupation layer at Flixborough (19690) approximately 4.9 km to the south-east of the Site, a Bronze Age occupation site at Walcot Hall (4621) approximately 4.5 km to the east, a possible Round Barrow at Alkborough (19665) approximately 4 km to the east, and a Bronze Age cinerary urn at Flixborough (19681) approximately 4.9 km to the south-east of the Site, as well as several flint and lithic find spots throughout the study area. Many of the prehistoric HER records appear to be from the east of the River Trent.
- 5.2.8 Roman: There are no heritage assets dating to this period within the Site. Within the 1 km study area are two find spots of a Roman Coin (1641) approximately 1.2 km east of the Site and an amphora rim and handle (1639) approximately 1.1 km to the south. In the wider area, there was a substantial Roman riverside settlement and industrial site (MHU27008) just to the north of Adlingfleet, approximately 2 km from the Site. The pottery finds within this area suggest the settlement extended over six hectares and suggest two main periods of activity AD 100 – 230 and AD 230 – 370. Furthermore, two possible Roman roads at Blacktoft between 3.4 km and 4 km south-east of the Site (MTU25535 and MTU25534), several potential crop marks and find spots, have been recorded outside of the study area.
- 5.2.9 Early Medieval: There are no heritage assets dating to the early medieval period within the Site or the 1 km study area. In the wider area, this period is mainly represented by find spots, particularly potsherds. Notably, a sherd of Torksey Ware pottery has been found at Adlingfleet (10900), approximately 1 km to the east of the Site. This type of pottery attests to Anglo-Scandinavian settlement activity in the vicinity. In addition, the site of a temporary Danish camp (13186) is known at the mouth of the River Trent, to the north of Adlingfleet, approximately 2.6 km to the north-east of the Site.
- 5.2.10 Medieval: There are six heritage assets within the Site dating to the Medieval period. These comprise two pottery find spots (10902 & 7313), a Medieval open field system (21291), the site of Bracken Hill Wayside Cross (U5), and two areas of ridge and furrow (27009 and 22605). The medieval period is well represented within the 1 km study area, with several sites evidencing medieval settlement and occupation. These include the village of Adlingfleet, which has medieval origins (10896), approximately 1.1 km to the east of the Site; Deserted Medieval Villages (DMVs) at Garthorpe (9596), approximately 800 m to the east of the Site; Halenby (16386); and Luddington (7150), approximately 2.1 km south of the Site; and two moated sites (1348 and 1349), approximately 630 m east of the Site and 3.9 km south of the Site, respectively. Other medieval sites include the site of a chapel south of



Whitgift (17531), approximately 130 m to the west of the Site; the site of Haldenby Hall and Chapel (10903), approximately 33 m from the Site; medieval property boundaries at Garthorpe (11039), approximately 1.2 km east of the site and the site of an earlier hall at Garthorpe Hall (17506), approximately 1 km east of the Site. Evidence for medieval agricultural activity is represented by two areas of ridge and furrow cultivation (21284 and 21291).

- 5.2.11 Post-Medieval: There are no post-medieval HER records with the Site. It is, however, well represented within the 1 km study area, reflecting the area's historic agricultural character. A total of 44 HER records dating to the post-medieval period have been identified within the 1 km study area. These comprise 19 farmsteads, four barns, five houses, three religious buildings, three drains, two windmills, and one railway. The remaining records relate to findspots, field boundaries, and cropmarks. Collectively, these records illustrate the predominantly agrarian nature of the historic landscape and its associated rural settlement pattern.
- 5.2.12 Modern: There are no heritage assets dating to the modern period within the Site or the wider 1 km study area. Outside the wider 1 km study area there are four HER records, three of which relate to a Former Station Master's House (22554, 22556 and 22558) approximately 1.5 km to the east of the Site. The fourth is the site of a searchlight battery, on Haldenby Moor (21392) approximately 2 km to the south-west.

5.3 Assessment Methodology

Relevant Policy, Legislation and Relevant Guidance

- 5.3.1 The potential effects of the Proposed Development on archaeological and cultural heritage receptors would be considered in the Cultural Heritage ES chapter, which would reference, as appropriate, relevant legislation, policy and guidance including, but not limited to, the following:

Legislation

- Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended)
- Planning (Listed Buildings and Conservation Areas) Act 1990; and
- Ancient Monuments and Archaeological Areas Act 1979.

Policy

- 5.3.2 The UK Government, Historic England and the relevant local authorities have issued a number of statements of policy with respect to dealing with the historic environment in the planning system:
- East Riding of Yorkshire Local Plan Local Plan – Policy ENV3: Valuing our heritage (2025);
 - North Lincolnshire Local Development Framework - Policy CS6: Historic Environment (2011);
 - the Saved Policies of the North Lincolnshire Local Plan 2003 (2024), Policies HE5: Development Affecting Listed Buildings; HE8: Ancient Monuments; and HE9: Archaeological Excavation;
 - National Planning Policy Framework (NPPF) (MHCLG, 2026);
 - Planning Practice Guidance (PPG) (MHCLG, 2024); and



- National Policy Statements (NPSs);
 - EN-1 (Overarching Energy) (2025); and
 - EN-3 (Renewable Energy Infrastructure) (2025).

Guidance

Historic England Guidance:

- GPA1: Understanding Place – Historic Area Assessments (2017);
- GPA2: Managing Significance in Decision-Taking in the Historic Environment (2015);
- GPA3: The Setting of Heritage Assets (2017);
- Conservation Principles, Policies and Guidance (2010);
- Advice Note 12, Statements of Heritage Significance (2019); and
- Commercial Renewable Energy Development and the Historic Environment (2021).

Chartered Institute for Archaeologists (CIfA):

- Standard and Guidance for Historic Environment Desk-Based Assessment (2020); and
- IEMA, IHBC and CIfA: Principles of Cultural Heritage Impact Assessment in the UK (2021).

Scope of assessment

- 5.3.3 Grade I and II* nationally significant designated assets from the National Heritage List for England (NHLE) within the 10 km study area, as well as all Grade II listed designated heritage assets and conservation Areas within a 5 km study area, will be subject to an initial setting assessment in order to determine any potential impacts (**Technical Appendix 5.1**). A final scope of assets that have the potential for significant effects as a result of the Proposed Development will be agreed with the relevant consultees and assessed in full within the ES.
- 5.3.4 In the absence of industry-standard criteria for assessing impacts on built heritage, the methodology for establishing the relative value or importance of heritage assets ('heritage significance'), the magnitude of impact, and the level and significance of effect is drawn from the Design Manual for Roads and Bridges (DMRB) and its tables, and from Principles of Cultural Heritage Impact Assessment in the UK (July 2021). The details of the methodology will be agreed with Historic England and the Conservation Officers at ERYC and NLC.
- 5.3.5 The assessment of likely significant effects to sensitive receptors will consider the sensitivity of the receptor (henceforth referred to as cultural heritage significance) (on a scale of high, medium, low and negligible) and the magnitude of change (on a scale of large, medium, small and negligible) to determine the level of effect on a scale of major, moderate, minor and negligible.
- 5.3.6 Significant effects will be determined following this, using professional judgement, which is informed by an understanding of the heritage significance (sensitivity to change) of these assets and having regard to the DMRB (which advises that the effect on the cultural heritage resource is not significant when the impact does not substantially diminish the heritage interest of the cultural heritage resource).
- 5.3.7 HER records within the 1 km study area will be identified from the HER records of East Riding of Yorkshire and Hull HER and North Lincolnshire HER.



- 5.3.8 A final scope of assets that have the potential for significant effects as a result of the Proposed Development will be agreed with the relevant consultees and assessed in full within the ES Chapter and accompanying technical appendix.

Assessment and Types of Impact

- 5.3.9 Impacts have the potential to be caused by the Proposed Development where it changes the baseline condition of either the asset itself or its setting; it being noted that a change does not necessarily result in a negative impact to its setting.
- 5.3.10 A core area, which includes all land within the Site, will be subject to assessment for potential direct physical effects. This study area will be subject to a detailed walkover survey, and archaeological remains that may be directly or indirectly impacted by the Project will be identified. In addition, a wider 1 km study area will be used to identify all known heritage assets and previous archaeological interventions, to help inform the likelihood of unknown remains being present within the Site.
- 5.3.11 The qualitative assessment will be carried out in accordance with: EN 1 Section 5.9: Historic Environment; Section 16 of the NPPF; Conservation Principles: Policies & Guidance; Historic Environment Good Practice Advice in Planning Note 2 - Managing Significance in Decision -Taking in the Historic Environment and best practice documents and guidance published by the Chartered Institute for Archaeologists (CIfA).
- 5.3.12 The assessment of likely significant effects to sensitive receptors will consider the sensitivity of the receptor (on a scale of high, medium, low and negligible) and the magnitude of impact (on a scale of large, medium, small and negligible) to determine the level of effect on a scale of major, moderate, minor and negligible. Significant effects will be determined following this through professional judgement.
- 5.3.13 The definition of impact is described below:
- Direct impacts (physical) occur where the physical fabric of the asset is removed or damaged, or where it is preserved or conserved, as a direct result of the Proposed Development. Such impacts would most likely occur during the construction phase and would most likely be permanent.
 - Indirect (physical) impacts are those which would affect the heritage significance of an asset by causing change to its fabric indirectly, such as increased changes in water draining patterns, which could indirectly affect the preservation of heritage materials.
 - Setting impacts could result from the Proposed Development causing change within the setting of a heritage asset and subsequently affecting its cultural significance or the way in which it is appreciated. Such impacts are generally, though not exclusively, visual, occurring directly as a result of the Proposed Development's appearance in the asset's surroundings. Setting impacts may also relate to other senses or factors, such as noise, odour, or emissions, or to historical relationships that do not relate entirely to intervisibility, such as historic patterns of land use and related historic features. Such impacts may occur at any stage of a Project's lifespan and may be permanent, reversible, or temporary. Setting impacts are generally considered as an effect of the operation of the wind farm array.
 - Cumulative impacts: can relate to the physical fabric or setting of assets. They may arise from impact interactions, either from different impacts of the Project itself, or from additional impacts resulting from incremental changes caused by the Project together with other projects within the scope of the cumulative assessment area.
 - Impacts upon non-designated heritage assets and unknown buried remains are generally considered an effect of construction.



- Assessment will be undertaken separately for direct physical impact, indirect impact and direct setting impacts and will consider the level of their heritage significance (where known) and the magnitude (extent) of the identified impacts.

Desk Study

- 5.3.14 The ES chapter will include a desk-based study, based on the sources and methodology outlined above, and complemented by field surveys where necessary and agreed with consultees.

Planned Surveys

- 5.3.15 A desk-based Deposit Model will be produced in relation to all recorded assets within the Site; the aim of this would be to establish the condition of any recorded assets and identify the potential for any additional presently unrecorded assets.
- 5.3.16 Targeted field inspection of assets scoped in for further assessment due to potential impacts from changes to their setting as a result of the Proposed Development will also be undertaken following a desk-based comparison of asset mapping with ZTV and satellite imagery. This survey will inspect any identified designated heritage assets through an in-field settings assessment. These measures will be subject to consultation with consultees throughout the pre-application phase of the Proposed Development.

5.4 Potential Impacts

Designated Heritage Assets

- 5.4.1 There are no designated heritage assets within the Site. Within the 10 km study area, there are 18 scheduled monuments, 13 Grade I, 16 Grade II* and within 5 km, there are 99 Grade II listed buildings, and four conservation areas. There are no registered parks and gardens, World Heritage Sites, or registered battlefields, within the 10 km study area. **Technical Appendix 5.1** shows the full list of designated heritage assets.
- 5.4.2 Of the assets included within the study area outlined in **Table 5-2** and **Technical Appendix 5.1**, it is anticipated that the asset types listed below are unlikely to give rise to significant effects from the Proposed Development (i.e., their cultural significance is retained). This is due to their cultural significance lying wholly / predominantly within their fabric and / or the lack of change which the Proposed Development would cause in respect to elements of setting which contribute towards their significance. Accordingly, the types of assets listed below are proposed to be scoped out of further assessment:
- assets in built up areas for which cones of view to / from are not significant;
 - churches / chapels and associated rectories whose significance draws from its architecture and churchyard settings, where there are also limited or distant views which would not affect an appreciation or understanding of the asset;
 - assets located within a built-up village area where understanding of function lies within the village setting;
 - former / distant farmsteads, farmhouses and ancillary farm buildings to which an understanding and appreciation is restricted to the principal farmhouse, farmyard and / or the immediate rural backdrop which would be unaffected and / or with no historic links to the land within the footprint of the Site;
 - distant cottages and houses to which rural setting is restricted with no historic link to the land within the footprint of the Site; and
 - non-designated heritage assets within the study area.



5.4.3 Subsequent to this filtering process, the assets deemed to be potentially sensitive to change as a result of the Proposed Development are listed below in **Table 5-2**. These assets will be subject to field observations, where possible, to determine the necessity for assessment of their significance in accordance with Historic England's guidance *The Setting of Heritage Assets* (2017) and *Statements of Heritage Significance* (2019).

Table 5-2 Designated Assets Potentially Sensitive to Change

List Entry	Name	Grade	NGR
1013190	Hall Garth moated site, associated drainage channels and fishpond	SM	SE 82501 22963
1016933	Adlingfleet medieval rectory, 60 m south of All Saints Church	SM	SE 84365 20944
1083144	Church of All Saints	I	SE 84395 21003
1103747	Church of St Andrew	I	SE 87016 17875
1083149	Whitgift Hall, including attached Walls to North Outbuildings and Screen Wall to South East	II*	SE 81662 22808
1260341	Walcot Old Hall	II*	SE 87872 21011
1260344	Church of Etheldreda	II*	SE 90512 20838
1203298	Saltmarshe Hall	II*	SE 78204 23965
1103307	Goole Hall	II*	SE 75325 21521
1346748	Stone Building approximately 25 m South of Church House	II*	SE 84381 20944
1083142	Haldenby Grange Farmhouse	II	SE 82625 17889
1083143	Barn and adjoining Horse Mill approximately 50 m North of Haldenby Grange Farmhouse	II	SE 82622 17912
1083145	Elm Tree Farmhouse	II	SE 84396 20836
1083148	Ross Farmhouse	II	SE8319223150
1083179	Church of Saint Oswald	II	SE 83499 17248
1083180	Haldenby Park House	II	SE 82019 16991
1083330	Shrublands	II	SE 77160 22360
1083331	Park Farmhouse	II	SE 77348 22220
1103277	Reedness Hall	II	SE 79248 23284
1103278	Elmtree House	II	SE 79253 23241
1103279	The Old Manor	II	SE 79819 22967
1103280	Reedness Manor House	II	SE 80126 22942
1103281	The Old Parsonage	II	SE 80227 22900
1103282	Moorend Farmhouse	II	SE 78147 18822
1161643	The Hall, Including attached Walls and Outbuildings	II	SE 80459 16304
1161782	Manor Farmhouse	II	SE 85087 19351
1161800	Fockerby Hall	II	SE 84699 19041
1309777	Inglenook	II	SE 82008 22949



List Entry	Name	Grade	NGR
1309899	Haldenby Hall	II	SE 82921 18114
1346764	The Old Vicarage, Including Adjoining Carriage House and Stables	II	SE 80648 16668
1352656	The Beeches	II	SE 86302 24118
1241765	Walcot Hall	II	SE 87786 21093
1242379	Peel Cottage Approximately 170 m North West of Walcot Hall	II	SE 87696 21175
1346749	Grange House (On Corner With Cow Or Pinfold Lane)	II	SE 84406 20792
1347044	The Fernery Farmhouse	II	SE 79166 23258
1281749	Cotness Hall	II	SE 79898 24086
1083313	Metham Hall	II	SE 80991 24702
1352658	Yokefleet Hall	II	SE 82441 24063
1161472	Lilac Cottage	II	SE 87244 15144
UID4600	Normanby	CA	N/A
UID6751	Adlingfleet	CA	N/A
UID4552	Burton upon Stather	CA	N/A
UID4509	Alkborough	CA	N/A

HER Records

- 5.4.4 There are seven HER records within the Site and a further 54 within the 1 km study area. It is expected there will be a direct impact on those within the Site, which are:

Table 5-3 HER records within the Site

HER Reference	Name
MLS10902	Medieval pot sherds & flint, Haldenby
MLS17313	Medieval pottery, Haldenby Hall
MLS21050	Cropmark, East Green
MLS21291	Medieval open field system, Luddington and Haldenby parish
MHU5	Site of Bracken Hill Wayside Cross
MHU27009	Medieval Ridge and Furrow
MHU22605	Medieval Ridge and Furrow

Summary of Potential Impacts Scoped In

- 5.4.5 Cultural heritage assets both within the Site and the study area will be considered for the potential for direct, indirect, settings and cumulative impacts as a result of the Proposed Development.
- 5.4.6 Potential for direct impacts on yet unrecorded heritage assets will be considered within the ES. If warranted, mitigation will be agreed with the relevant local authority (ERYC and NLC Archaeologists).



5.4.7 As a result of the initial appraisals, the impacts proposed to be scoped in for further assessment to be included within the ES are outlined in **Table 5-4**.

Table 5-4: Impacts proposed to be scoped into the assessment for Archaeology and Cultural Heritage

Impact	Description	Proposed Approach to Assessment Including Description of Any New Data Collation Required and Any Analyses (Such as Modelling)
Construction		
Direct physical impacts on non-designated heritage assets within the Site	This includes both HER recorded assets and previously unrecorded archaeological remains. A range of potential direct impacts on archaeological and cultural heritage receptors may arise during construction. These include ground disturbance from wind turbine foundations, access tracks, crane pads, cabling, substation works, and associated infrastructure.	Potential direct impacts will be assessed through a combination of Data Collation and Desk-Based Work • A desk-based assessment will be carried out to inform the baseline for the Site. • Historic map regression and documentary review. • Desk based Deposit Modelling Consideration of evaluative fieldwork (e.g. geophysical survey, trial trenching) if required to clarify archaeological potential. Relevant mitigation measures will be embedded within the design of the Proposed Development as the design progresses. Potential mitigation is discussed in Section 5.6 of this Scoping Report.
Indirect effects on heritage assets within the Site	The known heritage assets within the Site may be subject to indirect physical impacts arising from construction related activities such as vibration, changes to ground hydrology, and temporary or sustained dewatering. These processes have the potential to affect buried archaeological deposits, especially those that rely on stable hydrological or anaerobic conditions for their preservation. Vibration may cause movement, settlement, or micro-fracturing of fragile features, while dewatering may accelerate the deterioration of waterlogged remains or alter the preservation environment. Even where no direct physical disturbance is proposed, these indirect mechanisms can compromise the integrity, stability, or evidential value of archaeological assets.	The assessment of indirect effects will incorporate a review of construction methodologies, vibration-generating activities, and any works likely to alter groundwater levels. This will be supported by hydrogeological appraisal, geotechnical data, and where appropriate, vibration modelling or zone of influence analysis. Assets identified as potentially sensitive to hydrological or vibratory change will be evaluated to determine their susceptibility, with mitigation embedded in the design where necessary, such as adjustments to construction methods, monitoring strategies, or preservation measures. If unavoidable risk remains to any archaeologically important assets, if any present, additional targeted investigations or protective measures may be recommended to ensure that archaeological receptors are safeguarded throughout construction, operation, and decommissioning.



Impact	Description	Proposed Approach to Assessment Including Description of Any New Data Collation Required and Any Analyses (Such as Modelling)
Setting Effects	Short term change within the setting of designated heritage assets could affect the appreciation of their cultural significance. This could occur during construction and be associated with visual and audible changes associated with heavy plant (presence and movements) and earthworks.	Historic England's guidance on assessing setting impacts has been used to determine which assets are potentially sensitive to change, and which assets of this subgroup would experience an effect upon their cultural significance. Assets fitting these criteria have been scoped in for further assessment and are outlined in Table 5-2 .
Operation and Maintenance		
Direct physical impacts	Maintenance activities have the potential to result in direct physical impacts on archaeological and cultural heritage assets where additional ground disturbance is required during the operational lifespan of the Proposed Development. Such impacts may arise from works including track widening, excavation for repairs, ground-breaking required for replacement of buried cables or drainage infrastructure, and the establishment of temporary laydown or crane hardstanding areas.	If maintenance works require additional ground-breaking, the potential for further impact on recorded or unrecorded heritage assets will need to be considered. Where this occurs, further mitigation may be required, in line with the broader approach to embedded mitigation outlined for the Proposed Development. This would ensure that any maintenance-related works are informed by the presence of known assets and by the possibility of unrecorded remains within the Site, with measures implemented to avoid or reduce direct physical impacts wherever possible.
Settings effects on designated heritage assets	During the operational phase, the presence and movement of wind turbines may give rise to indirect impacts on the settings of heritage assets within the wider landscape. These impacts may occur where the visibility, character, or experience of an asset's surroundings contributes to its cultural significance.	Historic England's guidance on assessing setting impacts has been used to determine which assets are potentially sensitive to change, and which assets of this subgroup would experience an effect upon their cultural significance. Assets fitting these criteria have been scoped in for further assessment and are outlined in Table 5-2 .
Decommissioning		
Setting Effects	Short term change within the setting of designated heritage assets could affect the appreciation of their cultural significance. This could occur during decommissioning and be associated with visual and audible changes associated with heavy plant (presence and movements) and earthworks.	Historic England's guidance on assessing setting impacts has been used to determine which assets are potentially sensitive to change, and which assets of this subgroup would experience an effect upon their cultural significance. Assets fitting these criteria have been scoped in for further assessment and are outlined in Table 5-2 .



Impact	Description	Proposed Approach to Assessment Including Description of Any New Data Collation Required and Any Analyses (Such as Modelling)
Cumulative		
Direct Effects on Heritage Assets within the Site	Ground disturbance affecting archaeological remains would add to the cumulative disturbance of remains in general.	The ES will consider the potential cumulative effects in accordance with the methods presented in Chapter 3: Approach to EIA of the Scoping Report. This will include consented (not built out) schemes and pending decision schemes.
Settings Effects	Cumulative impact through setting change caused by consented (but not built out) schemes and pending schemes could combine with any effects identified by this Proposed Development to cause a greater cumulative effect.	The ES chapter will consider the potential cumulative effects in accordance with the methods presented in Chapter 3: Approach to EIA of the Scoping Report. This will include consented (not built out) schemes and pending schemes. Assets with a minor or higher significance of effect resulting from the Proposed Development in isolation will be considered for cumulative assessment, as these assets are most likely to be susceptible to significant cumulative effects.

5.5 Impacts Proposed to be Scoped Out

- 5.5.1 Based on the baseline environmental information currently available and the Proposed Development description (outlined in **Chapter 2**) several impacts are proposed to be scoped out the EIA for archaeology and cultural heritage. The impacts are outlined in **Technical Appendix 5.1** together with a justification for scoping them out.

Table 5-5: Impacts proposed to be scoped out of assessment for Archaeology and Cultural Heritage

Impact	Justification for Scoping Out
Decommissioning	
Direct Effects	On the basis that effects are likely to be similar to or less than construction effects, it is unlikely that there will be any direct impacts upon known heritage assets as a result of decommissioning. The direct effects of decommissioning will therefore not be taken forward for assessment within the ES chapter.

5.6 Mitigation

- 5.6.1 As part of the early design process for the Proposed Development, suitable embedded primary mitigation measures to reduce the potential for impacts on archaeological and cultural heritage receptors are presented below. It is expected that these may evolve throughout the iterative design of the Proposed Development as the EIA progresses and in response to consultation feedback.
- 5.6.2 Additional mitigation measures will be considered where significant effects are anticipated to remain after embedded design measures and standard good practice controls have been



applied. If residual impacts persist, proportionate further actions, such as enhancement, remediation or compensation, will be identified to address those remaining effects.

- 5.6.3 As the Proposed Development progresses, opportunities to enhance archaeology and cultural heritage, including through public benefit, will be considered in line with relevant guidance, with any measures identified defined in the ES Chapter.
- 5.6.4 Suitable measures for minimising impacts through ground disturbance might include:
- the micro-siting of infrastructure, with due consideration for wider site constraints and engineering practicalities, away from sensitive locations;
 - the fencing off or marking out of heritage assets or features in proximity to construction activity to avoid disturbance where possible;
 - a programme of archaeological work where required, such as an archaeological watching brief during construction activities in or in proximity to areas of archaeological sensitivity, or excavation and recording where impact is unavoidable; and/or
 - a working protocol to be implemented should unrecorded archaeological features be discovered.
- 5.6.5 Suitable measures for mitigating any setting impacts during the iterative design process might include, but is not limited to:
- alteration of the proposed wind turbine layout
 - deletion or removal of wind turbines; and/or
 - reduction of proposed wind turbine heights.
- 5.6.6 The requirement for, and feasibility of, any mitigation measures will be subject to consultation with consultees throughout the pre-application phase of the Proposed Development.

5.7 Consultation

- 5.7.1 The initial baseline study utilising constraint mapping in relation to a ZTV has identified sensitive designated heritage assets to be considered within the ES and technical appendix (**Figure 5.1**). This filters out those assets that do not require further assessment as the Proposed Development progresses, as detailed in **Technical Appendix 5.1**.
- 5.7.2 This is because the asset has no intervisibility with the Proposed Development; the setting of the asset does not contribute to its cultural significance; and/ or it is not anticipated that the Proposed Development will change the setting of the asset to such an extent as to cause harm to the ability to appreciate it. The figures and appraisal are provided to identify and agree on the most potentially sensitive assets, which may then require computer-generated visualisations to be produced as part of their assessment. Consultees (including Historic England, ERYC and NLC) are invited to confirm they are agreeable to the current scope of assets to be assessed in the ES.
- 5.7.3 Additional follow up consultation, post-scoping, will be undertaken as required with Historic England and the local authorities to agree on the scope of assessment for the final design layout of the Proposed Development.

5.8 Summary of Scope

- 5.8.1 It is anticipated that the ES will reference a baseline in respect to a finalised layout. The baseline will include a full desk-based assessment using HER data, historic mapping, documentary sources and a deposit model.



- 5.8.2 The study area referenced to assess archaeological potential would be set at 1 km from the Site boundary. This search area will be used for consultation with the East Riding of Yorkshire and Hull and the North Lincolnshire Historic Environment Records and is expected to represent the archaeological character of the area within the Site.
- 5.8.3 The scope of assets requiring detailed settings assessment will be confirmed through ongoing consultation with the relevant stakeholders. The heritage team will refine the list of assets requiring detailed settings assessment, incorporating consultee feedback and any design evolution, and will prepare full statements of significance for all scoped-in designated and non-designated assets. ZTV analysis and proposed viewpoint visualisations, where required, will be presented to support settings assessments. Full statements of significance, detailed assessment of setting impacts, and any required mitigation strategies will then be developed for inclusion in the ES.
- 5.8.4 Where required, recommendations for archaeological evaluation will be developed in consultation with the relevant local authorities and Historic England. The findings will feed into the detailed ES Chapter, which will identify likely significant effects, propose mitigation measures, and confirm any required consent pathways. Engagement with consultees will continue throughout to ensure agreement on methodology.

5.9 Questions for Consultees

- 5.9.1 The following questions are provided to help frame the consultees comments on the Scoping Report for Archaeological and Cultural Heritage:

- Q5.1** Do consultees agree with assets and matters scoped out?
- Q5.2** Are there any assets, not listed in the appraisal, that key consideration should be given to?
- Q5.3** Do consultees have any specifications on required visualisations and their locations?
- Q5.4** Do consultees agree with the methodology set out?

5.10 References

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UK Government (2025). *National Policy Statement for Renewable Energy Infrastructure (EN-3)*. Available at: <https://www.gov.uk/government/publications/national-policy-statement-for-renewable-energy-infrastructure-en-3-2025>

UK Government (2026). *National Planning Policy Framework*. Available at: <https://www.gov.uk/guidance/national-planning-policy-framework>



6.0 Ecology

6.1 Introduction

- 6.1.1 This chapter of the Scoping Report sets out the proposed scope and methodology of the ecological impact assessment of the Proposed Development. It identifies the potential likely significant effects arising from the construction, operation and management, and decommissioning of the Proposed Development, in isolation and cumulatively, on ecological receptors. This chapter also explains how likely significant effects would be assessed for the purposes of the EIA, and outlines potential for biodiversity enhancement measures, which will be integral to the project design.
- 6.1.2 This chapter of the Scoping Report should be read alongside the following chapters of this Scoping Report:
- **Chapter 7: Ornithology;**
 - **Chapter 8: Hydrology and Hydrogeology;** and
 - **Chapter 9: Geology, Soils and Ground Conditions.**
- 6.1.3 This chapter is supported by the following Figures and Technical Appendices:
- **Figure 6.1** Non-avian statutory designated sites within 10 km;
 - **Figure 6.2** Non-avian statutory and non-statutory designated sites within 2 km;
 - **Figure 6.3** Ancient Woodland, Priority Habitats and Bluesky National Tree Mapping within 100 m.
 - **Figure 6.4** Area of Particular Importance for Biodiversity (APIB) and Areas that Could Become of Particular Importance for Biodiversity (ACB) (from the LNRS, where available);
 - **Technical Appendix 6.1** Ecological desk study and Protected and Priority Species Habitat Based Assessment; and
 - **Technical Appendix 6.2** Great Crested Newts (GCN) Survey results.

6.2 Baseline Conditions

Study Area

- 6.2.1 The scoping Study Area for ecology is based on the Proposed Development's realistic zone of influence and is tiered as follows:
- Site + 10 km (as shown on **Figure 6.1**): Special Areas of Conservation (SAC), Ramsar sites and statutory designated sites (SAC and/ or Sites of Special Scientific Interest (SSSI) for bats. It should be noted that Special Protection Areas (SPAs) have been excluded from discussion in this Chapter as they will be discussed in **Chapter 7: Ornithology** given that their qualifying features are exclusively avian related; and
 - Site + 2 km (as shown on **Figure 6.2**): SSSIs, Local Nature Reserves (LNR), Local Wildlife Sites (LWS), ancient woodland and priority habitats (as shown on data.gov.uk datasets), protected and notable plant and faunal species.
- 6.2.2 This tiered approach ensures that:
- Highly sensitive or wide-ranging receptors (e.g. SAC features) are assessed at an appropriately broad scale.



- Local habitats and species are captured within a focused, proportionate search area.
- Assessment effort matches ecological risk, avoiding both under-scoping and unnecessary over-scoping.
- The study remains aligned with regulatory expectations and established ecological assessment methodologies.

Data Sources

6.2.3 This Scoping Report has been prepared based upon desk study and field survey data gathered to date, as set out in **Table 6-1**. Certain surveys are ongoing / scheduled to be undertaken in 2026, the results of these would also be used to inform the EIA.

Table 6-1: Key sources of information for Ecology

Source	Summary	Spatial Coverage of Study Area
Desk Study		
Greater Lincolnshire Nature Partnership (GLNP)	For designated sites for wildlife, protected and notable species records. Data obtained 21/05/26	Site +2 km.
North & East Yorkshire Environmental Partnership (NEYEDC)	For designated sites for wildlife, protected and notable species records. Data obtained 13/05/26	Site +2 km.
Data.gov.uk website	Ecological datasets, specifically relating to priority habitats and protected species.	Site +10km.
Multi Agency Geographic Information for the Countryside (MAGIC) web-based mapping tool ("MAGIC" website)	Ecological datasets, specifically relating to priority habitats and protected species. Data obtained 27/04/26	Site +10 km.
Greater Lincolnshire Local Nature Recovery Strategy including the interactive plan at: https://www.glinclnrs.org.uk/local-habitat-map	The Local Habitat Map includes two key elements: • Existing core sites - Areas of Particular Importance for Biodiversity (APIBs). • Potential nature recovery areas - Areas that Could Become of Particular Importance for Biodiversity (ACBs).	Site +10 km.
Hull and East Yorkshire Local Nature Recovery Strategy	As above	Site +10 km
National Library of Scotland website ² historical maps; specifically, Ordnance Survey 1 st and 2 nd edition mapping	Historical land use at the Site Data accessed 16/07/26	Site +2 km

² <https://maps.nls.uk/geo/explore/side-by-side/#zoom=5.0&lat=56.00000&lon=-4.00000&layers=1&right=ESRIWorld>



Source	Summary	Spatial Coverage of Study Area
Data from landowners	Details from the landowners in respect of biodiversity, forestry <i>and / or</i> environmental schemes. This includes historic, current and aspirational projects.	Site +2 km
Field Survey		
Protected, priority and invasive species habitat-based assessment	The Lead Ecologist will undertake a walkover survey of the entire Site, to assess its potential to support priority, protected and/ or invasive species, and the likely importance of the habitat for such species. This site familiarisation will be used to refine the scope of follow on species survey work, and when later collaborating with the design team and other technical specialists.	Entire Site (where access allowed)
UK Habitat Classification and mapping	UK Habitat Classification (UKHab³) has been undertaken at the Site in summer 2026; this method enables robust evaluation against nationally and internationally recognised categories (such as Priority Habitats and Annex 1 Habitats). Ahead of site survey work, a pre-mapping exercise was undertaken using aerial photographs to accurately divide the Site into habitat polygons and linear lengths to aid precision in the field and ensure data captured are of the highest standard. A minimum mapping unit of 400 m² has been used for this task. Habitat data for the Site is being recorded during field survey. For each area, the following line or point habitat features are recorded: • primary habitat type; • essential secondary habitat codes; • Biodiversity Net Gain (BNG) Metric specific secondary codes; • project specific additional secondary habitat codes; and • dominant and characteristic species, including relative abundance.	Entire Site (where access allowed).
Condition Assessment (using Natural England Metric Criteria) including River Condition Assessment where relevant	The condition of each habitat parcel (or group adjacent parcels of the same habitat type and condition) at the Site has been/ is being assessed using the criteria produced by Natural England ⁴ . The condition assessment will include, for example, collecting information on the physical characteristics of the habitat, the presence of positive indicator species and the presence of invasive non-native species. Each habitat parcel that requires it will be assigned a condition score of 'poor', 'moderate' or 'good'.	Entire Site (where access allowed).
Bat Surveys	The proposed scope of survey work is designed to meet current NatureScot <i>et al.</i> (2021) survey guidelines. These	Site +200 m

³ UKHab. 2023. UK Habitat Classification Version 2.0 (at <https://www.ukhab.org>).

⁴ Natural England. 2023. The Biodiversity Metric 4.0 -Technical Annex 1: Condition Assessment Sheets and Methodology. Peterborough: Natural England.



Source	Summary	Spatial Coverage of Study Area
	are applicable across the UK and are considered to be the most appropriate survey guidelines in this instance, based on the type of development and anticipated impacts. Daytime Bat Walkover/ Key features survey A Daytime Bat Walkover (DBW) has been undertaken to identify and record any structures (buildings, bridges, tunnels etc) or trees at the Site that could be suitable for bats to roost in and/ or any habitats that could be suitable for bats to commute, forage or swarm at/ in. The results of the DBW have been used to determine the scope for further surveys. The NatureScot <i>et al.</i> (2021) guidelines require key features that could support maternity / hibernation roosts or swarming sites within 200 m (plus rotor radius) of proposed wind turbine locations to be subject to further investigation. A search for any such features within the relevant areas has therefore been undertaken. Automated bat activity survey In this instance, based on the potential impacts and the practicalities at this Site we propose to answer the following questions: • Which bat species are present at the Site, and where? • How does bat activity (as measured by mean, median and maximum calls per night) for high collision risk species vary across the Site? • Does activity survey indicate the presence of nearby maternity roost(s) for high collision risk species? At this stage the methods we propose to achieve this include automated static detector surveys, noting that bat surveys are iterative and targeted follow up surveys may be required depending on results. The automated survey comprises 15 nights of recording in each of: spring (April-May); summer (June-mid-August) and autumn (mid-August-October). The guidelines recommend the minimum survey effort is 10 suitable nights per recording period, however we have allowed for 15 nights per period to account for poor weather and minimise the risk of abortive work. A weather station is being deployed at the same time as the bat detectors, to verify conditions are appropriate for baseline data gathering. The guidelines require one detector per wind turbine for the first ten turbines then one per each three turbines after the first ten – so 8 detectors will be required for the proposed 8 turbine scheme. Given wind turbine locations are indicative at this stage, detector locations have been located to ensure representative habitats within areas likely to be occupied by wind turbines are sampled. Recordings will be analysed using Kaleidoscope Pro Auto-ID software with the Bats of Europe filter (UK region) to determine species. Where necessary bat calls will also be checked manually to confirm species identification. The	



Source	Summary	Spatial Coverage of Study Area
	data will then be evaluated to answer the questions set out above. Thereafter, the standardised format for presenting bat activity data given in Appendix 1 of the NatureScot <i>et al.</i> (2021) guidelines will be used. This will include a measure of relative bat activity obtained using the secure online tool Ecobat.	
Otter Survey	During summer 2026 watercourses and wetland habitat will be assessed for potential to support otters while resting, foraging, breeding or on passage. Searches will be made for evidence of otter activity including spraints, footprints, feeding remains, slides (into water) and resting sites. Where these features are identified their location will be recorded and photographs taken of the evidence. In addition, any structures which could potentially be used as a resting site (breeding or otherwise) but does not display any evidence of current use by otter will also be recorded as these features have the potential to be utilised by otter for resting in the future. One survey visit will be undertaken. Surveys for otter can be done at any time of year, but ideally periods following prolonged heavy rainfall and/or high water will be avoided.	All watercourses within the Site and up to 200 m up and downstream from it, where accessible.
Water Vole Survey	A habitat-based assessment will be undertaken to record the following: • suitability of bank profile and substrate for burrow excavation; • extent of herbaceous vegetation (within channel and along bank); • water level extent and stability; and • overshading extent. The extent of such habitats will be mapped and photographed. The habitats will then be classified negligible, suitable but poor, suitable, good, optimal, which in turn informs follow on survey effort and design. Survey for water vole will be undertaken on all relevant watercourses, i.e. except for those classed as having negligible potential. This comprises a search for evidence of water voles including burrows, feeding remains and latrines. Evidence of brown rat and American mink will also be recorded during the survey. Two visits are required, one in the first half of the season (mid-April to the end of June) and one in the second half of the season (July to September inclusive). These visits should be undertaken at least two months apart.	All watercourses within the Site and up to 200 m up and downstream from it, where accessible.
Great Crested Newt (GCN) Survey – Habitat Suitability Index and eDNA Presence/Absence test	Our review of local mapping suggested there are two ponds within the Site and four within 250 m of the Site. In June 2026 the identified ponds have been • assessed using the Habitat Suitability Index (HSI) for potential to support breeding GCN; and	Site + 250 m



Source	Summary	Spatial Coverage of Study Area
	sampled using the eDNA technique following standard protocol⁵. This involves the collection of water samples from each waterbody by licensed (or experienced and accredited) surveyors, the samples will then be sent to a specialist laboratory for analysis using qPCR. The results confirm the presence or likely absence of GCN in each waterbody and are detailed in Technical Appendix 6.2.	
Update walkover survey	Given the time elapsed between baseline data gathering and final submission, it is anticipated that an update walkover survey will be required to confirm that baseline data remains valid for informing the impact assessments.	Site +200 m.

- 6.2.4 On the basis of the current design of the Proposed Development, surveys for reptiles, invertebrates and other priority mammal species are not proposed based on lack of significant impacts anticipated. This reflects the anticipated localised nature of any effects on these faunal groups, particularly once standard construction best practice and pollution-prevention measures (which will be detailed in the ES) are implemented. These measures will include, as a minimum, minimising the construction footprint, establishing buffers to watercourses, appointing an Ecological Clerk of Works (ECoW) for the duration of construction, and preparing a detailed Construction and Environmental Management Plan (CEMP).
- 6.2.5 It should be noted that during all surveys, surveyors have noted / will note the presence of protected, notable and / or invasive plant or animal species.
- 6.2.6 Detailed survey results will be presented in a series of baseline survey reports, which will be appended to the ES.

Description of Baseline Environment

Designated Sites

- 6.2.7 There are no designated sites for nature conservation within the Site. However, there are two SACs and one SSSI within the Study Area. In summary, these are:
- International:** The Humber Estuary SAC and Ramsar site is located approximately 1.2 km to the north. This site contains a series of important habitats, including intertidal mudflats, sand flats and coastal saltmarsh as well as saline lagoons, sand dunes and standing waters. In addition, Thorne Moor SAC located approximately 6.2 km to the west. It includes degraded and active raised bogs and supports a variety of bog mosses.
 - National:** The Humber Estuary SSSI is located approximately 1.2 km north of the Site.
 - County:** No LWS are located within 2 km of the Site boundary.

⁵ Biggs, J; Ewald N, Valentini A, Gaboriaud C, Griffiths RA, Foster J, Wilkinson J, Arnett A, Williams P, and Dun F. 2014. Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (*Triturus cristatus*) environmental DNA. Oxford.: Freshwater Habitats Trust.



- 6.2.8 Refer to **Figure 6.1** and **Figure 6.2** for the location of designated sites in relation to the Site and **Technical Appendix 6.1** for additional site descriptions details.

Habitats & Flora

- 6.2.9 At the time of writing the UKHabitat Classification is ongoing; full details will be provided in a Technical Appendix to the ES Ecology Chapter. It has however been confirmed that the Site is predominantly agricultural habitats, with field boundaries being defined by an extensive ditch/ drain network with occasional lines of trees and small plantation woodlands. The ditches, ponds and field boundaries comprise the habitats of greatest non-avian ecological importance.
- 6.2.10 No irreplaceable habitat has been recorded at the Site, nor is it anticipated based on the available information. Areas of deciduous woodland within the Site are noted to be Priority Habitat within Natural England's dataset. Areas adjacent to the Adlingfleet Drain are noted to be "*Areas that Could Become of Particular Importance for Biodiversity*" (ACB) within the LNRS.
- 6.2.11 No records for protected or notable plant species have been returned for the Site. However, the following invasive non-native species (INNS) were returned from the desk study data search within 4 km of the Site. These include but are not limited to: American mink (*Neogale vison*), grey squirrel, Chinese water deer (*Hydropotes inermis*), Himalayan balsam (*Impatiens glandulifera*), rhododendron ponticum (*Rhododendron ponticum*), Japanese knotweed (*Fallopia japonica*), Montbretia (*Crocsmia × crocosmiiflora*).
- 6.2.12 Further details are included at **Technical Appendix 6.1**, **Figure 6.3** and **Figure 6.4**.

Bats

- 6.2.13 Desk study data confirms the presence of the following bat species in the surrounding area to the Site:
- common pipistrelle (*Pipistrellus pipistrellus*);
 - brown long-eared bat (*Plecotus auritus*); and
 - noctule (*Nyctalus noctula*).
- 6.2.14 The data included records of a brown long-eared bat maternity roost with a count of 23 individuals in 2015 located at the Blacktoft Community Church, approximately 1.8 km to the north of the Site. No other significant roost records within the surrounding 4 km have been recorded.
- 6.2.15 There are no buildings or other structures that offer roosting potential for multiple bats (i.e. scope for maternity / hibernation roosts or swarming) within 200 m of the proposed wind turbine locations (this being the key distance to refer to, in accordance with NatureScot guidance⁶). However, there are numerous trees located in plantation woodlands and tree lines within the Site that may be used by foraging or roosting bats: none are anticipated to be affected by the Proposed Development.
- 6.2.16 Full details in respect of the bat surveys that have been undertaken will be provided as technical appendices to the ecology ES chapter. This will include use of the online EcoBat tool to compare the bat pass data against a large, regional, and national dataset, providing context on how activity at the Site compares with others.

⁶ NatureScot (2021) Bats and onshore wind turbines - survey, assessment and mitigation



Otter

- 6.2.17 NEYEDC returned no records of otter (*Lutra lutra*) while GLNP returned 11 records of otter primarily located on Alkborough Sands, approximately 4.1 km east of the Site. No records originated within the Site.
- 6.2.18 Wetland habitats within the Site are considered suitable for use by otter. Full details in respect of the otter survey that is ongoing at the time of writing will be provided as a technical appendix to the ecology ES chapter.

Water Vole

- 6.2.19 NEYEDC returned no records of water vole and GLNP returned 152 records from the last ten years including records from Adlingfleet Drain and Fockerby Drain that both cross through the centre of the Site.
- 6.2.20 Wetland habitats within the Site are considered suitable for use by water vole. Full details in respect of the water vole survey that is ongoing at the time of writing will be provided as a technical appendix to the ecology ES chapter.

Amphibians

- 6.2.21 Neither Local Record Centre (LRC) returned any records of GCN within 2 km. Common frog (*Rana temporaria*), common toad (*Bufo bufo*) and smooth newt (*Lissotriton vulgaris*) are recorded locally.
- 6.2.22 Survey has confirmed that GCN are absent from the waterbodies at the Site (or its vicinity) (refer to **Technical Appendix 6.2** for details). However, they may be used by other locally occurring amphibian species.

Reptiles

- 6.2.23 Grass snake (*Natrix helvetica*), common lizard (*Lacerta vivipara*) and adder (*Viperus berus*) have been recorded within the Study Area. However, the most recent records for adder and common lizard supplied by the LRCs are from 1977, compared with 2021 for grass snake. Wetland habitats at the Site and surroundings are highly suitable for use by grass snake.

Invertebrates

- 6.2.24 A range of priority invertebrate species records were returned from the LRCs, including:

- | | |
|--------------------------------|------------------------------|
| • <i>Coenonympha pamphilus</i> | Small Heath |
| • <i>Lasiommata megera</i> | Wall |
| • <i>Satyrrium w-album</i> | White-letter Hairstreak |
| • <i>Hipparchia semele</i> | Grayling |
| • <i>Tyria jacobaeae</i> | Cinnabar |
| • <i>Coenonympha tullia</i> | Large Heath |
| • <i>Litologia literosa</i> | Rosy Minor |
| • <i>Pelurga comitata</i> | Dark Spinach |
| • <i>Xanthorhoe ferrugata</i> | Dark-barred Twin-spot Carpet |
| • <i>Caradrina morpheus</i> | Mottled Rustic |
| • <i>Hoplodrina blanda</i> | Rustic |
| • <i>Diarsia rubi</i> | Small Square-spot |



- *Carabus monilis* Necklace Ground Beetle
- *Panagaeus cruxmajor* Crucifix Ground Beetle
- *Helochares punctatus* A water beetle
- *Bembidion fumigatum* A ground beetle
- *Hypera meles* A weevil
- *Chaetarthria seminulum/ simillima* A water beetle

6.2.25 Most of these species are associated with specific plant species or habitats; it is considered possible that priority habitats and/ or the ditch network on Site could support notable invertebrates.

Other protected or notable species

6.2.26 NEYEDC also returned records for badger (*Meles meles*), though no evidence of presence has been recorded during the surveys completed to date.

6.2.27 Records of brown hare (*Lepus europaeus*), harvest mouse (*Micromys minutus*) and hedgehog (*Erinaceus europaeus*) were returned within the 4 km search area. Woodland and field boundary habitats within the Site are suitable for use by these species.

Summary of Important Ecological Features

6.2.28 **Table 6-2** outlines the important ecological features (IEF) that have been identified within the relevant study areas, or which based upon desk study information, habitat suitability or via more recent survey data are considered likely to be present within the relevant study areas, and which may be affected by the Proposed Development.

6.2.29 All remaining ecological features within the study area that are likely to be affected by the Proposed Development (amphibians and certain mammal species of principal importance under Section 41 (S41) of the Natural Environment and Rural Communities Act 2006) are assessed as being common and widespread at the local and national level. Therefore, they will not be taken forward for detailed assessment in the EclA.

Table 6-2: Important Ecological Features

Important Ecological Feature	Reason for Importance	Geographical Scale of Importance
Humber Estuary SAC	Statutory Designated Site	International
Humber Estuary Ramsar	Statutory Designated Site	International
Thorne Moors SAC	Statutory Designated Site	International
Humber Estuary SSSI	Statutory Designated Site	National
Habitats of conservation importance.	S41 habitats	TBC following survey
Bat Assemblage	All UK bat species are European and UK protected species. Common pipistrelle, soprano pipistrelle, brown long-eared bat are S41 species.	TBC following survey
Otter	Otter is protected through its inclusion in Schedule 5 of the WCA and in Schedule 2 of The	TBC following survey



Important Ecological Feature	Reason for Importance	Geographical Scale of Importance
	Conservation of Habitats and Species Regulations 2017, it is also S41 species. No evidence of otter has been recorded at the Site to date, but potential future presence cannot be ruled out. Therefore, the species is taken forward in the assessment.	
Water vole	Water voles are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). No sightings have been recorded to date, but surveys are ongoing. Desk study records indicate populations are present in the vicinity.	TBC following surveys
Amphibians and Reptiles	Great crested newt is confirmed absent from the Site. Common toad, common frog and smooth newt are recorded locally and may use wetland habitats for breeding and field boundaries/ woodland for foraging and shelter. Common toad is a S41 species. All native reptiles are UK protected species (common lizard receives partial protection although the level of protection afforded to adder is currently subject to review and may increase) and recognised as a species of principal importance under Section 41 of the NERC Act 2006. Desk study data confirms that no reptiles are recorded on the Site, but the ditch network is considered to have potential to support grass snake.	Local
Invertebrates	Potential for populations of Section 41 species and/ or Red Data Book (RDB) species associated with priority habitats.	Local, based upon the limited presence of suitable of habitats.



6.3 Assessment Methodology

- 6.3.1 Whilst **Chapter 3: Approach to EIA** provides an indicative EIA assessment method, it also identifies that assessment methodologies may differ in accordance with the prevailing technical area guidance and specific requirements of receptor groups. As such the following sections provide a description of the assessment criteria and assessment methodologies of relevance to ecology, which are derived from best practice guidance documents applicable to this topic and differ from those presented in the broader methodology chapter.
- 6.3.2 The ecological evaluation and impact assessment approach used in this report is based on CIEEM Guidelines for Ecological Impact Assessment v1.3 in the United Kingdom and Ireland ('CIEEM guidelines') (CIEEM, 2018), which are widely regarded as industry best practice.

Determining Importance

- 6.3.3 In accordance with the CIEEM guidelines, only ecological receptors which are considered to be IEF and potentially affected by the Proposed Development will be subject to detailed assessment. Ecological features can be important for a variety of reasons and the rationale used to identify them is explained here. Importance may relate, for example, to the quality or extent of the habitats within the Site; habitat and/ or species rarity; the extent to which such habitats and/ or species are threatened throughout their range, or to the habitats' and/ or species' rate of decline.
- 6.3.4 Important habitats are considered here to be those which:
- match descriptions of habitats listed on Annex 1 of the Habitats Directive, so far as it applies to the UK and as transposed by The Conservation of Habitats and Species Regulations 2017;
 - match descriptions of habitats of principal importance for biodiversity under Section 41 (S41) of the NERC Act 2006;
 - comprise irreplaceable habitats; such as (but not limited to) lowland fen, ancient woodland and veteran trees;
 - meet the LWS selection criteria for Northeast Yorkshire and Lincolnshire; and / or
 - comprise a significant habitat resource for an important species (see below).
- 6.3.5 Important species are considered here to be those:
- of European conservation importance (as listed on Annexes II, IV and V of the Habitats Directive) so far as it applies to the UK and as transposed by The Conservation of Habitats and Species Regulations 2017;
 - specially protected under the terms of the Wildlife and Countryside Act 1981;
 - of principal importance for biodiversity under S41 of the NERC Act 2006;
 - red listed or listed as near threatened using International Union for the Conservation of Nature (IUCN) criteria (IUCN, 2012; IUCN, 2016; IUCN 2019), e.g. in one of the UK Species Status Project reviews, or, where a more recent assessment of the taxonomic group has not yet been undertaken, listed in a Red Data Book);
 - which are listed as a Nationally Rare or Nationally Scarce species (e.g., in one of the Species Status Project reviews) or listed as a nationally notable species where a more recent assessment of the taxonomic group has not yet been undertaken;
 - endemic to a country or geographic location (it is appropriate to recognise endemic sub-species, phenotypes, or cultural behaviours of a population that are unique to a particular place); and/ or



- Meet the LWS selection criteria for the East Riding of Yorkshire or North Lincolnshire.

6.3.6 The CIEEM guidelines state that the importance of an ecological feature should be considered within a defined geographical context. The following frame of reference is used:

- International
- National (i.e. England)
- Regional (i.e. north-east England)
- County (i.e. East Riding of Yorkshire and North Lincolnshire)
- Local (i.e. the Site plus circa 2 km)
- Less than local

6.3.7 For the purposes of this assessment only ecological features of local importance or greater and/ or subject to legal protection are included (and are referred to as IEFs). Effects on other ecological features of lower importance are considered unlikely to be significant in legal or policy terms so are not subject to detailed assessment.

Identification and Characterisation of Impacts

6.3.8 The identification and characterisation of impacts on IEFs will be undertaken in accordance with the CIEEM guidelines (2018) with reference made to magnitude (e.g. area or number of individuals to be impacted), extent, duration and reversibility as appropriate. Impacts will be considered during the construction, operational and decommissioning phases and will be assessed on the basis that a clearly defined range of avoidance and standard good practice measures are implemented.

Significant effects

6.3.9 CIEEM (2018) guidelines define a 'significant effect' as an effect that either supports or undermines conservation objectives for IEFs 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). Potentially significant effects identified will be expressed with reference to an appropriate geographic scale. For example, a significant effect on a nationally designated site is likely to be of national significance. However, the scale of significance does not necessarily always relate to the importance of an ecological feature. For example, an effect on a species which is considered of national importance, may not have a significant effect upon its national population.

6.3.10 Consideration of conservation status is important for evaluating the effects of impacts on habitats and species and assessing their significance. Conservation status is determined by the sum of influences acting on the habitat or species concerned that may affect its abundance and distribution within a given geographical area.

6.3.11 In relation to significance of effects on IEFs, this will be expressed within the ES chapter with reference to the regional, national or international scale (as relevant). The significance of effects at a local scale may also be assessed where sufficient information allows a meaningful assessment.

Relevant Policy, Legislation and Guidance

6.3.12 Scoping has been carried out with reference to the legislation, policy (National and Local) and guidance listed below. The list of guidance is not exhaustive and other relevant guidance documents may be referred as appropriate.

- The Town and Country Planning Act (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations')



- Environment Act (2021)
- The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017
- The Conservation of Habitats and Species Regulations 2017 (as amended) (the Habitats Regulations)
- Natural Environment & Rural Communities (NERC) Act 2006
- The Wildlife and Countryside Act (WCA) 1981 (as amended)
- Ramsar Convention
- Hedgerow Regulations 1997
- Protection of Badgers Act 1992
- Salmon and Freshwater Fisheries Act 1975
- National Planning Policy Framework December 2026 (England)
- Government circular 06/05: Biodiversity and Geological Conservation
- East Riding Local Plan Update (2025)
- North Lincolnshire Local Plan (2003), Core Strategy (2011) and the emerging Local Plan
- Greater Lincolnshire Local Nature Recovery Strategy (LNRS)
- Chartered Institute of Ecology and Environmental Management (CIEEM) (2017) Guidelines for Preliminary Ecological Appraisal, 2nd edition. Chartered Institute of Ecology and Environmental Management, Winchester
- CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.3. Chartered Institute of Ecology and Environmental Management, Winchester
- BS42020: Biodiversity – Code of Practice for Planning and Development
- NatureScot et al. (2021). Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation
- Collins, J. (ed) (2023). Bat Surveys for Professional Ecologist. Good Practice Guidelines
- Chanin, P. (2003). Monitoring the Otter *Lutra lutra*
- Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016). The Water Vole Mitigation Handbook
- Dean, M. (2021). Water Vole Field Signs and Habitat Assessment A Practical Guide to Water Vole Surveys
- NatureScot (2003). Best Practice Guidance – Badger Surveys
- UKHab Ltd (2023). UK Habitat Classification Version 2.0. Available online at: <https://www.ukhab.org/>

6.4 Design, Mitigation and Enhancement Measures

- 6.4.1 As part of the design process for the Proposed Development, several embedded primary mitigation measures are proposed to reduce the potential for impacts on ecological receptors. These are presented in **Table 6-3** below. It is expected that these may evolve



throughout the design evolution of the Proposed Development as the EIA progresses and in response to consultation.

- 6.4.2 The Applicant is committed to implementing these measures, and also various standard sectoral practices and procedures. It is therefore considered that these measures are inherently part of the design and have been considered in the judgements as to which impacts can be scoped in / out of assessment presented in later sections of this chapter.

Table 6-3: Embedded design and applied mitigation measures

Parameter	Mitigation Measures
General	
Project Design	Careful wind turbine siting and track alignments to avoid key areas of ecological sensitivity, including wetland habitats, wherever possible. Cabling to be installed within the earthworks extent: • At all watercourse crossings; and • In all areas where important habitat is crossed or occurs immediately adjacent. Cable routing to avoid the root protection zone (RPZs) of all retained trees and woodland. A 50 m bat buffer (distance between wind turbine blade tip and woodland) to be applied to all woodland and trees in respect of wind turbine locations, in accordance with NatureScot guidelines.
Construction	
Vegetation Clearance and Other Construction Works	Full details of construction mitigation measures will be provided in a Construction Environmental Management Plan (CEMP); an Outline CEMP will be provided as an Appendix to the ES at application stage. Good practice measures in relation to pollution risk, sediment management and watercourse crossings to be adopted during the construction and operation phases, and further details on water management during construction are set out in Chapter 10: Hydrology and Hydrogeology. General Measures General good practice measures to protect important ecological features either known to be present or with the potential to be present will be set out in the Outline CEMP and will be implemented during the construction phase. These will include: • Micrositing of project elements will be used to avoid important ecological features, where possible. • Where appropriate protective fencing will be installed around retained habitats of importance and retained trees located directly adjacent to working areas (in accordance with recommendations in BS 5837:2012). • All working areas, including tracks, construction areas, and sloping verges will be reinstated to their original condition in terms of vegetation cover, except where they are to be enhanced. • All disturbed habitats that will not be permanently lost will be reinstated as soon as possible after construction. • As advised by the ECoW (see below) and where practically possible, cutting of vegetation (by strimming or flailing) to a height of 10 cm will be undertaken in all areas of grassland or scrub habitat, prior to works starting. All places of shelter shall be moved and checked for the presence of amphibians, reptiles, small mammals – log piles, rock piles etc. by hand



Parameter	Mitigation Measures
	where possible, with use of machinery only where objects are too heavy or unwieldy to move by hand and only under direct supervision of the ECoW. • Where possible, vegetation removal will be undertaken outside the core nesting bird period. If this is not possible, the area will be subject to pre-construction checks and work will proceed following the advice of the ECoW (see below). • All potentially dangerous substances or materials within the temporary construction compound would be carefully stored to reduce accidental pollution risk and prevent them causing any harm to mammal species which may enter the compound at night. • During construction, all excavations greater than 0.5 m depth would either be temporarily covered at night or designed to include a ramp to allow reptiles and other animals a means of escape should they fall in. • A speed limit of no greater than 15 mph would be implemented onsite to reduce the risk of road traffic collisions with wildlife. Ecological Clerk of Works (ECoW) A suitably qualified ECoW team will be employed for the duration of the construction and reinstatement periods, to oversee the safeguarding of important habitats and species and the implementation of ecological mitigation, compensation or enhancement measures, although this may not necessarily be a full-time role throughout. The role of the ECoW team will include the following tasks: • give toolbox talks to all staff onsite, so staff are aware of the ecological sensitivities on the Site and the legal implications of not complying with agreed working practices; • agree and monitor measures designed to minimise damage to retained habitats; • undertake pre-construction surveys and checks and advise on ecological issues where required; • during the construction period and in advance of work, undertake inspections of areas which require protected species mitigation (such as for reptiles or breeding birds) and carry out an appropriate level of supervision during vegetation clearance; and • oversee vegetation and habitat reinstatement on areas subject to disturbance during construction. The ECoW team may also support wider environmental management activities, including advising on drainage and reinstatement and establishing / monitoring appropriate exclusion areas. Where required, these activities may be undertaken in coordination with an Environmental Clerk of Works (EnvCoW) or other suitably qualified specialists (see Chapter 10: Hydrology and Hydrogeology and Chapter 8: Ornithology). Pre-construction Surveys Pre-construction surveys for protected species whose distribution could have changed since the baseline surveys would be undertaken to update the baseline and inform the implementation of any mitigation necessary. Additional checks for the presence of badger, otter and other protected or notable species will also be carried out by the ECoW immediately prior to vegetation clearance. In the unlikely event that protected species not recorded at the Site previously are identified during the pre-construction surveys and/ or ECoW checks, appropriate mitigation measures would be identified, agreed with Natural England (if licences are required) and implemented.



Parameter	Mitigation Measures
Biosecurity and Invasive Non-Native Species (INNS) Method Statement	All construction work will be undertaken in accordance with a Biosecurity and INNS Management Plan, the requirement for which can be secured by planning condition.
Pollution Prevention and Emergency Incident Response	Construction practices will incorporate measures to prevent pollution: All construction work will be undertaken in accordance with the CEMP, which will include a Pollution Prevention and Emergency Incident Response Plan (PPEIRP) setting out the pollution prevention measures, and emergency incident responses, which will be implemented by the Applicant and its contractors during construction. The requirement for the CEMP to include a PPEIRP can be secured by planning condition.
Best Practice	All construction work will be undertaken in accordance with the CEMP and relevant good practice guidance including, but not limited to: - Control of Water Pollution from Construction Sites – Guidance for Consultants and Contractors CIRIA (C532) (CIRIA, 2001); - CIRIA – SuDS Manual (C753) (CIRIA, 2015b); No discharge to main river watercourses will occur without permission from the EA (SuDS Manual), or from the lead local flood authority in the case of ordinary watercourses; Wheel washers, or alternative measures to minimise the transfer of detritus onto the highway, and dust suppression measures (if required), to be used as appropriate to prevent the migration of pollutants (SuDS Manual); Regular cleaning of roads of any construction waste and dirt to be carried out (SuDS Manual); and Surface water drainage arrangements to be submitted for approval by the Local Planning Authority as a requirement of the consent.
Operation	
General	The operational wind farm will include machinery that contains potential pollutants which could include cooling oils, lubricants, fuels, greases, etc. The design, maintenance and operation of the facility will follow good practice in line with the prevailing/future guidance and legislation with regard to measures such as the storage and management of potentially polluting substances, emergency spill response procedures, clean up and control of any potentially contaminated surface water runoff and routine inspection to prevent or contain leaks of any pollutants. In line with current good practice, feathering, i.e. the reduction of rotation speed while the wind turbine is idling (based on the findings of Arnett et al. (2013)), will be considered and implemented, depending upon the findings of detailed assessment, throughout wind farm operation. In respect of feathering the current NatureScot et al. guidelines state: <i>“The reduction in speed resulting from feathering compared with normal idling may reduce fatality rates by up to 50%. As this option does not result in any loss of output, as best practice, it is recommended wherever it is practically possible and there remains uncertainty over the risk posed to bats. It can be applied at any site with a blade pitch control system which can be automated using SCADA data”</i> . The relevant measures in both respects would be set out in an Operational Management Plan (OMP), the requirement for which can be secured by planning condition.



Parameter	Mitigation Measures
	An integral part of the project will be the production and implementation of a Habitat Management Plan (HMP) to detail long-term compensation and enhancement measures for biodiversity (potentially including ornithological as well as ecological interests) and agreed with relevant consultees, prior to the construction of the Proposed Development commencing. Outline details of measures to be included within the HMP will be provided in the relevant ES chapters. An Outline HMP will be submitted with the application and the requirement for a final HMP can be secured by planning condition.
Decommissioning	
General	An outline Decommissioning, Restoration and Aftercare Strategy will be prepared and submitted for the approval of the Local Planning Authorities, in consultation with relevant consultees, following the grant of planning permission and prior to the commencement of development. The strategy will set out the overarching principles for the decommissioning of the Proposed Development and the restoration and aftercare of the Site. A detailed Decommissioning, Restoration and Aftercare Plan will be prepared and submitted for the approval of the Local Planning Authorities in consultation with the relevant consultees prior to the commencement of decommissioning. The plan will provide updated and detailed proposals, in accordance with relevant guidance at that time, to ensure the decommissioning and removal of the Proposed Development in an appropriate and environmentally acceptable manner and the restoration and aftercare of the Site, in the interests of safety, amenity and environmental protection. The requirement for Decommissioning, Restoration and Aftercare Plan can be secured via a planning condition.

6.5 Potential Impacts to be Scoped In

- 6.5.1 A range of potential impacts on ecological receptors have been identified which may occur during construction, operation and maintenance, and decommissioning phases. The impacts that have been scoped into the EIA are outlined in **Table 6-4**, together with a description of any proposed additional data collection (e.g. site-specific surveys) and/ or supporting analyses (e.g. modelling) to enable an assessment of the impact.

Table 6-4: Impacts proposed to be scoped into the assessment for Ecology

Impact	Description	Proposed Approach to Assessment Including Description of Any New Data Collation Required and Any Analyses (Such as Modelling)
Construction		
Indirect impacts Humber Estuary SAC, Ramsar (and the underpinning SSSI)	The Humber Estuary SAC and RAMSAR is located approximately 1.2 km to the north of the Site (at its nearest point) and is of importance for the associated estuary habitats. It is hydrologically connected to the Site via the network of drains and ditches. Air quality impacts from construction traffic could result in impacts to the SAC, depending on	Data in respect of construction traffic and any associated air quality impacts will be used to determine potential for adverse effects at the SAC. Hydrological data will be used to determine potential impact pathways that could affect the SAC. Natural England's conservation advice will be used to inform the EIA and HRA.



Impact	Description	Proposed Approach to Assessment Including Description of Any New Data Collation Required and Any Analyses (Such as Modelling)
	routes to Site and number of vehicle movements. The SAC is scoped into the EIA as a result and a Habitats Regulations Assessment will be included as part of the application.	
Indirect impacts to Thorne Moor's SAC	This SAC is located approximately 6.2 km to the west of the Site. It includes degraded and active raised bogs and supports a variety of bog mosses. It is not hydrologically linked to the Site, but air quality impacts from construction traffic could result in impacts to the SAC, depending on routes to Site and number of vehicle movements. The SAC is scoped into the EIA as a result and a Habitats Regulations Assessment and will be included as part of the application.	Data in respect of construction traffic and any associated air quality impacts will be used to determine potential for adverse effects at the SAC. Natural England's conservation advice will be used to inform the EIA and HRA.
Permanent and temporary loss or degradation of important habitats via vegetation clearance/ excavation or through hydrological changes.	At the on-site substation, wind turbine bases, crane pads and access tracks there will be permanent loss of habitat due to the construction footprint of this element of the Proposed Development. Temporary habitat loss during construction, such as to enable creation of construction compounds or working areas around infrastructure, may also result in temporary (and depending on habitat type perhaps permanent) habitat loss. Degradation could result from altering water tables (hydrological degradation) and edge effects (e.g., drying out or waterlogging, or dust deposition). Key considerations are likely to be loss of areas that may support priority habitats and/ or which support protected and notable species.	UKHabitat Classification data (survey ongoing at the time of writing) is considered sufficient for the purpose of impact assessment. Design and construction detail, including drainage arrangements will be necessary to determine the scheme footprint and potential for downstream impacts. Hydrological data will be used to determine potential impact pathways that could affect important habitats, and the extent over which such impacts may have adverse effects. The assessment of impacts will be undertaken in accordance with CIEEM (2018) Guidelines.
Impacts upon protected or otherwise notable terrestrial species or upon their resting or breeding sites.	The potential exists for protected species to be impacted by construction activities either physically or from indirect disturbance via changes to	Field survey and desk study data outline in Table 6-1 is considered sufficient for impact assessment; the IEFs have been



Impact	Description	Proposed Approach to Assessment Including Description of Any New Data Collation Required and Any Analyses (Such as Modelling)
Species include bat assemblage, otter, water vole, amphibians and reptiles, invertebrates.	hydrology, light, noise and/ or human presence.	identified based on data to date and are included in Table 6-2 . Design and construction detail, including drainage arrangements will be necessary to determine the scheme footprint and potential for downstream impacts. The assessment of impacts will be undertaken in accordance with CIEEM (2018) Guidelines.
Habitat fragmentation and species isolation	There is potential for permanent habitat fragmentation and species isolation as a result of wind turbine and infrastructure construction. Temporary habitat fragmentation and species isolation may also result from construction requirements.	As above
Spread of invasive non-native species (INNS)	There is potential for the presence of INNS which could be spread by construction activities.	As above.
Accidental Pollution	The impact of pollution including accidental spills and contaminant releases associated with the construction of infrastructure may lead to direct or indirect disturbance or damage to designated sites, species and/ or habitats.	As above.
Operation and Maintenance		
Killing and injury to high collision* risk bat species recorded at the Site (tbc following survey, but likely to include pipistrelle species and noctule based on desk study data to date). * In this context the term 'collision' is taken to mean any form of injury or mortality associated with the operation of wind turbines, i.e. it includes mortality due to barotrauma	Operational wind turbines represent a potential risk to bats which may fly within the swept rotor area. The frequency and likelihood of a collision occurring depends on a range of factors. These include aspects of the behaviour of the bat species (including their use of a site), the nature of the surrounding environment, and the structure and layout of the wind turbines.	As above.
Disturbance via maintenance	Maintenance during the operation of the wind farm is likely to be highly localised with a minimal likelihood of disturbance expected	As above



Impact	Description	Proposed Approach to Assessment Including Description of Any New Data Collation Required and Any Analyses (Such as Modelling)
	to the adjacent habitats and species.	
Decommissioning		
Decommissioning impacts: similar in nature to those during construction but would be more limited in geographical extent and timescale.	It is proposed that the onsite substation electrical infrastructure and wind turbine components would be removed as part of the decommissioning phase. Closer to the time of decommissioning, it may be decided that removal of certain infrastructure would lead to greater environmental impacts than leaving components in situ, in which case certain components may be left buried. The decommissioning methodology cannot be finalised until immediately prior to decommissioning; but would be in line with relevant policy and guidance at that time.	Update surveys would be required to inform the decommissioning process.
Cumulative		
For ecological features potential cumulative impacts are only likely to be significant for other developments which: - are directly adjacent or very close to the Site and may affect the same habitats and species; - are located within the same hydrological catchment(s) so may be affected by water-borne sedimentation or pollution events, e.g. brown trout; or - are located within the regular range of more mobile species, e.g. bats.	The short list of other developments for the cumulative assessment will therefore be restricted to other development projects within 2 km, or within 5 km and within the same surface water catchment, or within the Core Sustainance Zone distance of the most widely ranging bat species recorded at the Site. The cumulative assessment will be based on consideration of residual effects, assuming that proposed mitigation and compensation measures for other projects are implemented.	The cumulative assessment will be conducted in accordance with the CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland, with specific reference to the section related to cumulative impacts and effects.

6.6 Additional Mitigation

- 6.6.1 Additional mitigation measures will be considered where significant effects are anticipated to remain after embedded design measures and standard good practice controls have been applied. If significant residual impacts persist, proportionate further actions, such as mitigation and compensation will be identified to address those remaining effects.



- 6.6.2 The requirement for, and feasibility of, any mitigation measures will be subject to consultation with consultees throughout the pre-application phase of the Proposed Development.

6.7 Cumulative Effects

- 6.7.1 The cumulative assessment will be conducted in accordance with the CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland, with specific reference to the section related to cumulative impacts and effects.
- 6.7.2 Cumulative effects will be assessed for all ecological receptors for which detailed assessment has been undertaken, based upon residual effects. The cumulative assessment will be based on consideration of residual effects of other schemes also i.e. assuming that consented or proposed schemes will deliver the mitigation and compensation measures described in their application/ consent.
- 6.7.3 For habitats and species outside of designated sites, the approach will depend on whether the feature is mobile or not. For mobile features (such as bats) the proposed approach is to use the core foraging range / core sustenance zone for each species included in the assessment, taken from most recent relevant guidance for the species in question, to determine the spatial extent of the cumulative assessment. For example, for a bat species with a maximum core foraging range of 4 km, other relevant plans or projects within 8 km will be included in the cumulative assessment. Where impacts on aquatic receptors are possible then other developments within the same sub-catchment will be considered in the cumulative assessment. For other ecological receptors cumulative effects are unlikely beyond 2 km, therefore only development within 2 km will be included.

6.8 Impacts Proposed to be Scoped Out

- 6.8.1 Based on the baseline environment information currently available and the Proposed Development description (outlined in **Chapter 2**) a number of impacts are proposed to be scoped out the EIA for ecology. The impacts are outlined in **Table 6-5**, together with a justification for scoping them out.

Table 6-5: Impacts proposed to be scoped out of assessment for Ecology

Impact	Justification for Scoping Out
Construction	
Impacts to certain LWS - those >200 m from the Site boundary and with no mobile notified features (e.g. bats) and/ or no hydrological connection	Potential impacts to LWS >200 m from the Site are not anticipated.
Operation and Maintenance	
Killing and injury to low collision risk bat species recorded at the Site (common pipistrelle and brown long-eared bat)	NatureScot guidelines state these species are at low risk from collision and the populations are of low vulnerability. Potential impacts to these populations are therefore assessed as not significant.
Decommissioning	
N/A	N/A
Cumulative	
N/A	N/A



6.9 Consultation

- 6.9.1 No consultation has been undertaken to date with respect to ecology. Consultation is anticipated with Natural England, ERYC and NLC, and the Environment Agency to:
- confirm the scope of surveys is adequate to inform the EclA and that all potential impact pathways have been identified;
 - confirm agreement with the Important Ecological Features subject to assessment;
 - discuss the approach to mitigation and/ or compensation;
 - confirm the detail in respect of meeting statutory requirements for BNG.

6.10 Summary of Next Steps

- 6.10.1 The next steps comprise commencing consultation with key stakeholders and undertaking the additional surveys as previously described.

6.11 Further Consideration for Consultees

- 6.11.1 The following questions are provided to help frame the consultees comments on the Scoping Report for Ecology:

- Q6.1** Are there any additional baseline data sources that should be used to inform the assessment?
- Q6.2** Do consultees agree that the scope of the surveys undertaken and proposed will be sufficient to inform the assessment?
- Q6.3** Are the consultees in agreement with the identification of Important Ecological Features taken forward for detailed assessment?
- Q6.4** Are the consultees content to scope out the effects in **Table 6-5**?

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7.0 Ornithology

7.1 Introduction

- 7.1.1 This chapter of the Scoping Report considers the scope of work required to assess potential significant effects associated with ornithology, during the construction, operational and decommissioning phases of the Proposed Development.
- 7.1.2 In accordance with standard Chartered Institute of Ecology and Environmental Management (CIEEM) (2018, updated 2024) guidelines, this ornithology scoping exercise aims to:
- establish an initial understanding of the baseline ornithological conditions and the potential significant effects that could arise;
 - determine and agree the zone of influence of the Proposed Development and which important ornithological features could be significantly affected;
 - determine and agree the proposed surveys and methods for survey, evaluation and assessment; and
 - determine and agree the content of the Ornithological Impact Assessment.
- 7.1.3 This chapter should be read alongside the following chapters of this Scoping Report:
- **Chapter 6: Ecology**
- 7.1.4 This chapter is supported by the following figures:
- **Figure 7.1** Avian Survey Areas;
 - **Figure 7.2** Vantage Points and Viewsheds;
 - **Figure 7.3** International Designated Sites for Birds within 20 km; and
 - **Figure 7.4** National Designated Sites for Birds within 20 km.

7.2 Baseline Conditions

Study Area

- 7.2.1 The land within the Site boundary is moderately flat and used for arable farming with drainage ditches between fields.
- 7.2.2 The village of Adlingfleet is directly to the east of the Site. The River Ouse is to the north, on its banks is RSPB Blacktoft Sands. The River Trent is to the east, which joins the Ouse north-east of the Site to form the River Humber, a designated Special Protection Area (SPA) and Ramsar site. Land surrounding the Site is all arable or pastoral farmland.
- 7.2.3 The survey area for ornithology varies by survey type as described in **Table 7-1** but includes the Site and a buffer of up to 2 km. The study area for desk study includes a 20 km buffer around the Site to account for mobile species that may occur and potentially be impacted by the Proposed Development.

Data Sources

Desk Study

- 7.2.4 A desk study was undertaken to inform the scope of surveys and the ornithology impact assessment. A search was undertaken using the Multi-Agency Geographic Information for the Countryside (MAGIC) website (Defra, 2026) for:



- SPAs, Ramsar sites, Sites of Special Scientific Interest (SSSIs) and National Nature Reserves (NNRs) with cited ornithological features within 20 km of the Site and boundary; and
- Local Nature Reserves (LNR) with ornithological interest features and Royal Society for the Protection of Birds (RSPB) reserves within 5 km of the Site boundary.
- Non-statutory Local Wildlife Sites (LWS) within 4 km with ornithological interest features.

7.2.5 Data searches were undertaken for records of protected and conservation priority species, specifically those listed on:

- Annex I of European Council (EC) directive 2009/147/EC ('the Birds Directive');
- Schedule 1 of the Wildlife and Countryside Act (WCA) 1981 (as amended);
- Birds of Conservation Concern (BoCC) Red and Amber; and
- Species of principal importance included on Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006.

7.2.6 Searches were undertaken with the following organisations:

- Greater Lincolnshire Nature Partnership (GLNP), including a buffer of up to 10 km around the Site boundary.
- North and East Yorkshire Environmental Records Centre (NEYEDC), including a buffer of up to 10 km around the Site boundary.
- The British Trust for Ornithology (BTO), a Site Data Report covering the Site.

Field survey scope and methodologies

7.2.7 The baseline ornithology surveys started in April 2025 and are currently planned to be completed in March 2027. The surveys are being conducted across the Site and associated buffer zones (**Figure 7.1**). Survey effort in buffer zones is being undertaken from publicly accessible areas only.

7.2.8 The scope is based on current NatureScot (SNH, 2017, updated 2025) guidance, along with other guidance from the Bird Survey Guidelines (2026) and relevant species-specific guidance. Whilst some of these guidance documents have been prepared for projects in Scotland, in the absence of alternative guidance in England these documents have become best practice across the UK. The scope of the completed and planned surveys is summarised in **Table 7-1**.

Table 7-1: Scope of ornithology studies at Adlingfleet Wind Farm, April 2025 to date.

Survey Type	Dates Undertaken	Methodology
Vantage Point (VP) surveys	April – July 2025 March – July 2026	Spring passage and core summer surveys based on nine hours per VP per month (45 hours total in both years) each of 2 VPs.
	August 2025 – March 2026 August 2026 – March 2027	Autumn passage and core winter surveys based on nine hours per VP per month (63 hours total in both years) each of 2 VPs.



Survey Type	Dates Undertaken	Methodology
Breeding raptor, owl, wildfowl and wader surveys	April – July 2025 March – July 2026	Four visits to suitable habitat within 2 km of the Site for raptors and 500 m for wildfowl and waders. Methods following Hardey <i>et al.</i> (2013) and Gilbert <i>et al.</i> (1998).
Non-breeding bird walkover surveys	August 2025 – March 2026 August 2026 – March 2027	Two visits per month using transect approach across the Site and 600 m buffer following methods in Birds Survey Guidelines (2026).
Nocturnal surveys	August 2025 – March 2026 August 2026 – March 2027	One visit per month using transect approach across the Site and 600 m buffer following methods in Birds Survey Guidelines (2026).
Standard breeding bird surveys	March – July 2026	Six visits across the buffer following methods in Birds Survey Guidelines (2026).
Barn owl surveys	Summer 2026	One visit by licenced surveyors following methods in Shawyer (2011).

Flight activity surveys

- 7.2.9 Flight activity surveys (also known as VP surveys) are being undertaken from two locations, following the standard NatureScot methodology which recommends a minimum survey effort of 36 hours per VP during a single season. NatureScot recommends that VP effort should be greater than this if the site is particularly sensitive and where migration movements may occur, sampling within this period should be stratified to ensure adequate data collection across passage periods.
- 7.2.10 Given the relative proximity to the Humber Estuary SPA and Ramsar site and associated other designated sites with avian interest, the Site was considered to be potentially sensitive. Accordingly, the following survey effort was undertaken which goes beyond the minimum requirements specified by NatureScot guidance, due to the proximity of designated sites:
- spring passage, March to mid-May, 9 hours per VP per month; and
 - core summer, June to July, 9 hours per VP per month.
- 7.2.11 The main purpose of VP surveys was to collect data on target species that will enable estimates to be made of:
- the time spent flying over the Site;
 - the relative use by birds of different parts of the Site;
 - the proportion of flying time spent at Collision Risk Height (CRH); and
 - an index of flight activity for secondary species within the Site.
- 7.2.12 VPs were selected to cover the maximum extent of turbine deployment plus a 500 m buffer where possible to account for inaccuracies of flight line recording. The viewshed is the area visible from each VP within a 2 km radius and 180° viewing arc. The VPs were selected during a reconnaissance visit undertaken in March 2025 to determine optimal positions



accounting for hedgerows and patches of woodland in the local landscape. The locations and the viewsheds from the VPs are shown in **Figure 7.2**. As viewsheds overlap VPs are not undertaken simultaneously as the presence of a surveyor within the viewshed could influence bird behaviour.

- 7.2.13 The two VPs were selected to provide representative coverage of the whole Site. All of the wind turbine locations are covered by the viewsheds from the VPs. For seven of the wind turbines, the VPs also cover the majority of each associated 500 m buffer. The 500 m buffer of one wind turbine (T1) is only partially covered; however, the habitat is very similar in this area to the remainder of the Site and buffer and no significant differences in flight activity are expected. Any birds flying from the west towards the Proposed Development would be visible from VP1 and VP2 when they approach wind turbine T1.
- 7.2.14 Primary target species are limited to those that are likely to be affected by wind farms. The following target species were selected:
- Annex I of the European Council (EC) Directive 2009/147/EC ('the Birds Directive');
 - Schedule 1 of the Wildlife and Countryside Act 1981 (as amended); and
 - Birds of Conservation Concern (BoCC) Red List, with the exception of kestrel, although an amber list BoCC, the behaviour of this species (hovering while foraging) makes kestrel potentially vulnerable to impact from wind farms (e.g. collision mortality).
- 7.2.15 Additionally, primary target species are limited to those that are likely to be affected by wind farms. The following target species are selected:
- raptors and owls;
 - wildfowl;
 - waders; and
 - gulls.
- 7.2.16 Secondary species are those non-target species which are susceptible to impacts from wind farms and are of regional or local conservation concern. It is generally accepted that passerine species are not significantly impacted by wind farms and are therefore not included as target or secondary species. Recording of secondary species is subsidiary to the recording of target species. The following secondary species are selected:
- widespread raptors (sparrowhawk, buzzard); and
 - other waterfowl (BoCC green listed e.g. cormorant, grey heron).
- 7.2.17 A summary of observations of secondary species is recorded at the end of each five-minute period during VP watches, in accordance with NatureScot guidance. For each target species observation, the following details are recorded:
- time of observation;
 - duration of flight;
 - species, age and sex (where determinable); and
 - time spent within each Height Band (HB) in 15 second intervals.
- 7.2.18 The range of specifications of the wind turbines that could be installed at the Site are as follows:
- Hub height: 82.5 m and 115 m
 - Min 149.5 m to tip and Max 200 m to tip



7.2.19 Therefore, the following HBs are used, bands two to four were considered potential collision risk height:

- HB1 - <15 m;
- HB2 - 15-30 m;
- HB3 - 30-150 m;
- HB4 - 150-220 m; and
- HB5 - >220 m.

Targeted breeding raptor, owl, wader and wildfowl surveys

7.2.20 Species-specific surveys are being undertaken for raptors, owls, wildfowl and waders likely to occur within the survey area, following the relevant methods detailed within Hardey et al., (2013) and Gilbert et al. (1998). The survey area covers the Site plus a 2 km buffer for raptors and owls and the Site plus a 500 m buffer for waders and waterfowl. The buffer areas are surveyed via public rights of way and accessible tracks only.

7.2.21 Prior to the surveys, available information was reviewed to identify known and suitable breeding habitat within the survey area. The field method varies between target species and broadly entails a combination of walkovers and observation point watches. Walkovers were used to check for field signs including droppings, pellets, prey remains, moulted feathers and nests. Watches are used to observe target species activity and breeding behaviour, including territorial interactions, display and carrying of prey. Watches are undertaken over potential nesting areas to identify birds changing over at the nest site.

7.2.22 Target species are all Annex I, Schedule 1 and BoCC Red listed raptors, owls, wildfowl and waders, in accordance with NatureScot (2025) guidance, known or likely to occur within the survey area. Secondary species are other raptor, owl, wader and wildfowl species of regional or local conservation concern.

Winter walkover surveys

7.2.23 The methodology for non-breeding walkover survey, as detailed in the Bird Survey Guidelines, is being employed. Surveys seek to qualify the diversity of birds interacting with a land parcel, in the context of their specific ecology and population status.

7.2.24 The method involves walking a transect, with frequent stops to scan for target species. The route enables visual coverage of the survey area, which encompassed the Site plus a 600 m buffer. Target species are all species listed on Annex I, Schedule 1, BoCC Red or Amber. Secondary species were other species of regional or local conservation concern. All target species observations are recorded onto a map of the survey area, using BTO notation to record behaviour. Secondary species are counted in discreet locations, recording the total number from each location, being careful to avoid repeat counting.

Nocturnal surveys

7.2.25 To establish the species present within the Site after dark in the non-breeding season, nocturnal surveys are being undertaken. These involve surveyors surveying the Site using a



thermal imaging camera. Visits are timed to make full use of the light provided by a full moon where possible.

- 7.2.26 Where possible, birds are identified to species, but this was often not possible when birds are in flight across the Site, birds are too distant to confidently identify, or very similar species could be involved. Target species include all waterfowl, waders and owls.

Standard breeding bird surveys

- 7.2.27 Standard breeding bird surveys are being undertaken in 2026, following the methodology described by the Bird Survey Guidelines, which involves the surveyor walking a transect at a slow, ambling pace, ensuring all accessible land within the Site plus a 100 m buffer are covered.
- 7.2.28 The route approaches all parts of the survey area to within 50 m where possible, such that the surveyor covers all parts of the survey area (e.g. from the edge of an arable field). All visual and auditory contact with all target species is recorded, mapping the locations on a field map using BTO species codes. Behavioural notation is used to record the bird behaviour for each encounter (e.g., singing, alarm calling and flight paths).
- 7.2.29 Target species are all species listed on Annex I, Schedule 1, NERC Section 41, BoCC Red or Amber list species. Secondary species are other species of regional or local conservation concern and recording of such species is subsidiary to that of target species.
- 7.2.30 In accordance with the guidelines, six visits are being completed across the breeding season. The method aims to measure the importance of the survey area for avian diversity, and which species may be breeding on Site.

Barn owl nest surveys

- 7.2.31 Dedicated checks of potential barn owl nest and roost sites are being undertaken on Site and in a 100 m buffer in 2026. Methods used are those prescribed in standard guidance (Shawyer, 2011) and are being undertaken by licenced surveyors.

Survey limitations

- 7.2.32 Ornithological surveys are affected by a variety of factors that affect the presence of birds (e.g. season, weather, food availability, species behaviour and disturbance). The absence of any species within the study area should not be taken as conclusive evidence that the species is not present or that it will not be present in the future. The results of these bird surveys give an indication of the use of the Site by non-breeding bird species at the time of survey.
- 7.2.33 There is a relatively high, though gappy hedgerow to the south of the Site, that partially obscures the view of the south portion of the Site from VP1. It is possible that some observations are subsequently missed. This hedgerow however only obscures birds flying below CRH, so the limitation is not considered significant. Additionally, this issue is further reduced after leaf fall in autumn.
- 7.2.34 The buffer areas beyond the Site that are part of the survey area for non-breeding birds in general are only accessed by public rights of way and public highways. The coverage is considered sufficient to establish non-breeding habitat use for key target species, given the availability of minor roads and paths in the area.



Description of Baseline Environment

Results of desk study

Statutory designated sites

- 7.2.35 There are three SPAs and two Ramsar sites within 20 km of the indicative wind turbine layout. Additionally, there are seven SSSIs and three NNRs with named ornithology features within 20 km. Sites with internationally and nationally designated ornithological features within the search area are summarised in **Table 7-2** and **Table 7-3** respectively. The locations of these designated sites relative to the Site are illustrated in **Figures 7.3** and **7.4**.

Table 7-2: Details of European and internationally designated ornithological sites within 20 km of the search area

Designated site	Distance and direction from the Site at closest point (km)	Qualifying or notable ornithology features
Humber Estuary Ramsar Site 663	1.2 km north	Wintering • Bar-tailed godwit • Black-tailed godwit • Dunlin • Golden plover • Knot • Redshank • Shelduck Passage • Black-tailed godwit • Dunlin • Golden plover • Knot • Redshank⁷
Humber Estuary SPA UK9006111	1.2 km north	Non-breeding • Avocet • Bittern • Hen harrier • Golden plover • Bar-tailed godwit • Black-tailed godwit • Shelduck • Knot • Dunlin • Redshank

⁷ Humber Estuary Ramsar Designated features
<https://designatedsites.naturalengland.org.uk/SiteGeneralDetail.aspx?SiteCode=UK11031&SiteName=humber%20estuary&countyCode=&responsiblePerson=&SeaArea=&IFCAAarea=Humber>
[Eshttps://rsis.ramsar.org/ris/663tuary](https://rsis.ramsar.org/ris/663tuary) | Ramsar Sites Information Service



Designated site	Distance and direction from the Site at closest point (km)	Qualifying or notable ornithology features
		- Ruff Breeding - Avocet - Bittern - Marsh harrier - Little tern Passage - Ruff - Knot - Dunlin - Black-tailed godwit - Redshank⁸
Thorne and Hatfield Moors SPA	6.2 km west-south-west	Breeding nightjar
Lower Derwent Valley Ramsar	15.4 km north-west	Non-breeding - Teal - Wigeon - Waterbird assemblage Passage - Assemblage of migratory waders - Passage
Lower Derwent Valley SPA	15.4 km north-east	Non-breeding - Bewick's swan - Golden plover - Ruff - Teal - Wigeon Breeding - Shoveler Waterbird assemblage

⁸ Humber Estuary SPA Designated features
<https://designatedsites.naturalengland.org.uk/SiteGeneralDetail.aspx?SiteCode=UK9006111&SiteName=humber%20estuary&countyCode=&responsiblePerson=&SeaArea=&IFCAAraa=>



Table 7-3: Details of nationally designated ornithological sites within 20 km of the search area

Designated site	Distance and direction from the Site at closest point (km)	Qualifying or notable ornithology features
Humber Estuary SSSI 2000480	1.2 km north	Aggregations of non-breeding birds of the following species: • Avocet • Bar-tailed godwit • Black-tailed godwit • Bittern • Brent goose (dark-bellied) • Curlew • Dunlin • Golden plover • Goldeneye • Greenshank • Grey plover • Knot • Lapwing • Oystercatcher • Pochard • Redshank • Ringed plover • Ruff • Sanderling • Scaup • Shelduck • Teal • Turnstone • Whimbrel • Wigeon Assemblages of breeding birds - Lowland open waters and their margins
Thorne, Crowle and Goole Moors SSSI	6.2 km west-south-west	Aggregations of breeding birds - Nightjar Assemblages of breeding birds - Mixed: Lowland damp grassland, Lowland heath, Scrub, Woodland
Humberhead Peatlands NNR	6.2 km south-west	Breeding nightjar population.
River Derwent SSSI	14.1 km north-west	Aggregations of non-breeding birds - Bewick's swan Assemblages of breeding birds - Mixed
Brighton Meadows SSSI	14.1 km north-west	Assemblages of breeding birds - Lowland damp grasslands



Designated site	Distance and direction from the Site at closest point (km)	Qualifying or notable ornithology features
Hatfield Moors SSSI	14.5 km south-west	Aggregations of breeding birds - Nightjar Assemblages of breeding birds - Lowland heath
Lower Derwent Valley NNR	15.7 km north-north-west	• Assemblage of nationally important breeding birds • Birds - Wintering bird species assemblage • Breeding birds • Migratory birds • Rare breeding birds • Spring passage birds • Variety of bird species • Wintering birds
Messingham Sand Quarry SSSI	15.8 km south-south-east	Assemblages of breeding birds - Lowland open waters and their margins.
Far Ings NNR	17.2 km east	No named features but underpinned by Humber Estuary SSSI.
Derwent Ings SSSI	17.5 km north-north-west	Aggregations of breeding birds of the following species: • Gadwall • Garganey • Pochard • Ruff • Shoveler • Tufted duck Aggregations of non-breeding birds of the following species: • Bewick's swan • Golden plover • Mallard • Pochard • Ruff • Teal • Whimbrel • Wigeon More than 20,000 non-breeding waterbirds.

7.2.36 There are no LNRs within 5 km of the Site. One RSPB reserve, RSPB Blacktoft Sands, is located approximately 1.8 km north-north-west of the Site. The reserve is most noted for bittern, marsh harrier and bearded tits, as well as wintering waders including avocet and golden plover.

Results from GLNP

7.2.37 The GLNP search confirmed a total of six LWSs within 4 km. Of these, the following LWS have listed ornithology interest:



- Alkborough Flats LWS, approximately 3.2 km north-east, has a diverse range of wintering bird species including pink-footed geese and golden plover. Breeding birds include lapwing and bearded tit.
- Normandy Park LWS, approximately 4 km south-east, supports breeding birds including cuckoo and song thrush.

- 7.2.38 The data requested from the GLNP returned one record of a barn owl nest in 2023 within the requested area of search. The GLNP did not return any other nests of target species.
- 7.2.39 GLNP also returned data for a mixture of Wetland Bird Survey (WeBS) counts, and general field observations.
- 7.2.40 WeBS counts were conducted between 2021 and 2022 at Alkborough Flats and Island Farm. Notable raptor records included 16 observations of marsh harrier, and a single observation of a peregrine. Lapwing (33 observations), curlew (27 observations), and redshank (19 observations), were the most frequently recorded wader.
- 7.2.41 General field observations were also made at Alkborough Flats and Island Farm, as well as a number of other sites in the area of search including RSPB Blacktoft Sands. The most notable records included 352 observations of whooper swan at various sites, as well as a range of other species that are qualifying features of the Humber Estuary SPA and Ramsar.

Results from NEYEDC

- 7.2.42 The NEYEDC search confirmed there are no non-statutory designations such as LWS within 5 km.
- 7.2.43 The data requested from NEYEDC largely returned species observations from RSPB Blacktoft Sands.
- 7.2.44 Target species records consisted of a range of BoCC amber and red listed passerines. Species that are qualifying features of the Humber Estuary SPA and Ramsar were also returned.
- 7.2.45 A corn bunting nest was recorded within the area of search in 2017. The NEYEDC did not return data for nests of any other target species.

Results from BTO data search

- 7.2.46 The BTO Data Report provides a comprehensive baseline of bird distribution using Atlas data from 2007–2011, supplemented by more recent records from BirdTrack and the Breeding Bird Survey (BBS). Although the Atlas data is approximately 15 years old, it remains the most comprehensive assessment of bird distribution available. Coverage across the Site is complete at 10 km resolution, although this wider scale encompasses a greater range of habitats than those present within the Site, meaning that some recorded species may not be representative of the predominantly arable site.
- 7.2.47 The BTO data identified 106 species with breeding evidence and 138 wintering species during 2007–2011, including species of elevated conservation importance such as Schedule 1, Annex I and BoCC Red-listed species. The data also highlighted numerous notable species associated with Yorkshire and the Humber, East Riding of Yorkshire and Lincolnshire recording areas. These included species such as marsh harrier, avocet, lapwing, golden plover, curlew, redshank, snipe and corn bunting.
- 7.2.48 More recent BTO data from 2022–2026 recorded 158 species during the breeding season and 174 species during the non-breeding season, including 35 Schedule 1, 26 Annex I and 38 BoCC Red-listed species. However, no relevant species were confirmed breeding, or recorded, within 2 km of the Site during the respective survey periods.



Summary of baseline field survey results to date

- 7.2.49 The results of the baseline field surveys will be reported within the ES and associated technical appendices. The second-year breeding bird surveys are ongoing and the non-breeding season surveys are planned for August 2026 to March 2027. A summary of the key findings so far from the first year of surveys is provided below.

Flight Activity Surveys

- 7.2.50 During the first year of spring passage and core summer (April – July 2025), a total of 282 flights recorded, from 17 primary target species. The most numerous species recorded included mallard (82), kestrel (54), marsh harrier (41), peregrine (31), herring gull (26) and lesser black-backed gull (22).
- 7.2.51 During the non-breeding season (August 2025 – March 2026), a total of 751 flights were recorded, of 30 primary target species. The most numerous species recorded included pink-footed goose (176), kestrel (152), herring gull (53), marsh harrier (53), black-headed gull (48), common gull (46), golden plover (38), mallard (30), lesser-black-backed gull (29), peregrine (25), herring gull (24), lapwing (22) and whooper swan (22).
- 7.2.52 Flight activity surveys for the 2026 spring passage and core summer periods are ongoing. To date a similar range of species and activity has been recorded as in 2025.

Targeted raptor, owl, wader and wildfowl surveys

- 7.2.53 The 2025 breeding raptor surveys produced three breeding target raptor species. A pair of peregrines successfully raised and fledged two young in the buffer zone. Additionally, a pair of kestrels successfully raised and fledged at least two young, approximately 0.8 km south-west of the Site, in an old oak tree. On the edge of the 2 km buffer, a pair of marsh harriers bred at RSPB Blacktoft Sands located to the north of the Site.
- 7.2.54 It was noted during the raptor, wader and VP surveys that the marsh harriers were using the Site to hunt for prey, taking their prey items back to territories at RSPB Blacktoft Sands.
- 7.2.55 The breeding wader/wildfowl surveys produced no breeding evidence of any wader or wildfowl species. This is almost certainly due to the lack of suitable habitats on the Site and within the 500 m buffer.

Non-breeding walkover surveys

- 7.2.56 A total of 45 target and other relevant species (including large aggregations of green listed species) were recorded during the winter walkover surveys.
- 7.2.57 Foraging whooper swans were present on Site between November and March (maximum 12 birds). Pink-footed geese were mostly recorded in flight, though some large groups were recorded foraging in fields in the buffer zone north of the Site boundary. Golden plover (maximum flock of 120 birds) and lapwing (37 birds) were recorded on Site foraging, in December and January. Other waders included curlew and greenshank (both involving two birds) in March, along with a single snipe in January.
- 7.2.58 Raptors recorded included single hen harrier on five occasions, plus regular sighting of marsh harrier across the Site. Kestrel were frequently recorded, as were buzzard. A single merlin was noted in December, and peregrine were recorded seven times. There were also single observations of short-eared owl in October and March, presumed to relate to passage birds. Farmland birds were well represented with grey partridge (maximum count of 28), linnet (240), yellowhammer (31) and corn bunting (18).



Nocturnal surveys

- 7.2.59 A total of 22 target species were recorded during the nocturnal surveys. The nocturnal surveys recorded lapwing and golden plover using fields within the Site for foraging at night, notably between December and January. Small numbers of curlew were also recorded in this period. Other waders included regular use by woodcock, snipe and jack snipe in small numbers.
- 7.2.60 Wildfowl were scarce, with only mute swan and mallard regularly recorded. Single whooper swan and pink-footed goose only were recorded, both on one occasion, along with a group of three wigeon in March.
- 7.2.61 Owls included regular barn and tawny owls, with one record of little owl and short-eared owls only noted in October.

7.3 Assessment Methodology

- 7.3.1 The approach and method to the assessment will be informed by the following legislation and policy.

Legislation

- Conservation of Habitats and Species Regulations 2017 (as amended) (the 'Habitats Regulations');
- Wildlife and Countryside Act 1981 (as amended);
- Countryside and Rights of Way (CROW) Act 2000;
- Environment Act 2021; and
- Natural Environment and Rural Communities (NERC) Act 2006.
- The Town and Country Planning Act (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations').

Policy

- East Riding Local Plan Update (2025);
- North Lincolnshire Local Plan (2003), Core Strategy (2011) and the emerging Local Plan;
- Overarching National Policy Statement for Energy (EN-1);
- Renewable Energy Infrastructure (EN-3); and
- National Planning Policy Framework (NPPF) August 2026.

Data sources and planned surveys

- 7.3.2 Following the completion of the first study year (April 2025 to March 2026), the second breeding season is currently underway (April to July 2026), and the second non-breeding season surveys are planned (August 2026 to March 2027).
- 7.3.3 The baseline ornithology surveys started in April 2025 and will be completed in March 2027.

Assessment of effects

- 7.3.4 The assessment and reporting process will follow CIEEM guidelines (CIEEM, 2018, updated 2024) with reference to relevant NatureScot guidance as appropriate. The intended process is set out below:



- further desk studies and collation of existing material, including all baseline survey data collected, analysis of BTO data and information from other nearby wind farm developments;
- identification of the important ornithological features (IOFs) at the Site; from survey work completed, these are likely to include:
 - raptors including marsh harrier and peregrine in both breeding and non-breeding period;
 - golden plover on passage and over winter; and
 - other waterfowl that may form part of assemblages of the Humber Estuary SPA/Ramsar site.
- evaluation of the potential impacts of the Proposed Development during construction, operation and decommissioning and the effects these could have on the IOFs, including any visible aviation lighting;
- ornithological features will be considered within a defined geographical context. The following geographic frame of reference will be used:
 - international;
 - national (i.e. England);
 - regional (i.e. Eastern England);
 - county (i.e. East Riding of Yorkshire / Lincolnshire);
 - local (i.e. the Site plus circa 10 km); and
 - less than local.
- analysis of data including collision mortality modelling, if required, for those IOFs with sufficient flight activity within the collision risk zone (NatureScot, 2000 and 2024, 2024a; Band, 2007), and assessing the potential displacement of IOFs with significant populations within the Site;
- evaluation of the significance of effects by considering the impacts on the IOFs by employing appropriate guidance and professional judgement. When describing impacts, in accordance with CIEEM guidelines, reference will be made to the following:
 - magnitude (area or number of individuals to be impacted);
 - extent;
 - duration;
 - frequency and timing (i.e., the number of times an activity occurs); and
 - reversibility, i.e., will the impact be permanent or reversible over a given timescale.
- applying the mitigation hierarchy and incorporating measures to avoid and mitigate (reduce) potentially significant effects;
- assessing the significance of any residual effects after mitigation;
- identifying appropriate compensation measures to offset significant residual effects (if required);
- identifying opportunities for biodiversity enhancement; and
- cumulative effects assessment.



- 7.3.5 The ES will provide sufficient information to allow the competent authority to undertake a Habitats Regulations Assessment (HRA) of the Proposed Development in relation to internationally designated sites, including the Humber Estuary SPA and Ramsar (and underpinning SSSI), with the scope of information agreed in consultation with Natural England, if required prior to submission.

Cumulative assessment

- 7.3.6 Cumulative assessment will be undertaken for each of the IOFs identified within the EIA to consider applicable population areas for which interaction could give rise to potentially significant effects.
- 7.3.7 The assessment will include operational projects, projects under construction, consented projects which are not yet under construction and projects for which planning applications have been submitted but have not yet been determined.
- 7.3.8 Regarding the scale of the cumulative assessment, a maximum distance of 20 km is proposed.

7.4 Potential Impacts

- 7.4.1 The key ornithological issues relating to the Proposed Development are the potential for it to adversely affect the conservation status of bird species with statutory protection (e.g. qualifying features for designated sites or listed on Schedule 1 of the Wildlife & Countryside Act, as amended) or otherwise those of high conservation concern, through habitat loss, disturbance, displacement, barrier effects and / or collisions with wind turbines. Potential negative impacts (direct or indirect) on birds could arise during the construction, operation and decommissioning stages. These are defined as follows:

Construction Phase

Direct land take

- 7.4.2 Direct land take for the installation of the Proposed Development infrastructure (wind turbine bases, sub-station, access tracks, borrow pits, etc.) would result in the long-term or permanent loss of habitat for birds within the Site, albeit such losses would be relatively small in the context of the Site as a whole.

Disturbance and displacement

- 7.4.3 Disturbance caused by construction may directly displace birds from breeding sites, directly affecting breeding success, or may temporarily displace birds from foraging areas, affecting their breeding success and/or winter survival.

Destruction of nests

- 7.4.4 In addition to these possible impacts on individuals and populations, any wind farm construction work undertaken during the bird breeding season (March to July / August, inclusive) carries a risk of illegal destruction, damage or disturbance to occupied bird nests. The ES will propose measures to address this impact through mitigation such as seasonal timing of certain construction works, pre-construction surveys and the employment of an Ecological Clerk of Works (ECoW) during construction.



Operational Phase

Disturbance/displacement and barrier effects

- 7.4.5 The operation and maintenance of wind turbines have the potential to cause disturbance and displace certain bird species from the Site. During the lifetime of the Proposed Development, birds of some species at least may habituate to the presence of wind turbines so this impact may decline in the long-term. Barrier effects can be caused by the presence of operational wind turbines. They can potentially create an obstacle to the regular movements of birds, which will be considered in the EIA.

Collision Risk

- 7.4.6 The EIA will consider the potential collision risk from the proposed wind turbines on the primary target species that have been identified as using the Site. The impact of potential collision mortality on a species population is influenced by several characteristics of the affected population, notably its size, density, recruitment rate (additions to the population through reproduction), mortality rate in the absence of collision mortality, and immigration and emigration rates to and from the population.
- 7.4.7 In general, the impact of an individual (of breeding age) being lost from the population will be greater for species that occur at low density, are relatively long-lived and have low annual reproductive rates. Such species include wildfowl, waders and the larger raptors. Conversely, the impact will often be insignificant for short-lived species with high reproductive rates, including most passerines (e.g. skylark).
- 7.4.8 Collision risk is perceived to be higher in species that spend much of their time in the air, such as foraging raptors and those that have regular flight paths between feeding and breeding/roosting grounds (e.g. geese). Vulnerability to collision is also influenced by factors such as the flight manoeuvrability of a species and its tendency to fly in conditions of reduced visibility (e.g. at night or in fog). These variances will be considered in the EIA as relevant to the identified species.

Decommissioning and Restoration Phase

- 7.4.9 During decommissioning of the Proposed Development, it can be assumed that the process of decommissioning would likely result in similar impacts to that of the construction phase but with a lesser magnitude and of a shorter period. On this basis it is therefore not proposed to undertake a separate assessment of the decommissioning phase.

7.5 Cumulative Effects

- 7.5.1 It is also important to assess the cumulative impacts of this and other operational, consented and proposed wind farms that may affect the broader populations of birds identified as target species in the survey area. NatureScot (2018) guidance on cumulative assessment states that the concept of favourable conservation status (FCS) should be used outside designated sites to determine whether an impact on a sensitive species is likely to be significant. A species' conservation status is favourable when:
- a species' population dynamics indicate that the species is maintaining itself on a long-term basis as a viable component of its habitats;
 - a species natural range is not being reduced, nor is it likely to be reduced for the foreseeable future; and
 - there is (and will probably continue to be) a sufficiently large habitat to maintain its population(s) on a long-term basis.



- 7.5.2 A cumulative effect will be judged as significant where it would negatively affect the favourable conservation status of a sensitive species, whether exacerbating an existing decline or preventing a sensitive species that is recovering from reaching favourable conservation status. The premise here is that impacts from a number of developments, when assessed cumulatively, may exceed some threshold value (e.g., for loss of habitat or loss of breeding birds from collision), beyond which the impact becomes unacceptable.

7.6 Mitigation

- 7.6.1 The mitigation hierarchy principles will be followed (avoidance, mitigation and compensation), incorporating emerging results into the iterative design of the Proposed Development, which will be set out in detail in the ES. Mitigation and compensation measures are dependent on the assessment of impacts in the EIA. Outline details will be provided in the ES with further details provided in an Outline CEMP and Outline Habitat Management Plan (HMP), to be included as part of the ES. The Outline CEMP will form the basis of the final CEMP which will be produced and agreed post-consent. A detailed HMP will also be produced and agreed post-consent.

7.7 Consultation

- 7.7.1 Further consultation will be undertaken with Natural England, ERYC, NLC and other relevant organisations as required following receipt of scoping responses.

7.8 Summary of Scope

- 7.8.1 Matters proposed to be scoped out of the EIA with respect to ornithology include:
- effects on a species whose populations are below a certain geographic level of importance. In accordance with CIEEM (2018, updated 2024) guidelines, detailed assessment is only required for species with a certain level of importance or above. For the Proposed Development, it is proposed to assess only species of local importance and above;
 - impacts on species/groups not susceptible to significant effects from wind farms. As specified in current NatureScot guidance (SNH 2017), impacts on species groups which are not considered vulnerable to significant effects from collision with wind turbines are proposed to be scoped out; other potential impacts such as habitat loss and nest destruction will be scoped into the assessment; and
 - nightjar associated with the Thorne and Hatfield Moor SPA is proposed to be scoped out of assessment, reflecting the spatial separation of suitable breeding habitat from the Site and adoption of embedded mitigation measures during construction and on the basis of current studies and evidence (including from the Clocaenog, Pen Y Cymoedd and Brechfa Wind Farms) and as recently reviewed by Nicklin et al. indicating that the species is not significantly displaced or likely to experience significant collision mortality risks from onshore wind farm developments.

7.9 Questions for Consultees

- Q7.1** Do consultees agree that the scope of surveys and effort (completed and planned) are sufficient to inform the assessment and that the proposed assessment methodologies are appropriate?
- Q7.2** Do consultees agree that all the statutory and non-statutory designated sites within the potential Zone of Influence (Zoi) have been identified?
- Q7.3** Do consultees agree with the identified IOFs and potential impacts?



- Q7.4** Do consultees agree with the matters proposed to be scoped out?
- Q7.5** Are consultees aware of any other relevant consultees and additional sources of data, not referred to above, that may be relevant to the assessment?

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8.0 Hydrology, Hydrogeology and Flood Risk

8.1 Introduction

- 8.1.1 This chapter sets out the proposed scope and methodology of the hydrology, hydrogeology and flood risk assessment of the ES. It identifies the potential likely significant effects arising from the construction, operation and maintenance, and decommissioning of the Proposed Development, in isolation and cumulatively, on hydrology, hydrogeology, and flood risk. This chapter also explains how likely significant effects would be assessed for the purposes of the EIA.
- 8.1.2 This chapter of the Scoping Report should be read alongside the following chapters:
- **Chapter 6: Ecology**, which includes consideration of the likely significant effects of the Proposed Development on water dependent and ecologically sensitive receptors; and
 - **Chapter 9: Geology, Soils and Ground Conditions**, which considers the likely significant effects of the Proposed Development on geology, soils, and ground conditions.
- 8.1.3 This chapter of the Scoping Report is supported by the following figures:
- **Figure 8.1:** Hydrological Features; and
 - **Figure 8.2:** Watercourses and Flooding.

8.2 Baseline Conditions

Study Area

- 8.2.1 The hydrology, hydrogeology and flood risk study area has been defined for the purposes of scoping and will extend 500 m from the Site boundary. This study area encompasses the areas over which all desk based, and field data will be gathered to inform the assessment. This buffer reflects professional judgement and industry best practice based on the likely Zone of Influence (Zoi) on hydrology, hydrogeology and flood risk for onshore wind farm projects.
- 8.2.2 However, it is also possible, without suitable mitigation, for impacts on the hydrology, hydrogeology and flood risk to extend further downstream. The distance in which impacts may occur is influenced by various factors i.e. watercourse characteristics, channel flow, pollutant type, etc. The hydrology, hydrogeology and flood risk baseline will be further developed at later stages of assessment, and consideration of any other downstream surface water receptors will be identified at this stage. A precautionary distance of 2 km downstream from the Proposed Development will be considered, however this will be kept under review as further information around the baseline and Proposed Development is obtained.
- 8.2.3 The study area for hydrology, hydrogeology, and flood risk is shown on **Figure 8.1**. The study area will be subject to ongoing review as the design of the Proposed Development progresses and would be confirmed in the ES based on the draft wind turbine locations and Site boundary.

Data Sources

- 8.2.4 The data sources that have been used inform this chapter are presented within **Table 8-1** and were accessed in September 2026. These data sources will be taken forward and used to inform the EIA, alongside any additional sources, data provided by regulators through



consultation, or site-specific data that will be collected during the hydrology site survey. At the time of preparing this report, no hydrology site survey work has been undertaken.

Table 8-1: Key sources of information for Hydrology, Hydrogeology and Flood Risk

Source	Summary	Spatial Coverage of Study
Google Earth aerial imagery (Google Earth, 2026)	Used to identify existing land uses and sensitive receptors within the study area.	Full coverage of the study area and land out to 2 km from the Site boundary.
Ordnance Survey (Ordnance Survey, 2026)	Ordnance Survey mapping for identification of topography, watercourses, springs, lakes and other water features.	Full coverage of the study area and land out to 2 km from the Site boundary.
Environment Agency (EA) and data.gov.uk website (EA, 2026)	Flood zone mapping; spatial flood defence data and mapping; flood warning and flood alert areas; main rivers; ordinary watercourses; groundwater Source Protection Zones (SPZ); Water Framework Directive (WFD) surface water and groundwater classification data.	Full coverage of the study area and land out to 2 km from the Site boundary.
British Geological Survey (BGS) Mapping (BGS, 2026)	Geology (artificial ground, superficial deposits, bedrock); borehole/ well data; aquifer designation and groundwater vulnerability.	These are national datasets providing full coverage of the study area.
Department for Environment Food and Rural Affairs (DEFRA) MAGIC website/ Natural England (DEFRA, 2026)	Statutory and non-statutory environmental designations	These are national datasets providing full coverage of the study area.

Description of Baseline Environment

Current Baseline

- 8.2.5 The following section provides a summary of the current hydrology, hydrogeology and flood risk baseline for the study area.

Geology

- 8.2.6 The indicated geology beneath the Site has been presented below in order to provide context regarding hydrogeology. The geology is also described in detail in **Chapter 9: Geology, Soils and Ground Conditions**.
- 8.2.7 The whole Site is underlain by sedimentary mudstone bedrock of the Mercia Mudstone Group.
- 8.2.8 Two types of superficial deposits are noted within the study area. The mudstone bedrock beneath the Site is predominantly overlain by Alluvium, consisting of clay, silt, sand and gravel. The bedrock beneath the south of the Site is generally overlain by Warp, consisting of clay and silt.



- 8.2.9 The Site is absent of made ground deposits, nor are there any mapped linear features within the study area.

Hydrogeology

- 8.2.10 The mudstone bedrock is designated as a Secondary B Aquifer. Secondary B Aquifers are defined as “predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers”.
- 8.2.11 The Alluvium and Warp superficial deposits are designated as Secondary A Aquifers. Secondary A Aquifers are defined as “permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers”.
- 8.2.12 Groundwater beneath the Site forms part of the regional Lower Trent Erewash WFD groundwater body. During the last reporting cycle (Cycle 3, 2019) the Lower Trent Erewash WFD groundwater body had a classification of good overall status.
- 8.2.13 EA mapping shows that groundwater beneath the study area has a medium to high vulnerability to pollutants discharged at ground level.
- 8.2.14 There are no SPZs located within the study area.

Local Hydrology

- 8.2.15 The local hydrology for the study area is shown on **Figure 8.1** and **Figure 8.2**.
- 8.2.16 The Site is wholly located within the Trent and Tributaries operational catchment. This operational catchment forms part of the wider Humber River Basin District.
- 8.2.17 The majority of the Site is located within the surface water catchment of the Adlingfleet Drain, an artificial river monitored under Cycle 3 of the WFD as part of the Adlingfleet Drain Dupper Catchment waterbody, with a current (2022) overall classification of moderate ecological status. The very south of the Site and the northern area of the Site form part of the coastal catchment.
- 8.2.18 None of the watercourses within the study area are designated as Main Rivers by the EA. The Site is, however, hydraulically connected to the River Trent which lies approximately 1.6 km to the east and the River Ouse, which is 1.2 km to the north, both part of the larger Humber Estuary. Both watercourses are designated as EA Main Rivers.
- 8.2.19 The Site lies within the Isle of Axholme and North Nottinghamshire Water Level Management Board / Internal Drainage Board (IDB) district and is drained by a network of Ordinary Watercourses and artificially made drainage ditches. The local watercourses ultimately drain into the Adlingfleet Drain which bisects the southern area of the Site. An IDB pumping station is present approximately 390 m east of the Site, which actively discharges water within Adlingfleet Drain to the River Trent via the Adlingfleet Outfall Drain.
- 8.2.20 Of the watercourses on the Site, the following are managed by the IDB:
- Adlingfleet Drain, drains from south-west to north-east across the south of the Site, towards Cow Lane Pumping Station. Water is then lifted into Adlingfleet Outfall Drain, which outfalls to the River Trent approximately 3 km downstream of the Site;
 - Haldenby Drain and Fockerby Boundary Drain are located in the southern extent of the Site, converging to meet the Adlingfleet Drain;
 - Cleggs Drain is located in the central extent of the Site, draining for a short length before meeting the Adlingfleet Drain;



- Causeway Farm Drain and Stone Cross Drain are located at the western extent of the Site, draining north-west to south-east towards Cow Lane Drain;
- Cow Lane Drain is located in the central region of the Site and drains in a north-easterly direction towards New Cut Drain;
- New Cut Drain is located approximately 330 m downstream of the Site and outfalls into the Adlingfleet Drain;
- Quart Lane Drain, Dog Hall Drain and Moxon Close Drain are located in the north-east extent of the Site, converging to form Nursery Drain; and
- Nursery Drain, Broadlane Drain, Pentlands Dyke and Soil Bank Drain are located in the northern area of the Site, and overall drain in an easterly direction towards the New Cut Drain.

Flood Risk

- 8.2.21 Flood risk mapping for the study area is shown on **Figure 8.2**.
- 8.2.22 The EA flood risk mapping indicates that the whole Site lies within Flood Zone 3, having a 1% or greater annual probability of flooding from rivers and /or a 0.5% or greater annual probability of flooding from the sea (high risk).
- 8.2.23 The study area is located within a strong estuarine influenced setting. From EA mapping data, the Site is at a high risk of both fluvial and tidal flooding.
- 8.2.24 EA surface water (pluvial) flood mapping indicates that the Site is generally at very low risk of surface water flooding. Where areas of the Site are shown to be at increased risk of surface water flooding, these are generally concentrated along field drains and within isolated topographic depressions.
- 8.2.25 A desk-based review of the geology and hydrogeology within the study area indicates that the underlying ground is unlikely to contain significant amounts of groundwater. Moreover, the underlying aquifer has been characterised as a low productivity aquifer, where flow is virtually all through fractures and other discontinuities. As such, it is unlikely that groundwater will be a sole source of flooding at this location. Any local rises in groundwater levels are also likely to be in continuum with the local watercourses, meaning that during periods of overbank flow it is not possible to distinguish between the two flood sources. The risk of flooding from groundwater is therefore considered to be low.
- 8.2.26 Given the remote nature of the study area, it is not anticipated that any significant sewer infrastructure is located in the study area, and therefore the risk of flooding from sewers is considered to be low.
- 8.2.27 Information provided by the IDB indicates that there is an IDB pumping station on Adlingfleet Drain located within the study area, approximately 430 m downstream of the Site at its closest point. The risk of flooding from infrastructure fail is therefore a possibility.
- 8.2.28 As identified by EA mapping there are no EA formal flood defences with the study area. However, tidal embankments are present along the banks of the River Humber and the River Trent which influence flood risk at this location.

Water Abstractions

- 8.2.29 Information presented by NLC and ERYC from data requests states that there are no registered Private Water Supplies (PWS) in the study area.
- 8.2.30 EA licenced abstraction data has been obtained from the EA to identify licenced surface water or groundwater abstractions within the study area and is shown on **Figure 8.1**. There are no licenced groundwater abstractions within the study area. There are two surface water



abstractions for agricultural irrigation to the west of the Site, both located approximately 500 m upstream of the Site. There are also six licenced surface water abstractions from Adlingfleet Drain and Adlingfleet Outfall Drain for agricultural uses.

Designated Sites

- 8.2.31 The statutory designated sites located within proximity to the Site are shown on **Figure 8.1**. There are no designated sites within the study area.
- 8.2.32 The Humber Estuary lies approximately 1.2 km north of the Site at its closet point and is hydraulically connected to the Site by the Adlingfleet Drain. The Humber Estuary is designated as a Site of Special Scientific Interest (SSSI), Special Protection Area (SPA), Special Area of Conservation (SAC) and Ramsar. It is designated for its internationally important habitats, including the estuary itself (with its component habitats of intertidal mudflats and sandflats and coastal saltmarsh) and the associated saline lagoons, sand dunes and standing waters. Designated sites are discussed further in **Chapter 6: Ecology** and **Chapter 7: Ornithology**.

Summary of Sensitive Receptors

- 8.2.33 The desk study presented above has identified the following key sensitive receptors of relevance to hydrology, hydrogeology and flood risk:
- Adlingfleet Drain and Adlingfleet Outfall Drain (Adlingfleet Drain Dupper Catchment WFD waterbody);
 - licenced abstractions from Adlingfleet Drain and Adlingfleet Outfall Drain;
 - onsite Ordinary Watercourses, including those managed by the IDB;
 - groundwater within the superficial deposits; and
 - downstream and downslope flood risk receptors.
- 8.2.34 These features have several attributes that could be affected by the Proposed Development, including water quality and quantity, flow conveyance, and hydro morphology. Watercourses may also support existing water interests such as abstractions, receiving discharges and transporting/diluting waste waters. This will be confirmed through further assessment work post-scoping.
- 8.2.35 The presence of any Groundwater Dependent Terrestrial Ecosystems (GWDTEs) will be identified through review of results of ecological surveys conducted post-scoping and will be assessed as part of the ES.

8.3 Assessment Methodology

- 8.3.1 The EIA will follow the overarching methodology outlined in **Chapter 3: Approach to EIA**. While those principles provide the foundation for this assessment, this chapter explains how they will be applied and, where necessary, adapted to address the specific requirements of the Hydrology and Hydrogeology assessment in the ES.
- 8.3.2 A Flood Risk Assessment (FRA) will be prepared as a technical appendix to the ES and will inform the assessment of impacts in the Hydrology and Hydrogeology chapter. The FRA will assess the risk of flooding from all sources, both now and in the future, outlining any required flood risk mitigation measures, including the principles for the management of surface water runoff.
- 8.3.3 A watercourse crossing survey will be undertaken, with the information presented in the hydrology, hydrogeology and flood risk chapter of the ES. The survey will include recommendations with regard to the type of crossings to be adopted.



Relevant Legislation and Policy

8.3.4 The hydrology, hydrogeology and flood risk chapter of the ES will be prepared with reference to the following legislation, policy and guidance:

Legislation

8.3.5 The following European legislation is considered relevant to the hydrology, hydrogeology and flood risk

- The Water Framework Directive (2000/60/EC) (the WFD), which is transposed and implemented within England through the Water Environment (WFD) (England and Wales) Regulations 2017.
- The Groundwater Directive (2006/118/EC, including amendments to Annex II detailed under Directive 2014/80/EU) (the GWD). Aspects of the GWD are transposed and implemented through the Water Environment (WFD) (England and Wales) Regulations 2017, the Environmental Permitting (England and Wales) Regulations 2016 and the Groundwater (England and Wales) Regulations 2009.
- The Floods Directive (2007/60/EC), which is transposed and implemented within England through the Flood Risk Regulations 2009.
- The Town and Country Planning (Environmental Impact Assessment) Regulations 2017.

8.3.6 The objectives of the above directives that are relevant to the hydrology, hydrogeology and flood risk are met through the following UK legislation, relevant to the protection of the hydrology, hydrogeology and flood risk:

- Environmental Permitting (England and Wales) Regulations 2016;
- Flood and Water Management Act 2010;
- Water Resources Act 1991 (Amendment) (England and Wales) Regulations 2009;
- Land Drainage Act 1991;
- Land Drainage Act 1994;
- Environment Act 1995 and Environment Act 2021;
- Private Water Supplies (England) Regulations 2016;
- Environmental Protection Act 1990; and
- Water Act 2014.

National Policy

8.3.7 The National Planning Policy Framework (NPPF) sets out the national planning policies within England and is supported by the Planning Practice Guidance (PPG) which sets out how these policies should be applied.

8.3.8 The PPG provides a web-based resource which supplements the NPPF and provides further guidance on flood risk within its 'Flood Risk and Coastal Change' section, as well as explanatory advice on water quality within its 'Water supply, wastewater and water quality' section. The PPG also provides a 'Climate Change' chapter, which identifies the requirement for all developments to mitigate against the impact of climate change by incorporating climate change factors into the design.



Local Policy

- East Riding of Yorkshire Council Local Plan Update 2020 – 2039:
 - Policy S2: Addressing climate change;
 - Policy ENV4: International, National and Local Sites of Importance for biodiversity;
 - Policy ENV5: Enhancing biodiversity and geodiversity; and
 - Policy ENV6: Managing environmental hazards.
- North Lincolnshire Council Core Strategy Adopted June 2011:
 - CS18: Sustainable Resource Use and Climate Change; and
 - CS19: Flood Risk.

8.3.9 Further local documents, of relevance to the hydrology, hydrogeology and flood risk, which feed into and set out the delivery aspects of local policy are listed below:

- North and Northeast Lincolnshire Council Strategic Flood Risk Assessment 2022;
- North Lincolnshire Council Local Flood Risk Management Strategy 2016;
- East Riding of Yorkshire Council Level 1 Strategic Flood Risk Assessment 2019;
- East Riding of Yorkshire Council Level 2 Strategic Flood Risk Assessment 2020; and
- East Riding of Yorkshire Council Local Flood Risk Management Strategy 2015.

Guidance

8.3.10 Other guidance on good practice that is of relevance to the hydrology, hydrogeology and flood risk includes:

- Control of Water Pollution from Construction Sites (C532), Construction Industry Research, and Information Association, (CIRIA) 2001;
- Environmental Good Practice on Site (C811), CIRIA 2023;
- The Environment Agency's approach to groundwater protection, version 1.2, February 2018;
- The SuDS Manual (C753), CIRIA 2015;
- National Standards for Sustainable Drainage Systems (SuDS) 2025; and
- Design Manual for Roads and Bridges (DMRB).

8.3.11 In the absence of relevant English guidance in relation to wind farm developments, the following Scottish guidelines will also be adopted:

- Guidance on Assessing the Impacts of Development on Groundwater Dependent Terrestrial Ecosystems (SEPA, 2024); and
- Guidance on Assessing the Impacts of Development on Groundwater Abstractions (SEPA, 2024).

Significance Evaluation Methodology

8.3.12 The significance level attributed to each effect will be assessed based on the 'sensitivity' of the affected receptor and the magnitude of change resulting from the Proposed Development. The level of significance is then determined by the combination of receptor sensitivity and magnitude of change.



- 8.3.13 Receptor sensitivity is assessed on a scale of High, Medium, Low and Very Low, whilst magnitude of change is assessed on a scale of High, Medium, Low and Negligible. These criteria are defined and applied based on professional judgement, using recognised approaches to classification relevant to the receptor types, including WFD, the NPPF and DMRB, all of which represent good practice for hydrology, hydrogeology and flood risk assessments within EIAs.

Sensitivity of Receptor

- 8.3.14 The sensitivity of the receiving environment (i.e. the baseline quality of the receiving environment as well as its ability to absorb the effect without perceptible change) will be considered through a set of pre-defined criteria outlined in **Table 8-2**.

Table 8-2 Definitions of Receptor Sensitivity

Sensitivity	Criteria	Description
High	Aquatic environment feature with a high quality and rarity at an international scale, with little potential for substitution. Water resources supporting human health and economic activity at a regional scale. Property and infrastructure with a very high vulnerability to flooding.	Watercourses, waterbodies and tributaries of national importance. Watercourses or waterbodies supporting highly sensitive large abstractions. Watercourses or waterbodies of good chemical status/ high ecological status and/ or high-quality targets under the WFD. Watercourses or waterbodies protected under international legislation, with an environmental designation for ecological/ conservation value, for example SAC, SPA, Ramsar. Aspects of the Proposed Development are classified as highly vulnerable to flood risk. Flood Zone 3 floodplains within the Flood Map for Planning, which are narrow and floodplains where a small increase in volume results in a relatively large increase in flood levels. Public potable water supply from either surface or groundwater source. Aquifer is a Principal Aquifer providing regionally important potable water supply and classified as a groundwater SPZ.
Medium	Aquatic environment feature with a high yield and/ or quality and rarity at a national scale, with a limited potential for substitution. Water resources supporting human health and economic activity at a local scale. Property and infrastructure with a high vulnerability to flooding.	Watercourses, waterbodies and tributaries of district or regional importance. Watercourses or waterbodies supporting moderately sensitive abstractions. Watercourses or waterbodies of good chemical status/ moderate to good ecological status and/ or moderate to high quality targets under the WFD. Watercourses or waterbodies protected under national conservation designations, for example SSSI, National Nature Reserve (NNR), where the designation is based specifically on aquatic features. Flood Zone 2 floodplains within the Flood Map for Planning with limited constraints to the watercourse. PWS from a watercourse or waterbody for potable use or non-drinking water abstraction for agricultural use from either surface or groundwater source.



Sensitivity	Criteria	Description
		Aquifer is a Principal Aquifer not designated as SPZ.
Low	Aquatic environment feature with a medium yield and/ or quality at a regional scale, or good quality at a local scale, with some potential for substitution. Water resources supporting human health and economic activity at household or individual business scale. Property and infrastructures with a moderate to low vulnerability to flooding.	Watercourses, waterbodies and tributaries of local importance. Watercourses or waterbodies supporting abstractions of limited sensitivity. Watercourses or waterbodies with a chemical water quality status classed as 'fail' or an ecological water quality status classed as 'poor' and/ or moderate quality targets under the WFD. Watercourses or waterbodies protected under local conservation designations, for example LNR, County Wildlife site, where the designation is based specifically on aquatic features. Receptors classified as 'less vulnerable' to flood risk. Flood Zone 1 or 2 floodplains within the Flood Map for Planning, where any floodplain is wide and a large increase in volume results in a small increase in flood levels. Aquifer is a Secondary A or Secondary B Aquifer.
Very Low	Aquatic environment feature with a low yield and/or quality at a local scale, with good potential for substitution. Water resources that do not support human health, and of only limited economic benefit. Property and infrastructure that are resilient to flooding.	Small artificial, or heavily modified watercourses or waterbodies of limited local importance, with low habitat potential. Watercourses or waterbodies supporting no recorded abstractions. Watercourses or waterbodies with a chemical water quality status classed as 'fail' and an ecological water quality status classed as 'poor', and/ or low-quality targets under the WFD. Unlicensed non-potable surface water abstractions.

Magnitude of Impact

- 8.3.15 The magnitude of impact upon hydrology, hydrogeology and flood risk receptors is determined by defining the duration and reversibility of the impact. The potential magnitude of impact would depend upon whether the potential impact would cause a fundamental, material or detectable change. In addition, the timing, scale, size and duration of the potential change resulting from the Proposed Development are also determining factors.

Significant of Effect

- 8.3.16 The likelihood of an effect occurring needs to be considered in any assessment and is evaluated using professional judgement and past experience of similar developments.
- 8.3.17 The effect's significance is determined by correlating the potential magnitude of the impact and sensitivity of the receptor, as defined in the matrix presented in **Table 8-3**. The nature of effect would be defined as either Adverse, Beneficial or Neutral.



Table 8-3: Significance of Effect Matrix

Sensitivity	Magnitude			
	High	Medium	Low	Negligible
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Minor	Negligible
Very Low	Minor	Negligible	Negligible	Negligible

- 8.3.18 The final assessment for each effect is based upon professional judgement, after taking likelihood into consideration. Effects assessed as Major will be considered significant and reported as such in the ES. Effects assessed as Moderate will be considered potentially significant and will be subject to further investigation during the assessment process, following refinement of design information. Effects assessed as Minor or Negligible are deemed to be not significant in EIA terms.

Cumulative Effects

- 8.3.19 The assessment will also consider potential cumulative effects associated with other developments within 5km of the Site and in the same surface water catchments as the Proposed Development. A cumulative effect is considered to be the effect on a hydrological and hydrogeological receptor arising from the Site in combination with other developments within the cumulative study area which are likely to affect surface water and groundwater.

Further Baseline Data

- 8.3.20 A number of site walkovers will be undertaken to inform the EIA. This will enable a visual survey of the Site to verify existing features but to also identify any outstanding hydrological, hydrogeological and flood risk related issues or features, particularly those not readily apparent from desk-based assessments or existing mapping.
- 8.3.21 In addition to the walkover survey, further data collection will be undertaken to fully assess the potential impacts of the Proposed Development on the hydrology, hydrogeology and flood risk within the study area. This will include targeted data requests to the EA, Lead Local Flood Authority, Local Planning Authorities, and IDB to gather essential information, such as flood risk, maps, data relating to water users (licenced abstractions or registered PWS), groundwater data and hydrological studies.
- 8.3.22 Properties within the study area that are not registered PWS users and are not within an area currently supplied by mains water will be identified via a programme of site-specific field investigation. This will involve contacting and visiting (should permission be granted) the properties within the study area, enquiring about their water use and source, and mapping any water abstraction locations.

8.4 Potential Impacts

- 8.4.1 Without mitigation or adherence to best practice, a range of potential impacts on hydrology, hydrogeology and flood risk have been identified, which may occur during construction, operation and maintenance, and decommissioning phases of the Proposed Development.

Construction Phase

- 8.4.2 The following potential impacts during the construction phase will be considered in the ES:
- impacts on surface water and groundwater quality from pollution from fuel, oil, concrete or other hazardous substances resulting from construction activities;



- discharge of sediment laden runoff to drainage systems and watercourses as a result of ground excavation;
- increased flood risk to areas downstream of the Site during construction through increased surface runoff as a result of construction activities, such as soil compaction or vegetation removal;
- changes in groundwater levels or groundwater flow paths in areas of GWDTEs as a result of localised construction activities;
- potential adverse impacts to licenced abstractions and PWS (where identified), as a result of localised changes to surface water and groundwater flows due to construction activities;
- surface water or groundwater pollution resulting from borrow pit formation and use; and
- impacts of flooding from pluvial, fluvial and tidal sources to construction areas.

Operational Phase

8.4.3 The following potential impacts during the operational and maintenance phase will be considered in the EIA Report:

- increased runoff rates and volumes, and subsequently flood risk, as a result of increases in areas of impermeable hardstanding;
- increased flood risk elsewhere through development within Flood Zone 3 which could displace flood waters;
- increased flood risk from restriction of flow at permanent watercourse crossings;
- changes in natural surface water and groundwater drainage patterns as a result of permanent land use changes, which could impact water dependent habitats;
- changes to the quality of surface water runoff associated with the altered land use and maintenance activities;
- changes to groundwater levels and groundwater movement through permanent subsurface structures; and
- longer term impacts on abstractions for water supplies, particularly any supplies dependent on groundwater, due to changes in surface water and groundwater levels and flows.

Decommissioning and Restoration Phase

8.4.4 Potential impacts arising during decommissioning of the Proposed Development would likely be similar to those during the construction phase, however would depend on the exact nature of the decommissioning activities that take place. Mitigation similar to that implemented during the construction and operational phases, although updated to reflect changes in legislation / guidance, would be implemented to ensure the significance of impacts arising is minimised. On this basis it is therefore not proposed to undertake a separate assessment of the decommissioning phase.

8.5 Cumulative Effects

8.5.1 A review of other existing and proposed developments near the Site will be undertaken and potential impacts on hydrology, hydrogeology and flood risk will be assessed to identify cumulative effects on common receptors.



- 8.5.2 The cumulative effects on hydrological, hydrogeological and flood risk receptors will be assessed using the surface water catchments within the study area, with a maximum downstream distance of 5 km from the Site boundary.

8.6 Mitigation

- 8.6.1 As part of the early design process for the Proposed Development, several embedded and standard mitigation measures are proposed to reduce the potential for impacts on hydrology, hydrogeology and flood risk. These are presented below. It is expected that these may evolve throughout the design evolution of the Proposed Development as the EIA progresses and in response to consultation.

- 8.6.2 Measures adopted as part of the Proposed Development will include but are not limited to the following:

- embedded design measures including, but not limited to:
 - existing access tracks and watercourse crossings will be utilised as part of the Proposed Development where technically possible, and any new tracks will be designed to limit the amount of watercourse crossings required;
 - a buffer of 50 m will be applied to watercourses shown on 1:10,000 scale mapping; and
 - design to avoid impacts on PWS sources, licenced abstractions, and areas of GWDTEs where possible.
- development of, and adherence to, a Construction Environmental Management Plan (CEMP), which would include, but not be limited to the points below. An outline CEMP will be submitted with the planning application:
 - Pollution Prevention and Emergency Incident Response Plan (PPEIRP) which would set out the pollution prevent measures, and emergency incident responses, which would be implemented during the construction phase of the Proposed Development;
 - setting out principles for storage and handling of oils, fuels, or other potentially polluting substances;
 - good practice measures for the management of erosion and sedimentation;
 - water quality monitoring requirements before, during and immediately post-construction; and
 - drainage principles, including the incorporation of Sustainable Drainage Systems (SuDS) and good practice in relation to the management of surface water runoff rates and volumes.
- adherence to flood risk mitigation measures outlined in the site-specific FRA.
- during operation, an Operational Phase Environmental Management Plan (OPEMP) will be developed to describe the overarching principles and measures through which environmental impacts associated with the operational and maintenance phase, as identified in the EIA, would be appropriately managed.
- development of, and adherence to, a Decommissioning, Restoration and Aftercare Plan, which would be prepared for the Proposed Development prior to decommissioning in accordance with the latest available guidance and legislation. The hydrology and hydrogeology input to the Decommissioning, Restoration and Aftercare Plan measures during decommissioning would be consistent with those applied during construction but would be proportionate to the nature of the decommissioning activities.



- 8.6.3 The Applicant is committed to implementing these measures, together with established good practice measures, industry-standard procedures and relevant construction and environmental management controls. It is therefore considered that these measures are inherently part of the design and have been considered in the judgements as to which impacts can be scoped in / out of assessment presented in **Section 8.4** and **Section 8.8**.
- 8.6.4 Additional mitigation measures will be considered where significant effects are anticipated to remain after embedded design measures and standard good practice controls have been applied. If residual impacts persist, proportionate further actions, such as enhancement, remediation or compensation, will be identified to address those remaining effects.
- 8.6.5 Further detail on the role of mitigation commitments, as part of a proportionate EIA approach, is provided in **Chapter 3: Approach to EIA**.
- 8.6.6 The requirement for, and feasibility of, any mitigation measures will be subject to consultation with consultees throughout the pre-application phase of the EIA.

8.7 Consultation

- 8.7.1 Consultation will be undertaken and recorded throughout the pre-application stages of the Proposed Development, with the following key consultees:
- Environment Agency;
 - ERYC and NLC inclusive of their Lead Local Flood Authorities (LLFAs);
 - Isle of Axholme and North Nottinghamshire Water Level Management Board;
 - Severn Trent Water (where required); and
 - Natural England (where required).
- 8.7.2 The aim of this consultation will be to discuss findings with a view of reaching agreement on issues prior to submission of the application. Where required, this will also include discussion on details of assessment methods.
- 8.7.3 Consultation will be reviewed throughout the assessment process. Additional consultees such as local or specialist groups will be contacted should a requirement to consult with other bodies arises. Engagement with the key consultees will continue post submission.

8.8 Summary of Scope

- 8.8.1 Based on the baseline hydrology, hydrogeology, and flood risk information currently available and the Proposed Development description (outlined in **Chapter 2: Project Description**) a number of receptors and / or impacts are proposed to be scoped out the EIA for hydrology, hydrogeology, and flood risk. The impacts are outlined, together with a justification for scoping them out, below.
- 8.8.2 The sensitive receptors identified in **Section 8.2** and the potential impacts outlined in **Section 8.4** will be assessed in full.
- 8.8.3 At this stage, it is proposed that the following can be scoped out of detailed assessment:
- Effects on water dependent designated sites. Whilst the Humber Estuary SSSI, SPA, SAC and Ramsar is present downstream of the Site, as measures will be taken to protect the Adlingfleet Drain Upper Catchment WFD waterbody, the hydraulic pathway between the Site and Humber Estuary, it is unlikely that the Proposed Development will have any significant adverse effects on this designated site as a result of changes to the hydrology or hydrogeology at the Site.
 - Potential decommissioning effects as the decommissioning of the Proposed Development will be carried out in accordance with an approved decommissioning



plan which will be expected to include the same safeguards as those provided during the construction stage of the Proposed Development which will be outlined in the EIA.

8.9 Questions for Consultees

The following questions are provided to help frame the consultees comments on the Scoping Report for hydrology, hydrogeology, and flood risk:

- Q8.1** Do the consultees agree that the receptors and impacts described in **Section 8.8** can be scoped out?
- Q8.2** It is not proposed to undertake any water quality sampling, establish groundwater monitoring points, surface water monitoring points, or undertake leachability trials of any rock as there is published data that can be used to characterise baseline conditions and complete the impact assessment. Is this acceptable?
- Q8.3** Please advise if there is any specific information or methodology that should be used / followed as part of a PWS risk assessment?
- Q8.4** Do you agree that the scope of the proposed assessment is appropriate?

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9.0 Geology, Soils & Ground Conditions

9.1 Introduction

- 9.1.1 This chapter outlines the proposed scope of the Environmental Statement (ES) to assess the likely significant effects from the Proposed Development on geology, soils and ground conditions. It identifies the potential likely significant effects arising from the construction, operation and maintenance, and decommissioning of the Proposed Development, in isolation and cumulatively, on geology, soils and ground conditions. The chapter also explains how likely significant effects would be assessed for the purposes of the ES.
- 9.1.2 There are interrelationships between the potential effects on geology, soils and ground conditions and other environmental topics. Therefore, this chapter should be read alongside the following chapters of the Scoping Report:
- **Chapter 6: Ecology**
 - **Chapter 8: Hydrology, Hydrogeology and Flood Risk**
- 9.1.3 This chapter of the Scoping Report is supported by the following figures:
- **Figure 9.1:** Predictive Agricultural Land Classification; and
 - **Figure 9.2:** National Soil Map.

9.2 Baseline Conditions

Study Area

- 9.2.1 The Study Area for geology, soils and ground conditions has been defined by the Site boundary. The Site boundary encompasses all locations where physical ground disturbance or a change in land use could arise from the Proposed Development and therefore represents the maximum foreseeable area within which the Proposed Development could give rise to direct or indirect effects on geological features, soil resources or existing ground conditions.
- 9.2.2 The Study Area has been used to describe the current baseline conditions in relation to geology, soils and ground conditions in the sections below.

Data Sources

- 9.2.3 The data sources to be consulted in the production of the geology, soils and ground conditions ES chapter include, but are not limited to, those outlined in **Table 9-1**.

Table 9-1: Key sources of information for Geology, Soils and Ground Conditions

Source	Summary	Spatial Coverage of Study Area
British Geological Survey (BGS) Onshore Geoindex	Provides information on bedrock geology, superficial geology, linear features, and mines and quarries within the Study Area.	Full Coverage
Met Office	Climatological Data for Agricultural Land Classification - Climatic records used to calculate Agricultural Land Classification (ALC) grades	Full Coverage
National Library of Scotland, Side by Side Viewer	Historical Maps of England	Full Coverage



Source	Summary	Spatial Coverage of Study Area
National Soil Map for England and Wales	1:250,000 map showing over 300 soil associations	Full Coverage
Natural England Peat Map	Provides predicted peaty soil depth and peaty soil extent and condition within the Study Area.	Full Coverage
Natural England	Post-1988 Agricultural Land Classification	Full Coverage
Natural England	Provisional Agricultural Land Classification	Full Coverage
Natural England	Predictive Agricultural Land Classification for England	Full Coverage
Natural England	Likelihood of Best and Most Versatile (BMV) Agricultural Land	Full Coverage
Knox et al. (2015)	Research to develop the evidence base on soil erosion and water use in agriculture	Full coverage
LandIS Soils	Provides information regarding soils within the Study Area.	Full Coverage
The UK Soil Observatory (UKSO)	Provides information regarding soils within the Study Area.	Full Coverage
ERYC	Provides information regarding Mineral Safeguarding Areas in the East Riding of Yorkshire council area.	Full Coverage
NLC	Provides information regarding Mineral Safeguarding Areas in the North Lincolnshire Council area.	Full Coverage
Google Earth imagery (2026)	Used to identify potential soil boundaries; e.g. poorly drained soils, crop wilting etc	Full Coverage
Mining Remediation Authority	Provides information regarding mining within the Study Area.	Full Coverage
Natural England DEFRA open data	Provides information regarding designated sites, and agricultural land classification within the Study Area.	Full Coverage
Zetica, Unexploded Bombs Website	Provides information regarding UXO	Full Coverage

Description of Baseline Environment

- 9.2.4 An initial desk-based review was undertaken to obtain information on geology, soils and ground conditions (including those that have been subject to potentially contaminative activity). The findings of this research are presented below in order to provide an understanding of the baseline environment of the Study Area and to inform the scoping process.

Bedrock Geology

- 9.2.5 British Geological Survey (BGS) Onshore GeoIndex 1:50 k scale mapping records the Study Area to be underlain by Triassic age sedimentary formations of the Mercia Mudstone Group.
- 9.2.6 No linear features (faults or dykes) are mapped across the Study Area.



Superficial Geology

- 9.2.7 BGS Onshore GeoIndex 1:50 k scale mapping indicates that the majority of the Study Area is underlain by superficial deposits comprising Alluvium composed of clay, silt, sand and gravel. A band of Warp (artificially induced alluvium composed of clay and silt) is present in the southern half of the Study Area.
- 9.2.8 BGS Onshore GeoIndex indicates no Artificial Ground deposits are present across the Study Area. However, the band of Warp is considered to be a type of artificial ground as it is a historical agricultural soil created by intentionally flooding embanked fields with sediment-rich river or estuarine water leaving behind the suspended silt and clay.

Soil and Peat

- 9.2.9 BGS mapping at 1:50 k scale does not indicate the presence of peat. The Natural England Peat Map (2025) indicates localised pockets of peaty soils, concentrated within two parcels of forestry in the north of the Site, and as isolated pockets within adjacent fields. The Natural England Peat Map does not indicate the presence of peatland drainage and erosional features (e.g. bare peat, hags and gullies).
- 9.2.10 The England Peat Map is a strategic, modelled dataset that predicts the likely extent and characteristics of peat across England. As the mapping is derived from machine-learning models rather than comprehensive ground verification, it should be considered indicative and used only as a scoping tool to assess the potential presence of peat. Site-specific surveys are required to confirm the actual presence, extent and depth of peat within any area of interest.
- 9.2.11 Although published mapping does not indicate extensive peat deposits, historical BGS borehole records locally indicate the presence of buried peat up to ~ 2 m thick, overlain by sands and silts
- 9.2.12 No peat was observed on site during a walkover, except for peat that had been excavated from the base of dykes, which indicates potential for peat at 1-2 m depth in line with the observations from the BGS.
- 9.2.13 Baseline information on the soil resources present within the Site are available from the National Soil Map for England and Wales and the LandIS soils datasets. These are based on soil surveys carried out by the Soil Survey of England and Wales in the 1970s. The map has a scale of 1:250,000 which is not sufficiently detailed to show small-scale variation in soil type at the field level. However, it does provide a general indication of the soil types within the wider area which would be verified with the Site-specific soil information from detailed ALC survey.
- 9.2.14 The National Soil Map indicates that two soil associations occur within the vicinity of the Site: the Blacktoft (532a) and Romney (532b) associations. Romney (532b) association soils are mapped across most of the Site. These soils are characterised by deep stoneless permeable calcareous coarse and fine silty soils. The Blacktoft (532a) association is mapped along the northern boundary of the Site. These soils are similar, consisting of deep, stoneless permeable calcareous fine and coarse silty soils, with some calcareous clayey soils also associated. Both associations are found on flat land where groundwater is controlled by ditches and pumped drainage systems. Buried peat horizons are possible in these two soil associations. The presence of such horizons would be further investigated in the proposed



detailed soils and ALC survey and will feed into the overall peat assessment. The key characteristics of these soil associations are summarised in **Table 9-2**.

Table 9-2: Soil Associations within the Site

Soil Association	Romney (532b)	Blacktoft (532a)
Geology	Marine alluvium	Marine alluvium
Soil Series	Romney, Blacktoft	Blacktoft, Romney, Newchurch
Soil characteristics	This association consists of gleyic brown calcareous coarse and fine silty soils in marine alluvium. It is formed on low lying land through a process of artificially allowing tide-water to flood embanked land and deposit sediment, before it is released via sluices at a subsequent ebb tide. The principal soil series, the Romney series, is a calcareous, coarse silty soil which is sometimes laminated and has faint subsoil mottling. It is stoneless, usually weakly structured and may overlie peat or clay at about 1.5 m depth. The Blacktoft series is also included in this association. It differs to the Romney series by having better structured fine silty upper horizons, passing downwards in places into laminated silt loam.	Blacktoft (532a) soils are stoneless, fine silty, calcareous alluvial soils with a gleyic brown colour and subsoil mottling. The main constituent series (Blacktoft) is usually well structured and pass downwards into laminated silt loam or clay, and occasionally overly peat at depth. The Romney series is often weakly and is coarse silty throughout the profile, becoming increasingly mottled and laminated with depth. There is a small but variable proportion of clayey soils (the Newchurch series), which are slowly permeable, strongly mottled calcareous clayey soils.
Soil Water Regime	Groundwater levels are kept low by a pumped drainage system. The subsoil mottling is therefore relic and the association as a whole is well drained (Wetness Class I)	Soils have a drier regime than the subsoil mottling suggests, being well drained or only occasionally waterlogged (Wetness Classes I or II). This is due to the groundwater being controlled by a drainage system of pumped dykes. The Newchurch soils are less well-draining and seasonally waterlogged (Wetness Class III).
Erodibility*	Very small risk	Very small risk
*Based on Knox et al. (2015)		

Agricultural Land Classification

- 9.2.15 Provisional ALC data indicate that most of the Site consists of Grade 2 (very good) quality agricultural land, with areas of Grade 1 (excellent quality) and Grade 3 (good to moderate) agricultural land also present within the Site. The predictive ALC map for England indicates that the agricultural land consists entirely of Grade 1 quality land, as shown in Figure 9.1. The scale of provisional ALC mapping (1:250,000) is not accurate to the field level and cannot identify variations in ALC grade within an area of less than 80 ha. Similarly, the scale and resolution of the predictive ALC map for England means that it should only be used for strategic or indicative purposes and cannot be used as a replacement for detailed field-based ALC surveys. The ALC grading within the Study Area can only be conclusively determined through a detailed ALC survey.



- 9.2.16 There are no detailed post-1988 ALC survey data available for the Site. The nearest two detailed ALC surveys were carried out approximately 8 km north-west and 3 km south-east of the Site. The surveyed areas nearest to the Site consisted of Grade 1 and Grade 2 quality agricultural land respectively, with areas of Subgrade 3a and 3b also recorded further away from the Site. This confirms the presence of BMV land within the vicinity of the Site. The Natural England likelihood of BMV agricultural land map for Yorkshire and the Humber indicates that land within the Site and the surrounding area has a 'High Likelihood' of BMV presence (>60% of area BMV).
- 9.2.17 Due to the absence of detailed ALC survey data and the likely presence of BMV land within the Site boundary, a detailed ALC survey will be carried out to inform the ES chapter. The methodology for this proposed survey is described further in Section 9.3.

Mines and Quarries

- 9.2.18 The Mining Remediation Authority (MRA) interactive map identifies the Site as being located outwith a coal mining reporting area or development high-risk area.
- 9.2.19 No mines or quarries are indicated to be present across the Study Area.

Mineral Safeguarded Areas

- 9.2.20 The East Riding of Yorkshire & Kingston upon Hull Joint Minerals Local Plan Policies Map (October 2019) indicates the north and centre of the Study Area to be located within a Minerals Safeguarding Area. This is related to the superficial deposits of sand and gravel that are present beneath the Study Area.

Designated Sites

- 9.2.21 There are no designated areas of protection located within the Study Area in relation to sensitive geological or soils receptors. The closest Site of Special Scientific Interest (SSSI), Humber Estuary, is located approximately 1.2 km to the north of the Site at its closest point.

Unexploded Ordnance (UXO)

- 9.2.22 An Unexploded Ordnance (UXO) Risk Assessment has been undertaken for the Site, identifying it as being within a low bomb risk area.

Contaminated Land

- 9.2.23 The Contaminated Land Public Register maintained by ERYC and NLC lists no contaminated sites within or near to the Study Area.

Historic past use and Industrial activities

- 9.2.24 Contaminated soils are generally associated with historical or current industrial activities where localised or widespread contamination has occurred. In general, these former activities are concentrated in and around urban areas.
- 9.2.25 Review of freely available historical mapping for the Site shows it to have been largely undeveloped, in a rural setting comprising fields.
- 9.2.26 No historic landfills sites are recorded to be present on the Site. The nearest is recorded to be Knaptons Landfill approximately 1.3 km south of the Site, which was a former quarry then backfilled as a licensed landfill site.



9.3 Assessment Methodology

Relevant Policy, Legislation and Relevant Guidance

- 9.3.1 The likely significant effects of the Proposed Development on geology, soils and ground conditions would be considered in the relevant topic-specific ES chapter, which would follow, as appropriate, relevant legislation, policy and guidance including:

Local Policy

- East Riding Local Plan Local Development Scheme Updated March 2025.
- East Riding of Yorkshire and Kingston Upon Hull Joint Minerals Local Plan 2016-2033, Adopted November 2019. Relevant policies may include:
 - Policy AGG1: Supply of Sand and Gravel
 - Policy AGG10: Safeguarding of Mineral Infrastructure and Facilities
 - Policy NAM2: Peat Working
 - Policy DM4: Best & Most Versatile Agricultural Land
- East Riding Local Plan: Strategy Document Update:
 - Policy EC5: Supporting the Renewable and Low Carbon Energy Sector
 - Policy EC6: Protecting Mineral Resources
 - Policy ENV5: Enhancing Biodiversity and Geodiversity
 - ENV6: Managing Environmental Hazards
- North Lincolnshire Local Plan 2003 (Updated 2024).
 - Policy LC1: Special Protection Areas, Special Areas of Conservation and Ramsar Sites
 - Policy LC2: Sites of Special Scientific Interest and National Nature Reserves
 - Policy M5: Best and Most Versatile Agricultural Land
 - Policy M6: Proposals for Mineral Extraction on Sites Allocated for Development
 - Policy M7: Transportation of Minerals
 - Policy M8: Safeguarding Aggregate Minerals
 - Policy M14: Borrow Pits
 - Policy M20: Peat Workings
 - Policy DS21: Renewable Energy

Legislation

- Environmental Permitting (England and Wales) (Amendment) Regulations 2023
- Environmental Protection Act 1990
- The Town and Country Planning (Environmental Impact Assessment) Regulations 2017

National Policy

- National Policy Statements (NPS):
 - Overarching National Policy Statement for Energy (EN-1)
 - Renewable Energy Infrastructure (EN-3).



- National Planning Policy Framework, August 2026

Guidance

Whilst some of the guidance documents listed below have been prepared by NatureScot and the Scottish Environment Protection Agency (SEPA) for projects in Scotland, in the absence of alternative guidelines in other jurisdictions these guidance documents have become established best practice across the UK.

- CIRIA C811: Environmental Good Practice on Site (fifth edition)
- NatureScot (2024) Good Practice During Wind Farm Construction Guidance
- Land contamination risk management (LCRM)
- Defra: Agricultural Land Classification of England and Wales: Guidelines for grading the quality of agricultural land
- Institute of Sustainability and Environmental Professionals (Formerly the Institute of Environmental Management and Assessment – IEMA): A New Perspective on Land and Soil in Environmental Impact Assessment
- Natural England Technical Information Note TIN049: Agricultural Land Classification: protecting the best and most versatile agricultural land
- Institute of Quarrying: Good Practice Guide for Handling Soils in Mineral Workings
- Defra Construction Code of Practice for the Sustainable Use of Soils on Construction Sites
- SEPA Regulatory Position Statement: Developments on Peat (2012)

9.4 Further Baseline Data

Desk Study

- 9.4.1 A detailed desk study will be undertaken to determine and confirm the baseline characteristics of the Site by reviewing available information relating to geology, soils and ground conditions. This will include review of published geological maps, Ordnance Survey maps, aerial photographs, digital terrain models (slope plans) and geological literature.
- 9.4.2 The desk study will identify sensitive features which may potentially be affected by the Proposed Development and will confirm the geological and environmental baseline.

Field Surveys

- 9.4.3 A targeted site walkover of areas of interest will be undertaken, informed by the findings of a Preliminary Land Quality Risk Assessment (PLQRA) to identify potential sources of contamination and assess surrounding site uses.
- 9.4.4 Due to the absence of peat at surface, traditional probing methods are unlikely to identify peat soils. Therefore, an assessment of peat soils would be gathered in conjunction with targeted ALC surveys, via hand pits.

Peat Management Plan

- 9.4.5 To enable the avoidance, protection and mitigation of impacts on peat soils arising from the Proposed Development, an understanding of the extent and condition of peat soils on Site



will be required. This will support the approach detailed in the 2025 Environmental Improvement Plan (UK Government, 2025).

- 9.4.6 Subject to the identification of peat and potential disturbance by the Proposed Development, a Stage 1 Peat Management Plan (PMP) will be prepared as a technical appendix to the ES, in line with NPPF and guidance provided in the SEPA Regulatory Position Statement: Developments on Peat (2012) and NatureScot Good Practice During Wind Farm Construction guidance (2024). The Stage 1 PMP will set out measures including, but not limited to, the following:

- avoiding peat excavation where practicable;
- minimising the volume of peat excavated where disturbance cannot be avoided;
- reusing excavated peat in a manner to which it is suited; and
- peat condition survey to classify peatland type and condition.

Mineral Resource Assessment

- 9.4.7 To ensure potential impacts associated with the possible sterilisation of safeguarded mineral resources arising from the Proposed Development are appropriately considered, a review of mineral resources and mineral safeguarding designations will be undertaken. If required, a Mineral Resources Assessment will identify whether the Site lies within a Mineral Safeguarding Area (MSA) or contains minerals of economic importance. The assessment will review BGS mapping, and publicly available records to determine the presence, extent and potential viability of safeguarded minerals.

Agricultural Land Classification Survey

- 9.4.8 Baseline data for assessing impacts on soil resources and functions would be obtained from a detailed soils and ALC survey. It is proposed that the survey would cover each field where a wind turbine would be located in its entirety, in addition to the proposed entry points for the cable routes and access routes that extend outside of those fields identified. In addition to forming the baseline for the assessment in the ES, the survey can also be used to inform project design by allowing for potential micro-siting of wind turbines within fields to avoid siting wind turbines on areas of higher quality agricultural land or higher sensitivity soil resources. However, opportunities for such avoidance may be constrained by other environmental, technical and design considerations. The survey would also provide the necessary detail for soil management planning to safeguard soil resources from damage or loss during construction.
- 9.4.9 The survey would be carried out in accordance with the updated ALC guidelines (Defra, 2025). ALC is a standardised method for grading agricultural land based on factors such as soil type, climate, topography, and drainage. The ALC system places land into five Grades (with Grade 3 subdivided into Subgrades 3a and 3b) from Excellent to Very Poor. Grades 1, 2 and Subgrade 3a (Excellent, Very Good and Good quality land) are termed BMV land.
- 9.4.10 Survey points would be distributed across the Site on a 100 m x 100 m rectilinear grid, ensuring a density of at least one point per hectare as required by Natural England in TIN049. The survey points would consist of a combination of soil auger cores surveyed with a 70 mm diameter Edelman auger, along with representative soil pits, to a depth of 1.2 m. The proposed ALC survey would also involve the collection of samples for laboratory analysis to validate assessments of soil texture made in the field, in line with the IEMA 2022 guidance.
- 9.4.11 The ALC surveys will also incorporate a peatland specialist to support the identification of any peat through trial pitting and logging. Any areas of peat or peaty soils encountered during ALC survey, would be subjected to a further peat survey to map the extent and



assess the quality and depth of peat or peaty soils. These surveys would provide information on the ALC classification of the land within the Site, in addition to characterising the soil and peat resources present.

Assessment of Effects

- 9.4.12 The assessment of effects would reflect the methodology in the Institute of Sustainability and Environmental Professionals (formerly the Institute of Environmental Management and Assessment's, IEMA) 2022 'A New Perspective on Land and Soil in Environmental Impact Assessment', which provides a framework for the inclusion of land and soil in the EIA process. This methodology would be supplemented by industry standard good practice and professional judgement. The assessment methodology allows for the separate assessment of soil resource (both in situ and during handling and storage) and soil functions.
- 9.4.13 Using the IEMA guidance, three receptors have been identified for assessment:
- soil resources;
 - agricultural land (or the soil function 'biomass production' as termed in the IEMA guidance); and
 - Soil carbon.
- 9.4.14 The methodology for the assessment is provided below for each receptor.

Assessment of Sensitivity

- 9.4.15 The criteria for determining the significance of effects is a two-stage process which involves defining the sensitivity of the receptors and the magnitude of the impacts. This section describes the criteria that will be used to assign values to the sensitivity of receptors and to the magnitude of potential impacts.
- 9.4.16 **Table 9-3** sets out the scale of sensitivity that has been applied to the receptors identified in relation to this technical assessment.
- 9.4.17 The land within the Site boundary is primarily used for agriculture. As such, the assessment of impacts on soil functions would include 'biomass production', that is, the land's capacity to provide food, fibre or timber, as defined in the IEMA guidance. Impacts upon the agricultural land receptor would be assessed using the criteria set out in **Table 9-3** which is based on Table 2 of the IEMA guidance. Baseline data to assess the sensitivity of the agricultural land within the Study Area would be obtained from a detailed ALC survey.
- 9.4.18 Soil carbon would also be included as a receptor, assessed with the sensitivity criteria provided in **Table 9-3**, which are based on Table 2 of the IEMA guidance. The IEMA guidance does not distinguish between 'Medium' and 'Low' sensitivity mineral soils. The criteria for distinguishing between Medium and Low sensitivity of mineral soils included in **Table 9-3** is therefore based on Figure 7 of the Soil Survey Field Handbook - limiting percentages of organic carbon/matter and clay content for soils.



Table 9-3: Sensitivity of Receptor

Receptor Sensitivity	Receptor Type
Very High	Agricultural Land: ALC Grades 1 and 2 - Land with no or very minor limitations to agricultural use. A very wide range of agricultural and horticultural crops can be grown. Yields are high and less variable than on land of lower quality. Grade 2 may comprise soils that show difficulties with the production of more demanding crops (e.g., Winter harvested vegetables and arable root crops). The level of yield is generally high but may be lower or more variable than Grade 1. Soil Carbon: Peat soils and highly organic material with minimal mineral content, which are a high-density stable carbon store but subject to rapid wastage and carbon loss if disturbed. Geology: very rare and of international importance with no potential for replacement (e.g. UNESCO World Heritage Sites, UNESCO, Global Geoparks, SSSIs and GCR. Where citations indicate features of international importance). Geology meeting international designation citation criteria which is not designated as such. Contamination: human health: very high sensitivity land use such as residential or allotments.
High	Agricultural Land: ALC Subgrade 3a - Land capable of consistently producing moderate to high yields of a narrow range of arable crops (especially cereals) or moderate yields of a wide range of crops (including cereals, grass, oilseed rape, potatoes, sugar beet) and the less demanding horticultural crops. Soil Carbon: Organo-mineral soils which have topsoils with organic matter contents of 10-25% or a surface peat horizon which is <40 cm thick. Geology: rare and of national importance with little potential for replacement (e.g. geological SSSI, National Nature Reserves (NNR)). Geology meeting national designation citation criteria which is not designated as such. Contamination: human health: high sensitivity land use such as public open space.
Medium	Agricultural Land: ALC Subgrade 3b - Land capable of producing moderate yields of a narrow range of crops (principally cereals and grass) or lower yields of a wider range of crops or high yields of grass that can be grazed or harvested over most of the year. Soil Carbon: Mineral soils primarily composed of mineral particles (sand, silt and clay) with organic matter levels typically less than 10%, or fine and medium textured mineral soils able to hold moderate levels of organic matter (5 to 10%). Geology: of regional importance with limited potential for replacement (e.g. Regionally Important Geodiversity Sites (RIGS) and County Geological Sites). Geology meeting regional designation citation criteria which is not designated as such. Contamination: human health: medium sensitivity land use such as commercial or industrial.
Low	Agricultural Land: ALC Grades 4 and 5 – Land with severe limitations that significantly restrict the range of crops and / or level of yields. Is mainly suited to grass with occasional arable crops (e.g., cereals and forage crops) the yields of which are variable. In moist climates, yields of grass may be moderate to high, but there may be difficulties in utilisation.



Receptor Sensitivity	Receptor Type
	Mineral soils; Soils primarily composed of mineral particles (sand, silt and clay) with organic matter levels less than 5%, or coarse textured mineral soils only able to hold low levels of organic matter (typically 0 to 5%). Geology: of local importance/interest with potential for replacement (e.g. non designated geological exposures, former quarries/mining sites). Contamination: human health: low sensitivity land use such as highways and rail.
Negligible	Agricultural Land and Soil Carbon: as for low sensitivity, but with only indirect, tenuous, and unproven links between sources of impact and soil functions Geology: no geological exposures, little/no local interest. Contamination: human health: undeveloped surplus land / no sensitive land use proposed.

- 9.4.19 Impacts upon the soil resource include the loss of soil through erosion and structural damage caused by improper handling or storage. The susceptibility of the soil resource to structural damage and erosion is related to its texture and degree of development. The sensitivity of the soil resource to structural damage would be evaluated using the criteria set out in **Table 9-4** below, adapted from Table 4 of the IEMA guidance. The sensitivity of the soil resource to erosion would be assessed using the criteria set out in **Table 9-5** which are based on the Knox et al. (2015) soil erosion sensitivity classification. Baseline data to assess the sensitivity of the soil resources to these impacts would be available from the detailed soil and ALC survey.

Table 9-4: Definitions of Receptor Sensitivity for Soil Resources (Structural Damage)

Sensitivity	Description
High	Soils with low resilience to structural damage; Soils with high clay and silt fractions (clays, silty clays, sandy clays, heavy silty clay loams and heavy clay loams) and organo-mineral and peaty soils where the Field Capacity Days (FCDs) are 150 or greater. Medium-textured soils (silt loams, medium silty clay loams, medium clay loams and sandy clay loams) where the FCDs are 225 or greater. All soils in wetness class (WC) WCV or WCVI.
Medium	Soils with medium resilience to structural damage; Clays, silty clays, sandy clays, heavy silty clay loams, heavy clay loams, silty loams, and organo-mineral and peaty soils where the FCDs are fewer than 150. Medium-textured soils (silt loams, medium silty clay loams, medium clay loams and sandy clay loams) where FCDs are fewer than 225. Sands, loamy sands, sandy loams, and sandy silt loams where the FCDs are 225 or greater or are in wetness classes WCIII and WCIV.
Low	Soils with high resilience to structural damage; Soils with a high sand fraction (sands, loamy sands, sandy loams, and sandy silt loams) where the FCDs are fewer than 225 and are in wetness classes WCI to WCII.

Table 9-5: Definitions of Receptor Sensitivity for Soil Resources (Loss through Erosion)

Sensitivity	Description
High	Soils with high risk of erosion: light textured soils, organic soils (peat), soils on steeper gradients.



Sensitivity	Description
	Soils with a high fine sand and silt fraction have inherently weaker development and low aggregate stability. Soils on steep ground are also more susceptible to erosion. Peat has high importance as a carbon store and an active role in carbon sequestration, as well as being of high biodiversity value. Peatlands have little capacity to tolerate change. Increased mitigation requirements beyond standard measures are required for peatland. Development on these soils should be avoided where possible. If this is not possible, they require careful consideration and site-specific planning of construction methods (e.g., use of temporary working surfaces, sensitive storage, protection from drying out) in order to preserve their functions.
Medium	Soils with moderate risk of erosion: organo-mineral soils (peaty soils or peaty gleys, peat < 50 cm), loamy soils, gently undulating topography relief Whilst standard mitigation measures will provide appropriate protection to these soils, loss is likely to occur if worked in less-than-ideal conditions (e.g., when above their plastic limit – the moisture state where soil begins to behave as a plastic material). The soils should be given appropriate consideration due to their importance for agricultural production.
Low	Soils with low risk of erosion: heavier textured soils, soils on level or gently sloping land. These soils are generally more resistant to erosion and may be appropriately managed by standard good practice construction measures.

Assessment of Magnitude

- 9.4.20 The magnitude of an impact is based on its duration and spatial extent. Data sources, feedback received from consultation, and expert judgement will be used to inform the assessment of magnitude for impacts to Geology, Soils and Ground Conditions receptors. The criteria for defining magnitude of impacts are defined in **Table 9-6**.

Table 9-6: Scale of Magnitude

Scale of Magnitude	Description of Impact
Major	Agricultural Land, Soil Carbon, and Soil Resources: Permanent, irreversible loss of one or more soil functions or soil volumes over an area of more than 20 ha or loss of soil-related features. Geology: loss of geological feature/designation and/or quality and integrity, severe damage to key characteristics, features or elements. Contamination: human health: significant contamination identified. Contamination levels significantly exceed background levels and relevant screening criteria (e.g. category 4 screening levels) SP1010 [Ref 4.N] with potential for significant harm to human health. Contamination heavily restricts future use of land.
Moderate	Agricultural Land, Soil Carbon, and Soil Resources: 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. Geology: partial loss of geological feature/designation, potentially adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements. Contamination: human health: contaminant concentrations exceed background levels and are in line with limits of relevant screening criteria (e.g. category 4 screening levels) SP1010 [Ref 4.N]. Significant contamination can be present. Control / remediation measures are required to reduce risks to human health / make land suitable for intended use.



Scale of Magnitude	Description of Impact
Minor	Agricultural Land, Soil Carbon, and Soil Resources: Permanent, irreversible loss over less than 5ha or a temporary, reversible loss of one or more soil functions or soil volumes), or temporary, reversible loss of soil-related features. Geology: 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: human health: contaminant concentrations are below relevant screening criteria (e.g. category 4 screening levels) SP1010 [Ref 4.N]. Significant contamination is unlikely with a low risk to human health. Best practice measures can be required to minimise risks to human health.
Negligible	Agricultural Land, Soil Carbon, and Soil Resources: No discernible loss or reduction or improvement of soil functions or soil volumes that restrict current or proposed land use. Geology: very minor loss or detrimental alteration to one or more characteristics, features or elements of geological feature/designation. Overall integrity of resource not affected. Contamination: human health: contaminant concentrations substantially below levels outlined in relevant screening criteria (e.g. category 4 screening levels) SP1010 [Ref 4.N]. No requirement for control measures to reduce risks to human health / make land suitable for intended use.

Assessment of Significance

- 9.4.21 The significance of the effect upon Geology, Soils and Ground Conditions receptors is determined by correlating the sensitivity of the receptor and the magnitude of the impact, as outlined in **Table 9-7**. For the purposes of this assessment, any effects with a level of Very Large, Large and Moderate are considered significant in EIA terms. Any effect that has a significance of Slight or Neutral are deemed non-significant. The approach to assigning the significance of effect relies on reasoned argument and professional judgement. Where effects are assessed as being Slight/Moderate, professional judgement will be used to determine the significance.

Table 9-7: Significance Matrix

Sensitivity	Magnitude of Impact				
	No Change	Negligible	Minor	Moderate	Major
Very High	Neutral	Slight	Moderate/ Large	Large/ Very Large	Very Large
High	Neutral	Slight	Slight/ Moderate	Moderate/ Large	Large/ Very Large
Medium	Neutral	Neutral/ Slight	Slight	Moderate	Moderate/ Large
Low	Neutral	Neutral/ Slight	Neutral/ Slight	Slight	Slight/ Moderate
Negligible	Neutral	Neutral	Neutral/ Slight	Neutral/ Slight	Slight



9.5 Potential Impacts

9.5.1 A range of potential impacts on geology, soils and ground conditions have been identified which may occur during construction, operation and maintenance, and decommissioning phases. The impacts that are proposed to be scoped into the ES are outlined in **Table 9-8** below.

Table 9-8: Impacts proposed to be scoped into the ES

Impact	Description / Potential Effect	Proposed Approach to Assessment Including Description of Any New Data Collation Required and Any Analyses (Such as Modelling)
Construction		
Disturbance and loss of carbon rich soils and peat deposits.	1-2m buried peat indicated by BGS boreholes, overlain with ~2m of sands and silts England Peat Map indicates small patches of peatland within forestry to north of site, but this was not evident during site visit	Targeted ALC surveys across the site will incorporate a peatland specialist to identify any peat through trial pitting and logging. Peat Management Plan (PMP) to be prepared and will be applied if peat is disturbed at depth during construction.
Disturbance and loss of Agricultural Land	Agricultural land within the Site would be temporarily lost during the construction phase as the development is constructed. As a worst-case to account for construction compounds, access tracks and other temporary infrastructure required for construction, it is assumed that the entire Site would be removed from agricultural use during this period, but that most of the land would be returned to agricultural use at the end of the construction phase. There would also be localised areas of long-term agricultural land loss within the footprint of the turbines and associated infrastructure. As a reasonable worst-case this is assessed as being permanent due to the degree of soil disturbance and long soil storage period (30-year operational phase).	The soil across the Study Area is mapped as Grade 1 in the Predictive ALC map, and Grades 1 & 2 in the provisional ALC data. A detailed ALC survey will be carried out to verify the existing desk-based information, using the methodology described in detail above in section 9.3. The results of the survey will be used to inform the baseline for the ES chapter and provide site-specific information for a SMP. The data can also be used to microsite turbine locations within fields to avoid areas of higher quality agricultural land and/or higher sensitivity soil resources.
Structural damage to soil resource	Machinery-induced soil compaction, particularly when moisture is above plasticity thresholds, reduces porosity, pore connectivity, aeration, and hydraulic conductivity, leading to progressive structural degradation.	Data obtained from the detailed ALC survey will be used to form the baseline for this receptor. The assessment will follow the methodology described earlier in this chapter.
Loss of soil resource from erosion	Disturbed, excavated, translocated, and temporarily stockpiled topsoil is at higher risk of soil erosion, relative to undisturbed in situ soils. In the absence of protective vegetative	Data obtained from the detailed ALC survey will be used to form the baseline for this receptor. The assessment will follow the



Impact	Description / Potential Effect	Proposed Approach to Assessment Including Description of Any New Data Collation Required and Any Analyses (Such as Modelling)
	cover, exposed soil surfaces are subject to detachment and transport by wind-driven and rainfall-runoff mechanisms. This erosive loss can diminish the physical and chemical integrity of the soil mantle, reducing its capacity to support agricultural functions.	methodology described earlier in this chapter.
Loss of soil organic carbon	The disturbance of soils during construction would potentially result in the loss of soil organic carbon.	Data obtained from the detailed ALC survey and laboratory analysis of soil samples will be used to inform the baseline for an ES chapter. The assessment will follow the methodology described earlier in this chapter.
Sterilisation of potential resources within the Mineral Safeguarding Area	The north and centre area of the Study Area lies within a sand and gravel safeguarding area. Where overlaps occur between the permanent infrastructure and minerals safeguarding areas this could sterilise future resources.	A Mineral Resource Assessment may be required in order to determine whether mineral resources are present, whether project would result in sterilisation of those minerals, and whether the project would be compliant with the relevant mineral safeguarding policies.
Operation and Maintenance		
No activities during this phase are scoped into the assessment as detailed in Table 9-9.		
Decommissioning		
Structural Damage to Soil Resources	The process of removing Site infrastructure during the decommissioning phase will involve soil handling and storage for the re-establishment of temporary compounds and access tracks. This poses a risk of causing structural damage to soils, particularly if the soil moisture is above plasticity thresholds. Potential impacts during this phase are anticipated to be similar to the construction phase.	The assessment methodology will be consistent with that of the construction phase.
Loss of Soil Resources through Erosion	As described above, soils will again be disturbed, moved, and temporarily stockpiled during this phase, and the disturbed soils will be at higher risk of being lost through erosion. It is anticipated that this impact will be consistent with the construction phase impact on this receptor.	The assessment methodology will be consistent with that of the construction phase.
Loss of soil organic carbon	Soil disturbance associated with decommissioning activities may result in the loss of soil organic carbon.	The assessment methodology will be consistent with that of the construction phase.



Impact	Description / Potential Effect	Proposed Approach to Assessment Including Description of Any New Data Collation Required and Any Analyses (Such as Modelling)
Loss of Agricultural Land	Agricultural land will be temporarily removed from production during the decommissioning phase. It is assumed that the impacts involved in this phase will be similar to that of the construction phase. There will be no further permanent loss of agricultural land during this phase.	The assessment methodology will be consistent with that of the construction phase.
Cumulative		
Disturbance and Loss of Agricultural Land	In addition to the consideration of the loss and disturbance of agricultural land as a direct impact from the construction of the Proposed Development, the assessment will also consider impact on agricultural land availability on a regional basis.	A review of potential cumulative projects will be undertaken to determine the impact of the Proposed Development on the loss of agricultural land availability on a regional basis. The methodology for the cumulative impact assessment of agricultural land loss will follow the approach described in the IEMA (2022) guidance.
Sterilisation of Mineral Safeguarding Area	Potential sterilisation of safeguarded minerals. The north and centre of the Study Area lie within a sand and gravel safeguarding area.	A review of potential cumulative projects will be undertaken to determine the cumulative impact to safeguarded minerals.

9.6 Mitigation

- 9.6.1 As part of the early design process for the Proposed Development, several embedded and standard mitigation measures are proposed to reduce the potential for impacts on geology, soils and ground conditions. These are presented below. It is expected that these may evolve throughout the design evolution of the Proposed Development as the ES progresses and in response to consultation and as more survey data becomes available.
- 9.6.2 Measures adopted as part of the Proposed Development would include, but not be limited to, the following:
- Avoidance by design where possible. Inherent in the emerging design of the Proposed Development is the commitment to avoid impacts on peat wherever practicable. The design process will prioritise the routing and siting of infrastructure avoiding areas of deeper peat (greater than 1 m depth) where technically possible, to minimise excavation volumes and ensure that any peat unavoidably removed is carefully handled, stored and reused on site in accordance with recognised best practice.
 - An outline Construction Environmental Management Plan (CEMP), which will form part of the planning application, which will comprise of.
 - 1) An outline Soil Management Plan (SMP) which will set out how soils will be protected, handled, stored and reinstated during the construction phase of the Project and the principles to be followed when the SMP is finalised.
 - 2) A Peat Management Plan (PMP) will be prepared to outline the overall approach to minimising disruption to peatland present on Site. It will aim to identify and take



forward all further opportunities to minimise peat disturbance and extraction during detailed design and construction of the Proposed Development. An outline PMP (a Stage 1 PMP), will be developed and submitted, as part of the application for development consent, to establish the peat management strategy for the Proposed Development, and inform the ES by identifying peat risks, sensitivities, and likely effects associated with the Proposed Development.

- 9.6.3 Additional mitigation measures will be considered where significant effects are anticipated to remain after embedded design measures and standard good practice controls have been applied. If residual impacts persist, proportionate further actions, such as enhancement, remediation or compensation, will be identified to address those remaining effects.
- 9.6.4 The Applicant is committed to implementing these measures, and various standard sectoral practices and procedures. It is therefore considered that these measures are inherently part of the design and have been considered in the judgements as to which impacts can be scoped in / out of assessment presented in Section 9.5 and Section 9.8.
- 9.6.5 Further detail on the role of mitigation commitments, as part of a proportionate EIA approach, is provided in **Chapter 3: Approach to EIA**.
- 9.6.6 The requirement for, and feasibility of, any mitigation measures will be subject to consultation with consultees throughout the pre-application phase of the Proposed Development.

9.7 Consultation

- 9.7.1 As part of the consultation phase of the Proposed Development environmental data and views of the Project will be sought from:
- Natural England;
 - Environment Agency; and
 - Local Planning Authorities, ERYC and NLC.

9.8 Summary of Scope

- 9.8.1 Based on the baseline environment information currently available the impacts in **Table 9-9** are proposed to be scoped out of the ES for geology, soils and ground conditions:

Table 9-9: Impacts proposed to be scoped out of ES

Impact	Description / Potential Effect	Proposed Approach to Assessment Including Description of Any New Data Collation Required and Any Analyses (Such as Modelling)
Construction		
Impacts to Contaminated Land	Potential contaminated land from historic activities may be present within the Site. However, preliminary review of freely available mapping indicates the Site has comprised open, undeveloped ground with no contaminative past land uses.	Scoped out subject to the results of a Preliminary Land Quality Risk Assessment. Any contamination encountered during the construction phase would be subject to appropriate risk assessment and if necessary, either removed, treated and/or mitigated as part of the project.
Damage to land drainage systems	Potential collapse, blockage, or silting of drainage ditches and subsurface drains could worsen soil wetness, reduce	It is proposed that impacts upon this receptor are scoped out based on a commitment within a CEMP or detailed



Impact	Description / Potential Effect	Proposed Approach to Assessment Including Description of Any New Data Collation Required and Any Analyses (Such as Modelling)
	workability and cropping potential, and increase livestock poaching risk.	SMP to reinstatement and repair any land drains damaged during construction and restoration.
Impacts on farm businesses	The Proposed Development will result in long-term (assessed as permanent as a worst case) agricultural land loss where turbines and associated infrastructure involving soil sealing will be located.	Affected farm businesses have agreed to the Proposed Development, and it is assumed they would be compensated for the loss of land. Access to surrounding land would not be severed, and all impacts will be contained within the Site boundary. Consequently, significant economic effects on land holdings are not anticipated, and this matter is proposed to be scoped out.
Loss of soil resource through off-site export	Stripped and excavated soils may be lost during the construction phase through off site export. This results in a permanent loss of soil resource, reducing the volume of material available for future restoration or reuse on site.	Industry standard good practice guidance encourages the reuse of displaced soils within the Site. Off-site removal of soils is considered a last resort. An outline SMP will be produced alongside the ES chapter as embedded mitigation which will set out the requirements of the final, detailed SMP which would be produced pre-construction. This will include measures to ensure the sustainable use of soils within the development and prevent the loss of soils through unauthorised export. It is therefore proposed that this impact is scoped out.
Operation and Maintenance		
Activities associated with the operational and maintenance phase of the Proposed Development are not anticipated to give rise to significant effects on geology, soils and ground conditions and are proposed scoped out of further assessment. This is because this phase would not involve excavation or large-scale earthworks activities and any ground disturbing activities would be minimal and restricted to maintenance activities on access tracks and other infrastructure areas. Whilst the development will involve areas of permanent loss of agricultural land, this impact would first occur during the construction phase, and it is not re-assessed during the operational phase to avoid double counting impacts. If necessary a planning condition requiring an Operational Phase Environmental Management Plan to monitor operation and maintenance activities could be submitted and approved by ERYC and NLC prior to the start of construction.		
Decommissioning		
Potential decommissioning effects.	Decommissioning the Proposed Development will be carried out in accordance with an approved Decommissioning, Restoration and Aftercare Plan which will be expected to include the same safeguards as those provided during the construction stage of the project which will be outlined in the ES.	
Cumulative		
Except for consideration of disturbance and loss of agricultural land on a regional basis and mineral safeguarding (see Table 9-8), a cumulative effects assessment relating to all other aspects of geology, soil and ground conditions is proposed to be scoped out of assessment.		



Impact	Description / Potential Effect	Proposed Approach to Assessment Including Description of Any New Data Collation Required and Any Analyses (Such as Modelling)
	Cumulative impacts with regards to all other aspects of geology, soils and ground conditions are typically anticipated to be significant only where construction activities associated with nearby developments and the Proposed Development would overlap in both spatial footprint and timelines. This is because activities with the potential to adversely affect receptors identified within this chapter would be substantially minimised post-construction through the implementation of mitigation measures set out within Section 9.6 . However, with reference to Table 3-2 in Chapter 3: Approach to EIA , other developments within the wider area are either sufficiently distant from the Proposed Development or are already operational, such that there would be no meaningful overlap of both spatial footprint and timeline. On this basis, the potential for significant cumulative effects on geology, soils and ground conditions is considered unlikely and further assessment is not proposed.	

9.9 Questions for Consultees

9.9.1 The following questions are provided to help frame consultee comments on the Scoping Report for geology, soils and ground conditions:

- Q9.1** Should any additional investigation or data sources be considered when assessing baseline conditions?
- Q9.2** Is the proposed methodology for investigating the baseline conditions suitable?
- Q9.3** Do you agree that the scope of the proposed assessment is appropriate?
- Q9.4** Do consultees agree with impacts scoped in and impacts scoped out?

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10.0 Noise and Vibration

10.1 Introduction

- 10.1.1 This chapter of the Scoping Report sets out the proposed scope and methodology of the noise and vibration assessment of the Proposed Development. It identifies the potential likely significant effects arising from the construction, operation and maintenance, and decommissioning of the Proposed Development, in isolation and cumulatively, on noise and vibration. This chapter also explains how likely significant effects would be assessed for the purposes of the EIA.
- 10.1.2 Consultation with ERYC and NLC environmental health officers (EHOs) will continue throughout the assessment process regarding the following:
- the status of identified potential Noise Sensitive Receptors (NSRs);
 - noise monitoring positions for the baseline survey;
 - identification of potential cumulative effects and a detailed method for the consideration of potential cumulative effects; and
 - the derivation of appropriate noise limits.
- 10.1.3 This chapter should be read alongside the following chapters of this Scoping Report:
- **Chapter 2: Description of the Proposed Development**
- 10.1.4 This chapter is supported by the following figures:
- **Figure 10.1: Study Areas, Noise Contours and Noise Sensitive Receptors.**

10.2 Baseline Conditions

Study Area

- 10.2.1 The noise study area has been informed by preliminary modelling of the Proposed Development operating in isolation. The study area and 35 dB $L_{A90,T}$ noise contour is shown in **Figure 10.1**, for operation of the Scoping layout in isolation. A selection of the closest representative NSRs is shown, but the final list of NSRs will be advised to the ERYC and NLC EHOs following a review of maps of the area to identify residential properties. **Figure 10.1** also shows the 40 dB $L_{A90,T}$ contour.
- 10.2.2 Following a review of any potential cumulative developments, if applicable the study area will be extended beyond the 35 dB $L_{A90,T}$ contour to consider NSRs at which the difference between the Proposed Development and cumulative schemes is less than 10 dB.

Data Sources

- 10.2.3 The data sources that have been used to inform this chapter of the Scoping Report are presented in



10.2.4 **Table** 10-1. These data sources will be taken forward and used to inform the EIA, alongside additional data sources for Site-specific data that will be collected for the Proposed Development.



Table 10-1: Key sources of information for Noise and Vibration

Source	Summary	Spatial Coverage of Study Area
Google Maps	Maps and aerial imagery	Entire study area.
Ordnance Survey	Maps, aerial imagery and sensitive receptor details	Entire study area.
Environment Agency National LiDAR Programme	LiDAR data at 1 m resolution for England	Entire study area
Wind turbine manufacturer	Source noise terms for candidate wind turbine	n/a

Description of Baseline Environment

- 10.2.5 A desk study review of maps and aerial images has identified that the Site and surroundings comprise predominantly farmland with minor, local roads running to the north, east, south and west of the Site. Scattered residential properties and small hamlets are located to the north, south, east and west of the Site, with larger settlements at Adlingfleet and Garthorpe to the east and south-east, Ousefleet to the north and Luddington and Eastoft to the south and south-west.
- 10.2.6 Based on review of the available information and knowledge of the area it is expected that background noise levels in the vicinity of the Site will be moderately low, though with some influence from anthropogenic noise. The noise environment is likely to be dominated by the wind, wildlife and farming activities.

10.3 Assessment Methodology

Relevant Policy, Legislation and Relevant Guidance

- 10.3.1 For a development of this nature, there is no specific all-encompassing legislation relating to the standard associated with noise and vibration impacts. In lieu of any specific legislation, assessing the effect of such a development during the construction, operational and decommissioning phases must draw on information from a variety of sources. This assessment, therefore, makes reference to a number of British Standards, official planning guidance notes and national guidelines.
- 10.3.2 The potential effects of the Proposed Development on noise and vibration would be considered in the relevant topic-specific ES chapter, which would have regard to, as appropriate, relevant legislation, policy and guidance including:
- **Local Policy**
 - East Riding Local Plan Update (2025); and
 - North Lincolnshire Local Plan (2003), Core Strategy (2011) and the emerging Local Plan.
 - **Legislation**
 - The Control of Pollution Act (CoPA) 1974;
 - Environmental Protection Act (EPA) 1990; and
 - Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended).



- **National Planning Policy**
 - Overarching National Policy Statement for Energy (EN-1);
 - National Policy Statement for Renewable Energy Infrastructure (EN-3); and
 - National Planning Policy Framework (NPPF);
- **Guidance**
 - Department for Energy Security and Net Zero, Assessment and Rating of Wind Turbine Noise (ARWTN) (2026);
 - Institute of Acoustics (IoA) (2013) 'A good practice guide to the application of ETSU-R-97 for wind turbine noise assessment' (IoA GPG) and associated Supplementary Guidance Notes (SGS).
 - British Standard (BS) 5228 (2009) + A1 (2014) Parts 1 and 2: Code of practice for noise and vibration control on construction and open sites; and
 - British Standard (BS) 6472-2:2008: Guide to Evaluation of Human Exposure to Vibration in Buildings. Blast-induced vibration.

10.3.3 Where ERYC and NLC have their own noise-related requirements, these will also be taken into account in the ES chapter. We request that any such requirements should be highlighted in the scoping response.

Construction

10.3.4 Potential impacts from construction noise and, where appropriate, vibration, will be assessed at the closest identified NSRs. Predictions of noise will be based on the likely site preparation and construction methods and programme. Where appropriate, the assessment of construction noise will also consider off-site activities such as construction traffic and deliveries, where the necessary information is available. Should borrow pits form part of the development (dependent upon site investigations), blasting / excavation noise and vibration would be considered in the ES.

10.3.5 The assessment of construction noise and vibration will be undertaken in accordance with BS 5228:2009+A1:2014 Parts 1 and 2 and BS 6472-2:2008.

Operation

10.3.6 We will consult directly with ERYC and NLC EHOs regarding the detailed method of assessment, however the proposed general approach is outlined below.

10.3.7 The identity of the closest NSRs will be agreed and any financial involvement established. Any relevant wind energy schemes that should be included in the cumulative assessment, whether in planning, consented or operational, will also be identified and agreed. Potentially cumulative developments will be excluded on the basis of a 10 dB difference in noise emissions at relevant NSRs, where this can be demonstrated through prediction.

10.3.8 The baseline noise survey will be undertaken in accordance with the IoA GPG. Wind speed measurements will be collected and standardised to 10 m in accordance with the method provided in the IoA GPG. Micro-siting of the baseline survey locations will seek to exclude influence from non-representative noise sources such as plant, boiler flues, heat pumps, vegetation and any existing wind turbines. A record of the installation of monitoring locations will be provided to ERYC and NLC EHOs for review following the commissioning visit.

10.3.9 Daytime and night-time operational Total Noise Assessment Criteria (TNAC) across the range of critical wind speeds (typically 4 – 10 m/s) will be established at the closest identified NSRs in accordance with ARWTN. The TNAC will be based upon a combination of Lower Limiting Value (LLV) and a margin above typical background sound levels. A record of the



data analysis will be provided to the EHOs, identifying periods of rainfall excluded from the analysis and any other treatments of the data.

- 10.3.10 Following the baseline survey, TNAC will be applied at NSRs using monitoring locations as proxies. The approach to allocating proxy data to NSRs will be agreed with the EHOs.
- 10.3.11 A candidate turbine will be selected for the Proposed Development, the noise emission details of which will be reproduced in the ES chapter (A-weighted and octave band data) for critical wind speeds.
- 10.3.12 Noise levels, including relevant cumulative contributions, will be predicted in accordance with the ISO9613:2024 method and the IoA GPG requirements. Corrections for concave topography and topographic screening corrections will be applied to predicted noise levels in accordance with the IoA GPG, where applicable. The two corrections will be assumed not to apply simultaneously, i.e. where topographic screening occurs, it will be assumed that concave topography corrections will not also apply.
- 10.3.13 Site Specific Noise Limits (SSNL) will be determined in accordance with ARWTN.
- 10.3.14 Corrections for directivity may be applied within any cumulative assessment in accordance with the guidance set out in the IoA GPG, where appropriate, e.g., where NSRs lie between two developments and where simultaneous down-wind predictions are therefore overly conservative.
- 10.3.15 Predicted levels will be evaluated against the TNAC and the magnitude of impact and significance of effect determined accordingly. Noise from ancillary electrical equipment and infrastructure will be evaluated in accordance with BS4142:2014+A1:2019. Background noise levels will be characterised using data collected during the wind farm baseline monitoring campaign, supplemented by additional attended measurements where appropriate.

Planned Surveys

- 10.3.16 A comprehensive baseline noise survey will be undertaken, in accordance with the guidance contained in the IoA GPG, at a selection of identified noise sensitive receptors.

10.4 Potential Impacts

- 10.4.1 A range of potential impacts on noise and vibration have been identified which may occur during construction, operation and maintenance, and decommissioning phases. The impacts that are proposed to be scoped into the EIA are outlined in **Table 10-2**, together with a description of any proposed additional data collection (e.g. site-specific surveys) and/or supporting analyses (e.g. modelling) to enable an assessment of the impact.

Table 10-2: Impacts proposed to be scoped into the assessment for Noise and Vibration

Impact	Description	Proposed Approach to Assessment Including Description of Any New Data Collation Required and Any Analyses (Such as Modelling)
Construction		
Noise and vibration from construction	Potential effects due to noise and vibration from construction activities, including construction vehicle movements and blasting /	Noise and vibration from construction activities will be predicted, based on details of the construction methodology, phasing and programme, and



Impact	Description	Proposed Approach to Assessment Including Description of Any New Data Collation Required and Any Analyses (Such as Modelling)
	excavation of borrow pits (if part of the development)	assessed in accordance with BS 5228:2009+A1:2014 Parts 1 and 2.
Operation and Maintenance		
Operational wind turbine noise	Potential effects due to noise from wind turbines	Predictive noise modelling of the proposed wind turbines and assessment in accordance with ARWTN and the IoA GPG.
Operational non-wind turbine noise	Potential effects due to noise from ancillary electrical infrastructure	Predictive noise modelling and assessment in accordance with BS 4142:2014+A1:2019.
Cumulative		
Cumulative operational wind turbine noise	Potential cumulative effects due to noise from existing or proposed wind turbines within 10 km of the Proposed Development	Predictive noise modelling of the proposed/existing wind turbines and assessment in accordance with ARWTN and the IoA GPG.

10.5 Mitigation

- 10.5.1 Mitigation measures will be considered where significant effects are anticipated to remain after embedded design measures and standard good practice controls have been applied. If residual impacts persist, proportionate further actions, such as enhancement, remediation or compensation, will be identified to address those remaining effects
- 10.5.2 It is anticipated that key controls for construction noise and vibration such as core hours of works would be exerted through incorporation in a Construction Environmental Management Plan (CEMP), for which an outline will be submitted with the application, and that such controls would constitute effective mitigation measures.
- 10.5.3 Site-specific mitigation measures will be presented within the outline CEMP to reflect the principles of Best Practicable Means, as set out in the CoPA 1974. The purpose of these measures will be to reduce construction noise and, where relevant, vibration impacts insofar as is reasonably practicable.
- 10.5.4 Where predicted operational noise levels exceed the proposed noise limits at any wind speed, outline mitigation strategies will be proposed. Mitigation of operational noise, if required, may include an alternative selection of turbine, operating certain turbines in low noise modes under certain meteorological conditions, such as specific wind speeds and directions.
- 10.5.5 The requirement for, and feasibility of, any mitigation measures will be subject to consultation with consultees throughout the pre-application phase of the Proposed Development.

10.6 Consultation

- 10.6.1 ERYC and NLC will be consulted throughout the scoping and EIA process to agree regarding the methodology of the baseline survey and the approach to assessment.



10.7 Summary of Scope

- 10.7.1 Based on the baseline environment information currently available and the Proposed Development description (outlined in **Chapter 2**) a number of impacts are proposed to be scoped out of the EIA for noise and vibration. The impacts are outlined in **Table 10-3**, together with a justification for scoping them out.

Table 10-3: Impacts proposed to be scoped out of assessment for Noise and Vibration

Impact	Justification for Scoping Out
Operation and Maintenance	
Operational road traffic noise	Only occasional maintenance and inspection vehicle movements will be generated by the Proposed Development once it is operational.
Vibration during operation	ARWTN provides a summary of the current guidance and consensus on the assessment of groundborne vibration: <i>“The term ground-borne vibration refers to mechanical vibration from the operation of the wind turbine that is directly transferred to and propagates through the ground. Levels of ground-borne vibration from modern upwind turbines are very low and, although ground-borne vibration from wind turbines can be measured at large distances using sensitive equipment, these levels are significantly below the human perception threshold and therefore do not result in adverse effects on human receptors.”</i>
Operational infrasound, low-frequency noise, tonal noise and excess amplitude modulation	ARWTN provides a summary of the current guidance and consensus on the assessment of infrasound, low-frequency noise, tonal noise and excess amplitude modulation. <i>“The term infrasound refers to sound at frequencies below 20 Hz, and for wind turbines is often related to the blade passage frequency. Research has shown that, for modern upwind turbines (i.e. turbines where the rotor is positioned upwind of the tower when in operation), the levels of infrasound at typical receptor distances are well below the threshold of perception. The scoping review [WSP for the Department for Business, Energy & Industrial Strategy (2022), A review of noise guidance for onshore wind turbines.] (p114) concluded that ‘the findings from the existing evidence base indicate that infrasound from wind turbines at typical exposure levels has no direct adverse effects on physical or mental health.</i> <i>The term low frequency sound refers to sound occurring predominantly from approximately 20 to 200 Hz. Noise-sensitive receptors are considered to be suitably protected from low frequency sound by the proposed noise criteria and noise limits (which are based on A-weighted</i>



Impact	Justification for Scoping Out
	<i>noise levels...). In the absence of specific low frequency tonal noise (which is covered by the tonal assessment methodology of Appendix B), no specific low frequency limits are necessary to control wind turbine noise.</i> <i>All criteria set out in this guidance assume that noise levels from wind turbines are 'rated' by adding, where appropriate, a character correction to the measured wind turbine noise levels when assessing compliance with the SSNL for an operational wind farm. Character corrections are to be applied for the presence of tones and elevated amplitude modulation (AM) when determined through compliance measurements.</i> <i>It is generally not possible to predict the occurrence of such noise characteristics at the planning stage. Tonal noise from wind turbines, when it occurs, is usually associated with a specific design or a component malfunction (combined with operational characteristics), rather than being an expected general characteristic of all wind turbines. All wind turbines generate AM (or blade swish, to a limited extent), but the occurrence of elevated levels of AM is a complex phenomenon that is likely to be related to a combination of turbine and site characteristics; the current consensus is that AM cannot be predicted. Tonal noise and AM are therefore best controlled through enforcement of planning conditions which include the application of character corrections as described in section 4. The approach set out in this technical guidance is formulated on this basis, and consequently, character corrections should only be applied to compliance measurements and should not be added at the planning/application assessment phase, unless there is strong evidence to do so."</i> As detailed above, current national guidance and policy on wind turbine noise assessment indicate that specific assessments of infrasound, low-frequency noise and excess amplitude modulation outside the scope of ARWTN and the IoA GPG are not required at the planning stage for proposed onshore (free-standing) wind turbine developments. Therefore, no assessment of these matters is proposed.
Decommissioning	
Noise and vibration from decommissioning	Activities during decommissioning would likely be similar to those during construction. However, some elements of the Proposed Development (such as below ground infrastructure) may remain. Hence decommissioning of the



Impact	Justification for Scoping Out
	Proposed Development is likely to generate lesser effects than construction. Notwithstanding that, since consent is being sought for 30 years, the decommissioning of the Proposed Development would occur so far into the future that the information collected on the existing baseline would be of limited relevance. Furthermore, any projections of the future baseline would likely be too uncertain to be useful. A Decommissioning, Restoration and Aftercare Plan will be produced prior to the Decommissioning Phase, which will contain appropriate measures to reduce the effects of decommissioning noise and vibration.

10.8 Questions for Consultees

10.8.1 The following questions are provided to help frame the consultees' comments on the Scoping Report for noise and vibration:

- Q10.1** Do you agree with the proposed methodology set out above?
- Q10.2** Are the consultees aware of any additional potential noise-sensitive receptors, such as new housing developments in the vicinity of the site?
- Q10.2** Do you agree with the proposal to scope out the following from further assessment:
- operational traffic noise;
 - operational vibration;
 - infrasound, low-frequency noise and excess amplitude modulation; and
 - decommissioning phase related noise and vibration.

10.9 References

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11.0 Access, Traffic and Transport

11.1 Introduction

11.1.1 This chapter of the Scoping Report outlines the proposed methodology to assess the likely significant effects associated with traffic and transport during the construction, operation and decommissioning of the Proposed Development. The assessment method will follow the guidance in the Institute of Environmental Management and Assessment (IEMA)⁹ Guidelines: Environmental Assessment of Traffic and Movement (2023). The method will involve:

- establishing the environmental baseline;
- determining sensitive receptors;
- identifying potential sources of impact;
- quantifying impacts;
- assessing effects;
- identifying mitigation;
- assessing cumulative effects; and
- identifying residual effects.

11.1.2 Noise and vibration associated with construction related traffic will be addressed separately in the Noise and Vibration chapter.

11.2 Baseline Conditions

11.2.1 The baseline for the transport network around the Proposed Development will be established via a combination of site visits, collation of existing data and collection of new data.

11.2.2 Indicative access locations into the Site have been identified at the following locations:

- Common Lane which junctions with the A161 on the west boundary of the Site; and
- Haldenby Hall Farm access, which junctions with Garthorpe Road on the southern boundary of the Site.

11.2.3 The means of access to the Site will be discussed with the Local Highway Authorities during pre-application consultation. Access options could be via either of the above options or potentially both if this is viewed as efficient and acceptable.

Study Area

11.2.4 The study area for assessment will comprise the public road network likely to be used by traffic generated by the Proposed Development, between the Site access locations and the Strategic Road Network (SRN). The extent of the study area will be refined through the assessment, but it is likely to comprise the following links, as illustrated within **Figure 11.1**:

- A161 between the Site and M62 Junction 36 (west of Site):
 - Including King's Causeway, Goole Road, Swinefleet Road, Low Street, Bridge Street, Normandy Way and Anderson Road.

⁹ Note that as of July 2025, IEMA became the Institute of Sustainability and Environmental Professionals (ISEP)



- A161 between the Site and M180 Junction 2 (south of Site):
 - Including King's Causeway, Sandhill Road, Whins Gate, Field Lane, Yorkshireside, Sampson Street, Crowle Road, Eastoft Road, Woodland Avenue, High Street, Wharf Road, Crowle Bridge.
- B1392, Luddington High Street, Garthorpe Road.

11.2.5 In terms of Abnormal Indivisible Load Vehicle (AILV) requirements, an assessment of the routes between the Site and the Port options will be undertaken, with particular scrutiny placed on the route between the Site and the SRN.

Description of Baseline Environment

- 11.2.6 The A161 to the west of the Site routes toward the port town of Goole. It is a single lane carriageway rural road which passes through the settlements of Swinefleet and Old Goole. There are access locations to the Goole Fields Wind Farms along the A161. There is an old Department for Transport (DfT) Traffic Count Point on the King's Causeway to the east of Swinefleet (CP36746 - 2016 data) which indicates that there was an average annual daily traffic flow of 1,444 of which 99 were classified as Heavy Good Vehicles (HGV). There were also 9 cycle trips recorded.
- 11.2.7 Swinefleet is a village which has a population of approximately 800. The A161 routes through the village across a distance of approximately 1.5 km. The A161 is bound by residential and street-lit footways with a 30 mph speed restriction for the length of the village. There are some commercial properties and a primary school. To the west of the village is the Warpingdrain Bridge which crosses the Swine Fleet Warping Drain; the road narrows to single lane across the bridge. There is a DfT Traffic Count Point near the primary school in Swinefleet (CP89090 - 2025 data) which indicates that there was an average annual daily traffic flow of 3,702 of which 87 were classified as HGVs. There were also 28 cycle trips recorded.
- 11.2.8 Old Goole is located to the south of Goole, on the southern side of the Dutch River which feeds into the River Ouse. Old Goole comprises a mix of residential and commercial properties; it is subject to a 30 mph speed limit with street lit footways throughout and a marked on-street cycle lane, which is often blocked by on-street car parking.
- 11.2.9 The A161 Dutch River Bridge is a signal controlled operational swing bridge which provides access from Old Goole across the Dutch River toward the Goole Docks, where the A161 then routes west from a signalised junction toward the M62 at Junction 36. There is an old DfT Traffic Count Point on the bridge (CP77621 - 2016 data) which indicates that there was an average annual daily traffic flow of 8,577 of which 411 were classified as HGVs. There were also 246 cycle trips recorded.
- 11.2.10 The A161 runs south from the King's Causeway, parallel with the western Site boundary, where an indicative Site access location has been identified at Common Lane. The route continues south toward the A18 and M180 at Junction 2, a distance of approximately 15 km. This route is a single lane carriageway rural road which passes through the settlements of Eastoft and Crowle.
- 11.2.11 Eastoft is a village to the south of the Site with a population of approximately 500 and a primary school. The through route is approximately 1 km in length. The road is a single carriageway, street-lit, subject to a 30 mph speed limit with a footway on at least one of the sides throughout.
- 11.2.12 Crowle is a village with a population of approximately 5,000. The through route is flanked by residential and commercial properties, it is street-lit, has footways and is subject to a 30 mph speed limit. The High Street section of the route is constrained by properties on both sides to the point where it is a single lane road width which is signal controlled. There is a primary



school with signed school safety zone, and a vehicle activated speed restriction sign. There is a DfT Traffic Count Point just to the north of Crowle (CP73461 - 2025 data) which indicates that there was an average annual daily traffic flow of 2,061 of which 85 were classified as HGVs. There were also 15 cycle trips recorded.

- 11.2.13 The B1392 routes east from the A161 in Eastoft toward the villages of Luddington, Fockerby, Garthorpe and Adlingfleet. To the north of Luddington an indicative Site access location has been identified at Haldenby Farm, served off Garthorpe Road. The route is a single carriageway rural road.
- 11.2.14 Luddington is a village with a population of approximately 500 and has a primary school. The village is street-lit, has footways and is subject to a 30 mph speed restriction. The village High Street corridor width between buildings is narrow and there is on-street car parking.

Data Sources

- 11.2.15 The text above has been informed by data obtained from the following sources:

- DfT traffic data: <https://roadtraffic.dft.gov.uk/count-points>

Identification of Sensitive Receptors

- 11.2.16 Sensitive receptors have been considered against the IEMA Guidelines paragraph 1.30 which states:

“the following list identifies special interests that should be considered when defining sensitive receptor geographic locations...”

- *people at home;*
- *people at work;*
- *sensitive and/or vulnerable groups (including young age, older age, income, health status, social disadvantage and access and geographic factors);*
- *locations with concentrations of vulnerable users (e.g. hospitals, places of worship, schools);*
- *retail areas;*
- *recreational areas;*
- *tourist attractions;*
- *collision clusters and routes with road safety concerns; and/or*
- *junctions and highway links at (or over) capacity”*

- 11.2.17 However, judgement has been applied when assessing the sensitivity of receptors. For example, a section of road used by pedestrians, but with facilities to aid them crossing the road could be considered to have a lower sensitivity than a section subject to the same number of pedestrians but without facilities to aid them crossing the road. As the IEMA Guidelines note:

“pedestrians are less sensitive to changes in traffic if there are adequate footways and crossing facilities”.

- 11.2.18 On the basis of the initial site appraisal, it is expected that the following will be determined as receptors which would be sensitive to an increase in vehicular traffic levels:
- A161 - Swinefleet
 - A161 - Old Goole



- A161 - Eastoft
- A161 - Crowle
- B1392 - Luddington
- High Street / Garthorpe Road, Luddington

11.3 Assessment Methodology

Legislation, Policy and Guidance

11.3.1 The following legislation, policy and guidance are relevant to the consideration of the potential effects of the Project on access, traffic and transport. This list is not exhaustive, and other documents may be referred to as appropriate:

- **Local Policy**
 - East Riding of Yorkshire Local Transport Plan 5 2021-2039;
 - East Riding Local Plan Update (2025);
 - North Lincolnshire Local Transport Plan 3 2011-2026 alongside any review documents published in the meantime; and
 - North Lincolnshire Local Plan (2003), Core Strategy (2011) and the emerging Local Plan.
- **Legislation**
 - The Town and Country Planning (Environmental Impact Assessment) Regulations 2017;
 - Planning Act 2008;
 - The Road Vehicles (Construction and Use) Regulations (1986); and
 - The Road Vehicles (Authorisation of Special Types) (General) Order 2003.
- **National Policy**
 - National Planning Policy Framework (NPPF) (MHCLG, 2026);
 - National Policy Statements (NPS):
 - EN-1 (Overarching Energy) (2025); and
 - EN-3 (Renewable Energy Infrastructure) (2025).
- **Guidance**
 - IEMA Guidelines: Environmental Assessment of Traffic and Movement, July 2023;
 - Department for Transport (DfT) Circular 01/22: Strategic Road Network (SRN) and the Delivery of Sustainable Development (2022);
 - Planning practice guidance: Travel Plans, Transport Assessments and Statements (2014); and
 - Design Manual for Roads and Bridges (DMRB), LA 112: Population and Human Health.



Baseline Data

Traffic Survey Data

- 11.3.2 Traffic flow data is available from the DfT website covering Swinefleet and Crowle for the year 2025. New traffic surveys will be undertaken by means of Automatic Traffic Counts (ATC) to supplement this data to enable a comprehensive assessment to be completed.
- 11.3.3 Two classified ATCs will be undertaken covering a 7-day period during a neutral month. These will be at the following locations:
- A161 near to the proposed access location; and
 - High Street, Luddington.

Personal Injury Accident Data

- 11.3.4 Personal Injury Accident (PIA) data will be obtained from the Local Highway Authorities to inform the assessment. The request will cover the A161 between the Site and the M62 Junction 36 to the west and the M180 Junction 2 to the south. It will also cover the B1392 and the High Street / Garthorpe Road, Luddington.

Future Baseline

- 11.3.5 The number of future baseline vehicle movements on the roads in the study area will be estimated by applying a growth factor calculated using TEMPro and the National Road Traffic Forecasts (NRTF) database to the observed baseline vehicle movements.

Highway Boundary Data

- 11.3.6 Highway Boundary Data will be obtained covering the proposed site access locations to ensure that the access proposals can be accommodated within land under the control of the Applicant or within the highway corridor.
- 11.3.7 Highway Boundary Data may also be required at key junctions where it is identified that mitigation is required, or temporary measures are required to accommodate AILV loads.

Method

- 11.3.8 The additional vehicle movements expected to be generated by the Proposed Development will be compared to the baseline traffic flows and the percentage increase in all vehicles and in HGVs only will be calculated. These increases will then be reviewed against the IEMA Guidelines at paragraph 2.16, which state:

“Following the determination of a study area, it is recommended the competent traffic and movement expert applies two broad rules of thumb as criteria to assist in delimiting the scale and extent of the environmental assessment:

Rule 1 Include highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%)

Rule 2 Include highway links of high sensitivity where traffic flows have increased by 10% or more.”

- 11.3.9 All sections of road within the study area would be subject to the threshold in Rule 1. The application of Rule 2 in the IEMA Guidelines requires the identification of “any other link or location where it is felt specific environmental or population sensitivities may occur”.
- 11.3.10 It is proposed that sections of road will be identified as being of high sensitivity based on the extract from the IEMA Guidelines in paragraph 11.2.16 and if they are subject to substantial



use by sensitive groups (e.g. children, elderly or mobility impaired), they are at sensitive locations (e.g. fronted by schools, hospitals or care homes) or they have been identified by the relevant highway authority as having atypically-high accident rates.

- 11.3.11 Where the estimated increase in traffic arising from the Proposed Development does not breach the relevant 'Rule 1' or 'Rule 2' threshold for any section of road, the significance of any effects would be concluded to be negligible and not significant in EIA terms. No further assessment work would be undertaken on such sections.
- 11.3.12 Where the appropriate threshold is breached for a section of road, the effects of the traffic estimated to be generated by the Proposed Development will be considered on the following issues:
- Severance
 - Road Vehicle Driver and Passenger Delay
 - Non-Motorised User Delay
 - Non-Motorised User Amenity
 - Fear and Intimidation of and by Road Users
 - Road User and Pedestrian Safety
 - Hazardous / Large Loads

Magnitude of Impact

- 11.3.13 The magnitude of impact on each of the above considerations will be on a scale of high, medium, low and negligible. The application of that scale to each of the effects is shown in **Table 11-1**.

Table 11-1: Magnitude of Impact

Effect	Impact Magnitude			
	High	Medium	Low	Negligible
Severance	Change in road link traffic flow of over 90%.	Change in road link traffic flow of 60% to less than 90%.	Change in road link traffic flow of 30% to less than 60%.	Change in road link traffic flow of less than 30%.
Road Vehicle Driver and Passenger Delay	Judgement based on the individual characteristics of sections of road.			Change in road link traffic flow of less than 10%.
Non-Motorised User Delay	Judgement based on the individual characteristics of sections of road.			Change in road link traffic flow of less than 10%.
Non-Motorised User Amenity	Judgement based on the individual characteristics of sections of road subject to a change in total traffic flows or HGV flows of more than 100%.			Change in total traffic flows or HGV flows of less than 100%.
Fear and Intimidation of and by Road Users	Two changes in 'Level of fear and intimidation'.	One change in level of fear and intimidation with >400 vehicle increase in average 18 hour (hr) vehicle flow or >500	One change in level of fear and intimidation with <400 vehicle increase in average 18hr	No change in level of fear and intimidation.



Effect	Impact Magnitude			
	High	Medium	Low	Negligible
		Heavy Vehicle (HGV) increase in total 18hr HV flows.	vehicle flow or <500 HGV increase in total 18hr HGV flows.	
Road User and Pedestrian Safety	Judgement based on accident data and individual characteristics of sections of road.			Change in road link traffic flow of less than 10%.
Hazardous / Large Loads	Judgement based on number of such movements and nature of affected road network.			

Receptor Sensitivity

- 11.3.14 The sensitivity of receptors on the sections of road in the study area to potential effects from additional vehicle movements arising from the Proposed Development would be categorised. The proposed categorisation is presented in **Table 11-2**.

Table 11-2: Categorisation of Receptor Sensitivity

	Description
High	Receptors of greatest sensitivity to traffic flows: schools, colleges, playgrounds, accident cluster sites (if identified as such by roads authority), retirement homes, urban / residential roads without footways that are used by pedestrians.
Medium	Traffic flow sensitive receptors: congested junctions, doctors' surgeries, hospitals, shopping areas with roadside frontage, roads with narrow footways, unsegregated cycleways, community centres, parks, recreation facilities.
Low	Receptors with some sensitivity to traffic flow: places of worship, public open space, nature conservation areas, listed buildings, tourist attractions, residential areas with adequate footways, sections of road with pedestrian crossing facilities and sections of road with footways remote from the carriageway (either by presence of a verge or of on-street parking).
Negligible	Receptors with low sensitivity to traffic flows and those sufficiently distant from affected roads/ junctions.

Significance of Effect

- 11.3.15 The effect significance will then be determined using the matrix based on impact magnitude and receptor sensitivity as shown in **Table 11-3**.

Table 11-3: Effect Significance Matrix based on Impact Magnitude and Receptor Sensitivity

Receptor Sensitivity	Impact Magnitude			
	High	Medium	Low	Negligible
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible



Receptor Sensitivity	Impact Magnitude			
	High	Medium	Low	Negligible
Negligible	Minor	Negligible	Negligible	Negligible

- 11.3.16 Effects of 'Major' significance will be considered to be 'significant' in terms of the EIA Regulations. Effects of 'Moderate' significance will be considered to be either 'significant' or 'not significant' in terms of the EIA Regulations and professional judgement used to determine the level of significance. Effects of 'Minor' or 'Negligible' significance will be considered to be 'not significant' in terms of the EIA Regulations.

11.4 Potential Impacts

Construction Phase

- 11.4.1 The Proposed Development would generate demand for transport during its construction, and this demand would have the potential to impact on users of the transport network and potentially have an effect on those users. Transport demand would be generated during construction by staff traveling to and from the Site and plant, components, materials and supplies being delivered to or removed from the Site. This transport demand would lead to additional cars, vans, Light Goods Vehicles (LGVs) and HGVs on the local road network. Staff transport will be managed by means of a Staff Travel Plan.
- 11.4.2 The number of typical daily construction-related vehicle movements that would be generated during each month of the construction programme will be forecasted. These forecasts will reflect the activities that would take place during the various phases of the construction programme and the amount of materials and number of items of equipment that would need to be delivered to or removed from the Site. For the purposes of a robust assessment, it will be assumed that all material is imported.
- 11.4.3 The number of staff likely to be present during each week or month of the construction programme will be estimated based on the Applicant's experience of other similar developments, and the phasing plan for the construction of the Proposed Development.
- 11.4.4 Professional judgement will be applied to estimate the routes taken by vehicles travelling to and from the Site.
- 11.4.5 The delivery of the turbine components during construction would require AILV movements as some of the vehicles carrying the components would have at least one dimension that exceeds the maxima in The Road Vehicles (Construction and Use) Regulations 1986. The assessment of the traffic and transport effects of the Proposed Development will be accompanied by an investigation of the feasibility of the AILVs routeing to the Site. The potential effects from the passage of these AILVs will be considered in the ES.

Operational Phase

- 11.4.6 The Proposed Development would generate only a handful of maintenance and inspection vehicle movements per year once operational, and these would be expected to cause no significant traffic and transport-related effects. Hence, assessment of potential effects during operation are proposed to be scoped out of the assessment.

Decommissioning and Restoration Phase

- 11.4.7 Decommissioning of the Proposed Development is likely to generate fewer trips than construction as some elements of the Proposed Development may remain in place after decommissioning. Notwithstanding that, the decommissioning of the Proposed Development



would occur so far into the future that the information collected on the existing baseline would be of limited relevance. Furthermore, any projections of the future baseline would likely be too uncertain to be useful. It is anticipated that a Decommissioning, Restoration and Aftercare Plan will be prepared for review with the Local Highway Authority at the time. Hence, assessment of potential effects during decommissioning are proposed to be scoped out of the assessment.

11.5 Cumulative Effects

- 11.5.1 A cumulative assessment will be undertaken which will establish the cumulative increase in vehicle movements arising from the Proposed Development and other developments which are consented but not yet implemented and which would increase traffic on the same sections of the road network as the Proposed Development.
- 11.5.2 This approach is consistent with Schedule 4, Paragraph 5 of The EIA Regulations which requires that Environmental Statements provide “*A description of the likely significant effects of the development on the environment resulting from, inter alia: [...] (e) the cumulation of effects with other existing and/or approved projects...*”.
- 11.5.3 The significance of predicted cumulative effects will be assessed using the same process as described above.

11.6 Mitigation

- 11.6.1 The options to embed primary mitigation in the design of the Proposed Development will be considered throughout the design process. Examples of primary mitigation would be using on-site borrow pits (subject to geology findings) and batching plants. These examples are primary mitigation as they would generate fewer vehicle movements on the public road network than would be generated if all materials were imported to the Site.
- 11.6.2 Secondary mitigation measures will be suggested to avoid any potential significant effects. An example of such a measure would be stipulating that HGVs to and from the Site should avoid a specific route or avoid passing by a sensitive receptor at specific times.
- 11.6.3 Tertiary mitigation measures would include standard practices that are commonly implemented by contractors. Examples of such mitigation would be sheeting of loads (to prevent dust) and wheel washes (to prevent mud and debris being deposited on the public road).
- 11.6.4 Secondary and tertiary measures would be described in a Construction Traffic Management Plan (CTMP). The Access, Traffic and Transport chapter of the ES will summarise the measures that could be included in a CTMP. The satisfactory submission of a finalised CTMP could be made a condition of any planning permission granted for the Proposed Development.
- 11.6.5 Any further mitigation measures that may be required to address cumulative effects will be identified.

11.7 Consultation

- 11.7.1 SLR will liaise directly with the Local Highway Authorities and National Highways as necessary, to understand any concerns or opportunities relating to the traffic and transport implications of the proposals.



11.8 Summary of Scope

- 11.8.1 The scope of the Access, Traffic and Transport chapter of the ES will cover potential effects associated with vehicular traffic and transport during the construction period. Potential effects during operation and decommissioning will be scoped out of the assessment.
- 11.8.2 The assessment will follow the guidance in the IEMA Guidelines. Current and future baseline vehicle movements will be estimated for the roads within the study area. The additional vehicle movements estimated to be generated during the construction of the Proposed Development will be compared to these baseline estimates and assessed if the resulting increases breach the appropriate thresholds in the IEMA Guidelines.

11.9 Questions for Consultees

- 11.9.1 The following questions are directed to consultees:
- Q11.1** Can you please advise of any comments you may have on the suggested scope of works?
- Q11.2** Do consultees agree with items proposed to be scoped out?
- Q11.3** Can you please advise of any developments that should be considered as part of the cumulative assessment?
- Q11.4** Can you please advise of any upcoming changes you are aware of to the transport network surrounding the Site?
- Q11.5** Can you please advise if there are any locations on the roads within the study area that have particular concerns?

11.10 References

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[https://www.eastriding.gov.uk/planning-permission-and-building-control/planning-policy-and-the-local-plan/local-plan-library/local-plan-library-item/?entry=local transport plan 2021 2039 ltp](https://www.eastriding.gov.uk/planning-permission-and-building-control/planning-policy-and-the-local-plan/local-plan-library/local-plan-library-item/?entry=local%20transport%20plan%202021%202039%20ltpltp)

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<https://dft.maps.arcgis.com/apps/dashboards/ea3b071df62a434aa21ed80a6214d690>



12.0 Socio-Economics

12.1 Introduction

12.1.1 This chapter outlines the proposed approach for the consideration of socio-economic effects arising from the construction, operation, maintenance and decommissioning of the Proposed Development, including cumulative effects. It presents the baseline information, relevant policy and guidance context, and the rationale for scoping these topics out of the Environmental Impact Assessment (EIA). The chapter also sets out the proposed scope of a standalone Socio-Economic Statement, which will describe the anticipated economic, community, tourism and recreation effects of the Proposed Development in a proportionate manner. The information presented is intended to support consultation on the proposed assessment approach and to demonstrate why significant effects on these topics are not anticipated.

12.1.2 This chapter is supported by the following figures:

- **Figure 12.1** Direct and Indirect Social Area of Influence

12.2 Baseline Conditions

Study Area

12.2.1 The study areas of the assessment will be selected to meet the interests of key stakeholders and will be made of predefined geographies. The baseline assessment will include a description of the current socio-economic, recreation and tourism baseline within the local area.

12.2.2 The Proposed Development spans the administrative boundaries of ERYC and NLC. For the purposes of the baseline description, a tiered study area has been defined to reflect the geographical scales at which socio-economic effects may occur, namely, a Direct and an Indirect Area of Influence (AoI).

12.2.3 At the local level, the baseline will cover and compare the study areas of:

- East Riding of Yorkshire
- North Lincolnshire

12.2.4 This area represents the Local Area, or the Direct AoI, and the communities most likely to experience direct interactions with the Proposed Development. For the majority of direct effects, this includes social receptors located within 1km of the Site, as shown in **Figure 12.1**.

12.2.5 At a broader scale, the Regional Area, or the Indirect AoI, is defined as the jurisdiction of Yorkshire and the Humber. This regional context provides an appropriate basis for understanding labour market dynamics, supply-chain capacity, and wider socio-economic conditions relevant to the Proposed Development. For effects that extend beyond the regional economy, particularly those associated with national industry, policy, and employment, the assessment will also consider Great Britain as a whole.

Data Sources

12.2.6 Key data sources used include:

- Office for National Statistics (ONS), Census 2021 data (ONS 2025)
- ONS population data (ONS 2025)
- Nomis Labour Statistics (Nomis 2026)



- Indices of Multiple Deprivation 2025 (Ministry of Housing, Communities and Local Government 2025)

Description of Baseline Environment

Population

- 12.2.7 As shown in **Table 12-1**, current data indicates that in 2024, East Riding of Yorkshire has a population of 355,384, equivalent to 6.3% of the Regional Area's population, while North Lincolnshire has a population of 171,336, equivalent to 3.0% of the Regional Area's population (ONS 2025). The Regional Area has a population of 5,672,962, which accounted for approximately 9.7% of the total population of England (ONS 2025).
- 12.2.8 The Local Area has an older population, with 27.1% of the population aged 65 or over in East Riding of Yorkshire and 22.9% of the population aged 65 or over in North Lincolnshire (ONS 2025). In comparison, within the Regional Area, 19.3% of the population are aged 65 or over, which is slightly higher than the average for England (18.7%).
- 12.2.9 The comparatively older population profile of the Local Area is indicative of a mature rural population and a relatively smaller proportion of working-age residents compared with the regional and national averages. This demographic structure provides important context for the assessment of socio-economic effects, including the potential for the Proposed Development to support employment, skills development, expenditure within the local economy and wider community benefits.

Table 12-1: Population Estimates, 2024 (ONS 2025)

	East Riding of Yorkshire	North Lincolnshire	Regional Area	England
Total Population	355,384	171,336	5,672,962	58,620,101
% aged 0 - 15	15.6%	17.8%	18.4%	18.4%
% aged 16 - 64	57.4%	59.3%	62.3%	62.9%
% aged 65+	27.1%	22.9%	19.3%	18.7%

Economic Activity and Employment

- 12.2.10 In East Riding of Yorkshire, the employment rate was 81.3%, which is significantly higher than the regional area of 76.8% and higher than the national average of 79.2%. By contrast, North Lincolnshire recorded a lower employment rate of 77.5% which is slightly higher than the regional average but lower than the national average (Nomis 2026).
- 12.2.11 Within North Lincolnshire, the number of those unemployed in 2025 was higher than the regional (4.6%) and national (4.5%) at 5.6%. Conversely, those unemployed in East Riding of Yorkshire was lower than both the regional and national averages at 4.3% (Nomis 2026).
- 12.2.12 The employment indicators suggest that the Local Area benefits from a relatively strong labour market, particularly within East Riding of Yorkshire where employment rates exceed both regional and national averages and unemployment remains comparatively low. Whilst North Lincolnshire records a slightly higher level of unemployment than the regional and national averages, employment participation remains broadly comparable with wider



benchmarks. Collectively, these indicators are suggestive of an economically active area with an established workforce and generally resilient labour market conditions.

Table 12-2: Economic Activity, 2025 (Nomis 2026)

	East Riding of Yorkshire	North Lincolnshire	Regional Area	Great Britain
Economically Active	81.3%	77.5%	76.8%	79.2%
Unemployed	4.3%	5.9%	4.6%	4.5%

- 12.2.13 Regarding gross disposable household income per head, East Riding of Yorkshire's average of £23,705 and North Lincolnshire's average of £19,950 both fall below the average for England (£25,425) (ONS 2025).
- 12.2.14 In East Riding of Yorkshire, the sector that contributes the highest share of employment is wholesale and retail trade; repair of motor vehicles and motorcycles, which accounts for 15.6% of employment, compared to 13.7% nationally. Other sectors that are significant employers in East Riding of Yorkshire include the manufacturing sector which accounts for 14.1% of employment (compared to 7.3% nationally) as well as the Human, Health and Social Work Activities sector which also accounts for 14.1% of employment (compared to 14.2% nationally).
- 12.2.15 In North Lincolnshire, the sector that contributes the highest share of employment is manufacturing, which accounts for 24.7% of employment, compared to 7.3% nationally. Other sectors that are significant employers in North Lincolnshire include wholesale and retail trade; repair of motor vehicles and motorcycles, which accounts for 13.7% of employment (compared to 13.7% nationally), as well as the Human, Health and Social Work Activities sector, which also accounts for 12.3% of employment (compared to 14.2% nationally).

Table 12-3: Industrial Structure, 2024 (Nomis 2026)

	East Riding of Yorkshire	North Lincolnshire	Great Britain
Mining and quarrying	0.3%	0.3%	0.2%
Manufacturing	14.1%	24.7%	7.3%
Electricity, gas, steam and air conditioning supply	0.3%	0.5%	0.4%
Water supply; sewerage, waste management and remediation activities	1.4%	0.6%	0.7%
Construction	6.2%	6.8%	5.0%
Wholesale and retail trade; repair of motor vehicles and motorcycles	15.6%	13.7%	13.7%
Transportation & storage	4.7%	8.2%	5.0%
Accommodation & food service activities	8.6%	5.5%	7.8%
Information & communication	2.3%	0.6%	4.5%
Financial and insurance activities	0.7%	0.5%	3.4%
Real estate activities	1.2%	1.4%	1.9%
Professional, scientific and technical activities	7.0%	4.1%	9.3%



	East Riding of Yorkshire	North Lincolnshire	Great Britain
Administrative and support service activities	4.7%	4.8%	8.6%
Public administration and defence; compulsory social security	7.0%	4.1%	4.9%
Education	8.6%	6.8%	8.6%
Human health and social work activities	14.1%	12.3%	14.2%
Arts, entertainment and recreation	2.3%	2.1%	2.5%
Other service activities	2.0%	2.1%	1.9%

Education

- 12.2.16 In East Riding of Yorkshire, 44.4% of the population have achieved a qualification at RQF Level 4 or above, which is equivalent to a higher education certificate. This compares with 41.1% across Yorkshire and the Humber region, and 48.6% across Great Britain (Nomis 2026). The proportion of people qualified to RQF Level 3 or above in East Riding Yorkshire is 71.2%, a slightly greater proportion compared to the Yorkshire and the Humber average (65.2%) and for Great Britain overall (69.0%) (Nomis 2026).
- 12.2.17 For qualifications at RQF Level 2 or above, the average in East Riding Yorkshire is 88.4%, a slightly greater proportion compared to the Yorkshire and the Humber average (86.0%) and for Great Britain overall (87.0%) (Nomis 2026). For qualifications at RQF Level 1 or above, the average in East Riding Yorkshire is 91.0%, a slightly greater proportion compared to the Yorkshire and the Humber average (88.7%) and for Great Britain overall (89.3%) (Nomis 2026).
- 12.2.18 In North Lincolnshire, 33.7% of the population have achieved a qualification at RQF Level 4 or above, which is equivalent to a higher education certificate (Nomis 2026). This compares with 41.1% across Yorkshire and the Humber, and 48.6% across Great Britain. The proportion of people qualified to RQF Level 3 or above in North Lincolnshire is 59.8%, a slightly lower proportion compared to the Yorkshire and the Humber average (65.2%) and for Great Britain overall (69.0%) (Nomis 2026).
- 12.2.19 For qualifications at RQF Level 2 or above, the average in North Lincolnshire is 84.8%, a slightly lower proportion compared to the Yorkshire and the Humber average (86.0%) and for Great Britain overall (87.0%). For qualifications at RQF Level 1 or above, the average in North Lincolnshire is 88.2%, a slightly lower proportion compared to the Yorkshire and the Humber average (88.7%) and for Great Britain overall (89.3%) (Nomis 2026).
- 12.2.20 Overall, the educational attainment data suggests that the Local Area possesses a diverse labour force with varying skill levels. Whilst East Riding of Yorkshire demonstrates comparatively higher qualification attainment, North Lincolnshire records lower qualification levels relative to both regional and national comparators. These characteristics are indicative of differing labour market conditions across the Local Area and provide important context for understanding the capacity of the local workforce to support the Proposed Development and benefit from associated employment, training and supply chain opportunities.



Table 12-4: Education Levels, 2024 (Nomis 2026)

Qualification levels	East Riding of Yorkshire	North Lincolnshire	Regional Area	Great Britain
% with RQF4+	44.4%	33.7%	41.1%	48.6%
% with RQF3+	71.2%	59.8%	65.2%	69.0%
% with RQF2+	88.4%	84.8%	86.0%	87.0%
% with RQF1+	91.0%	88.2%	88.7%	89.3%
% with other qualifications (RQF)	3.5%	4.6%	4.4%	4.4%
% with no qualifications (RQF)	5.5%	7.2%	6.9%	6.3%

Deprivation

- 12.2.21 The Index of Multiple Deprivation (IMD) ranks East Riding of Yorkshire as 203 out of 296 Local Authority (LA) districts on the Overall IMD Index (where a score of 1 is the most deprived and a score of 296 is the least deprived), while for the Employment domain it ranks 202 (out of 296) and for Education, skills and training it ranks at 176 (out of 296) (Ministry of Housing, Communities and Local Government 2025).
- 12.2.22 The IMD ranks North Lincolnshire as 104 (out of 296) LA districts on the Overall IMD Index, while for the Employment domain it ranks 81 (out of 296) and for Education, skills and training it ranks 87 (out of 296) (Ministry of Housing, Communities and Local Government 2025).

Tourism and Recreation

- 12.2.23 The Site is situated in a rural area on the boundary between East Riding of Yorkshire and North Lincolnshire. The Site is in close proximity to the villages of Adlingfleet in the East Riding of Yorkshire and Garthorpe in North Lincolnshire. The Site itself does not have any notable tourist attractions. However, in the surrounding areas, there are tourist attractions such as the RSPB Blacktoft Sands, a large inter-tidal reedbed that is a prime location for birdwatchers, as well as the East Riding Coast, where historic towns such as Bridlington and Beverley are located.
- 12.2.24 Recreational opportunities within the wider area include public rights of way (PRoW), cycling routes and access to the countryside, which are used by local residents and visitors. The wider East Riding of Yorkshire also contains a number of established tourism destinations, including the historic market town of Beverley and the coastal resorts of Bridlington, Hornsea and Withernsea, which attract visitors for their heritage, leisure and coastal recreation offer.
- 12.2.25 The tourism and recreation baseline indicates that the principal tourism destinations and recreational assets within the study area are established attractions that are geographically separate from the Site and draw visitors for a range of natural, heritage and leisure-based reasons. Recreational use within the immediate vicinity of the Site is predominantly associated with public rights of way and access to the countryside. This is indicative of a tourism and recreation resource that is not dependent upon the Site itself and is therefore likely to be resilient to temporary changes associated with the Proposed Development. Consequently, significant effects on tourism and recreation are not anticipated.



12.3 Assessment Methodology

Legislation and Guidance

- 12.3.1 There is no statutory methodology specifically prescribed for the assessment of socio-economic effects arising from onshore wind farm developments. The assessment approach has therefore been developed with reference to established good practice guidance and recognised methodologies used within EIA and the renewable energy sector.
- 12.3.2 In particular, the assessment draws upon the evidence base established by BiGGAR Economics for RenewableUK and the former Department of Energy and Climate Change (DECC), including *Onshore Wind: Direct and Wider Economic Impacts* (2012) (BiGGAR Economics on behalf of the Department of Energy and Climate Change and Renewables UK 2012) and the subsequent update published in 2015. These studies provide a recognised framework for estimating employment, Gross Value Added (GVA), supply chain expenditure and wider economic benefits associated with the construction, operation, maintenance and decommissioning of onshore wind developments.
- 12.3.3 The assessment methodology has also been informed by the principles set out within the Institute of Sustainability and Environmental Professionals (ISEP) Social Impact Assessment guidance (ISEP 2025), which advocates a proportionate, evidence-based and transparent approach to the assessment of social and economic effects. This includes the establishment of a robust socio-economic baseline; consideration of the sensitivity and vulnerability of affected receptors; assessment of the magnitude, duration, reversibility and geographic extent of change; and evaluation of the significance of effects through the application of professional judgement supported by available evidence. The guidance also emphasises the importance of considering interactions between economic, social and community effects, together with appropriate stakeholder engagement throughout the assessment process.
- 12.3.4 Consistent with this guidance, the assessment considers both beneficial and adverse effects associated with the construction, operation and decommissioning phases of the Proposed Development. The assessment incorporates a combination of quantitative and qualitative techniques, drawing upon project-specific information, published economic multipliers, official statistics and relevant local and regional baseline data. The methodology is considered to represent current good practice for the assessment of socio-economic effects associated with major renewable energy developments.
- 12.3.5 In addition to the guidance identified above, the assessment and scoping exercise will have regard to the relevant policy framework, including the Town and Country Planning (Environmental Impact Assessment) Regulations 2017, the Development Plan policies for North Lincolnshire and East Riding of Yorkshire, the National Planning Policy Framework (NPPF) (Ministry of Housing, Communities and Local Government 2026), relevant Planning Practice Guidance and the National Policy Statement for Renewable Energy Infrastructure (EN-3) (Department for Energy Security and Net Zero 2023).
- 12.3.6 These documents recognise the role of renewable energy development in supporting economic growth, employment opportunities, skills development and wider community benefits. The policy review will also assist in determining whether there is potential for likely significant socio-economic, tourism or recreation effects and therefore whether detailed assessment within the Environmental Statement is necessary.

Method

- 12.3.7 It is proposed that socio-economics is scoped out of the ES and a separate Socio-Economic Statement is prepared. This is considered a proportionate approach for the Proposed Development.



- 12.3.8 The likely socio-economic effects are expected to be predominantly beneficial, arising principally through employment generation, expenditure within local and regional supply chains, the creation of GVA and business opportunities as well as Vattenfall's shared ownership initiatives and community benefit funding. These effects, however, are not considered to be significant in EIA terms. There is limited evidence to suggest the potential for significant adverse socio-economic effects that would warrant detailed assessment within the ES.
- 12.3.9 Preparing a standalone Socio-economic Statement allows the likely economic and community effects associated with the Proposed Development to be presented in a clear and accessible manner, drawing upon project-specific information and recognised industry evidence. This approach ensures that decision-makers are provided with a robust assessment of the likely socio-economic contribution of the Proposed Development, whilst maintaining a proportionate EIA focused on topics where significant environmental effects are likely to arise.
- 12.3.10 The assessment will focus on those socio-economic topics most likely to be influenced by the Proposed Development, including:
- employment generation;
 - GVA generation;
 - local and regional expenditure;
 - supply chain opportunities;
 - effects on tourism and recreation;
 - population and community effects;
 - Recreation and tourism effects;
 - skills, training and education opportunities; and
 - community benefit and wider socio-economic enhancement measures, where relevant.
- 12.3.11 This will primarily be a desk-based study with consultation undertaken by the Applicant with the local community to further inform the socio-economic, recreation and tourism baseline and inform any opportunities from the Proposed Development which arise therein.

12.4 Potential Impacts

- 12.4.1 Based on the nature, scale and location of the Proposed Development, no likely significant effects on socio-economics, tourism or recreation have been identified. Accordingly, these topics are proposed to be scoped out of the EIA, unless otherwise agreed through consultation.
- 12.4.2 During construction and operation, the Proposed Development has the potential to generate beneficial socio-economic effects through employment creation, expenditure within the local and regional economy, and opportunities for local businesses and suppliers.
- 12.4.3 As outlined above, these benefits will be described within a separate Socio-economic Statement. Based on the nature and scale of the Proposed Development, these effects are not anticipated to be significant in EIA terms. Potential effects on tourism and recreation are expected to be limited and are not anticipated to result in likely significant effects.



12.5 Cumulative Effects

- 12.5.1 As socio-economics is proposed to be considered within a standalone Socio-Economic Statement rather than the Environmental Statement, a formal cumulative effects assessment will not be undertaken. Nevertheless, reference will be made, where relevant, to other major developments within the region to provide appropriate context for the assessment of economic and community benefits arising from the Proposed Development.

12.6 Mitigation and Enhancement Measures

- 12.6.1 Potential measures which that reduce the potential for adverse socio-economic effects and may and maximising the socio-economic and wider community benefits of the Proposed Development may include:
- engaging early with the local community and local businesses;
 - development of a Local Supplier and Procurement Strategy to maximise opportunities for local businesses and suppliers;
 - provision of a Community Benefit Fund and exploration of other community investment initiatives in accordance with relevant industry guidance and Vattenfall's community benefit approach; and
 - exploration of opportunities for educational engagement, including links with local schools, colleges and universities to increase awareness of renewable energy and low-carbon careers.
- 12.6.2 At this stage, these measures remain subject to ongoing design development, technical and environmental review, landowner discussions and consultation feedback, and should therefore be regarded as indicative rather than committed measures.

12.7 Consultation

- 12.7.1 The assessment will use desk-based information sources to assess the likely effects, supplemented by consultation with stakeholders if relevant.

12.8 Summary of Scope

- 12.8.1 As outlined above, it is proposed that socio-economics be scoped out of the ES in place of a standalone Socio-economics Statement. The Proposed Development has the potential to give rise to both beneficial and adverse socio-economic effects; however, based on its nature, scale and location, no likely significant effects are anticipated in EIA terms.
- 12.8.2 Published evidence demonstrates that onshore wind developments are generally associated with beneficial socio-economic outcomes, including local employment generation, supply chain expenditure, inward investment and community benefit funding (BiGGAR Economics 2021). Recent Government guidance for onshore wind in England recognises the contribution that onshore wind can make to local economic growth, jobs and prosperous communities, while the Onshore Wind Taskforce Strategy (Department for Energy Security and Net Zero 2025) highlights the sector's role in supporting employment and economic activity across the UK.
- 12.8.3 In addition, economic impact assessments for operational UK wind farms consistently identify positive effects through construction expenditure, GVA, employment and long-term community benefit investment (Department for Energy Security and Net Zero 2025).



- 12.8.4 Whilst some adverse effects may arise, particularly during the construction phase, these are expected to be temporary, localised and limited in scale. Potential effects on local communities, tourism and recreational users are not anticipated to result in likely significant effects, having regard to the characteristics of the Site and the surrounding area.
- 12.8.5 The standalone Socio-Economic Statement will provide a proportionate and balanced appraisal of the likely socio-economic, tourism and recreation effects of the Proposed Development, including both beneficial and adverse effects where relevant. The Statement will therefore provide decision-makers with a clear understanding of the Proposed Development's likely socio-economic implications whilst avoiding unnecessary duplication within the Environmental Statement.

12.9 Questions for Consultees

- Q12.1** Do you agree with the baseline information presented?
- Q12.2** Do you agree with Socio-economics, tourism and recreation being scoped out of the ES in lieu of a Socio-economic Statement?
- Q12.3** Do you agree with the proposed scope for the Socio-economic Statement?
- Q12.4** Is there anything else you think should be considered within the Socio-economic Statement?

12.10 References

BiGGAR Economics on behalf of the Department of Energy and Climate Change and RenewableUK (2012) *Onshore Wind: Direct and Wider Economic Impacts*. Available at: <https://assets.publishing.service.gov.uk/media/5a74dfc7ed915d502d6cbaec/5229-onshore-wind-direct--wider-economic-impacts.pdf>

BiGGAR Economics (2021) *Onshore Wind and Tourism in Scotland*. Available at: <https://biggareconomics.co.uk/onshore-wind-and-tourism-in-scotland>

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13.0 Aviation

13.1 Introduction

- 13.1.1 This chapter sets out the proposed scope and method for assessing the potential effects of the Proposed Development on civil and military aviation. It is based on initial feasibility work undertaken, the project information available at the scoping stage, current aeronautical information and applicable Civil Aviation Authority (CAA) policy and guidance.
- 13.1.2 The feasibility study assessed turbines with a maximum blade tip height of 200 m above ground level (AGL) on low-lying land near Adlingfleet. Final turbine numbers, coordinates, dimensions, ground elevations and crane parameters are not yet fixed. The assessment will therefore use a realistic worst-case design envelope and will be updated as the layout develops.
- 13.1.3 Wind turbines can affect aviation through their physical presence, potential infringement of safeguarded surfaces or Instrument Flight Procedure (IFP) obstacle protection areas, interference with Communication, Navigation and Surveillance (CNS) systems, generation of radar returns, effects on aviation operations and the requirement for obstacle lighting and notification. The purpose of the aviation assessment is to establish whether those technical effects could lead to a material operational effect and, where required, identify suitable mitigation.
- 13.1.4 Impacts on aviation do not normally require assessment through the EIA process in a standalone ES chapter. It is therefore proposed that the aviation assessment would be provided as a standalone Technical Appendix to the ES. In the absence of guidance in England, this follows the recommended approach as set out in Scottish Renewables Guidelines on Streamlining Environmental Impact Assessments for Onshore Wind Farms (Scottish Renewables, 2025).

13.2 Study Area

- 13.2.1 Aviation effects do not follow a single fixed radius. Separate study areas are therefore proposed for each receptor type. The distances are screening limits; receptors outside them would also be considered where published safeguarding information, consultation or an operational dependency indicates a credible pathway for effect.

Table 13-1: Proposed Aviation Study Areas

Receptor or Topic	Study Area	Reason for Criterion
Surveillance radar, including civil, military and meteorological radar	All relevant radar installations within 100 Nautical Miles (NM) (185.2 km) of the Site. Radar line-of-sight and operational use would then be used to refine the receptor list.	Provides a conservative regional screen consistent with the range at which long-range surveillance systems may detect tall wind turbines.
Aerodrome Obstacle Limitation Surfaces (OLS) and physical safeguarding	Between 5 km and 15 km, selected according to aerodrome classification, runway characteristics and published safeguarding arrangements.	Reflects the different extent of obstacle safeguarding surfaces and consultation needs for large licensed/certified aerodromes, smaller aerodromes and unlicensed sites.
Instrument Flight Procedures (IFP)	Published or proposed IFPs associated with aerodromes within 30 NM (56 km), together with any procedure whose	Allows screening of procedure segments, holding areas, minimum sector altitudes and visual manoeuvring areas in



Receptor or Topic	Study Area	Reason for Criterion
	protected area extends over the Site.	accordance with CAP 785B: Implementation and Safeguarding of Instrument Flight Procedures in the UK (CAA, 2022) and Procedures for Air Navigation Services – Aircraft Operations (ICAO Doc 8168).
Aviation communication systems	10 km from each turbine and any larger published or operator-defined safeguarding area.	Screens for physical obstruction, reflection, diffraction, re-radiation and electromagnetic effects on relevant Very High Frequency (VHF)/Ultra High Frequency (UHF) and data communication facilities.
Ground-based navigation systems	10 km from each turbine and any larger published or operator-defined safeguarding area.	Screens navigation aids before applying the relevant Building Restricted Area or equipment-specific criteria.
Airspace, aviation activity and obstacle lighting	The Site and airspace within 30 NM (56 km), extended where operational routes or consultation identify a wider pathway.	Captures Doncaster Sheffield Airport (DSA) operations, local aerodromes, military activity, general aviation, emergency services and en-route obstacle requirements.

- 13.2.2 The study areas would be measured from the final turbine coordinates. Distances stated at scoping stage are approximate and would be verified using geographic information system data and authoritative aeronautical sources.

13.3 Baseline Environment

Overview of Available Data Sources

Table 13-2: Key Sources of Information for Aviation

Source	Information Used	Coverage
UK Aeronautical Information Publication and aeronautical charts	Current airspace, aerodromes, IFPs, navigation aids, Air Traffic Service (ATS) routes and notified obstacles.	United Kingdom and relevant regional airspace.
CAA CAP 764 Edition 7.1 (September 2026)	Current policy and guidance for wind turbine effects, consultation, evidence, safeguarding and mitigation.	Civil and military aviation interests affected by wind energy.
CAA CAP 738 and CAST safeguarding advice	Aerodrome safeguarding principles and OLS assessment.	Licensed/certified and other relevant aerodromes.
CAA CAP 785B and International Civil Aviation Organization (ICAO) Doc 8168, Volume II	Implementation and safeguarding of IFPs and obstacle assessment criteria.	Published and proposed procedures relevant to the Site.



Source	Information Used	Coverage
CAA CAP 670 and equipment-specific safeguarding criteria	Technical safeguarding of ATS communication, navigation and surveillance systems.	Relevant CNS facilities.
Ministry of Defence (MOD) and National Air Traffic Services (NATS) wind energy consultation services	Defence and en-route technical and operational screening, including formal pre-application responses.	All relevant MOD and NATS assets.
Met Office consultation and radar information	Weather radar screening and operational requirements.	Meteorological radar within the radar study area.
Adlingfleet aviation feasibility study	Initial airspace, OLS, IFP, Communication, Navigation and Surveillance (CNS), military and radar review.	Site and regional aviation interests.
Current DSA Airspace Change Proposal material	Proposed reinstatement of controlled airspace and IFPs associated with airport reopening.	DSA and surrounding airspace.
Terrain, surface and turbine design data	Ground elevation, radar line of sight, obstacle elevation and worst-case turbine/crane envelope.	Site and relevant receptor-to-turbine paths.

Overview of Baseline Environment

Doncaster Sheffield Airport and Airspace

- 13.3.1 The Site is approximately 14 NM (26 km) north-east of DSA and lies in Class G uncontrolled airspace. It is clear of the former DSA controlled airspace boundary and the upper airspace route network. The airport closed to commercial operations in 2022, but proposals for reopening and associated airspace change mean that both the current baseline and the reasonably foreseeable future aviation environment will be reviewed.
- 13.3.2 The Site has a ground elevation of approximately 1 m to 3 m AMSL. The feasibility study applied a conservative 5 m ground elevation, giving a maximum turbine tip elevation of approximately 205 m (673 ft) AMSL. The published Area Minimum Altitude was 2,200 ft AMSL, providing approximately 1,527 ft vertical clearance.

Obstacle Limitation Surfaces

- 13.3.3 The feasibility study found the Site to be outside the 15 km OLS safeguarding extent applied to DSA. Sandtoft Airfield is approximately 13 km south of the Site and outside the 5 km extent applied to its runway classification. No OLS infringement was identified. This conclusion will be checked against the final turbine layout and current safeguarding arrangements, including the transition toward the revised ICAO OLS framework applicable from 21 November 2030.

Instrument Flight Procedures

- 13.3.4 DSA, Humberside Airport, Sherburn-in-Elmet and Leeds East Airport were identified within the 30 NM IFP study area. The initial review found the 200 m turbine envelope below the relevant minimum sector and surveillance altitudes. No IFP effect was identified. A formal IFP safeguarding assessment by an Approved Procedure Design Organisation will nevertheless be undertaken, or written confirmation obtained from the responsible procedure



sponsors, once the final turbine elevations are available. Any proposed DSA procedures associated with reopening will be included where sufficiently defined.

Communication, Navigation and Surveillance Systems

- 13.3.5 No ground-based aviation navigation aid or communication facility was identified within 10 km of the Site. Subject to confirmation against the final layout, current infrastructure records and consultation, no detailed assessment is proposed for these systems.
- 13.3.6 Initial modelling predicts radar line of sight between the turbine envelope and the NATS Claxby, DSA and Hibaldstow PSRs. RAF Waddington was modelled as clear at 200 m, although the clearance was described as marginal. Radar line of sight establishes only that a turbine may be detectable. It does not confirm degradation of radar performance or an operational effect.
- 13.3.7 The 100 NM radar search will be refreshed for the EIA. The ownership, operational status, coverage purpose and safeguarding responsibility for the DSA and Hibaldstow systems will be confirmed. Relevant NATS, MOD, airport and Met Office radar will be retained as receptors only where modelling and consultation identify a credible technical and operational pathway.

Other Aviation Activity and Obstacle Lighting

- 13.3.8 The Site falls within MOD day low-flying Area 11 and night low-flying Area 4BW. It is not within an Area of Intense Air Activity or an Aerial Tactics Area. Military low flying will remain subject to MOD consultation, obstacle notification and agreed lighting. Local general aviation, police, air ambulance and search and rescue activity will also be considered.
- 13.3.9 At 200 m AGL the turbines would exceed 150 m and require aviation warning lighting under the Air Navigation Order 2016. The lighting design will comply with current CAA and MOD requirements. Its visual effects will be assessed in the Landscape and Visual chapter.

13.4 Proposed Approach to Environmental Impact Assessment

Proposed Assessment Methodology

- 13.4.1 The assessment would follow a staged, evidence-led process:
- confirm the final design envelope, turbine coordinates, maximum blade tip elevations, hub heights, rotor diameters, construction crane envelope and programme;
 - identify relevant aviation receptors using the study areas in **Table 13-1**, current aeronautical data, published safeguarding information and stakeholder consultation;
 - screen OLS, IFPs, airspace, physical safeguarding, CNS systems, aviation activity, obstacle notification and lighting requirements;
 - undertake detailed OLS and IFP safeguarding assessments using the applicable CAA and ICAO criteria;
 - model radar line of sight using appropriate terrain and surface data, followed where necessary by equipment-specific technical analysis;
 - obtain the relevant ANSP, aerodrome, MOD or equipment operator assessment of any predicted technical effect and its operational consequence;
 - assess cumulative effects with other wind farms where radar coverage, airspace use or mitigation arrangements overlap;



- identify embedded design measures and, where a material operational effect is demonstrated, develop proportionate technical, operational or procedural mitigation; and
- report residual effects, consultation outcomes, commitments and any matters that remain to be resolved through a Statement of Common Ground or DCO requirement.

13.4.2 The aviation assessment would not rely solely on a generic EIA sensitivity-magnitude matrix. Aviation receptors are regulated systems with receptor-specific tolerances. The key test would be whether the Proposed Development would cause an unacceptable effect on aviation safety or on the safe and efficient provision of an ATS, having regard to the view and supporting evidence of the responsible aviation stakeholder. Effects would be described as acceptable, acceptable subject to mitigation, or unacceptable. The wider EIA significance terminology would then be applied consistently with the project-wide methodology.

13.4.3 Radar line of sight establishes the potential for a turbine to be detected. It does not establish that returns would be displayed to a controller, that they would affect surveillance performance, or that an operational effect would occur. In accordance with CAP 764, the assessment would distinguish technical effect from operational consequence and would require a proportionate, evidence-based assessment of the local operating environment.

Relevant Policy, Legislation and Guidance

- Overarching National Policy Statement for Energy (EN-1) and National Policy Statement for Renewable Energy Infrastructure (EN-3), including aviation, defence and radar considerations;
- Air Navigation Order 2016, as amended, including obstacle notification and lighting requirements;
- UK Regulation (EU) No 139/2014 and associated aerodrome requirements, where applicable;
- CAA CAP 764, Policy and Guidelines on Wind Turbines, Edition 7.1, September 2026;
- CAA CAP 738, Safeguarding of Aerodromes, together with current Combined Aerodrome Safeguarding Team advice;
- CAA CAP 785B, Implementation and Safeguarding of Instrument Flight Procedures in the UK;
- CAA CAP 670, Air Traffic Services Safety Requirements, and relevant equipment-specific safeguarding guidance;
- CAA CAP 168, Licensing of Aerodromes, where applicable;
- ICAO Annex 14, Aerodromes, and Doc 8168, Procedures for Air Navigation Services - Aircraft Operations, Volume II; and
- MOD, NATS, Met Office and aerodrome-specific wind energy and safeguarding requirements.

13.4.4 The revised ICAO OLS framework becomes applicable from 21 November 2030. The assessment will therefore consider the framework applicable to the consent, construction and operational programme, together with any published UK transitional arrangements.



Consultation

Table 13-3: Proposed Aviation Consultation

Consultee	Purpose
FlyDoncaster Ltd / DSA safeguarding and ATS representatives	Confirm the reopening baseline, future IFPs, status and intended use of the DSA PSR, and whether any credible operational effect requires assessment.
NATS (En Route) plc	Obtain formal technical and operational assessment of relevant NATS radar and navigation infrastructure and discuss mitigation if required.
Ministry of Defence	Assess air defence and air traffic radar, military low flying, aviation lighting and other defence safeguarding interests.
Civil Aviation Authority	Confirm policy interpretation, obstacle notification/lighting, airspace change interfaces and any matters requiring regulatory input.
Met Office	Confirm whether weather radar is a relevant receptor and determine the need for further technical assessment.
Humberside Airport and relevant nearby aerodrome or CNS operators	Confirm the ownership and operational use of the Hibaldstow PSR, IFP safeguarding requirements and whether the Proposed Development creates a credible effect.
Local Planning Authorities	Agree the scope, evidence base and treatment of any unresolved aviation matters in the planning application.

13.5 Design Mitigation and Enhancement Measures

- 13.5.1 The primary approach would be to avoid or reduce effects through design where this is practicable. Embedded measures would include accurate control of turbine and crane coordinates and elevations; early safeguarding review of layout changes; compliance with statutory obstacle notification and charting requirements; and installation of agreed aviation lighting and marking.
- 13.5.2 Where assessment identifies a material operational effect, mitigation would be developed with the responsible stakeholder. Depending on the receptor and evidence, options may include micro-siting or height limits; amendment or restriction of an IFP; radar data filtering or blanking where operationally acceptable; use of alternative or multi-sensor surveillance data; radar upgrade or infill; changes to operating procedures; agreed construction crane controls; or other equipment-specific measures. No mitigation would be assumed available until its technical feasibility, operational acceptability, delivery route, cost responsibility and implementation timing have been agreed.
- 13.5.3 Aviation lighting is a safety requirement rather than an enhancement. The design would nevertheless seek the lowest compliant visual effect, including reduced intensity in good visibility, synchronisation and alternative lighting arrangements where these are permitted and agreed by the CAA and MOD.

13.6 Potential Impacts Scoped In

Phase / Impact	Reason For Scoping In	Proposed Assessment
Construction and decommissioning - cranes and temporary obstacles	Cranes may exceed turbine hub height and affect OLS, IFPs, radar and local operations.	Worst-case crane envelope review; OLS and IFP screening; radar/CNS screening; notification, lighting and operational controls agreed with relevant stakeholders.



Phase / Impact	Reason For Scoping In	Proposed Assessment
Operation - IFP safeguarding	Several procedure sponsors lie within 30 NM. Initial screening found adequate altitude clearance, but final turbine elevations and future DSA procedures require confirmation.	Formal APDO-led safeguarding assessment or written confirmation from the responsible procedure sponsors.
Operation - civil and military PSR	The Site is predicted to be in RLoS of NATS Claxby, DSA and Hibaldstow PSRs. RAF Waddington clearance was marginal at 200 m.	Updated RLoS and technical assessment, followed by stakeholder operational impact assessment and mitigation where justified.
Operation - SSR and other surveillance sensors	Tall turbines can cause masking, multipath or infrastructure effects even where rotating-blade clutter is primarily a PSR issue.	Facility-specific screening within 100 NM; detailed assessment only where a credible pathway is identified.
Operation - airspace and aviation activity	The Site lies in Class G airspace and within MOD day and night low-flying areas.	Review current and reasonably foreseeable airspace, local flying activity, emergency services and military low flying.
Operation - aviation lighting, marking and obstacle notification	Turbines above 150 m require obstacle lighting and notification.	Define compliant lighting/markings and notification in consultation with the CAA and MOD; pass visual characteristics to the LVIA.
Cumulative - radar, IFP, airspace and mitigation interactions	Other wind farms may add radar returns, affect shared procedures or use finite mitigation capacity.	Screen built, consented and reasonably foreseeable projects within overlapping radar/operational study areas and consult affected stakeholders.

13.7 Impacts Proposed to be Scoped Out

Impact	Justification
Operation - aerodrome OLS	The Site is outside the 15 km safeguarding extent for DSA and the 5 km extent applied to Sandtoft Airfield. Final layout screening and consultation will confirm this position.
Operation - aviation communications and navigation aids	No relevant facilities were identified within the 10 km screening areas. This will be checked against current infrastructure and the final layout.
Routine construction traffic using the public highway	No aviation pathway is anticipated. Abnormal load and road effects would be assessed in the Access, Traffic and Transport chapter. Any exceptional air transport would be separately notified and managed.
Effects from buried electrical and communication cables on aviation CNS	Buried infrastructure operating to applicable electromagnetic compatibility standards would not create a credible effect on aviation CNS systems. Above-ground substation or mast infrastructure would remain subject to normal safeguarding review.
Aviation effects after decommissioning is complete	Removal of turbines, cranes and associated above-ground obstacles would remove the identified aviation pathways. Temporary decommissioning effects remain scoped in.



Impact	Justification
Transboundary aviation effects	The potential effects are associated with UK radar, aerodromes, airspace and operational services and are not expected to result in a significant effect in another state.
Beneficial aviation effects	The Proposed Development is not intended to provide an aviation service or infrastructure improvement. Any stakeholder-funded system upgrade would be treated as mitigation rather than a beneficial environmental effect.

- 13.7.1 No named radar, aerodrome, IFP or CNS receptor would be scoped out solely by distance where consultation or modelling indicates a credible effect. The scoped-out position would be reviewed following receipt of the Scoping Opinion and formal stakeholder responses.

13.8 Summary of Effects and Conclusions

- 13.8.1 The initial assessment has not identified an aviation constraint that would prevent the Proposed Development from proceeding. The Site lies in Class G airspace, clear of the upper route network and outside the OLS safeguarding extents identified for DSA and Sandtoft Airfield. The 200 m turbine envelope is also substantially below the published Area Minimum Altitude. No aviation communication or navigation facilities were identified within 10 km.
- 13.8.2 Several airports with published IFPs lie within 30 NM. The feasibility study found adequate clearance from the relevant minimum sector and surveillance altitudes and therefore identified no likely IFP effect. This position will be confirmed against the final turbine coordinates and elevations, current procedures and any sufficiently developed procedures associated with the reopening of DSA.
- 13.8.3 Radar is the principal matter requiring detailed assessment. Initial modelling predicts Radar Line of Sight (RLoS) to the NATS Claxby, DSA and Hibaldstow PSRs. This is a technical screening result and does not, by itself, demonstrate an operational effect. The aviation assessment will confirm the status and operational purpose of each system, assess the potential effect in the local operating environment and identify mitigation only where a material operational consequence is demonstrated.
- 13.8.4 Military low flying, aviation lighting, obstacle notification and cumulative radar effects will remain scoped in. Subject to consultation and completion of the identified assessments, potential aviation effects are considered capable of being avoided or mitigated through established design, technical, operational or procedural measures.

13.9 Summary of Next Steps

- confirm the scoping design envelope, turbine layout, maximum ground and blade tip elevations and construction crane parameters;
- refresh the aerodrome, IFP, radar, CNS, airspace and aviation-activity baseline against current authoritative data;
- obtain formal pre-application responses from FlyDoncaster Ltd, NATS, the MOD, the CAA and the Met Office;
- confirm the OLS screening conclusion and complete formal IFP safeguarding assessment, taking account of any sufficiently developed DSA reopening procedures;
- undertake updated RLoS and, where required, technical and operational impact assessments;



- agree any design changes or mitigation and record delivery responsibilities and implementation timing; and
- assess cumulative effects and prepare the aviation assessment.

13.10 Questions for Consultees

13.10.1 Consultees are invited to comment on the following matters:

- Q13.1** Whether the receptor-specific study areas in **Table 13-1** are appropriate?
- Q13.2** Whether any additional radar, aerodrome, airspace, IFP, communication or navigation receptor should be included?
- Q13.3** The appropriate current and future baseline for DSA, including proposed airspace, IFPs and the status and use of its PSR.
- Q13.4** Whether the proposed distinction between technical effect and material operational consequence is appropriate?
- Q13.5** The scope and timing of detailed OLS, IFP, radar and CNS assessments.
- Q13.6** The proposed approach to cumulative effects and aviation lighting.
- Q13.7** Whether consultees agree with the impacts proposed to be scoped in and scoped out?
- Q13.8** Whether consultees agree that aviation assessment be presented as a standalone technical appendix rather than standalone ES chapter.

13.11 References

Civil Aviation Authority (2026), CAP 764: Policy and Guidelines on Wind Turbines, Edition 7.1, September 2026. <https://www.caa.co.uk/cap764>

Civil Aviation Authority, CAP 738: Safeguarding of Aerodromes.
<https://www.caa.co.uk/cap738>

Civil Aviation Authority (2022), CAP 785B: Implementation and Safeguarding of Instrument Flight Procedures in the UK. <https://www.caa.co.uk/cap785b>

Civil Aviation Authority, CAP 670: Air Traffic Services Safety Requirements.
<https://www.caa.co.uk/cap670>

Civil Aviation Authority, Combined Aerodrome Safeguarding Team Advice Note 1: Safeguarding - An Overview, April 2024.

Civil Aviation Authority (2026), New ICAO Obstacle Limitation Surfaces: applicability from 21 November 2030. <https://www.caa.co.uk/commercial-industry/aerodromes/aerodrome-safety/new-icao-obstacle-limitation-surfaces/>

Department for Energy Security and Net Zero (2025), Overarching National Policy Statement for Energy (EN-1) and National Policy Statement for Renewable Energy Infrastructure (EN-3).

International Civil Aviation Organization, Annex 14: Aerodromes, Volume I, and Doc 8168: Procedures for Air Navigation Services - Aircraft Operations, Volume II.

UK Government, Air Navigation Order 2016, as amended.

Relevant current Doncaster Sheffield Airport Airspace Change Proposal documentation.

Straten Consulting (2025), Aviation Feasibility Study: Adingfleet, document 110VAT002, 9 July 2025.



14.0 Other Considerations

14.1 Introduction

- 14.1.1 This chapter covers other topics that have been considered during the preparation of this Scoping Report for which no standalone technical ES chapter is proposed in the ES or which it is proposed to scope out of the ES.

14.2 Telecommunications and Broadcast Installations

- 14.2.1 Wind turbines can introduce electromagnetic interference through both physical and electrical mechanisms, which may affect telecommunications and broadcasting systems. Physical interference can disrupt electromagnetic signals, leading to signal degradation and multipath effects that may affect television reception and radar systems. Electrical interference stems from the operation of equipment within the turbine nacelle and may affect communications equipment located near the turbines.
- 14.2.2 Consultation will be undertaken with Ofcom and relevant system operators to identify any telecommunications and broadcasting assets that could be affected by the Proposed Development and to determine the potential for electromagnetic interference.
- 14.2.3 Where possible, any potential effects on radio communications links and television reception will be mitigated at the layout design stage through the use of exclusion zones around link paths. The paths of any links crossing the Site will be plotted and appropriate safeguarding buffers calculated. These buffers will be incorporated into the design process for the Proposed Development, with the primary aim of avoiding effects by locating turbine infrastructure outwith the respective safeguarding areas. Should wind turbines be proposed within identified safeguarding areas, a technical report would be prepared and included as a Technical Appendix to the ES, and appropriate mitigation measures would be developed and agreed with the relevant operator(s).

14.3 Shadow Flicker

- 14.3.1 Under certain combinations of geographical position, times of day and year, the sun may pass behind a wind turbine rotor and cast a shadow over the windows of neighbouring buildings. When the blades rotate and the shadow passes a window, to a person within that room, the shadow appears to flick on and off; this effect is known as 'shadow flicker'. This effect occurs only within buildings where the flicker appears through a window aperture and in the UK typically occurs only in buildings within 130 degrees either side of north relative to a wind turbine.
- 14.3.2 National Policy Statement for Renewable Energy Infrastructure (EN-3) (Department for Energy Security and Net Zero, 2025) states that:
- "As a general rule, there is unlikely to be a significant impact at distances greater than ten rotor diameters from a turbine. Where wind turbines have been proposed within ten rotor diameters of an existing occupied building, a shadow flicker assessment should be carried out by the applicant."*
- 14.3.3 Although this guidance is intended for Nationally Significant Infrastructure Projects and is not directly applicable to applications submitted under the Town and Country Planning Act 1990



(TCPA) regime, it represents relevant best practice for the assessment of shadow flicker effects.

- 14.3.4 There is no formal limit on the amount of shadow flicker that is considered acceptable within the UK. However, it is typically recommended shadow flicker that should not exceed 30 hours per year or 30 minutes per day at receptors.
- 14.3.5 As part of the EIA process, shadow flicker modelling will be undertaken to predict the frequency and duration of shadow flicker at window locations associated with any residential properties identified within 10 rotor diameters of the proposed turbine locations. This will be based upon the threshold limit of 30 minutes per day or 30 hours per year.
- 14.3.6 Where required, mitigation measures would be identified to avoid or reduce adverse effects. It is therefore proposed that this topic be addressed through a technical report included as a Technical Appendix to the ES, setting out the predicted shadow flicker effects at relevant properties and any necessary mitigation measures.
- 14.3.7 A review of cumulative developments will also be undertaken during the EIA process to identify any wind energy developments with the potential to give rise to cumulative shadow flicker effects. Any such developments will be assessed in accordance with the methodology described above.

14.4 Ice Throw

- 14.4.1 Modern wind turbines are typically designed to minimise the risk of ice throw. Depending on the turbine specification, this may be achieved through blade heating systems that reduce the potential for ice accretion or through ice detection systems that automatically shut down the turbine where ice accumulation is detected. As a result, the potential for ice throw from rotating blades is minimised through design and operational controls.
- 14.4.2 Ice fall from stationary turbine blades may still occur where ice has accumulated. Physical and visual warning measures for both site personnel and members of the public are typically used to alert people to the potential risk of ice fall in the immediate vicinity of wind turbines.
- 14.4.3 The Wind Power Icing Atlas (Rissanen and Lehtomäki, 2015) is a recognised source of information used to identify areas where icing conditions may occur. It helps to estimate how often ice is likely to form on wind turbines and whether this could affect turbine operation or give rise to risks such as ice fall or ice throw. The Site is located in an area with a very low risk of icing. This means that icing conditions are expected to occur only rarely during the year and are not considered to represent a significant constraint to the Proposed Development.
- 14.4.4 Given the very low risk of icing conditions at the Site, together with the embedded design and procedural mitigation measures, it is proposed that assessment of ice throw is scoped out of the ES.

14.5 Population and Human Health

- 14.5.1 The EIA will consider Population and Human Health primarily through the assessment of amenity-related effects, including any likely significant effects associated with air quality, water supplies, noise, traffic and visual amenity. No other sources or pathways through which the Proposed Development could give rise to likely significant effects on human health have been identified.
- 14.5.2 Appropriate measures to control potential construction effects relating to air quality, noise and water quality will be set out within an Outline CEMP, which will be included as a Technical Appendix to the ES. A similar management plan would be prepared for the



decommissioning phase in accordance with relevant guidance and good practice requirements applicable at that time.

- 14.5.3 It is therefore proposed that a standalone Population and Human Health chapter is not required within the ES. Any potential effects on population and human health will instead be assessed, where relevant, within the corresponding environmental topic chapters.

14.6 Risk of Major Accidents and/or Disasters

- 14.6.1 Potential effects on environmental receptors arising from major accidents and disasters associated with the Proposed Development will be minimised through adherence to relevant legislation, industry standards and good practice, including:

- The Construction (Design and Management) Regulations 2015, which place duties on clients, designers and contractors to ensure that health and safety considerations are incorporated throughout the lifecycle of a construction project, from design and construction through to decommissioning. Under the Regulations, designers are required to eliminate, reduce or control foreseeable risks so far as is reasonably practicable.
- The Health and Safety at Work etc. Act 1974, which places general duties on employers, employees and those in control of premises to ensure, so far as is reasonably practicable, the health, safety and welfare of workers and others who may be affected by their activities.
- The Electricity at Work Regulations 1989, which require precautions to be taken against the risk of death or personal injury arising from electricity in work activities.
- The Planning (Hazardous Substances) Regulations 2015, which establish the framework for hazardous substances consent where specified hazardous substances are present at or above controlled quantities.
- The Control of Major Accident Hazards (COMAH) Regulations 2015, which aim to prevent major accidents involving dangerous substances and to limit the consequences of such accidents for human health and the environment.

- 14.6.2 Given the nature of the Proposed Development and the regulatory framework governing its design, construction and operation, the potential for likely significant effects resulting from major accidents and disasters is considered to be low. Accordingly, major accidents and disasters will be addressed through the relevant topic assessments where appropriate, and a standalone assessment is not proposed.

14.7 Air Quality

- 14.7.1 Whilst the Proposed Development is not considered likely to give rise to significant effects on air quality for human receptors, detailed construction traffic data are not yet available, and it is therefore not currently possible to determine whether the relevant ecological screening criteria for traffic-related air quality effects on the Humber Estuary SAC would be exceeded. Accordingly, a precautionary approach has been adopted for the purposes of this Scoping Report and the potential for air quality effects on the Humber Estuary SAC has been scoped into the EIA.
- 14.7.2 Once detailed construction traffic information becomes available, an ecological air quality screening assessment will be undertaken in accordance with Natural England's Standing Advice and other relevant guidance. Subject to the outcome of that screening assessment, and in consultation with the project ecologists as necessary, it may be possible to conclude that significant air quality effects on the Humber Estuary SAC are unlikely and that no further detailed assessment is required. Where appropriate, this approach would be agreed with Natural England and the findings reported within the 'Other Considerations' chapter of the



ES. Should the screening exercise identify the potential for likely significant effects and detailed assessment be required, the findings would be presented within a standalone Air Quality chapter of the ES.

- 14.7.3 On this basis, air quality effects on human receptors are proposed to be scoped out of the ES. The potential for air quality effects on the Humber Estuary SAC will remain scoped into the EIA at this stage pending completion of the ecological air quality screening assessment. Air quality, dust management and pollution prevention measures will be secured through the Outline CEMP.

14.8 Climate

Carbon Emissions

- 14.8.1 The Proposed Development will contribute positively towards national carbon reduction and net zero objectives through the generation of renewable electricity, displacing electricity that would otherwise be generated from more carbon-intensive sources.
- 14.8.2 It is recognised that the Proposed Development will give rise to greenhouse gas (GHG) emissions during construction, including emissions associated with the manufacture and transportation of materials, wind turbine components, construction plant, site preparation works and other construction activities. Where relevant, potential carbon losses associated with peat and peaty soils will also be considered.
- 14.8.3 A Carbon Balance assessment will be prepared and submitted as a Technical Appendix to the ES. The assessment will provide a transparent account of lifecycle carbon emissions associated with the Proposed Development and will quantify the anticipated carbon savings arising from renewable electricity generation over the operational lifetime of the scheme. The assessment will be undertaken using the latest version of the Scottish Government Carbon Calculator (Nayak et. al., 2010), which remains the recognised industry-standard tool for assessing the net carbon effects of wind farm developments within the UK.
- 14.8.4 The Institute of Environmental Management and Assessment (IEMA) guidance on Assessing Greenhouse Gas Emissions and Evaluating their Significance (IEMA, 2022) recognises that all GHG emissions contribute to climate change; however, the principal consideration is whether a development would materially hinder the achievement of legally binding carbon reduction targets. Given the nature of the Proposed Development as a renewable energy scheme and its anticipated net carbon benefit, significant adverse effects relating to climate are not considered likely.
- 14.8.5 On this basis, climate change is proposed to be scoped out of detailed assessment within the ES. The carbon implications of the Proposed Development will instead be addressed through the Carbon Balance assessment submitted as a Technical Appendix to the ES.

Climate Resilience

- 14.8.6 The vulnerability of the Proposed Development to climate change will be considered throughout the design process, including the potential effects of climate change such as increased flood risk and the increased frequency and severity of extreme weather events.
- 14.8.7 The Proposed Development's approach to climate resilience will be described within the introductory chapters of the ES and the description of the Proposed Development. This will include consideration of embedded and additional mitigation measures incorporated to ensure the Proposed Development remains resilient to the foreseeable effects of climate change.
- 14.8.8 Each relevant environmental topic chapter of the ES will also include consideration of the likely consequences of climate change on baseline conditions and assessment outcomes, informed by the latest UK climate change projections. The principal climate-related risk to



the Proposed Development is considered to be flooding, which will be assessed in detail within the Hydrology and Flood Risk chapter. Other climate-related risks will be addressed, where relevant, within the corresponding environmental topic assessments.

- 14.8.9 Given that climate resilience will be embedded within the design of the Proposed Development and considered through the relevant environmental topic assessments, it is proposed that a standalone climate resilience assessment is scoped out of the ES.

14.9 Waste and Environmental Management

- 14.9.1 The Applicant is committed to minimising waste generation and promoting the efficient use of resources throughout the lifecycle of the Proposed Development. Resource efficiency, pollution prevention and waste management measures will be incorporated within the Outline CEMP and supported by site-specific management plans to maximise the reuse of materials on Site and minimise waste generation.
- 14.9.2 The Proposed Development will adopt good construction and environmental management practices to ensure that waste arising during the construction and decommissioning phases is minimised as far as practicable. This will include the reuse of suitable site-won excavated materials, particularly those associated with cable trenching and other earthworks, wherever feasible.
- 14.9.3 Waste arising during construction, operation and decommissioning will be managed through established good practice measures and appropriate management plans. Operational waste is anticipated to be limited to occasional maintenance activities, whilst waste generated during decommissioning will be managed through a dedicated Decommissioning, Restoration and Aftercare Plan prepared at the appropriate time, taking account of available recycling and recovery opportunities.
- 14.9.4 All waste generated by the Proposed Development will be managed in accordance with the waste hierarchy, with priority given to waste prevention, reuse, recycling and recovery before disposal.
- 14.9.5 Given the implementation of embedded mitigation and management measures, together with the relatively limited quantities of waste anticipated to arise, no likely significant effects relating to waste are anticipated. It is therefore proposed that waste is scoped out of the EIA, with waste management commitments secured through the Outline CEMP and associated management plans.

14.10 Questions for Consultees

- 14.10.1 The following questions are designed to focus the scoping exercise and inform the Scoping Opinion:
- Q14.1** Do consultees agree with the topics proposed to be scoped out/not considered in a standalone assessment in the ES?
- Q14.2** Do consultees agree that shadow flicker effects should be assessed at receptors located within 10 rotor diameters of a wind turbine, using significance thresholds of 30 minutes per day and 30 hours per year?

14.11 References

Department for Energy Security and Net Zero (2025). *National Policy Statement for Renewable Energy Infrastructure (EN-3)*, 2025. London: HMSO. Available at: <https://www.gov.uk/government/publications/national-policy-statement-for-renewable-energy-infrastructure-en-3-2025>



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Institute of Environmental Management and Assessment (2022) *Assessing Greenhouse Gas Emissions and Evaluating their Significance*. 2nd edition. Lincoln: IEMA. Available at: <https://www.isepglobal.org/content/iema-guide-assessing-greenhouse-gas-emissions-and-evaluating-their-significance/>

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Scottish Renewables (2025) *Guidelines on Streamlining Environmental Impact Assessment for Onshore Wind Farms*. Glasgow: Scottish Renewables. Available at: https://www.scottishrenewables.com/assets/000/005/061/Streamlining_EIA_Guidance_September_2025_original.pdf

Rissanen, S. and Lehtomäki, V. (2015) *Wind Power Icing Atlas (WIceAtlas) and Icing Map of the World*. Presented at Winterwind 2015, Piteå, Sweden. VTT Technical Research Centre of Finland Ltd. Available at: https://www.windren.se/WW2015/WW2015_44_533_Rissanen_VTT_Icing_atlas_world.pdf





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