Theddlethorpe Flexible Generation

A STATERA COMPANY

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Scoping Report

Company:	Theddlethorpe Flexible Generation Limited
Project:	Theddlethorpe Flexible Generation NSIP
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1 Introduction

1.1 Overview

1.1.1 Theddlethorpe Flexible Generation Limited (hereinafter referred to as 'the Applicant') is proposing to construct and operate a flexible generation plant facility (up to 1.5 GW), with electrolysis hydrogen production facility and Battery Energy Storage System (BESS) (up to 1 GW), known as the Theddlethorpe Flexible Generation Project, on land adjacent to the decommissioned Theddlethorpe Gas Terminal, and on land at Stain Lane and Strubby Airfield, all within East Lindsey district, Lincolnshire (hereafter referred to as 'the Proposed Development'). The Applicant is owned by Statera Energy Limited ('Statera').

1.1.2 Statera is a UK-based energy company that develops, owns and operates flexible generation, battery storage, pumped hydro and green hydrogen projects which will all provide critical grid balancing support in a future renewables-led system. These assets will help the UK build more renewable energy, more quickly, by providing the flexible capacity needed to balance the future grid during periods of extended shortfalls and excesses in renewable generation, due to the variability of wind and solar output. In turn, this technology will lower carbon emissions and deliver best value for energy users.

1.1.3 The key components of the Proposed Development comprise:

- Flexible generation thermal plant (Gas Engines or Combined Cycle Gas Turbines [CCGT]) powered by either natural gas, hydrogen or a combination of natural gas and hydrogen combustion, including a carbon capture plant if natural gas CCGT technology is used, landscaping, access and enhancement or mitigation works;
- Electrolysis facility to allow for the production of hydrogen gas with associated desalination plant and pipeline into North Sea;
- Battery Energy Storage System (BESS), associated infrastructure, landscaping, access and enhancement or mitigation works located at Stain Lane;
- Battery Energy Storage System (BESS), associated infrastructure, access and enhancement or mitigation works located at Strubby Airfield;
- Project substation located near Woodthorpe/Strubby Airfield, and;
- Cable connection route via underground cabling from the flexible generation thermal plant, linking to the two BESS locations and project substation, to a new substation proposed as part of the National Grid Grimsby to Walpole connection project.

1.1.4 The flexible generation plant will provide up to 1.5 GW of electrical generation capacity on a fast response basis when required by National Grid, together with up to 1 GW of battery storage capacity at Stain Lane and Strubby Airfield or electrolysis (hydrogen production). Due to the amount of electricity generated, the Proposed Development will constitute a Nationally Significant Infrastructure Project (NSIP) under Part 3 of the Planning Act 2008 (herein referred to as 'the Act'). As an NSIP, planning permission can only be provided by the making of a Development Consent Order (DCO) by the relevant Secretary of State (SoS) under the Act.

1.1.5 To prepare for a DCO application, the form of future assessment is scoped as a matter of good practice, and a Scoping Opinion sought from the Planning Inspectorate. This document represents the formal request under Regulation 10 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the EIA Regulations) for a Scoping Opinion to be issued by the Planning Inspectorate to inform the content of a future Environmental Impact Assessment (EIA) for the Proposed Development.

1.1.6 All references within this Scoping Report to future project documentation to be published, and future consultations to be undertaken, are as set out within existing legislative requirements. Future project documentation and consultations, after EIA Scoping, will be reactive to any future changes to legislation as may be relevant at that point in time.

2 Legislative Context, Policy and Need for EIA

2.1 Nationally Significant Infrastructure Project Definition

2.1.1 The project is defined under Part 3 (s15) of the Planning Act 2008 as being an NSIP. As an NSIP the Proposed Development constitutes development for which development consent must be obtained through the making of a Development Consent Order (DCO) by the relevant Secretary of State (SoS), which then obviates the need for planning permission.

2.2 EIA Requirement

2.2.1 Being an NSIP, the need to undertake an EIA is determined by the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (The EIA Regulations). The EIA Regulations specify which developments are required to undergo EIA, under Regulation 3 EIA development is that which falls within 'Schedule 1' or 'Schedule 2'. Under Schedule 1, the Proposed Development is EIA development, as providing "2. (1) Thermal power stations and other combustion installations with heat output of 300 MW or more".

2.2.2 Developments listed in Schedule 1 must be subject to EIA, in accordance with the EIA Regulations. As such, the Applicant acknowledges that EIA is required, and this EIA Scoping Report has been prepared to inform the scope and content of the assessment to be undertaken.

2.2.3 In order to commence the Development Consent Order (DCO) application process the Applicant has prepared this EIA Scoping Report ('the Scoping Report'), which presents an initial consideration of the likely significant effects associated with the construction, operation, maintenance, and eventual decommissioning of the Proposed Development.

2.2.4 The benefits of delivering proportionate EIA[1], are to:

- drive collaborative action and understanding across the EIA community;
- focus assessments so their findings are accessible to all stakeholders;
- reduce uncertainty and risk within project consenting;
- save time and costs for developers, consenting authorities and consultees; and
- allow more time to be spent exploring the delivery of environmental improvements.

2.2.5 The Institute of Environmental Management and Assessment (IEMA) identifies key actions to deliver proportionate EIA. One of these key actions is for scoping to become a core process running through EIA, presenting ongoing opportunities to define and redefine what information is of value and how it can be made available to stakeholders. An integral element of this report is therefore to focus on aspects which the Applicant believes can be scoped out at this stage in the interest of future assessment proportionality. The Preliminary Environmental Information Report (PEIR) or replacement document, and subsequently the Environmental Statement (ES), which reports the proportionate EIA, will be based on the Scoping Opinion, informed by the recommendations of the consultees and the information contained within this Scoping Report.

2.3 Notification that DCO Application will be Accompanied by an ES

2.3.1 With EIA being required, the Applicant will forgo making a request for a Screening Direction from the SoS under Regulation 7 of the EIA Regulations. The Applicant instead hereby gives notice, pursuant to Regulation 8(1)(b), that the application for a DCO will be accompanied by an

[1] As defined by the Institute of Environmental Management and Assessment (IEMA) Delivering Proportionate EIA (2017) Accessed April 2025: https://www.iema.net/media/lb0d3ten/delivering-proportionate-eia-july-2017.pdf.

ES. In providing notice under 8(1)b the Applicant also provides, as part of this report, information specified under Regulation 8(3), including:

- a plan sufficient to identify the land;
- a description of the development, including in particular—
    - a description of the physical characteristics of the whole development and, where relevant, of demolition works; and
    - a description of the location of the development, with particular regard to the environmental sensitivity of geographical areas likely to be affected.

2.3.2 The ES will include the information set out in Regulation 14 alongside any additional information specified in Schedule 4 relevant to the specific characteristics of the Proposed Development and to the environmental features likely to be significantly affected. It will include the information reasonably required for reaching a reasoned conclusion on the likely significant effects of the Proposed Development.

2.3.3 This EIA Scoping Report constitutes a request under Regulation 10(1) of the EIA Regulations for the SoS to provide a Scoping Opinion in respect of the information to be provided in the ES.

2.4 Policy Context

Introduction

2.4.1 This section of the Scoping Report provides an overview of policies relevant to the Proposed Development.

Planning Act 2008

2.4.2 The Planning Act 2008 is the primary piece of legislation that establishes the legal framework for the application, examination, and determination of applications for NSIPs. It sets out the consenting system for all NSIPs, including those in the energy sector. As confirmed earlier in this report, Part 3 of the Act sets out those projects which fall within the definition of an NSIP. In accordance with section 14(1)(a) and section 15 of the Act, development relating to the construction or extension of a generating station, the Proposed Development is defined as an NSIP.

2.4.3 As the scheme is an NSIP, development consent must be obtained from the SoS to authorise it, and an application for a DCO must be made to the Planning Inspectorate under Part 5 of Act, who administer the DCO process on behalf of the SoS. The Planning Inspectorate will examine the application submissions and make a recommendation to the relevant SoS to grant or refuse development consent. The relevant SoS for the Proposed Development is within the remit of the Department for Energy Security and Net Zero (DESNZ).

2.4.4 The DCO will authorise the Proposed Development, including associated development, in its entirety, which may include consents and licences which would otherwise be required under separate legislation. Any additional consents and licences which may be sought outwith the DCO will be identified during preparation of the DCO application and through consultations with statutory bodies.

National Policy Statements

2.4.5 The policy framework for examining and determining applications for NSIPs is set out within a suite of National Policy Statements (NPS). Section 104 of the Act (as amended), requires the SoS to determine NSIPs in accordance with the relevant NPS, unless this would:

- lead to the UK being in breach of its international obligations;
- be in breach of any statutory duty or enactment that applies to the SoS;
- be unlawful;
- result in adverse impacts outweighing benefits; or
- be contrary to other relevant prescribed conditions.

2.4.6 Part 2 of the Act specifies the provisions in relation to NPS, which set the framework for decisions by the SoS, whilst also identifying relevant environmental considerations. For the Proposed Development, the NPS considered to be relevant are:

NPS for Overarching Energy (EN-1)

2.4.7 EN-1 provides the overarching NPS for energy and provides guidance for energy related NSIPs. EN-1 outlines UK Government policy on the need for such projects, including how applications will be assessed. EN-1 seeks to ensure that energy infrastructure development aligns with national energy objectives, including security of supply, affordability, and sustainability.

2.4.8 EN-1 places emphasis on the importance of the transition to a low-carbon economy and supports the development of renewable energy sources, while also addressing the need to achieve a diverse energy mix. This NPS provides an overarching policy framework for decision-makers to balance the benefits of energy projects against potential impacts.

NPS for Natural Gas Electricity Generating Infrastructure (EN-2)

2.4.9 EN-2 provides policy guidance specific to the development of natural gas related electricity generation NSIPs, but also hydrogen gas-fired electricity generation infrastructure. As such, EN-2 is of specific importance to the Proposed Development. Building on the overarching policies provided by EN-1, EN-2 emphasises the importance of maintaining a reliable and affordable energy supply through natural gas electricity generation while new low-carbon technologies are developed and deployed.

2.4.10 EN-2 outlines the policy criteria for assessing applications for natural gas NSIPs, including consideration of related impacts and the need for such development to take place. EN-2 seeks to ensure that natural gas infrastructure is developed to support the UK Government's wider energy security and net-zero goals.

NPS for Renewable Energy Infrastructure (EN-3)

2.4.11 EN-3 provides specific guidance for the development of renewable energy projects. EN-3 complements overarching policy provided by EN-1 by detailing the need for renewable energy infrastructure to meet UK energy objectives and carbon reduction targets. EN-3 emphasises the importance of increasing electricity generation from renewable sources, such as wind, solar, and biomass, to support the transition to a low-carbon economy.

NPS for Oil and Gas Supply and Storage (EN-4)

2.4.12 EN-4 provides specific policy guidance for the development of gas supply infrastructure. EN-4 complements the overarching policies provided by EN-1 by detailing the need for efficient import, storage and transmission of natural gas.

NPS for Electricity Networks Infrastructure (EN-5)

2.4.13 EN-5 provides specific guidance for the development of electricity network infrastructure in the UK. EN-5 emphasises the importance of developing infrastructure that can accommodate

increased electricity generation from renewable sources and ensure a reliable and secure supply.

2.4.14 EN-5 outlines the policy criteria for the consideration of applications for electricity network projects.

2.4.15 Each NPS will remain in force in its entirety unless withdrawn or suspended in whole or in part by the relevant SoS and are subject to SoS review to ensure that the contents of the NPS remains appropriate.

National Planning Policy Framework and Planning Practice Guidance

2.4.16 The National Planning Policy Framework (NPPF) was first established in March 2012, and has since been revised, most recently in December 2024. The policies set out within the NPPF are expanded upon and supported within a set of documents which make up Planning Practice Guidance (PPG).

2.4.17 The NPPF sets out the Government's planning policies for England and how these should be applied. Paragraph 5 of the NPPF (2024) states that the Framework *"does not contain specific policies for nationally significant infrastructure projects. These are determined in accordance with the decision making framework in the Planning Act 2008 (as amended) and relevant national policy statements for major infrastructure, as well as any other matters that are relevant (which may include the National Planning Policy Framework)".*

2.4.18 The NPPF focuses on three overarching objectives: economic, social and environmental. Paragraph 8 of the NPPF states that these objectives are interdependent, and are to be pursued in mutually supportive ways (to provide opportunities for net gains across each objective). Changes to the NPPF made in 2024 strengthened support for the delivery of renewable and low carbon energy and associated developments. Paragraph 161 recognises the need for the planning system to support the transition to net zero by 2050, through radical reductions in greenhouse gas emissions, minimising vulnerability and improving resilience.

2.4.19 The Planning Practice Guidance (PPG) provides further context to the NPPF and is intended to be read alongside the NPPF to provide additional guidance on how the planning policy within the NPPF should be interpreted and applied.

2.4.20 The PPG recognises a need to increase the amount of energy from renewable and low carbon energy to support secure energy supply, reduce greenhouse gas emissions and stimulate investment in new jobs and businesses[2].

Local Planning Policy

2.4.21 The Proposed Development is located entirely within the administrative area of East Lindsey District Council which sits within Lincolnshire County Council. The local development plan for the area currently comprises the following documents:

- Lincolnshire Minerals and Waste Local Plan Core Strategy and Development Management Policies (2016)
- Lincolnshire Minerals and Waste Local Plan Site Locations (2017)
- East Lindsey Local Plan Core Strategy (2018)
- East Lindsey Settlement Proposals Development Plan Document (2018)

[2] PPG (Rev 06 03 2014) Paragraph: 001 Reference ID: 5-001-20140306. Accessed 19th August 2025 https://www.gov.uk/guidance/renewable-and-low-carbon-energy

- Various Neighbourhood Development Plans.

Emerging Local Planning Policy

2.4.22 East Lindsey District Council is currently reviewing its Local Plan. An Issues and Options consultation was conducted in 2021 as part of this review process. This is an early stage in the development of new planning policies, where the council seeks input on various issues and potential options for addressing them. A Preferred Options consultation stage is expected to take place later this year.

2.4.23 The Lincolnshire Minerals and Waste Local Plan is currently being updated, progressing through an Issues and Options consultation in 2022.

Wider UK Energy Policy

2.4.24 In December 2024 the Department of Energy Security and Net Zero published the Clean Power 2030 Action Plan. This plan sets a comprehensive UK Government policy strategy to achieve a transition to a clean, secure, and affordable energy system by 2030. The Action Plan seeks to achieve this by:

- Ambitious Targets: The plan aims to deliver 100% clean electricity by 2030, significantly reducing reliance on fossil fuels.
- Infrastructure Development: It outlines the need for new infrastructure, including renewable energy projects, grid upgrades, and energy storage solutions.
- Market Reforms: The plan includes reforms to create effective markets for clean energy, ensuring that investments are directed towards sustainable projects.
- Energy Security: By focusing on homegrown clean energy, the plan aims to reduce the UK's vulnerability to global energy market fluctuations.
- Economic Growth: The plan emphasises reindustrialising regions with new jobs in the clean energy sector, contributing to economic growth and stability.

Wider UK Legislation

2.4.25 The Energy Act 2023 is aimed at transforming the energy system in a number of ways, which includes provisions relating to:

- Energy Security: Strengthens energy security by reducing dependence on international energy markets.
- Net Zero: Supports the delivery of net-zero carbon emissions by 2050.
- Consumer Protection: Introduces measures to keep energy bills affordable and protect consumers.
- Infrastructure Investment: Unlocks £100 billion in private investment for energy infrastructure.
- Offshore Wind: Accelerates the development of offshore wind projects.
- Smart Meters: Expands the rollout of smart meters to improve energy efficiency.

2.4.26 The Climate Change Act 2008 establishes a legally binding framework to reduce greenhouse gas emissions for the UK. To achieve this, a series of Carbon Budget Orders under the Climate Change Act set legally binding carbon budgets to cap emissions over five-year periods. The Climate Change Act also sets a net zero target which commits the UK to achieving net-zero carbon emissions by 2050.

Designations

2.4.27 At a national level there are geographical designations identified for being of specific importance and these designations come with specific protections relevant to their status under the

planning process. Significant designations relevant to the project have been identified as part of the topic specific sections of this Scoping Report (chapters 8 - 21).

2.5 Need for the Proposed Development and its Objectives

2.5.1 Paragraph 3.2.6 of EN-1 confirms that the SoS should assess all applications for development consent for the types of infrastructure covered by EN-1 on the basis that the government has demonstrated that there is a need for that infrastructure. Therefore, if a project forms an NSIP under the Planning Act then the need for that project is established under the NPS.

2.5.2 Part 3 of the Planning Act sets out development which constitutes an NSIP, section 14(1)(a) confirms that *"the construction or extension of a generating station"* can form an NSIP. Section 15 provides specific clarification, stating that developments are only an NSIP under section 14(1)(a) of the Planning Act when proposed in England (2)(a), is not an offshore generating station (2)(b), and its capacity is more than 50 megawatts (2)(c). Electricity storage facilities are not NSIPs under the generation station definition of the planning act (section 15(6)), albeit such elements can form associated development. The approach taken for the Proposed Development is that the flexible generation facility meets the NSIP definition by virtue of being a generating station under sections 14 and 15 of the Planning Act, all other elements of the Proposed Development will be Associated Development consistent with section 115(2)(a) of the Planning Act.

2.5.3 As such, the project constitutes an NSIP by virtue of the generating capacity of the Proposed Development. The flexible generation plant will provide up to 1.5 GW of electrical generation capacity on a fast response basis when required by National Grid, together with up to 1 GW of battery storage capacity and hydrogen production through electrolysis. Being an NSIP, EN-1 confirms that the need for the proposal is already established. Paragraph 3.2.7 of EN-1 states that 'substantial weight' should be given to this need when considering applications for development consent under the Planning Act.

2.5.4 Beyond the in-principle support on the need of the Proposed Development provided by the NPS, wider project need is demonstrated through the significant level of electricity generation which the project can provide. The 2.5 GW (total flexible generation and BESS) supply will contribute meaningfully to the energy security of the UK, whilst helping support the wider decarbonisation objectives around the energy system.

2.6 Other Planning Matters

2.6.1 When determining a DCO application, Section 104 of the Act states that the SoS must have regard to any other matters that they consider to be both 'important and relevant' to their decision. Paragraph 4.1.5 of EN-1 provides some clarification on the other matters that the SoS may consider both important and relevant; this includes potential benefits alongside adverse impacts. Contributions to meeting energy infrastructure needs, job creation, reduction of geographical disparities, environmental enhancements and any long-term or wider benefits/impacts are specifically referenced as important considerations within EN-1.

2.6.2 Paragraph 4.1.12 of EN-1 states that development plan documents may be relevant considerations in decision making. EN-1 paragraph 4.1.15 confirms that in the event of a conflict between development plan documents and an NPS, the NPS prevails for the purpose of SoS decision making given the national significance an NSIP.

3 Purpose of Report

3.1 Request for Scoping Opinion

3.1.1 This Scoping Report includes a request for a Scoping Opinion from the Planning Inspectorate (on behalf of the SoS). The Scoping Opinion will inform the scope of the EIA for the Project. The results of the EIA would be presented in an ES to be submitted to the Planning Inspectorate as part of the DCO application.

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

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

3.2 Meeting EIA Regulation Requirements and Advice Note 7

3.2.1 This Scoping Report has been prepared in accordance with the EIA Regulations, notably Regulation 10, whilst also taking account of guidance provided by Planning Inspectorate Advice Note Seven. Meeting the requirements of Regulation 10 specifically, this Scoping Report includes:

- a plan sufficient to identify the land;
- a description of the proposed 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 as the person making the request may wish to provide or make.

3.2.2 Table 3.1 below sets out where within this Scoping Report the information set by Regulation 10(3) and the Planning Inspectorate Advice Note 7 is located.

Table 3.1 Compliance with Regulation 10(3) and Planning Inspectorate's Advice Note 7

Suggested Information to be Included	Location within Scoping Report
The Proposed Development	Chapter 5
An explanation of the approach to addressing uncertainty where it remains in relation to elements of the Proposed Development e.g. design parameters;	Chapter 5 and Chapter 7
Referenced plans presented at an appropriate scale to convey clearly the information and all known features associated with the Proposed Development;	Appendix A, Appendix B
EIA Approach and Topic Areas	Chapter 7

An outline of the reasonable alternatives considered and the reasons for selecting the preferred option;	Chapter 4
A summary table depicting each of the aspects and matters that are requested to be scoped out allowing for quick identification of issues;	Chapter 22
A detailed description of the aspects and matters proposed to be scoped out of further assessment with justification provided;	Chapters 8 – 21 and Chapter 22
Results of desktop and baseline studies where available and where relevant to the decision to scope in or out aspects or matters;	Chapters 8 – 21
Aspects and matters to be scoped in, the report should include details of the methods to be used to assess impacts and to determine significance of effect eg criteria for determining sensitivity and magnitude;	Chapters 8 – 21 and Chapter 22
Any avoidance or mitigation measures proposed, how they may be secured and the anticipated residual effects;	Chapters 8 – 21
Information Sources	Chapters 8 – 21
References to any guidance and best practice to be relied upon;	Chapters 8 – 21
Evidence of agreements reached with consultation bodies (for example the statutory nature conservation bodies or local authorities);	Chapter 6

3.2.3 The Scoping Report has been prepared by competent persons, the authorship and qualifications for which are stated in each topic chapter. The Scoping Report as a whole, including the proposed EIA methodology, has been produced by Statera Energy and managed by Chris Palmer, a chartered town planner with over 20 years of experience in EIA management across a range of infrastructure projects. The Scoping Report has been subject to peer review by Savills Environment and Infrastructure, which is accredited to the IEMA EIA Quality Mark scheme. The peer review has been managed by Tom Dearing, a Chartered Environmentalist with fifteen years' experience of EIA including many major energy infrastructure developments.

3.3 Document Structure

3.3.1 The Scoping Report is structured into five main parts. The first part of the document sets out the legislative context (Chapter 2) and the purpose of the Scoping Report (Chapter 3). The second part of the document provides for a summary of alternatives considered (Chapter 4) and a description of the Proposed Development (Chapter 5). The third part of the Scoping Report includes information on the approach to stakeholder engagement (Chapter 6) and approach to EIA (Chapter 7). The fourth part of the Scoping Report, Chapters 8 – 21, provides the topic-by-topic scoping information. The fifth and final part of the Scoping Report is the Summary and Conclusions Chapter (Chapter 22).

4 Main Alternatives Considered

4.1 Introduction and Approach

4.1.1 The EIA Regulations state that an ES should include a description of reasonable alternatives studied and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects. While there is no statutory requirement to include an assessment of alternatives in support of a request for a Scoping Opinion, the Planning Inspectorate's Advice Note Seven Environmental Impact Assessment: Preliminary Environmental Information, Screening and Scoping (Insert 2) recommends that a Scoping Report includes *"an outline of the reasonable alternatives considered"*.

4.1.2 This Scoping Report therefore provides an outline of reasonable alternatives considered and the reason for progressing the form of development included at scoping. The ES will provide a more detailed consideration of reasonable alternatives, as is necessary under the EIA Regulations. The ES will also include a record of any subsequent option refinements and scheme components, including a clear description of reasonable alternatives studied and the main reasons for the option chosen.

4.2 Core Principles

4.2.1 As an initial principle, a 'no development' alternative would not deliver the generation capacity to be provided through the Proposed Development, and as such this has not been considered further.

4.2.2 A core principle relates to the National Grid providing a future reinforcement project to the transmission network through Lincolnshire to accommodate the need for enhanced grid infrastructure along the east coast of England. As part of this connection National Grid are proposing to build a new high-voltage electricity transmission line between a new substation at Grimsby West in Northeast Lincolnshire and a new substation in the Walpole area, in Norfolk. National Grid are also proposing new substations within Lincolnshire. A connection into one of these new substations (known as Lincolnshire Connection Substation A; LCSA) forms a key project requirement and represents the identified connection into the national grid required by the project.

4.2.3 A further core principle, as a thermal generating facility, the development also needs to be located next to gas infrastructure. Therefore, in addition to finding a suitable substation, LCSA, the Applicant also considered the proximity of sites to the gas transmission network. This infrastructure needs to be able to supply natural gas or hydrogen in sufficient quantities to fuel the turbines proposed. As such, a connection into the high-pressure national gas transmission network is necessary to fuel the thermal generation element of the Proposed Development.

4.3 High Level Project Requirements

4.3.1 The difference between the various parts of the electricity network in the UK set the grid connection requirements for the Proposed Development. The UK grid principally comprises two aspects: the transmission network and the distribution network. The Proposed Development seeks to provide support to the transmission network, through high volume electricity supply onto the network, and providing large volumes of system services to meet transmission network legal requirements for System Security and Quality of Supply Standards. A connection onto the distribution network cannot provide the same ability to accommodate the volume of power

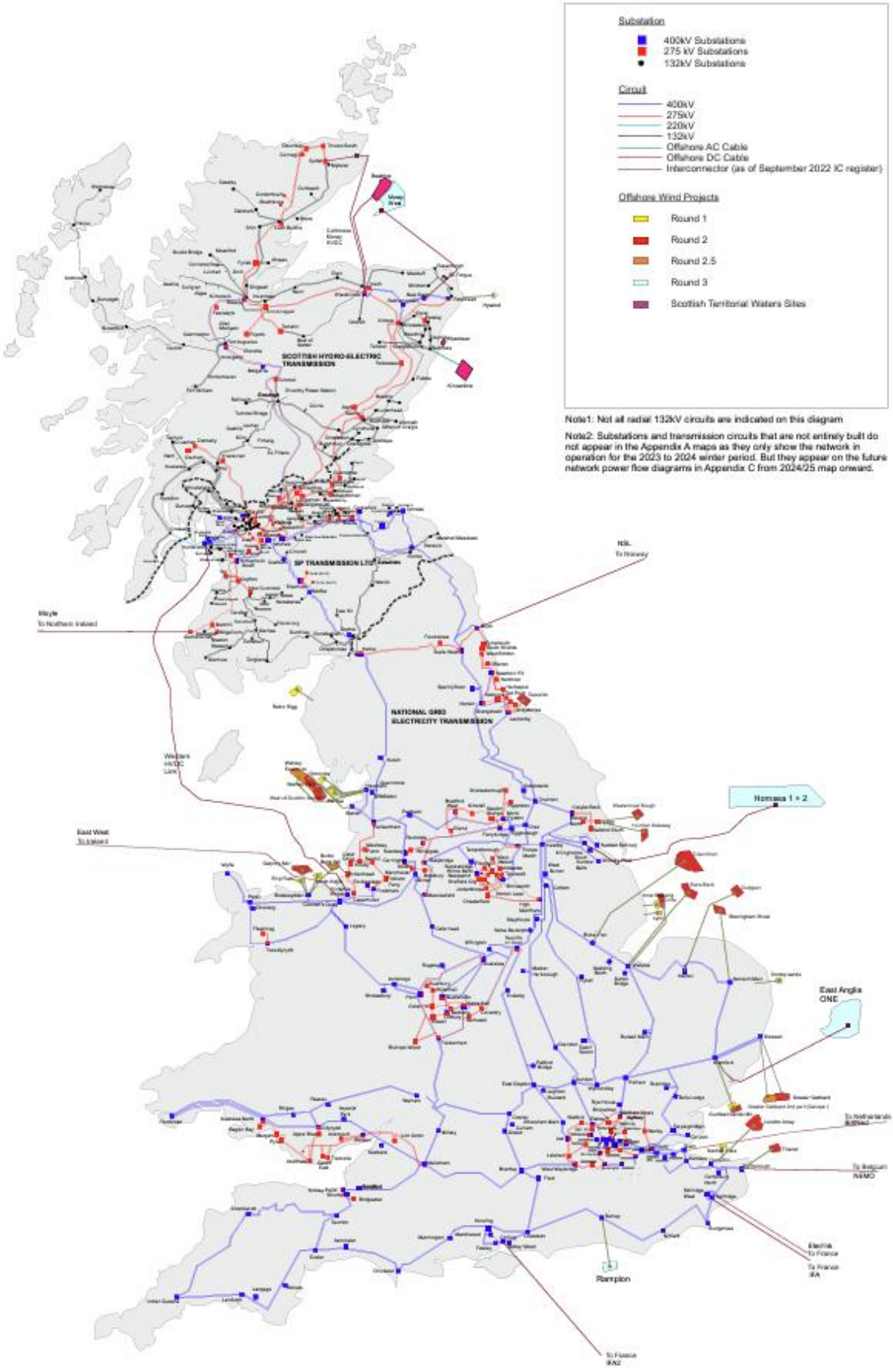
generated by the project, or benefit from the grid balancing nationally which can be provided through a connection onto the transmission network. As such a connection onto the transmission network through an available substation connection is necessary.

4.3.2 Within England, transmission is classed as 275 kV and 400 kV, whereas distribution is classed as 132 kV and below e.g., 11 kV, 33 kV, 66 kV and 132 kV.

4.3.3 The transmission networks move large volumes of electricity at a national level from where it is generated to the main regional substations. For efficiency purposes and due to the long distances involved, this is done at high transmission voltages (275 kV and 400 kV). By contrast, distribution networks take electricity from the transmission system and deliver it to the regional factories, schools, houses etc. This is done at lower voltages ranging from 11 kV, 33 kV, 66 kV and 132 kV, as distances are shorter, and the volume of electricity required is lower.

4.3.4 Figure 4-1 shows that the national transmission system for England, Scotland and Wales.

Figure 4-1 Map of the GB Transmission System



4.3.5 The Applicant considered existing National Grid substations, locations where there is land available to accommodate the Thermal and BESS infrastructure, the acceptability of environmental and planning constraints, proximity to the National Gas transmission system (including Project Union), the physical and visual separation from nearby properties and settlements and site access for construction.

4.3.6 On the existing transmission network within this part of Lincolnshire, there are no existing substations to which it would be possible to connect, either because of no available connection agreements with National Grid or there is insufficient available capacity at existing nearby substations to accommodate the generation provided by the Proposed Development. It has been necessary to consider future National Grid connection projects, and the opportunity to connect into these further projects, for the Proposed Development. Taking cables an extended distance from the Proposed Development would increase costs of the project, and environmental impact (given greater distance). The project therefore considered substations, and future substations, within 20 km of the Proposed Development site. This search area was refined to within 10km of the approximate LCSA substation location for connection infrastructure associated with the Proposed Development.

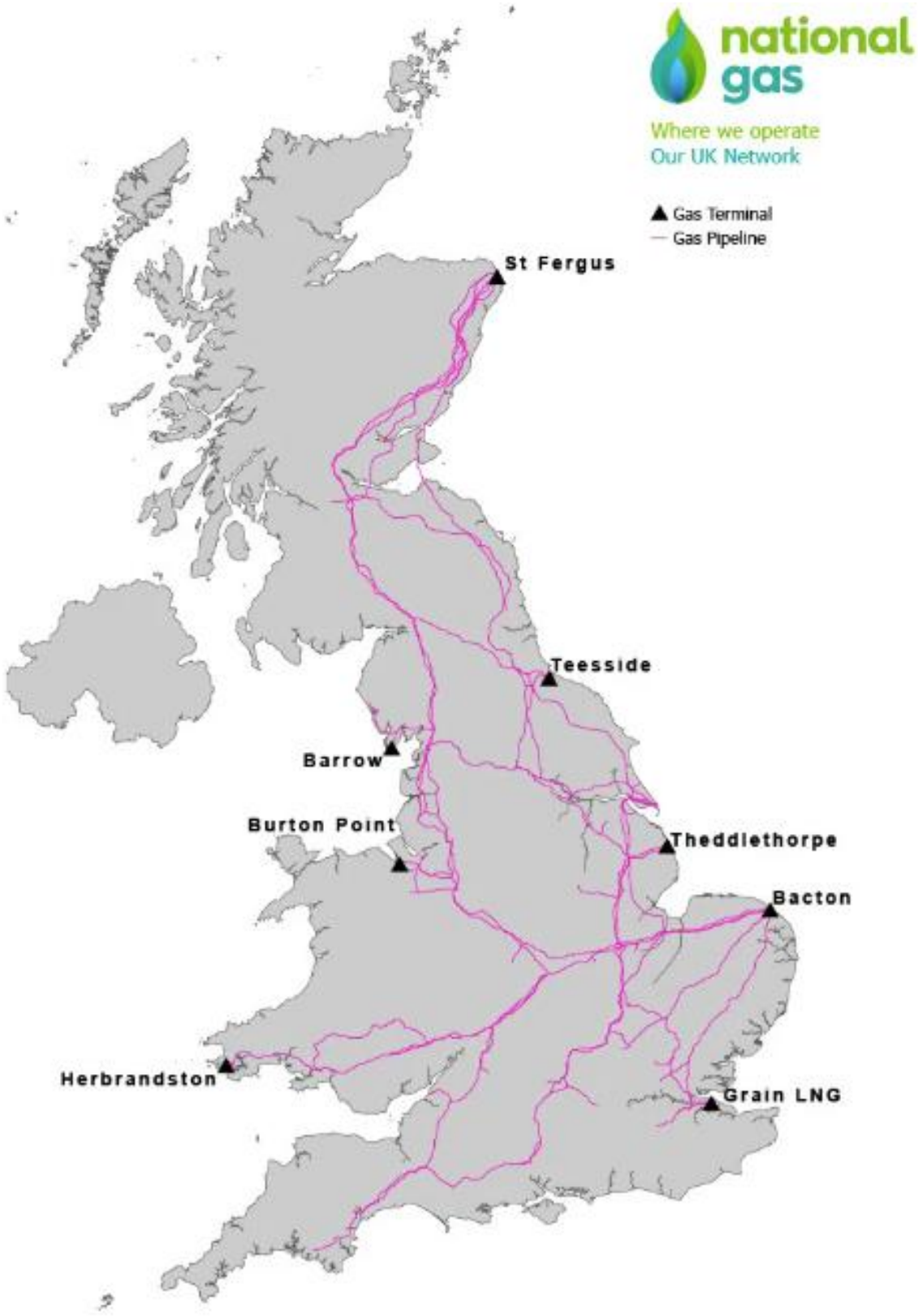
4.3.7 A further core consideration has been the distance between the Proposed Development location and access points into the national gas network/Project Union. The thermal generating facility will be fuelled by hydrogen or natural gas. A connection to a national gas network supply point is necessary, alongside a connection to the future hydrogen network as may be delivered via Project Union[3]. The Proposed Development therefore also needs to be sited in proximity to the Project Union hydrogen pipelines so that hydrogen fuel source is also available.

4.3.8 Taking a new pipeline from the national gas network / Project Union over an extended distance would increase costs for the project and associated environmental impacts (given greater distance). The project therefore considered sites within 5 km of the national gas network and proposed route for Project Union.

4.3.9 The national gas transmission network is shown at figure 4-2.

[3] National Gas, Project Union Map (accessed April 2025): https://www.nationalgas.com/future-energy/hydrogen/project-union

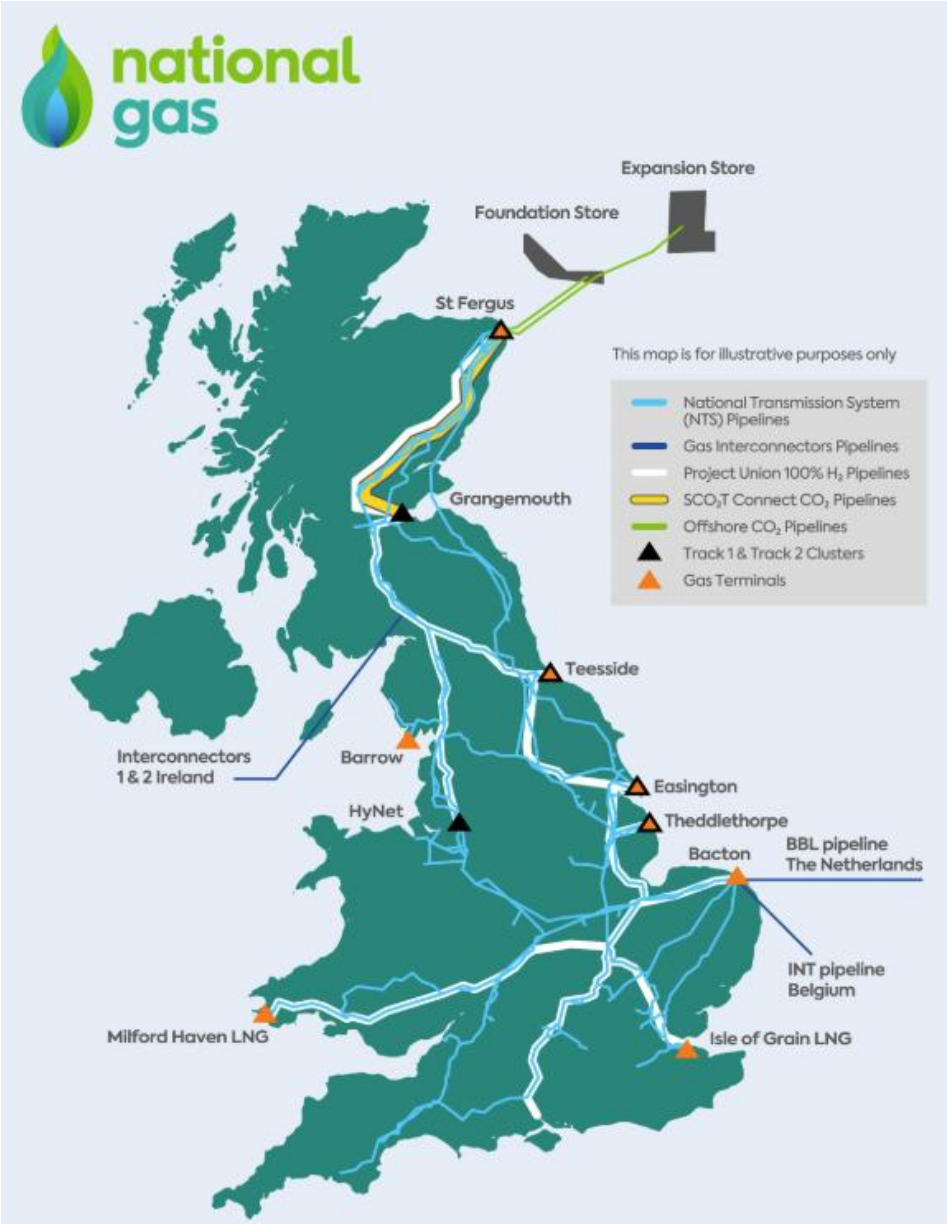
Figure 4-2 Gas Transmission Map UK[4]



[4] National Gas, network map (accessed April 2025): https://www.nationalgas.com/our-businesses/network-route-maps

4.3.10 Figure 4-3 below shows the intended future route of Project Union.

Figure 4-3 National Gas Project Union Map[5]



4.3.11 In consideration of the overall strategic objective for the project, the following informed initial site search:

- Connection into the transmission network, available grid infrastructure on the east coast
- Available gas transmission pipeline connection
- Project Union link.

4.3.12 The project undertook its initial search for the Proposed Development site by considering land available within 5 km of an access into the National Gas (Project Union) network. A greater distance than 5 km was considered to lead to significant increases in project costs (given the

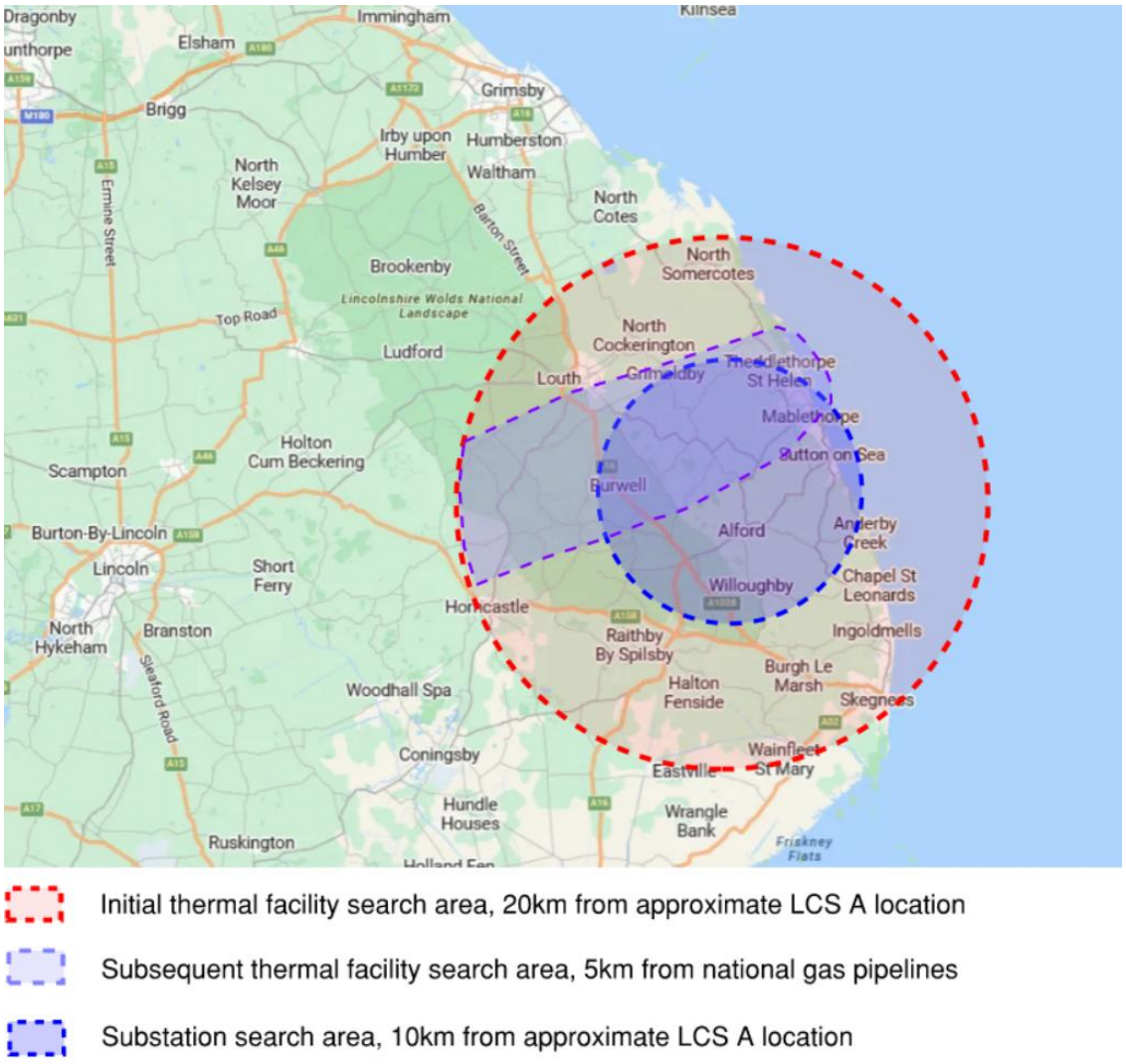
[5] National Gas, Project Union (accessed April 2025): https://www.nationalgas.com/future-energy/hydrogen/project-union

distance of high pressure pipeline required) and greater environmental impacts associated with a longer pipeline connection.

4.3.13 In summary, for the reasons above, the area of search for Proposed Development sites was defined using buffers of 20 km from LCSA for the thermal facility, 5 km from the national gas transmission network with Project Union potential for the thermal facility, and 10 km around LCSA for proposed project substation and BESS. The resulting search area is depicted in Figure 4-4. No further consideration of alternative locations outside this area of search is therefore proposed for the EIA, as the search area provides the specific combination of electricity grid connection capacity, gas connection and potential future hydrogen connection that is required.

4.3.14 Whilst the above represents the initial search criteria applied in identifying the Proposed Development site, a review of the initial criteria will be undertaken through future PEI and EIA stages.

Figure 4-4: Initial area of search



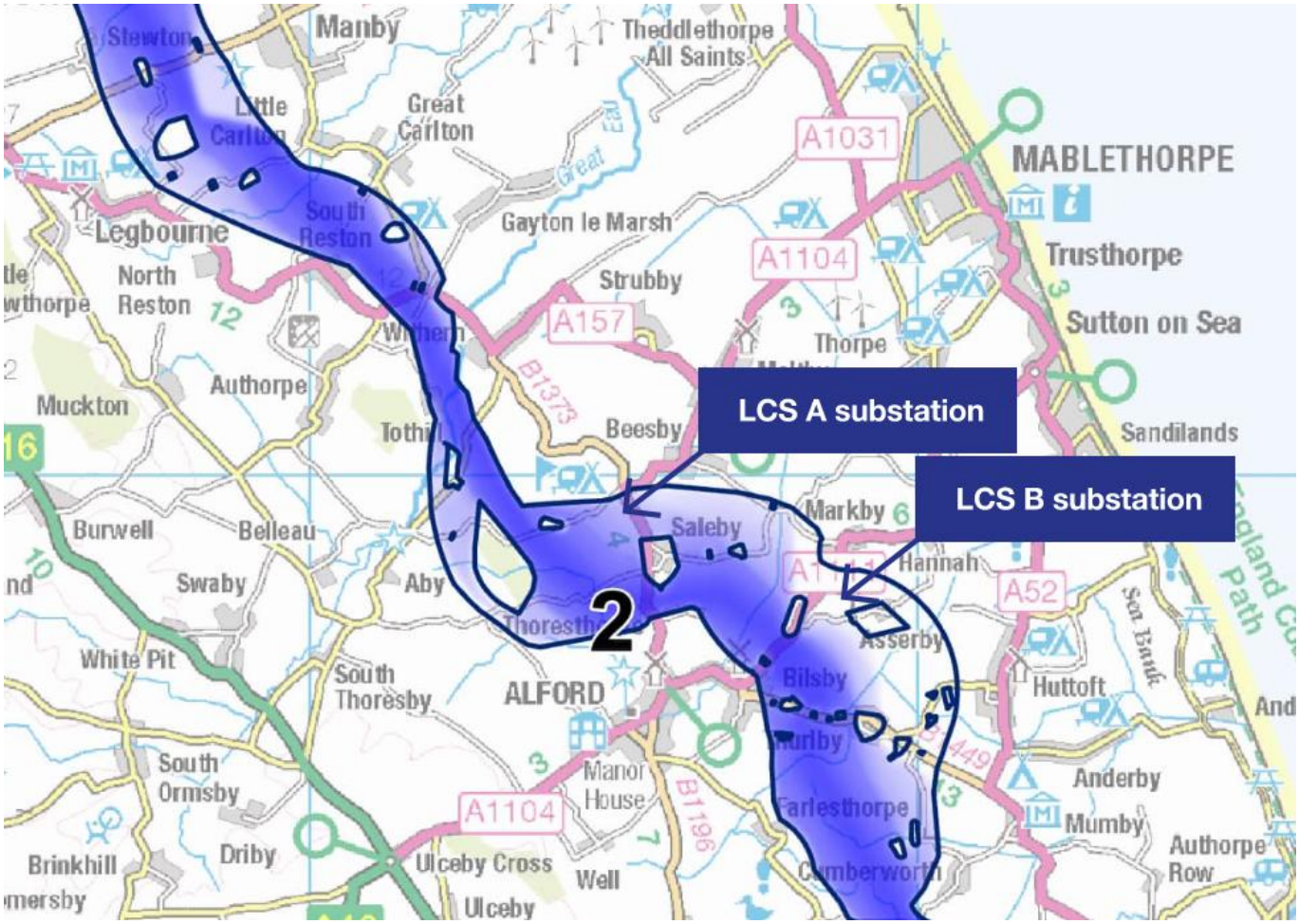
4.4 Connection

4.4.1 The Grimsby to Walpole LCSA substation location was identified as being the main access point into the National Grid and a search area around this was established with consideration of access to the national gas network, Project Union and siting of designations / constraints. The Grimsby to Walpole project is being promoted by National Grid and is currently at pre-application stage

4.4.2 Connecting directly to the NG transmission system (275 kV / 400 kV) means large volumes of MW (active power) can be exported to the transmission network at a viable cost. By contrast, a lower voltage distribution connection (132 kV and below) would not be able to support the large volume of power flows from the Proposed Development to provide supplies nationally, nor provide the balancing service to the national grid which BESS can supply. As such, the proximity and ability to connect into the national grid at high voltage is a core requirement when selecting the location for the Proposed Development.

4.4.3 The approximate location of the Grimsby to Walpole LCSA is shown at Figure 4-5.

Figure 4-5 Location of Grimsby to Walpole LCS A[6]



4.4.4 An overhead line or underground cable connection option has been considered for the Proposed Development at an early stage. Following an initial consideration of the need for multiple connections into each of the Proposed Development sites, and the visibility of an

[6] Source: National Grid Grimsby to Walpole Project 2024 Consultation Leaflet: https://www.nationalgrid.com/document/352586/download (accessed May 2025)

overhead line through the surrounding landscape in this location, an overhead line was not preferred. As such, a strategic choice for an underground only cable connection is being considered for the project.

4.4.5 Having identified the preferred strategic option for an underground cable connection, an initial consideration of cable corridors was undertaken. This consideration was based on a simple preference of being as direct as possible whilst avoiding residential property and important sites. Whilst this preference has driven the overall cable routes, an underlying requirement to link the Thermal site, BESS locations, project substation and connection into the national grid has resulted in identification of two potential underground cable connection corridors (a northern and southern route). These options remain open during scoping stage and will be refined following more detailed assessment and consultation with stakeholders.

4.5 Site Selection Factors and Constraints

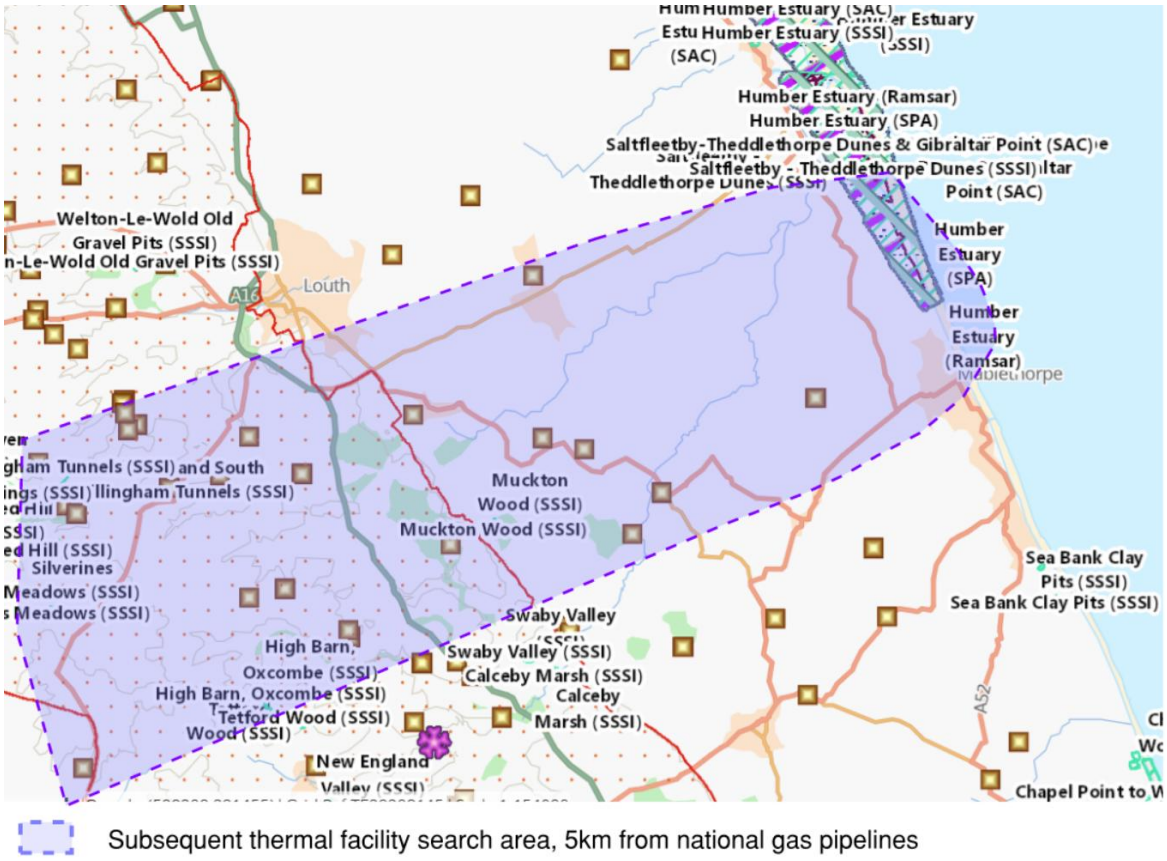
4.5.1 Within the defined area of search, the Applicant has initially considered the following factors to determine the preferred sites that are proposed for the flexible generation, BESS, project substation and cable connection route corridor.

- International and national nature conservation, cultural heritage and landscape designations.
- Other national and local designations such as Green Belt, local wildlife sites and flood risk zones.
- Physical and visual separation from properties and settlements, to reduce potential adverse impacts to amenity and local character.
- Opportunities for mitigation and enhancement taking into account space, existing habitats and land-use.
- Ease of access to the sites for construction, to reduce impacts to the local highway network and to limit disruption during construction.
- Availability of land for the project physically, including preference for land over which an option with a landowner for the Proposed Development exists - thus minimising the ultimate need for compulsory acquisition.
- Availability of water for use in electrolysis.

4.5.2 Key environmental constraints are shown in Figure 4-6. At a high level this includes a number of ecological constraints to the north and east of the initial search area associated with the Humber Estuary. Some scheduled monuments are identified, alongside the area of outstanding natural beauty (Lincolnshire Wolds National Landscape) to the west of the search area, some less extensive SSSI locations also exist to the west. Further information on these environmental constraints, and how they inform project design, will be provided in the consideration of alternatives and design evolution presented within the future ES.

4.5.3 The location of the Proposed Development has been chosen due to being able to link into the National Grid system (via the Grimsby to Walpole connection project) and the National Gas National Transmission System pipelines which run in close proximity, and nearby to a more than sufficient raw water supply from the North Sea.

Figure 4-6 High Level Search of Constraints and Designations[7]



4.6 Site Layout

4.6.1 The Proposed Development layout within each of the sites and the cable corridor will be informed by the EIA process, with consideration to environmental mitigation and enhancement opportunities. It is proposed to provide further detail of the design evolution and environmental reasons for the layouts proposed at the PEIR and final ES stage.

4.7 Technology Choices

4.7.1 A combination of flexible generation, electrolysis and battery storage is proposed, and it is anticipated that the DCO application will seek to retain optionality as to whether natural gas with carbon capture, hydrogen or a blended fuel is used for the flexible generation. This is because the future delivery of Project Union and/or CO_2 transport networks is not within the applicant's control.

4.7.2 Certain elements of the project may also not be maintained to DCO and could be discounted following future assessment.

4.7.3 The particular combination of technology choices proposed are to allow flexibility on how the project can respond to specific national energy system needs. Chapter 5 of this Scoping Report provides further information on technology choices and options.

4.7.4 Further information about project need, the consequent technology choices and the necessary optionality is proposed to be provided through the EIA and DCO application, but no other

[7] Data obtained from Defra Magic Map: https://magic.defra.gov.uk/MagicMap.html (accessed May 2025)

technology choices are considered to be reasonable alternatives and so consideration of other generation technologies is proposed to be scoped out of the EIA.

4.8 Summary

4.8.1 The applicant has taken and proposes to continue a structured approach to the consideration of reasonable alternatives for the EIA.

4.8.2 Firstly, the national need to which the Proposed Development responds has been defined: this is for a combination of low-carbon flexible generation, hydrogen production and energy storage which provide grid balancing, demand response and system frequency maintenance services.

4.8.3 Secondly, this has been used to define a specific area of search where the necessary electricity grid, gas grid and future hydrogen pipeline connections, with available capacity, are located. No further consideration of alternative sites outside this area of search is therefore proposed, as the chosen search area fulfils project requirements.

4.8.4 Thirdly, within this area of search, proposed sites for the flexible generation, hydrogen production, project substation, BESS and cable connection corridor elements of the Proposed Development have been identified and initial, broad Order Limits for EIA scoping purposes have been defined. This has been on the basis of environmental and planning constraints and opportunities, particularly designated protected sites and assets, and availability of land. Further detail of this and refinement of the Order Limits is proposed to be provided through the EIA process.

4.8.5 Fourthly, the applicant has considered whether alternative technology choices constitute reasonable alternatives to study for the EIA. The Proposed Development comprises a combination of flexible generation and battery storage technologies with hydrogen production, and is expected to retain an element of optionality in the DCO application as to whether the flexible generation element is natural-gas fired with carbon capture, or uses hydrogen fuel, or a blend, as this depends on the future delivery of Project Union and CO_2 transport networks. The particular combination of technology choices proposed, and the reasons for retaining flexibility in these, is considered the only feasible approach to meeting the defined project need. Further information about project need, technology choices and optionality is proposed to be provided through the EIA and DCO application, but no other technology choices are considered to be reasonable alternatives and so consideration of other generation technologies is proposed to be scoped out of the EIA.

4.8.6 Finally, the layout and working areas needed for each part of the Proposed Development are proposed to be considered further through the EIA process, with the PEIR and ES to document the design evolution and environmental reasons for the layout that is arrived at.

4.8.7 In summary, the Proposed Development has been subject to a high-level consideration of the requirements of the project and alternatives which has helped shape the project now submitted for scoping. This high-level consideration of alternatives is influenced by the necessary elements of the project and how these come together to form the Proposed Development as a whole, including specific project requirements, these include:

- Proximity / location of connection into the National Grid: Necessary for the project to operate / generate electricity.
- Proximity / location of connection into the National Gas Transmission Network: Necessary for the project to access natural gas or hydrogen (export and access) through Project Union.

- Sufficient land available for the project: For there to be sufficient land available to the project to accommodate necessary elements for electricity generation / operation.
- Sufficient water supply available (via the North Sea).
- A second high level consideration of the Proposed Development then included considering nationally significant designations of land which need to be avoided.

4.8.8 The Proposed Development therefore includes land sufficient to accommodate the project, in locations which are accessible to the National Gas transmission network and connection node into the National Grid, whilst avoiding national designations.

5 The Proposed Development

5.1 Overview

5.1.1 This chapter provides a description of the Proposed Development for the purposes of identifying and reporting the potential environmental impacts and likely significant environmental effects in this EIA Scoping Report. In addition, this chapter draws attention to the need for flexibility in the design process and provides a description of the application site.

5.1.2 The Theddlethorpe Flexible Generation project is a proposal for a flexible generation facility utilising natural gas or hydrogen fuelled thermal generation and two battery energy storage system (BESS) facilities, all strategically positioned at Theddlethorpe in Lincolnshire.

5.1.3 The main Theddlethorpe site may comprise turbines or reciprocating gas engines to generate electricity, with a potential electrolysis facility to produce hydrogen and desalination plant to provide a reliable water supply. The turbines or engines could be fuelled by natural gas from National Gas' adjoining network, with carbon capture if appropriate, or could be fuelled by hydrogen without carbon capture (hydrogen is a zero-carbon fuel at point of combustion). The works at the main Theddlethorpe site are collectively referred to as the Theddlethorpe Thermal and Electrolysis Site (Theddlethorpe TES) within this report. The Theddlethorpe TES will be connected by underground cable to two separate BESS locations, one at Strubby Airfield and the second at Stain Lane, and to a customer substation near Woodthorpe, before connecting into the proposed National Grid Lincolnshire Connector Substation A (LCS A) which is proposed as part of the National Grid Grimsby to Walpole connection project.

5.1.4 The Scoping Boundary for the Proposed Development is shown at Appendix A, an annotated version of this is provided at Appendix B.

5.1.5 Further details regarding the form of the Proposed Development will be included within the ES, consistent with the Order Limits, supporting a future application for Development Consent.

5.1.6 Due to the amount of electricity generated by the project, it will constitute an NSIP under Part 3 of the Planning Act 2008. As also confirmed within Chapter 2 of this document, the project constitutes EIA development as set by the EIA Regulations.

5.1.7 The description of the Proposed Development reflects the current understanding of the design parameters. As the design continues to evolve during the course of preparation of a DCO application, an updated description of the Proposed Development will be included within, and refined for, the PEIR. However, at this stage, the potential physical scale, design and construction works for the Proposed Development have been defined on a ‘maximum case’ basis in order to support robust scoping of impacts.

5.1.8 Between statutory consultation and submission of DCO application, further changes will be included in the ES, confirming the details for which development consent will be sought, including final design parameters and any limits of deviation.

5.1.9 Construction and decommissioning methods, although largely to be determined by appointed contractor(s), must be carried out within the assessed parameters for the Proposed Development and in line with the associated management plans. The future ES will therefore clearly outline construction and design parameters, alongside works involved for the Proposed Development. The EIA will ensure a clear understanding of assumptions and cumulative construction impacts to represent a 'worst case', ensuring a robust assessment of the likely significant environmental effects.

5.2 Assessment Limitations

5.2.1 As noted above, a number of design matters will become clearer as the Proposed Development progresses through the pre-application stage. There will however be details which will only be confirmed following consent ultimately being granted for the project, particularly around construction and detailed design. A degree of flexibility will therefore form a necessary part of the Proposed Development at pre-application and application stage so as to not restrict delivery of the project by constraining parameters too tightly. One flexibility typically used for a DCO will be the setting of "limits of deviation" within which a project will be delivered, and a similar approach will be taken for the Proposed Development. There is the additional need to maintain flexibility at an early stage of the project as a choice of type of fuel for the thermal element is considered, alongside potential battery technologies and cable route options within the overall cable corridor defined for EIA scoping.

5.2.2 To ensure flexibility of design, in-line with the above approach, the Applicant will use the 'Rochdale Envelope' approach with the identification of reasonable worst case scenarios for the purpose of assessment. The Rochdale Envelope is an established method of undertaking EIA where details are not fully resolved at point of application submission. The Planning Inspectorate Advice Note Nine[8] provides specific guidance concerning the use of Rochdale Envelope during the progression and assessment of NSIPs. The Advice Note recognises that there may be project design aspects which are not fixed and therefore that it will be necessary for the EIA to assess likely worst-case variations of a design to ensure that all foreseeable significant environmental effects will be assessed. In doing so Advice Note Nine states that the description of the development within the ES must be sufficiently certain to allow a meaningful assessment to be undertaken.

5.2.3 Flexibility around design changes may also be useful, this is particularly the case with regards to different types of technologies and that ongoing design refinement will be part of making the choice between these, informed through assessment. It will be important that a lack of flexibility in a DCO does not restrict the ability to accommodate future technological advancements. This is particularly important for the Proposed Development with the use of hydrogen and carbon capture technologies, within which designs are evolving. Furthermore, there is a rapid pace of change in BESS technologies and improvements to BESS technology is likely to continue as the Proposed Development moves toward application submission.

5.2.4 It is therefore necessary for the EIA to assess an 'envelope' within which the works will take place. To remain in accordance with the EIA Regulations, it will be essential that the parameters are defined to ensure that 'likely significant environmental effects' are identified, rather than unrealistically amplified effects, which could be deemed unlikely. These parameters will be considered in detail by the competent experts in the PEIR and ES to ensure the realistic 'worst case' effects of the Proposed Development are assessed for each potential receptor.

5.2.5 The envelope and parameters for the purpose of this EIA Scoping Report are set out within this Chapter and within Chapter 7. Within these parameters the broad locations for the elements of the project are set. However the specific arrangement of the elements of the Proposed Development, including specific locations for mitigation and / or enhancement measures, will be refined as the design for the Proposed Development evolves. For the purpose of Scoping, the reasonable worst-case scenario for each receptor is considered.

[8] Planning Inspectorate Advice Note Nine, accessed September 2025. https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-advice-note-nine-rochdale-envelope/nationally-significant-infrastructure-projects-advice-note-nine-rochdale-envelope

5.2.6 Following EIA Scoping stage, design parameters will be further developed for statutory consultation and presented within the PEIR. Final parameters will be included, alongside necessary limits of deviation, within the DCO and works plans and assessed within the ES.

5.3 Scoping Boundary

5.3.1 The site is located entirely within the administrative boundary of East Lindsey District Council within the county of Lincolnshire (grid reference 548371, 387454). The total site area is approximately 1,004 hectares. The area of the Proposed Development will be subject to change as the design and EIA progresses (see section 5.2).

5.3.2 The Scoping Boundary includes all elements of the Proposed Development as these are known at the scoping stage. This boundary provides the expected area of land potentially required for the construction, operation, maintenance, and decommissioning of the Proposed Development, which includes land required for permanent and temporary purposes, and is shown at Appendix A. The Scoping Boundary shows the envisaged current maximum extent of temporary and permanent land take for the Proposed Development, including the potential cable route options between each parcel.

5.3.3 In broad terms, the Scoping Boundary extends from the Theddlethorpe TES in the east to Woodthorpe in the west. Underground cable routes link the Theddlethorpe TES to the two BESS locations (Stain Lane and Strubby Airfield) and to a project substation near Woodthorpe, with onward underground cables to the south of Woodthorpe, where the Proposed Development will connect into the proposed National Grid Lincolnshire Connector Substation (LCSA).

5.3.4 The Scoping Boundary has been drawn to avoid main constraints and settlements where possible, in-line with alternatives considerations (see Chapter 4 to this report).

5.4 Site Context

5.4.1 The land within the Scoping Boundary predominantly consists of agricultural fields, hedgerows and some mature trees; the former airfield at Strubby and the former Theddlethorpe Gas Terminal site being different from this. Strubby Airfield operated as RAF Strubby from 1943 to 1972, some former airfield structures are now in alternative uses and a northern section of the RAF Strubby perimeter track is in use as an airstrip. Theddlethorpe Gas Terminal began construction in 1972 to receive gas from the Viking gas field. The gas terminal was closed in 2018 as offshore gas production was re-routed or ended. Terminal buildings have since been demolished and the former terminal site is now largely cleared to ground level.

5.4.2 The area between the main sites for the Proposed Development is being investigated for underground cable routes, access points and temporary construction compounds. The location of these elements will be defined as the project design progresses.

5.4.3 The scoping area and surroundings is characterised by flat fenland rising from Theddlethorpe in the East to Strubby Airfield in the West. Beyond Strubby Airfield, surrounding land gradually rises to form the more undulating and elevated Wolds to the west. The wider area is rural in character with small settlements and a limited road network locally, Mablethorpe is the nearest large settlement, the northern tip of which is located southeast of the Theddlethorpe site with holiday parks covering much intervening land. Holiday parks and windfarms are also a notable feature locally.

5.4.4 The area is underlain by chalk, which is highly permeable and forms an aquifer, with water known to be abstracted locally from the chalk for water supply.

5.4.5 There are a number of ecological designations to the northeast of the Proposed Development associated with coastal and dune areas to the north of Mablethorpe.

5.4.6 The Theddlethorpe TES and Stain Lane site are mostly within Flood Zone 3 (potential risk of flood). Woodthorpe and Strubby Airfield are not within an area at risk of flooding (Flood Zone 1).

5.4.7 There are no known areas of ground contamination across the Proposed Development site.

Designated Sites

5.4.8 The following internationally and nationally designated sites are located within 5 km of the Scoping Boundary:

- Saltfleetby – Theddlethorpe Dunes and Gibraltar Point SAC located east of the Theddlethorpe TES. Designated due to ecological status of dunes and habitats.
- Saltfleetby – Theddlethorpe Dunes SSSI located east of the Theddlethorpe TES. Designated for established vegetation dependant on flats, dunes, and marsh.
- Humber Estuary Ramsar located east of the Theddlethorpe TES. Designated for ecological status, supporting a number of important habitats for bird and seal populations.
- Lincolnshire Coronation Coast NNR located east of the Theddlethorpe TES. Designated for rich variety of sand dunes, salt marshes, mudflats and freshwater marshes.
- Humber Estuary SPA is located immediately east of the Theddlethorpe TES and is designated due to its estuarine status and condition, and extensive mudflats and sandflats.
- Greater Wash SPA is located east of the thermal generation site and is designated for its bird populations.

5.4.9 No listed buildings exist within the Scoping Boundary, a number of listed buildings exist in the wider area and within 5 km of the site.

5.4.10 A single Scheduled Monument ‘Moated Site’ (Historic Environment Record: 1017375) exists within the Scoping Boundary, located at Stain Lane (grid reference: 546868, 384696).

5.4.11 The project does not sit within a designated landscape at national or local level, the Lincolnshire Wolds National Landscape exists approximately 5 km to the southwest of Strubby Airfield.

5.4.12 There are nationally and locally designated sites beyond the scoping boundary and these are identified in the topic specific sections of this Scoping Report where relevant.

Access and Rights of Way

5.4.13 There are a number of local roads nearby, including crossings necessary for the cable route, with linkage to site accesses during construction and operation. Main routes within the local area include:

- A1031: This route runs north-south to the west of Mablethorpe, linking Mablethorpe with villages to the north.
- A1104: Road runs through Mablethorpe, connecting it to Alford and other nearby towns.
- A157: This road runs west of Mablethorpe, leading towards Louth, north of Strubby Airfield.
- Stain Lane: Rural road linking the A1031 to the A157.
- B1373: Links the settlement of Withern to the A1104 to the south of Strubby Airfield.

5.4.14 A number of public rights of way cross the Scoping Boundary or are in close proximity, these are:

- PROW Public Footpath: ThSH/253/1 runs east-west to the south of the Theddlethorpe site
- PROW Public Footpath: Mabl/311/1 to the south of Stain Lane
- PROW Public Bridleway: Stru/526/1 at Strubby Airfield

- PROW Public Footpath: Malt/257/1 which crosses the southern cable route option

Existing Infrastructure

5.4.15 Notable features which will need to be considered during detailed design include:

- High pressure National Gas transmission pipelines associated with the former Theddlethorpe Gas terminal, these cross the site at Theddlethorpe and travel further to the southwest, crossing the Scoping Boundary once more at Stain Lane.
- Local service routes which may interact with the project, including the local road network and utility connections.

Context Considerations

5.4.16 Interaction with the site context will form part of the detailed design considerations for the Proposed Development and will be an important consideration for future EIA and DCO.

5.5 Proposed Development

5.5.1 The Proposed Development is at an early stage and a detailed design is not yet progressed. However, at the present time, the Proposed Development comprises the following key components:

- Thermal generation facility at Theddlethorpe (either CCGT or Reciprocating Gas Engines) fuelled by natural gas (with carbon capture) or hydrogen
- Electrolysis hydrogen production facility at Theddlethorpe
- Desalination facility and associated water pipeline into the North Sea
- BESS at Stain Lane
- BESS at Strubby Airfield
- Project substation at Strubby Airfield or to southwest of Woodthorpe
- Underground cable connection linking thermal generation at Theddlethorpe to BESS sites, project substation and to the proposed National Grid Grimsby to Walpole project (approximately 10km in total)
- Works to connect into proposed National Grid Grimsby to Walpole LCS A substation
- Works to the highway to facilitate vehicular access, including permanent accesses to facilitate operation and maintenance
- Temporary works associated with the construction of the Proposed Development such as site compounds, haul roads, laydown areas and construction access highways works
- Potential utility diversions and / or modifications to facilitate construction
- Landscaping, habitat management, biodiversity enhancement and amenity improvements
- Ancillary infrastructure works, including any necessary demolition, cabling, connection to the national gas network, boundary treatments, security equipment, lighting, landscaping, access tracks, earthworks, surface water management, and any other works necessary to enable the Proposed Development

5.5.2 The nature of the Proposed Development is that it is able to continuously operate as required by the national grid, potentially supplying electricity all day for every day of the year. In practice, the need for the operation (generation) of the thermal facility, electrolysis or the operation of the BESS, will be determined by the demand for supplies on the national grid.

5.5.3 Each of the components outlined above and their associated key features are shown at Appendix B and are set out in in more detail below.

Theddlethorpe

5.5.4 The Theddlethorpe site comprises a collection of fields adjacent (to the north and west) of the former Theddlethorpe Gas Terminal. The site extends to some 28 ha and is proposed for flexible generation (thermal generation) alongside areas for biodiversity net gain or mitigation.

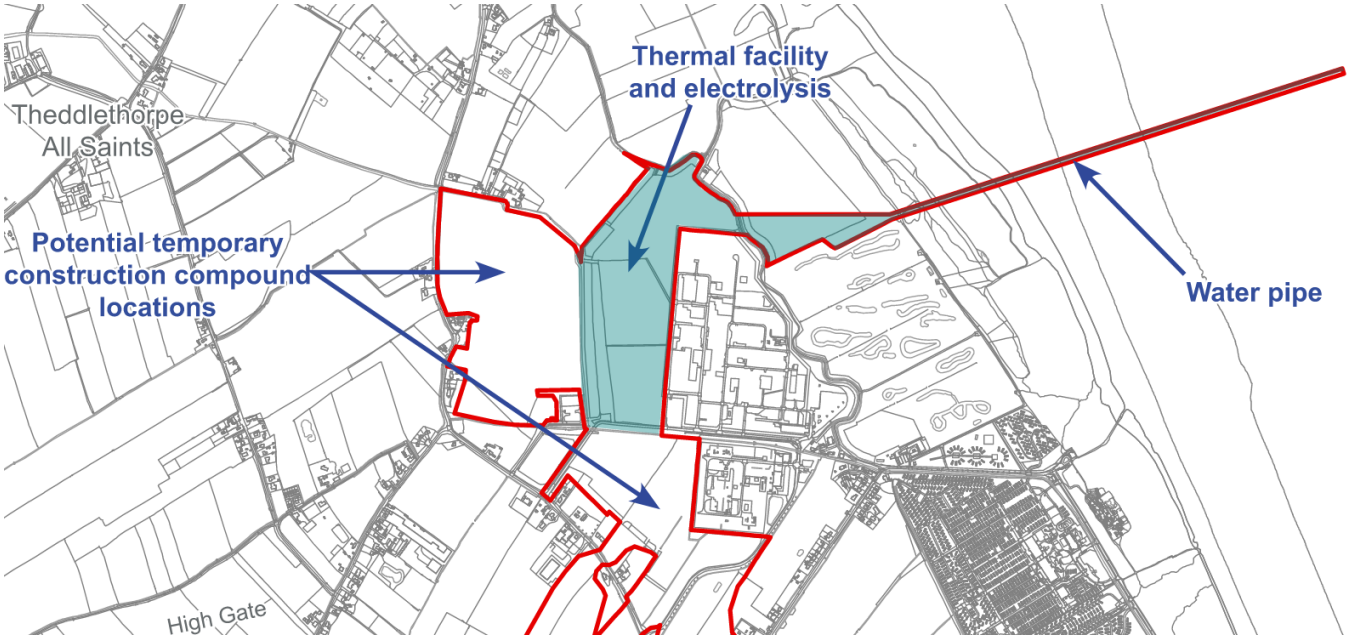
5.5.5 A thermal generation facility at Theddlethorpe will generate up to 1.5 GW of electricity through the combustion of either natural gas or hydrogen. The optionality to utilise natural gas or hydrogen as a fuel source will be maintained through to DCO application stage unless project specifics in advance of this dictate otherwise. The facility will comprise either a CCGT or Reciprocating Gas Engines and the optionality between either option will be maintained through to DCO application stage again unless project specifics in advance of this dictate otherwise.

5.5.6 There is an opportunity to co-locate hydrogen production onsite, with an electrolysis facility drawing water from the North Sea. Sea water would pass through a desalination plant, providing filtered water for use in electrolysis for the production of hydrogen.

5.5.7 The route for operational access into the Theddlethorpe site is anticipated to be through the existing access road onto the A1031 but further assessment will be necessary as to whether this is suitable or an alternative is required over land to the west or south of the Theddlethorpe site. Discussions with Lincolnshire Council, and Highways England if necessary, will be undertaken to confirm the access strategy and arrangements for both the construction and operational phases.

5.5.8 The location of the Theddlethorpe site is shown at Figure 5-1 below:

Figure 5-1: Theddlethorpe site location



CCGT

5.5.9 The thermal facility could comprise a CCGT. A choice of the turbine form and manufacturer has yet to be made. This choice will influence a number of factors which in term will change the likelihood for significant environmental impacts to occur. These factors will be around emission levels and type, any noise level produced and the footprint and height of the facility itself. A worst case maximum is therefore set out within this project description, in line with the Rochdale Envelope approach discussed within Section 5.2 of this report.

5.5.10 The choice of fuel source for the thermal generation has a bearing on the equipment necessary to be included. The turbines will be contained within a building regardless of fuel choice. However, should the fuel type be natural gas then carbon capture elements to mitigate CO_2 emissions may be required. Fuel choice will also determine the height of the chimney stacks associated with the thermal generation facility, additional height will be necessary to accommodate the necessary components for carbon capture to happen. Whilst there is uncertainty around the absolute dimensions of components onsite, until design evolution has progressed, the worst case scenario (highest) parameter of the chimney stack is 110 m under a natural gas (or mixed) fuel choice or 85 m under a hydrogen fuel choice. This difference in height is solely based on the accommodation of carbon capture technology, as hydrogen combustion does not emit CO_2 when it is used as a fuel, making it a zero carbon fuel at the point of combustion. The height of chimney stack, and other CCGT elements, will be an area of design refinement before submission of an application for DCO, with potential effects assessed through the ES.

5.5.11 The CCGT thermal generation facility will have a cooling water requirement in order to operate, a worst case maximum requirement for operation is considered to be 63000 l/s. Water will be supplied by pipeline from the North Sea with desalination facility (discussed in more detail below). The amount, source and approach to obtaining cooling water is a matter for refinement during preparation of DCO with potential environmental effects to be reported in the ES.

5.5.12 Under a natural gas fuel source option, CO_2 would be captured onsite and then transferred into a CO_2 storage project outside of the Proposed Development. A CO_2 pipeline link to a nearby carbon capture storage scheme or other transfer of CO_2 would be included within the Proposed Development if required. No CO_2 is proposed to be stored onsite. At scoping stage, under the Rochdale Envelope approach, it is assumed that there will be a visible plume created by water used in the cooling of the thermal facility.

5.5.13 The Theddlethorpe site once operational will provide employment. Whilst the exact number of future operational employees has yet to be determined, it is anticipated that the facility will create employment for at least 116 full-time equivalent (FTE) personnel. Parking for the employees will be accommodated within the Theddlethorpe site. During construction, worker numbers would be well in excess of this albeit the total number will be dependent on phasing of construction as it is unlikely that all will be required onsite at the same time.

5.5.14 The cooling design for the CCGT is yet to be determined and will be considered further as the Proposed Development design evolves through future PEIR and EIA stages. At scoping stage, under the Rochdale Envelope approach, it is assumed that there will be a visible plume created by water used in the cooling of the thermal facility.

5.5.15 For the purpose of this EIA Scoping Report, i.e. to give initial consideration to potential for likely significant impacts, an outline design envelope for the proposed CCGT has been defined. This envelope (see Chapter 7 for details on approach) with this chapter (5) setting out relevant parameters.

Reciprocating Gas Engines

5.5.16 Instead of using CCGT (discussed above) a configuration of gas engines could be utilised at the TES instead. The engines are smaller in scale than the CCGT and have a lower power output. As such, although smaller, a greater number of these would be required to provide the same output as the CCGT (up to 1.5 GW). The engines could be powered by natural gas, or hydrogen, with hydrogen combustion being less efficient (and potentially requiring more engines) to achieve 1.5 GW generation than that for a natural gas option.

5.5.17 There are various types of reciprocating gas engines which could be used, the size of which typically varies their output. As such, to achieve 1.5 GW there would need to be fewer of the larger type of engines (with a larger generation capacity individually) or more of the smaller type (with a lower generation capacity individually). Use of the larger type engines would require approximately 60 engines onsite if using natural gas or 80 if using hydrogen given a lower efficiency with the hydrogen option. If utilising the smallest engine type available there would be up to 350 smaller type engines to provide the same 1.5 GW generation capacity as the larger type engines.

5.5.18 The engines themselves sit within a container building; an exhaust chimney stack provides for the release of post combustion gasses. The tallest elements of the gas engines will be the exhaust stacks, which will be informed by emissions and dispersion modelling following scoping stage. In terms of height, the tallest stacks associated with the largest gas engines will not exceed those of the CCGT, the stack height of the CCGT is therefore taken as the worst-case parameter considered within this Scoping Report in-line with the approach set out at Chapter 7. A final decision on the configuration and the size of engines to be use will be made following scoping and in advance of DCO application preparation.

5.5.19 The cooling design for the engines is yet to be determined and will be considered further as the Proposed Development design evolves through future PEIR and EIA stages. At scoping stage it is assumed that the engines will be air cooled by radiators, so no visible plume would be created.

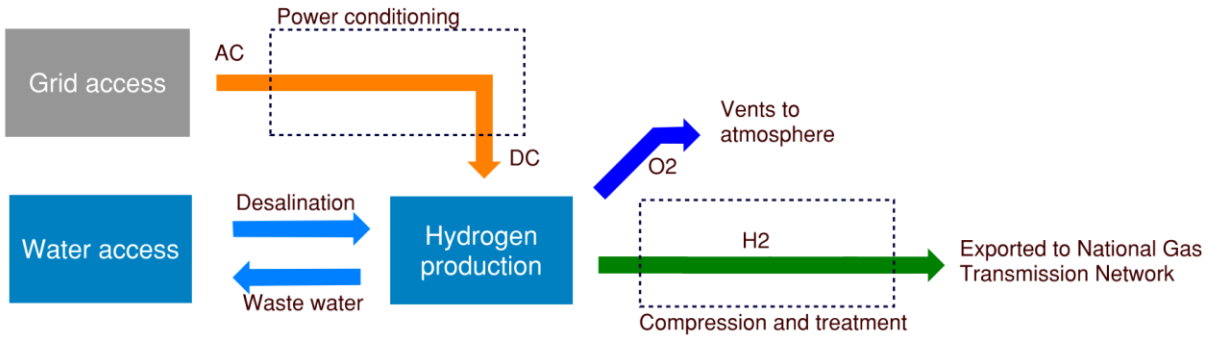
5.5.20 Once operational, whilst the exact number of future operational employees has yet to be determined, it is anticipated that the facility will create similar employment levels as for the CCGT, that being at least 116 full-time equivalent (FTE) personnel. Parking for the employees will be at the Theddlethorpe site. During construction, worker numbers would exceed those of operation albeit the total number will be dependent on phasing of construction as it is unlikely that all will be required onsite at the same time.

5.5.21 With a decision still to be taken with regards to the type of engines to be used, it has been necessary to consider the worst-case scenario relating to the gas engines at scoping stage. Therefore, the maximum number of engines (up to 350) is considered within this scoping report with these being air cooled by fans in-line with the approach set out within Chapter 7 of this Scoping Report.

Electrolysis

5.5.22 The electrolysis plant would produce hydrogen from water by electrolysis using mainly renewable energy, this is sometimes called ‘green hydrogen’. The electrolysis process uses electricity to split water (H2O) into hydrogen (H) and oxygen (O), as illustrated at Figure 5-2 below:

Figure 5-2: Hydrogen Production Diagram



5.5.23 The electricity would be supplied from a connection into the Grimsby to Walpole National Grid connection project. Taking supply from this helps the production of hydrogen as a solution to balancing the electricity grid, storing excess energy which would otherwise not be used. The hydrogen would be exported from site via repurposed National Gas pipeline infrastructure and onward to help decarbonise industrial centres across the UK. The hydrogen produced may also be combusted onsite by the thermal generation elements discussed earlier in this section to produce electricity.

5.5.24 Hydrogen may be produced using either proton exchange membrane (PEM, also known as polymer electrolyte membrane) electrolysis or alkaline electrolysis technology for the electrolyser modules, or a combination of both technologies in different phases of the development. Innovation continues within the electrolysis industry, so further advancements are expected. Later phases may deploy variants to these technologies. All technologies involve enclosed hydrogen production in a series of electrolysis cells housed within a building. The inputs to the electrolysis cells are fresh water and electricity and the outputs are separate streams of hydrogen and oxygen at the cathode and anode of the cell respectively.

5.5.25 By the early 2030s, a new hydrogen transmission backbone (repurposing existing pipes) is expected to have been developed under National Gas's 'Project Union', enabling a pure hydrogen supply to industrial clusters across the UK as well as for long duration energy storage. The electrolysis facility at Theddlethorpe could then become a major source of hydrogen for supply via the Project Union pipeline[9].

5.5.26 PEM and alkaline electrolysis cells are both flexible systems that are well suited to scaling up production over time in phases, initially for blending into the gas grid and then to supply the Project Union pipeline in due course.

5.5.27 It is not proposed that hydrogen would be stored onsite, all hydrogen produced would be transported directly into the National Gas network or combusted via the thermal facility onsite.

5.5.28 Water to supply the electrolysis facility is discussed further below.

Desalination, Water Treatment and Water Pipe

5.5.29 To source water necessary for cooling and the electrolysis facility, a desalination plant and associated water abstraction pipeline is proposed. The water pipeline will include for water abstraction from the North Sea and discharge of saltwater brine following desalination and electrolysis processes. The discharge of saltwater brine will be of a higher salinity than the seawater abstracted. The pipeline will comprise two pipes of 48 inch diameter (1220mm), one pipe will be for water intake and the second for outflow back into the North Sea. The pipeline

[9] Further discussed within Chapter 4 to this report.

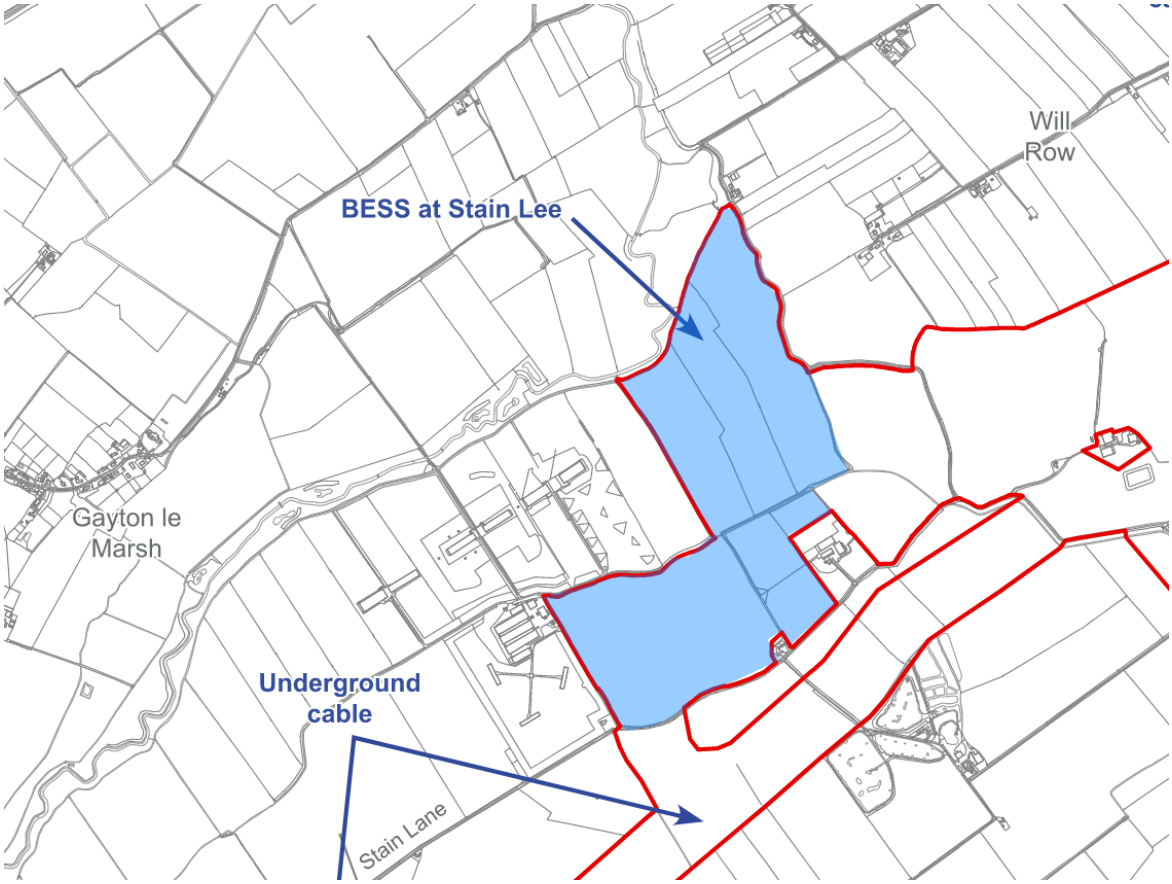
would be installed via HDD until beyond the foreshore and past Mean High Water Springs so to not disturb coastal onshore or offshore features. Filters or multiple smaller pipes may be used to disperse brine following use by the facility, such measures will be considered during detailed design and assessed within the ES.

5.5.30 The desalination facility will comprise either a multi-stage flash distillation or a reverse osmosis method. A multi-stage facility includes a method which “flashes” a portion of water into steam in multiple stages, each containing a heat exchanger and condensate collector. At each stage water is evaporated and condensed providing clear water output. A reverse osmosis process uses a semi-permeable membrane to separate water molecules from other substances. Seawater is passed through selective membranes at pressure, these membranes reject and capture larger molecules, whilst accepting smaller molecules (e.g. water) which passes through. Reverse osmosis method is a more common method of desalination to the multi-stage facility approach, due to lower energy demands involved. A choice between use of a multi-stage flash or osmosis process will be made in advance of EIA preparation. The water treatment and desalination plant will be of a scale considerably smaller, and ancillary, to the CCGT, engines or electrolysis facility.

BESS at Stain Lane

5.5.31 The BESS at Stain Lane would connect into, and be charged by, the project substation near Strubby Airfield. The location comprises a number of fields midway between the Theddlethorpe site and Strubby Airfield and extends across some 130ha. The location of the Stain Lane BESS site is highlighted at Figure 5-3 below:

Figure 5-3: BESS Stain Lane Location



5.5.32 Access to this site would be via Stain Lane to the south. An access track may be necessary from Stain Lane depending on the areas of the site which need to be accessed during construction or operation. Discussions with Lincolnshire Council will be undertaken to confirm the access strategy and arrangements.

5.5.33 A significant amount of land has been identified here and only a portion would be used for BESS development. The remainder of the Stain Lane location would be used as construction compounds during scheme construction phases and potentially for biodiversity net gain enhancements. Areas will also be identified for ecological mitigation, which will be confirmed as the design for the site progresses following scoping.

5.5.34 BESS themselves are designed to provide peak supply and grid balancing services to the electricity grid. This is by primarily allowing excess electricity generated to be stored in batteries and dispatched when required onto the national grid. It may also import surplus energy from the electricity grid when available supply exceeds demand.

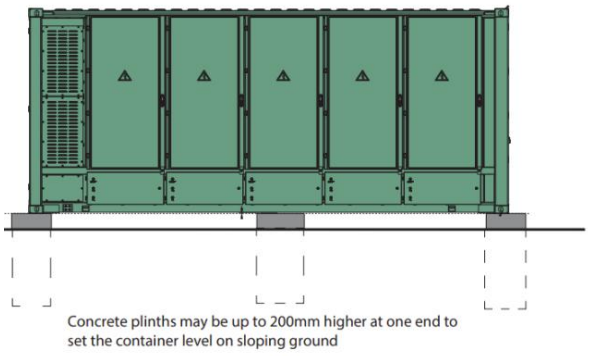
5.5.35 At Stain Lane the BESS will comprise an enclosure for the BESS units themselves, which will contain all associated equipment such as inverters, switchgear, transformers, monitoring and control systems, cables and water storage tanks. Whilst some voltage control equipment will be

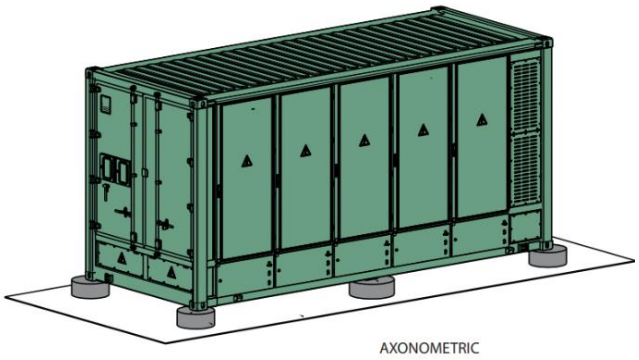
necessary at this location, the main project substation is intended to be located near Strubby Airfield and Woodthorpe.

5.5.36 The battery units themselves are akin in appearance to shipping containers. The colour palette for these containers will be developed in discussion with stakeholders as the project design evolves after scoping. The dimensions of the BESS containers are an approximate 2.6m width, 9.2m length and 2.9m height. The appearance of BESS containers is akin to a shipping container, example designs for the BESS containers are shown below (Figures 5-4 and 5-5).

Figure 5-4: Example BESS Container (1)

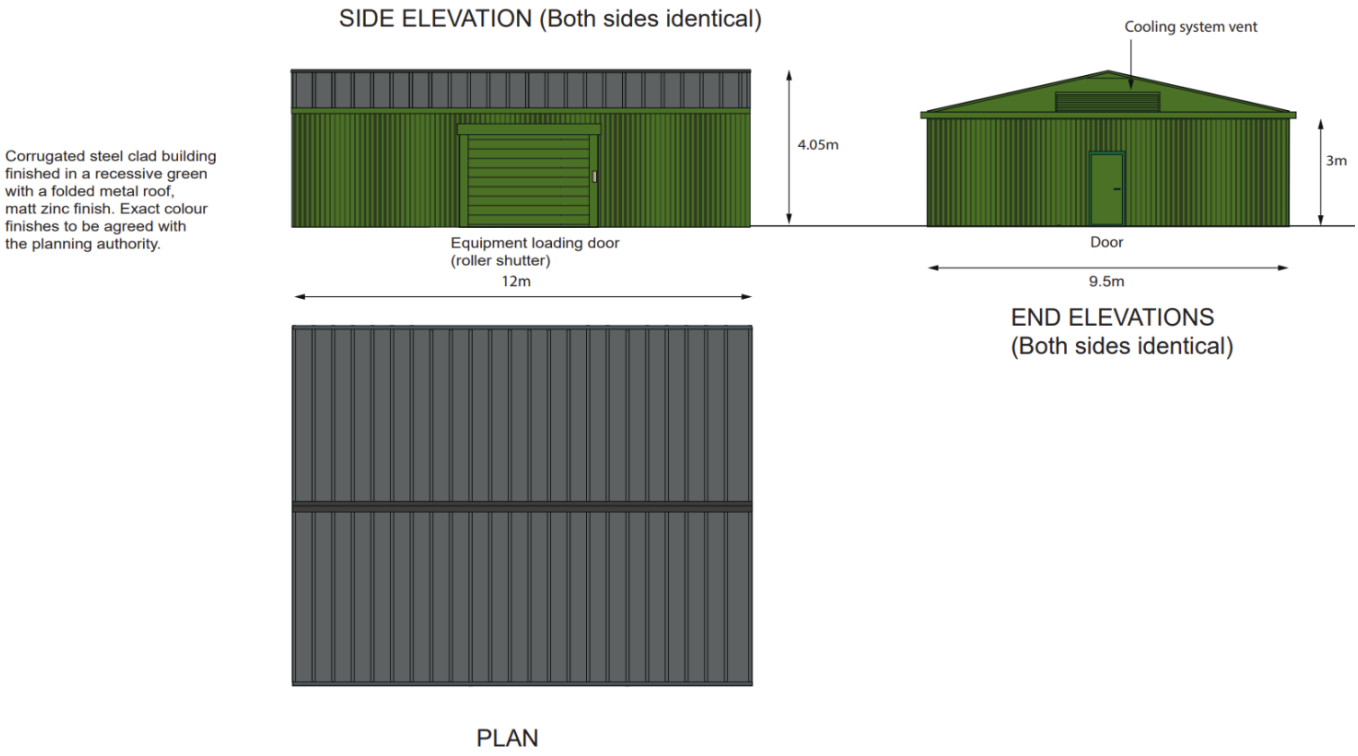
Figure 5-5: Example BESS Container (2)





5.5.37 The inverter buildings take an appearance of an agricultural shed. The dimensions of the Inverter Buildings are an approximate 9.5m width, 12m length and 4m height. An indicative design for an inverter building (to house the inverters) is shown on Figure 5-6 below.

Figure 5-6: Indicative Inverter Building Design



5.5.38 A control room distant from the BESS location will manage the day to day operation remotely, albeit there may be the need for occasional visits for site maintenance. For use during these occasional visits, an onsite control and welfare unit will also be provided, which would have an appearance similar to the BESS units themselves.

5.5.39 The BESS location will be lined with an impermeable layer to control runoff water quality. In operation, the BESS facility would therefore not have any process discharges to land, surface or groundwater other than clean rainwater runoff.

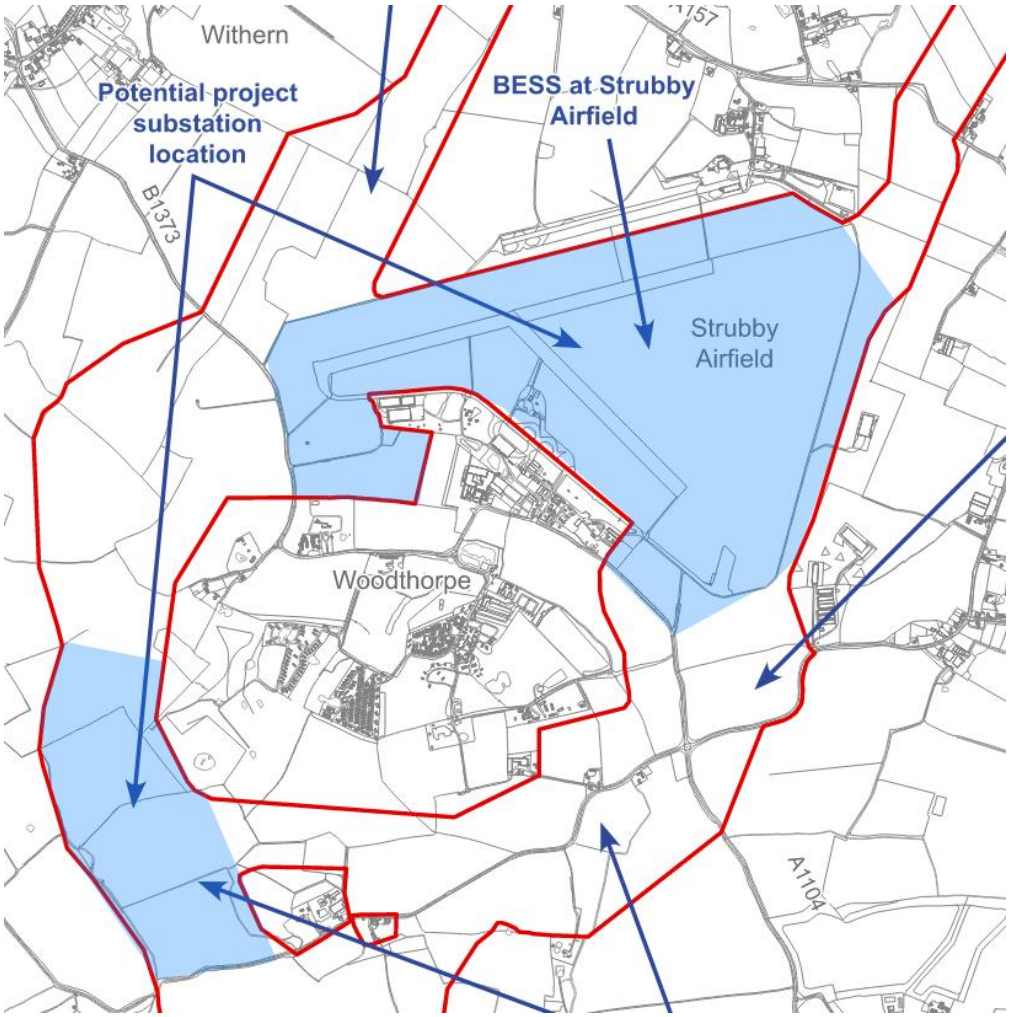
5.5.40 The configuration of the BESS will also be refined following scoping, in discussion with stakeholders and based upon environmental and technical factors apparent with this site. The BESS technology to be used will also be refined following scoping, once the constraints of the site have been investigated. The BESS may be lithium based or other technology. The location of the BESS element at the Stain Lane site will be determined as the design of the project progresses with further detail presented in the ES.

BESS at Strubby Airfield and Project Substation

5.5.41 The Strubby Airfield site sits on level land to the south of the village of Strubby and north of Woodthorpe. The site is the location of a former airfield which was in use during the during the latter half of World War II as RAF Strubby and continued in use up to the early 1970s by the RAF.

5.5.42 The Strubby Airfield BESS will include identical battery type, considerations and installation methods as the Stain Lane BESS discussed above, albeit with potential addition of the Project Substation within the Airfield site or to the southwest of Woodthorpe. The site at Strubby Airfield and potential Project Substation location is highlighted at Figure 5-7 below:

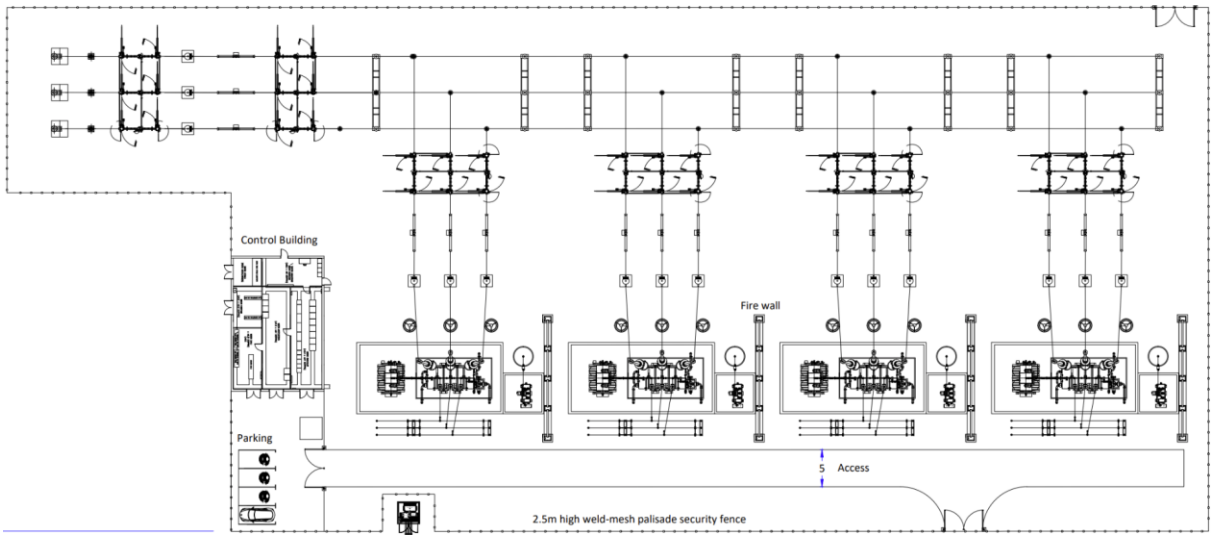
Figure 5-7: Location of Strubby Airfield BESS and Potential Project Substation Locations



5.5.43 The Strubby Airfield site extends to some 45 ha and will be the location for a BESS facility. A project substation may also be located within or near the Strubby Airfield site or to the southwest of this. In addition to the BESS elements listed for the Stain Lane BESS site, the Strubby Airfield site or land to the southwest of Woodthorpe may include the Project Substation, with switchgear and transformers to ensure voltage control into the national grid from the Proposed Development. The substation will serve the development by connecting the Thermal and BESS elements together and linking these to the proposed National Grid LCS A by an underground cable. The exact design of the project substation will be refined following scoping and presented in more detail within the PEIR.

5.5.44 An indicative design of a Project Substation is provided below at Figure 5-8:

Figure 5-8: Indicative project substation layout



5.5.45 As with Stain Lane, a larger amount of land has been identified beyond what is physically required to accommodate proposed infrastructure; only a portion would be used for BESS or substation development, the remainder could be used as construction compounds during scheme construction phases and potentially for biodiversity net gain enhancements. Areas may also be identified for ecological mitigation, which will be confirmed as the design for the site progresses following scoping.

5.5.46 Access will be taken from the B1373 road, either from the south or west. Access tracks may be required during construction or operation depending on the layout of the site. Access arrangements will be subject to detailed design following Scoping stage and subsequent discussions with Lincolnshire Council.

5.5.47 The configuration of the BESS will be refined following scoping, in discussion with stakeholders and based upon environmental and technical factors apparent with this site.

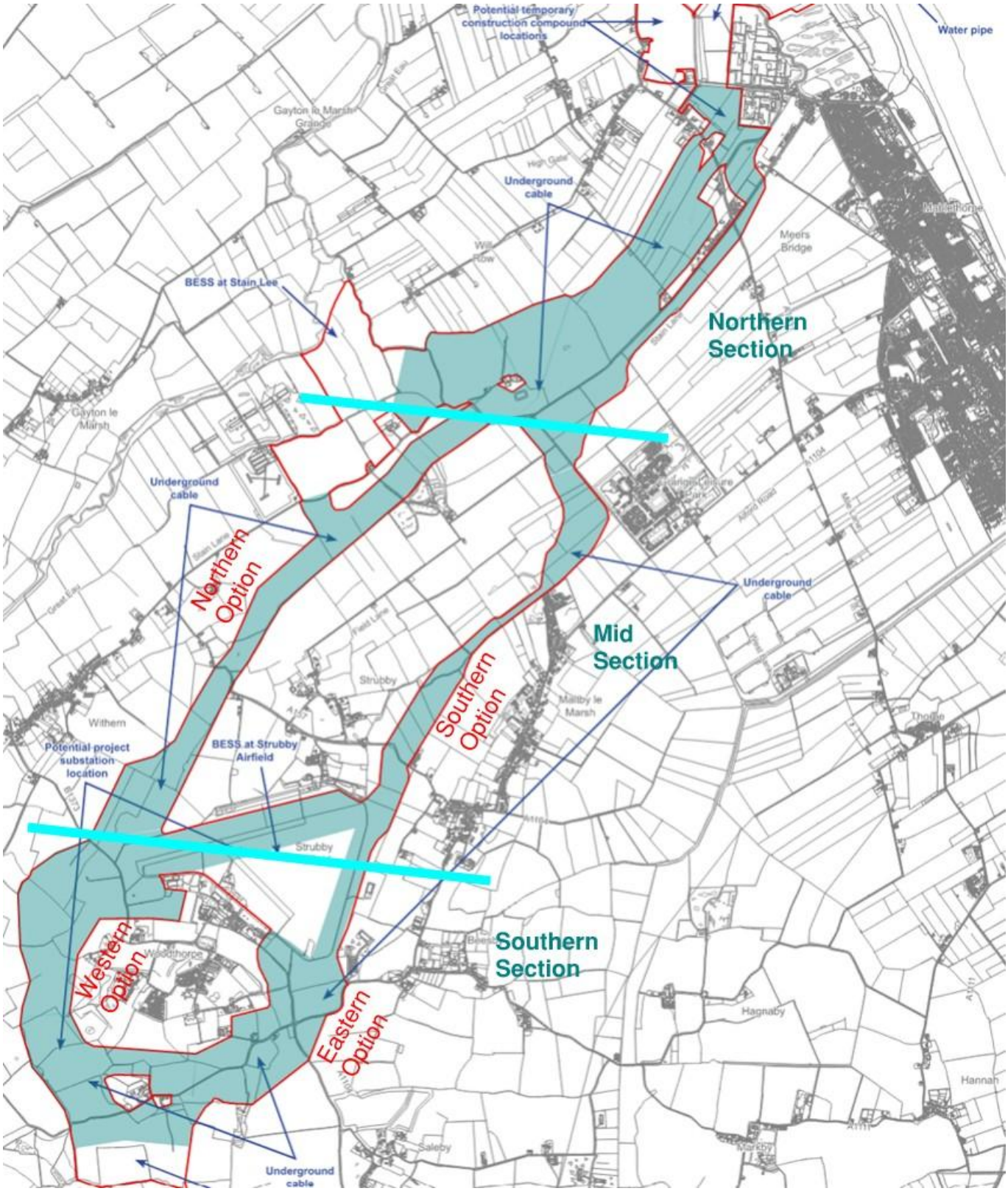
5.5.48 The separate airstrip maintained at Strubby North Airfield, using a section of resurfaced airfield perimeter track, is not within the Scoping Boundary.

Underground Cable Connection

5.5.49 The proposed underground cable route connects the three main sites for the Proposed Development (Theddlethorpe, Stain Lane BESS and Strubby Airfield) to a project substation (at Strubby Airfield or southwest of Woodthorpe), and onward to National Grid's proposed Grimsby to Walpole Project LCS A. The total distance for the cable route will be approximately 10km.

5.5.50 Across the project the Scoping Boundary has included a swathe of land for the cable route which is much wider (up to 300m in places) than the swathe which will be necessary during construction (circa 30m width) and operation (10m width). This is to ensure flexibility as to the location of the cable route within this corridor based on ground conditions encountered during future survey. A limit of deviation (LOD) will also be defined based on these ground conditions, the scope of this LOD will be determined as the design of the project progresses with further detail presented in the PEIR and ES. The potential swathe areas for the cable are shown shaded blue at Figure 5-9 below:

Figure 5-9: Areas (shaded) within which cable swathe and associated LOD may be sited



5.5.51 Following installation of the underground cable, land above would be reinstated to previous condition.

5.5.52 The cable route performs three functions which are distinct by the location of the cable route as part of the Proposed Development, as below:

5.5.53 Northern Section (between Theddlethorpe and Stain Lane): This section extends from the Theddlethorpe site some 3 km to the west towards Longlands Farm. The cable route in this section is for the connection of the Theddlethorpe site to the remainder of the Proposed Development and to allow the export/import of electricity from that location. The route would pass between Theddlethorpe village and Meers Bridge, passing through land in agricultural use until the Stain Lane site.

5.5.54 Mid Section (between Stain Lane and Strubby Airfield): From Stain Lane the purpose of the cable will be to facilitate the export/import of electricity from the project substation, allowing generation to connect to the grid and the import of electricity to provide charging to the BESS site at Stain Lane or the Theddlethorpe electrolysis facility. There are two possible cable route options for this mid-section, as below:

- A northern route option parallel and to the south of Stain Lane. The route passes from Stain Lane between the villages of Strubby and Withern, before joining the Strubby Airfield BESS site. A total distance of 5 km approx.
- A southern route option, runs south from Stain Lane before travelling west across agricultural land between the village of Maltby le Marsh and Strubby before joining the Strubby Airfield site. A total distance of 5 km approx.
- A link between the southern and northern route option across Strubby Airfield, to allow for additional flexibility between route options.

5.5.55 A choice between the northern and southern route option will be made following survey of these routes and before DCO application submission, taking into account the findings of the PEIR and consultation comments. The route option chosen will be determined as the design of the project progresses with further detail presented in the PEIR and ES.

5.5.56 Southern Section: The southern section of the cable route connects the proposed project substation at Strubby Airfield to the national grid. The purpose of this section is for the export/import of electricity, supplying and drawing electricity to and from remainder of the Proposed Development. The connection is to the proposed Grimsby to Walpole LCS A which is some 2 km south of Strubby Airfield. The cable will route from the project substation proposed taking two potential route options, as below:

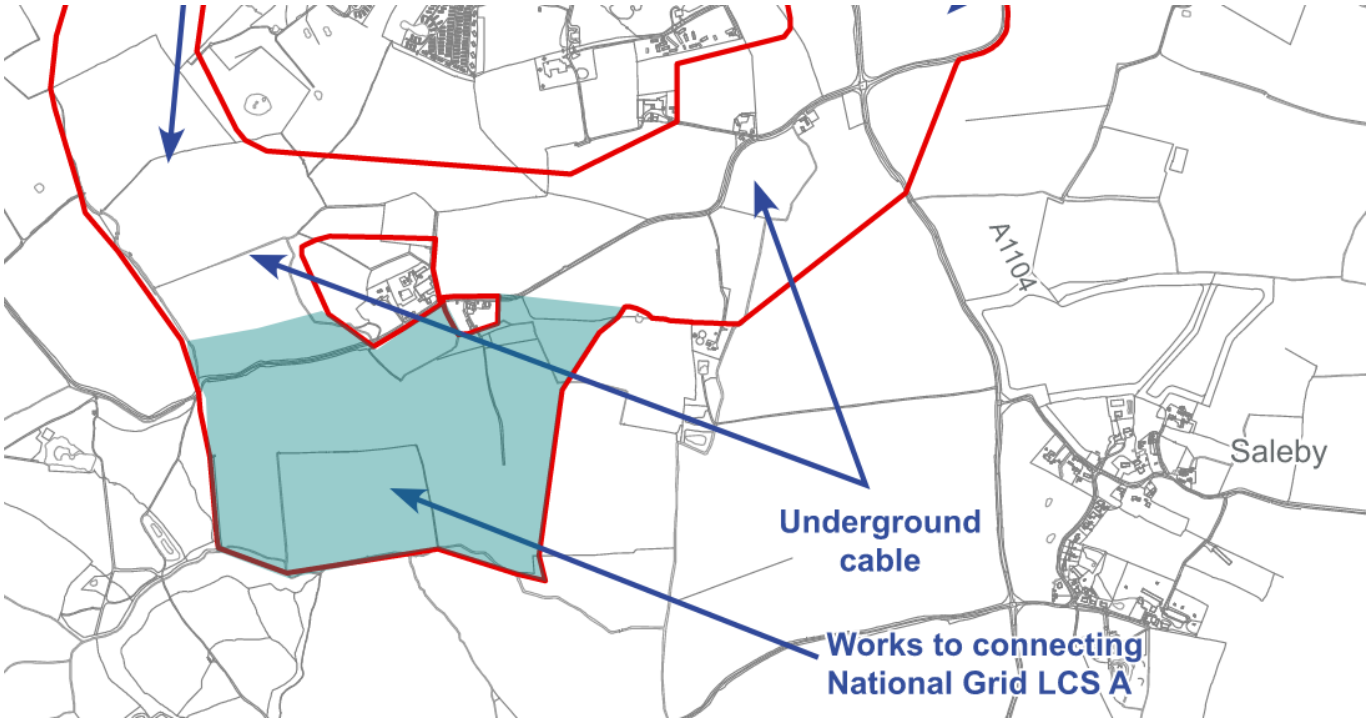
- An eastern route option, travelling south from Strubby Airfield to the east of Woodthorpe and into LCS A.
- A western route option, this passes to the west of Woodthorpe from Strubby Airfield into LCS A.
- A link between the eastern and western route options to the south of Woodthorpe, to allow for additional flexibility between route options.

Grid Connection Works

5.5.57 The Proposed Development will connect into the National Grid electricity transmission system through a new substation to be consented and delivered by the Grimsby to Walpole National Grid project. The Grimsby to Walpole National Grid project does not form part of the Theddlethorpe project. At present we anticipate routing to the proposed site of the LCS A substation. However, the layout of that substation has yet to be confirmed by National Grid and there may be the need for some ancillary connecting works at that location to facilitate the project linking to LCS A. The exact form of this will be confirmed once National Grid have provided details on the design for LCS A and will be reflected and considered through PEI,

statutory consultation and then ultimately as part of the ES. The location of the grid connection is highlighted blue at Figure 5-10 below:

Figure 5-10: Location of Grid Connection Works to LCS A



Permanent Access

5.5.58 Operational access traffic for the BESS sites will be limited to occasional movements for maintenance. The access to be used may be the same as that for construction or utilise separate access tracks.

5.5.59 The route for operational access into the Theddlethorpe site is anticipated to be through the existing access road onto the A1031 but further assessment will be necessary as to whether this is suitable or if an alternative is required.

5.5.60 Discussions with Lincolnshire Council will be undertaken to confirm the access strategy and arrangements as the design for the Proposed Development progresses between scoping and DCO application stage.

Potential Utility Diversions

5.5.61 Notable features which will need to be considered during detailed design include the presence of high pressure National Gas transmission pipelines associated with the former Theddlethorpe Gas terminal, which cross the Proposed Development site at Theddlethorpe and travel further to the southwest, crossing the Proposed Development once more at the Stain Lane BESS site.

5.5.62 There will also be instances where local service routes may interact with the project, including the local road network and utilities. Modifications or diversions may be necessary to existing local utilities to facilitate project construction. The nature of these will be established as the design for the project evolves between Scoping and DCO application stage. Interactions with utility services will form part of the detailed design considerations for the Proposed Development which will form consideration for the ES assessment and future DCO.

Areas for Biodiversity Mitigation and Enhancement

5.5.63 The Environment Act 2021 places a requirement on NSIPs submitted from November 2025 to provide at least 10% measurable biodiversity net gain (BNG). This requirement will be included within the scope of the Proposed Development and delivered within the final project design.

5.5.64 There will be an area of potential enhancements for biodiversity available on land at Theddlethorpe, Stain Lane and Strubby Airfield, but the exact scope of this will form part of future design development. The location for areas of biodiversity mitigation and enhancement within these sites is as yet to be determined, however there are clear potential areas for ecological enhancements northeast of the main Theddlethorpe site, within the northern area of the Stain Lane site and to the north and periphery of Strubby Airfield. The Theddlethorpe location specifically is close to ecological sites and may therefore provide an opportunity to extend these or improve connectivity.

Landscaping, habitat management / enhancement and amenity improvements

5.5.65 Landscaping works will form an integral part of the Proposed Development on the three main sites. This will include landscaping proposed to provide screening but also areas of habitat management or amenity and access improvements. The nature of this landscaping will be formed through the evolution of the design for the Proposed Development. The form of the landscaping proposed will be confirmed as part of an Outline Landscape and Ecology Management Plan (OLEMP) which will set out the location, extent, type, establishment timeframe and maintenance requirements for landscaped and ecological enhancement / mitigation areas. The OLEMP will form part of the DCO but will be reflected and considered as part of the PEIR produced at statutory consultation and then ultimately as part of the ES.

Offsite / Other Works to the Highway

5.5.66 Offsite highways works may be necessary as part of the Proposed Development, such as removal of street furniture to facilitate abnormal indivisible load (AIL) movements. The necessity for such works will be identified, reflected and considered as part of the PEIR produced at statutory consultation and then ultimately as part of the ES. The Outline Construction Traffic Management Plan (OCTMP) and AIL route proposed as part of the DCO will identify where such works will be necessary and the nature of offsite works, including any necessary permitting requirements.

Ancillary Infrastructure Works

5.5.67 Ancillary infrastructure works will be required and will include any necessary demolition, cabling, connection to the national gas network, boundary treatments, security equipment, lighting, landscaping, access tracks, earthworks, surface water management, and any other works necessary to enable the Proposed Development.

5.5.68 There may be a need to divert or reroute local utility services to facilitate project construction. Low voltage onsite electricity cabling may also be required as will connection to mains water supply and sewerage systems at the two BESS and Theddlethorpe locations, enabling operation of the Proposed Development and provide for employee welfare facilities.

5.5.69 Fencing will also be necessary for the enclosure of both the BESS areas, Project Substation and the Theddlethorpe site, to ensure public safety and site security. The exact form of this fencing will be discussed and refined with stakeholders, and be subject to assessment, as the design for the scheme evolves between scoping and DCO application stage.

5.5.70 Pole-mounted CCTV may also be necessary at BESS locations, Project Substation and the Theddlethorpe site to ensure site security.

5.5.71 Demolition works may be required to facilitate construction of the Proposed Development, no specific locations for demolition works have been identified at the current time.

5.5.72 There will be permanent lighting necessary at the Theddlethorpe facility and discussions with stakeholders will take place to devise a sensitive lighting strategy for this location, which ensures employee safety during operation, this may include stack lighting and engagement with the Civil Aviation Authority. The BESS locations and Project Substation would not normally be lit during operation but may include low level or sensor activated lighting. Lighting will be assessed as part of the future development design, within the PEIR and ES.

5.5.73 As part of the detailed design of the Proposed Development an operational drainage design will be identified and put in place during the construction phase. The objective of this operational design will be to ensure that pre-construction clean surface water runoff rates are maintained. This drainage design will take into account the Proposed Development as a whole, including the cable routes, accesses and foundations and will be assessed within the ES and informed by a Flood Risk Assessment which will support the DCO application. The need for sewage services will also be considered during design evolution and once the existence and adequacy of existing sewerage infrastructure has been assessed.

Temporary Works

5.5.74 An Outline Construction Transport Management Plan (OCTMP) will be provided as part of the future DCO application and considered as mitigation within the ES. This will set out the method of construction access and transportation associated with the construction of the Proposed Development such as access to site compounds, haul roads, heavy goods vehicle (HGV) routes and accesses and will be formed in consultation with Lincolnshire Council and National Highways.

5.5.75 Routes for construction access are temporary and may require temporary works to facilitate construction. However, the construction access into the Theddlethorpe site may utilise the existing site access road onto the A1031, albeit further assessment will be necessary as to whether this is suitable or if an alternative is required.

5.5.76 An abnormal indivisible load (AIL) heavy load route will also be agreed in consultation with Lincolnshire Council for AIL movements that would be undertaken during the construction phase.

5.5.77 Access tracks within the Scoping Boundary for internal access and transportation within and between the land parcels will follow the alignment of existing agricultural tracks, wherever possible. The access tracks will typically be constructed of permeable materials such as gravel and will have a maximum running width of up to approximately 8m. Where possible, existing trees and hedgerows will be retained.

5.5.78 The construction phase of the project will be transitory and will be separated into phases. The PEIR, ES and DCO will provide information on the construction phases and type of construction activities which may be required within these, including:

- Site clearance and preparation.
- Import and transport of construction materials to and across the Proposed Development.
- Provision of access, through upgrading of existing routes or construction of new access tracks.
- Installation of and diversion of utilities.
- Cable installation.
- Soil excavation and storage where necessary.
- Installation of foundations.

- Installation of necessary drainage measures.
- Installation of BESS units, substation construction and construction of thermal generation facility.
- Site reinstatements.
- Landscaping and biodiversity enhancements.
- All other construction works

5.5.79 Temporary construction compounds will be necessary to facilitate construction activities. These compounds will serve as a store of material, plant and equipment and will include staff welfare facilities, waste storage and offices.

5.5.80 The identification of suitable locations for construction compounds, and the land required to accommodate these, will be reflected and assessed as part of the future statutory consultation and then ultimately as part of the ES. There is enough land suitable for construction compounds included within the Scoping Boundary, with two indicative locations to the west and south of the Theddlethorpe site as shown at Appendix B.

5.5.81 An Outline Construction Environment Management Plan (OCEMP) will form part of the DCO application and will provide a series of proposed management processes which will be put in place to limit the environmental impacts of construction.

Decommissioning

5.5.82 At the end of the operational phase, above ground infrastructure would be dismantled and removed in accordance with industry best practice at the time. The use of decommissioned materials would follow the waste hierarchy such that reuse will be preferred over recycling and disposal least preferred.

5.5.83 During decommissioning it is assumed that hardstanding, structures and concreate will be removed up to a depth of up to 1m. It is assumed also that created BNG and landscaping will be maintained, as this will have reached an established maturity. Whether subsurface elements of the project are removed will depend on the impacts associated with their removal, which may outweigh the benefit of removing this infrastructure.

5.5.84 The regulatory framework in place at the point of decommissioning will inform the production and implementation of a Decommissioning Environmental Management Plan, ensuring that obligations are met with regards to best practice, to landowners and the environment. An Outline Decommissioning Environmental Management Plan will be submitted in support of the DCO application, which will be secured by way of a DCO requirement.

5.5.85 Whilst any future programme for decommissioning is not known, the activities and management processes which will be put in place during decommissioning are detail for future development design but, for the purpose of EIA scoping, these activities are assumed to be broadly similar to those associated with construction. Good-practice committed mitigation measures will also be taken to facilitate dismantling / re-use in future if required.

Parameters for Scoping

5.5.86 For the purpose of this EIA Scoping Report, i.e. to give initial consideration to potential for likely significant impacts, an outline design envelope for the proposed works at Theddlethorpe has been defined. The envelope (see Chapter 7 for details on approach) alongside the above Chapter 5 description of development sets out the parameters relevant to potential environmental impacts. Table 5.1 below provides the main worst case parameters for scoping captured within the description of development.

Table 5.1 Main Worst Case Parameters for Scoping

Element	Worst Case Parameter for Scoping
Height of Chimney Stack (CCGT)	110 m
Visible Chimney Plume (water vapour)	Yes
Number of Engines (Gas Engines)	350 (smallest type of engine)
Water Required (Electrolysis)	Up to 1800 m3 / hr
Ratio of Water *Abstracted: Used : Discharged* (Desalination)	4:1:3
Water Pipe Quantity (North Sea)	2
Water Pipe Diameter (North Sea)	48” (1219mm)
Running Time (CCGT / BESS / Electrolysis / Substation)	On demand 24 hrs, 365 days a year.
Employees (Operation)	116

6 Stakeholder Engagement

6.1 General Approach

6.1.1 Engagement with technical stakeholders and the local community is an important part of the EIA process, informing assessment approach and Proposed Development design. The Applicant has sought to engage with key stakeholders and host authorities from an early stage, to brief on the Proposed Development, and to help focus on any topic-specific issues. This has included discussions with the host local authorities, the Environment Agency and Natural England on potential issues for assessment. The specific topics identified in these discussions have been incorporated into this Scoping Report, and include:

- Agricultural land classification and Best and Most Versatile (BMV) land
- Proximity of ecological sites
- Flooding and flood risk
- Location of developments nearby

6.1.2 The Applicant has also commenced engagement with landowners regarding surveys which may be needed to support project design and assessment.

6.1.3 The Applicant will continue to engage with technical stakeholders, the host authorities, landowners and the local communities through consultation and during preparation of the ES. This will include complying with the consultation requirements set out in the Act and associated regulations and guidance.

6.1.4 Whilst the format of future engagement is still being developed, a Programme Document has been made available on the project website, setting out a timetable for important stages over the next two years, through the preparation of for consultation and drafting of the ES. As part of this future engagement programme, informal consultation and engagement will commence following the scoping stage, and the Applicant will continue to consult local communities, stakeholders and individual property owners as the project progresses.

6.1.5 Prior to undertaking statutory consultation, the Applicant will prepare the Statement of Community Consultation ('SoCC') setting out how the Applicant will consult the local community, in consultation with the host authorities, as required by Section 47 of the Planning Act.

6.1.6 Documentation to be published and consultation to be undertaken will be reactive to any legislative requirements as may be set out within a future Planning and Infrastructure Act (and associated guidance) or other legislation. At present, under existing legislative situation, the statutory consultation under the Act is anticipated to commence in Q2 2026. An environmental summary or PEIR will be issued as part of this and will set the likely environmental effects of the Proposed Development and help inform responses to the statutory consultation. Responses to the statutory consultation will inform project design, assessment and the form of the Proposed Development for which development consent will be sought. A Consultation Report will also be prepared as part of the DCO application, which will document pre-Application consultation and engagement undertaken, and how this has shaped project design. The above documents and stages are subject to change in light of revisions to planning legislation and emerging guidance.

6.1.7 The Applicant will also continue to engage with other developers in the area to consider opportunities for coordination and avoid potential conflicts between projects.

6.1.8 Documentation has been received from the EA (Flood Risk and Coastal Erosion Risk Data) and Natural England (Bird Survey Guidelines for Ecological Impact Assessment) following

discussions held to date. It was agreed that this information would be used to inform this Scoping Report, future surveys and will be used throughout EIA.

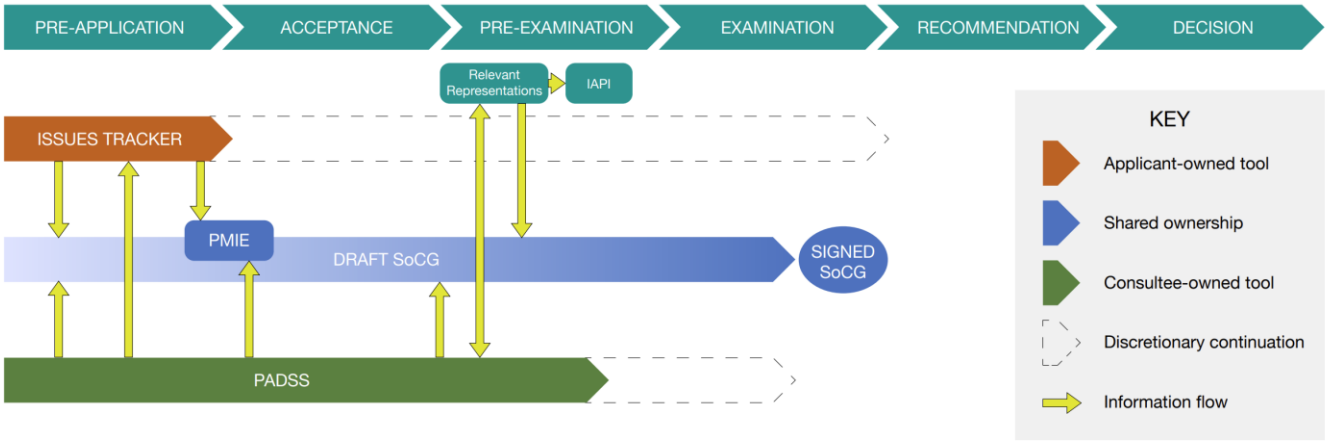
6.1.9 The ES will append the EIA Scoping Opinion Request (this document) and the received Scoping Opinion and include a summary of any other consultation undertaken as part of the EIA process.

6.1.10 Agreements are in place with the host councils, the EA and Natural England to hold regular update meetings to ensure that all parties are up to date on project progress and are able to highlight any concerns with regards to potential impacts.

6.2 Statements of Common Ground

6.2.1 A Principal Areas of Disagreement Summary Statement (PADSS) will be developed and maintained with core project stakeholders where appropriate, informed by an 'Issues Tracker' developed from responses to project consultation. The PADSS will be used to inform future Statements of Common Ground (SoCG) which may be developed between the Applicant and core stakeholders to record areas of disagreement and potential resolutions between scoping stage and submission of any future application for development consent. The relationship between the issues tracker, PADSS and SoCG through the DCO process is shown at Figure 6-1 below:

Figure 6-1 Relationship between Issues Tracker, PADSS and SoCG[10]



6.3 Engagement with the Planning Inspectorate

6.3.1 An Inception Meeting was held with the Planning Inspectorate on 25th July 2024 where a high-level programme was discussed for the Proposed Development, including submission of this Scoping Report. Programme related or procedural discussions may take place with the Planning Inspectorate during preparation of PEI, the ES and any future application for development consent.

[10] UK Government Asset Publishing Service, accessed April 2025: Flow Chart 1 - How the Issues Tracker, PADSS, PMIE and Statements of Common Ground interact

7 Approach to EIA

7.1.1 This chapter provides the overall approach to be taken for the EIA, including the general EIA methodology which will be applied when undertaking assessment of the likely significant effects of the Proposed Development. In addition to the general approach set out in this chapter, specific methodologies for any individual environmental topic are set out within the relevant topic-specific environmental sections of this report (Chapters 8-21).

7.2 Introduction

7.2.1 EIA is a process carried out which examines available environmental information to ensure that the likely significant environmental effects of certain projects are identified and assessed before a decision is taken on whether a project is granted planning permission. The objective is to present a clear, impartial assessment of the likely significant beneficial and adverse environmental impacts of a project, including direct and indirect effects. Doing so will ensure that environmental issues can be identified at an early stage, and projects can then be designed, to avoid or to minimise significant adverse environmental effects, and that appropriate mitigation and monitoring can be put in place.

7.2.2 Regulation 5 of the EIA Regulations sets out a number of environmental factors to be identified, described and assessed in an appropriate manner through EIA, including:

> *(2) The EIA must identify, describe and assess in an appropriate manner, in light of each individual case, the direct and indirect significant effects of the proposed development on the following factors—*
>
> *(a) population and human health;*
>
> *(b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC M1 and Directive 2009/147/EC M2;*
>
> *(c) land, soil, water, air and climate;*
>
> *(d) material assets, cultural heritage and the landscape;*
>
> *(e) the interaction between the factors referred to in sub-paragraphs (a) to (d).*

7.2.3 In-line with Regulation 5(2), this Scoping Report includes consideration of the following:

- Air Quality
- Biodiversity
- Climate Change
- Cultural Heritage
- Land and Soil (combined for purpose of proposed EIA)
- Landscape and Visual
- Material Assets and Waste
- Population and Human Health
- Water (including flood risk)

7.2.4 Alongside the specific environmental factors identified by Regulation 5(2), this Scoping Report also includes consideration of:

- Aviation
- Arboriculture

- Electric and Magnetic Fields
- Geology
- Major Accidents and Disasters
- Noise and Vibration
- Transport and Access
- Marine Environment

7.2.5 Each environmental topic to be considered in the ES will be given a separate chapter and the intended format and structure of the ES is set out at Appendix C.

7.3 EIA Methodology (General)

7.3.1 The method behind the EIA process generally takes into account the existing conditions of the area into which the Proposed Development is being introduced (the baseline) and makes reasonable predictions of the likely change (the impact), and the scale of that change (the magnitude) that may occur, during its construction, when the Proposed Development is completed and operating as proposed, and following its decommissioning.

7.3.2 The predicted impact will be considered in terms of key environmental and social aspects (receptor / resource) found within the surrounding area, and based on their sensitivity to change, the resulting effect is then determined. Any mitigation measures required to reduce or eliminate adverse effects or enhance beneficial effects are then considered and assessed, with the residual effect being determined as significant or not. The likely significant effects are then reported (within an Environmental Statement) for consideration by the Secretary of State when considering whether to grant development consent.

7.3.3 The evolved baseline (i.e., consideration of the site conditions in the future if the Proposed Development were to not come forward), effect interactions (i.e., where one or more identified residual effects may combine to result in a significant effect), cumulative effects (i.e., where the Proposed Development residual effects may combine with potential effects arising from other local schemes) and alternatives and design evolution (i.e., setting out how the design has evolved in response to constraints and opportunities) will be considered as relevant within the ES.

7.3.4 The EIA will be informed by related activities which will include the following:

- Establishing existing baseline conditions;
- Consultation with statutory and non-statutory consultees;
- Consideration of local, regional and national planning policies, legislation and guidelines as relevant to EIA;
- Consideration of technical standards;
- Review of secondary sources, previous environmental studies and publicly accessible databases and information;
- Physical surveys and monitoring;
- Desk based assessment;
- Modelling (where appropriate and proportionate); and
- Expert opinion.

7.3.5 An ES Non-Technical Summary (NTS) will be provided, this is a separate document providing a concise description of the Proposed Development, the alternatives considered, any identified mitigation measures and the residual likely significant environmental effects.

7.3.6 Relevant interaction and inter-relationships between topics will be reported within the 'scoped in' topics of the ES, such as inter-relationships between traffic generation and noise emissions; flood risk and climate change; heritage and visual effects; and environmental pathway and population/human health effects.

7.4 Limitations

7.4.1 Topic specific limitations are set out within the relevant topic specific sections of this report (Chapter 8 - 21). However, common limitations which apply to a number of environmental factor assessments include:

- **Design**: The Proposed Development has yet to be designed in detail and therefore the parameters on which the future assessment will be undertaken have yet to be set. Whilst this Scoping Report is based on information available at the time of writing, including those maximum "worst case" parameters identified within the description of development (Chapter 5) the proposed scope will be reviewed in advance of PEI stage and any necessary changes to the scope of the EIA will be reported as necessary within the PEIR and ES. Optionality between fuel choice (hydrogen or natural gas) and thermal facility type (gas engines or CCGT) will mean that there will be a joint EIA envelope for all options for most EIA topics. However, specific topics (such as air quality) will define separate assessment envelopes for each fuel option or thermal facility type, given their different characteristics and potential effects.
- **Location**: Whilst general areas of development have been identified, the precise location of development has yet to be set. This Scoping Report is therefore based on the general development types and at locations available at the point of drafting this report. The proposed scope will be reviewed in advance of PEI stage and necessary changes will be reflected in the PEIR and ES. The PEIR and ES will follow the Rochdale Envelope approach and thus ensure that the maximum reasonable level of significant environmental effects continues to be considered through the EIA.
- **Data**: Data from third party sources used to help inform baseline conditions may be out of date or inaccurate. All data will be reviewed and used by competent experts to ensure that data is suitable for purpose used through the EIA.

7.5 Transboundary and Cross-border

7.5.1 Consideration has been given to whether the Proposed Development would give rise to any transboundary impacts for the purpose of the EIA regulations. This has included consideration of the location, scale and nature of the Proposed Development. Following this initial consideration it has been concluded that the Proposed Development will not result in any transboundary or cross-border impacts for the purposes of the EIA regulations, whether alone or in combination with any other foreseeable project.

7.6 Intra-Project (inter-related) Effects

7.6.1 Intra-project effects exist where effects occur between different environmental topics within the same proposal, combining to affect a single receptor. Intra-project effects assessment can only be undertaken once the environmental topic assessments are complete as part of the ES, between EIA Scoping and ES stage the project will therefore identify a list of 'shared receptors' that have the potential to be changed by more than one topic/effect. An assessment of intra-project effects on these shared receptors will then be reported on within the future ES. Within this Scoping Report an initial view on potential inter-related effects is provided by the topic specific chapters (Chapter 8 - 20).

7.7 Legislation and Guidance

7.7.1 Whilst relevant policy background is set out within Chapter 2, each topic specific section (Chapter 8 - 20) will include reference to policy, guidance and legislation relevant to that specific environmental topic.

7.8 Setting the Study Area

7.8.1 Each environmental topic has considered the extent of the study area relevant to that specific topic. These study areas are defined within the topic specific sections of this report (Chapter 8 - 20).

7.9 Baseline Conditions

7.9.1 Schedule 4 (3) of the EIA Regulations requires that the ES must include:

> *A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge.*

7.9.2 The PEIR (or replacement document) and ES will describe the environmental effects of the Proposed Development. These effects are the changes which may be caused by all stages of the Proposed Development to the baseline environment.

Existing Baseline

7.9.3 The baseline environment comprises the current state of the environment at the Proposed Development location before any development or changes occur. To establish the baseline, desk top studies and field surveys will be undertaken, informed by third party information which may be available at the time of assessment, and data modelling where appropriate.

7.9.4 The approach to establishing baseline, and baseline information currently known, relevant to each environmental topic is set out within the topic specific sections of this report (Chapter 8 - 20).

Establishing Future Baseline

7.9.5 As required by Schedule 4(3), the ES will include consideration of the future evolution of the baseline as a result of potential changes to baseline conditions in the absence of the Proposed Development. This consideration will be based on third party scientific information available at the time of assessment, alongside the applied knowledge of the competent experts who will be involved in writing the ES to establish the future baseline. Reasonable effort will be made to characterise the future baseline, albeit recognising that there will be considerable limitations to predictions that can be made about future natural baseline conditions. Specific topic chapters may require future projections in considering change over time, such as changes to sea levels and the effect this has on flood risk associated with the Proposed Development.

7.9.6 The potential future baseline for climatic conditions will be shown in the probabilistic climate change projections used in the climate risk assessment. This changing baseline will also affect the future baseline for other receptors, particularly the water environment, ecological receptors and landscape receptors, which is an inter-related effect of climate change. Climatic projections will therefore be considered in the future baseline and receptor sensitivity of ES topics where necessary.

7.9.7 The approach to establishing baseline, and baseline information currently known, relevant to each environmental topic is set out within the topic specific sections of this report

7.10 Assessment Scenario

7.10.1 The EIA will be based on assessment of the existing baseline, and future baseline, during construction/enabling works, during operation and decommissioning of the Proposed Development. These assessment scenarios will be reported on within the ES.

7.11 Mitigation Approach

7.11.1 Mitigation represents the measures, techniques and design methods to be applied which can reduce the potential significant environmental effects from the Proposed Development. In accordance with EN-1, the approach to mitigation used by the Proposed Development will include use of the mitigation hierarchy, which is a widely used good practice guideline to identify mitigation for a project.

7.11.2 The IEMA Guidance Document 'EIA Guide to Shaping Quality Development'[11] (C.2) sets three distinct forms of mitigation to achieve a proportionate ES, including:

- **Primary** (inherent) – an intrinsic part of project design explained within the description of development;
- **Secondary** (foreseeable) – described within the topic chapters of the ES, often are secured through planning conditions; and
- **Tertiary** (inexorable) – necessary regardless of EIA, for example through legislative requirements.

7.11.3 The EIA, the PEIR and ES will provide information on primary, secondary and tertiary mitigation measures which are relevant to the Proposed Development. These will be based on the primary mitigation measures in the first instance, informed by the mitigation hierarchy.

7.12 Potentially Sensitive Receptors

7.12.1 Through completing an EIA, it is important to identify potential sensitive receptors that may be impacted by the Proposed Development and may need to be considered within the assessments undertaken. Each relevant topic chapter of the PEI and ES will set out how sensitive receptors have been identified and are considered to be potentially affected by the Proposed Development.

7.12.2 These sensitive receptors will be identified from a review of available information collected during the collection of surrounding environmental information setting the context for each technical assessment, including from historic and currently available information relating to the site itself, through EIA Scoping consultation and the consideration of the scope of the Proposed Development and its extent.

7.13 Identification of Impacts, Effects and Effect Significance

Impact and Effect

7.13.1 The terms impact and effect are distinctly different, in EIA terms this difference is where, having gained an understanding of the likely impact, then it is important to know whether the change in

[11] Website link (IAIA): https://www.iaia.org/pdf/wab/IEMA%20Guidance%20Documents%20EIA%20Guide%20to%20Shaping%20Quality%20Development%20V6.pdf accessed March 2025

environmental conditions results in a significant environmental effect. The impacts of the Proposed Development may or may not result in significant effects on the environment, depending on the sensitivity of the resource or receptor alongside other factors such as duration.

Receptor Sensitivity and Magnitude of Impact

7.13.2 A consistent approach to describing significant effects will be sought within the topic specific chapters of the PEIR and ES. This approach will set out how the sensitivity of receptors has been broadly defined, including the magnitude of impact or change from the baseline in order to derive resultant effect (and the significance of this effect). Where specific criteria are required for an individual topic, the methodology for describing effect significance will be set out within that relevant topic chapter of the ES.

7.13.3 The standard approach will be to set out the significance of impacts with reference to appropriate standards, accepted criteria, technical guidance or legislation where these exist, for each technical discipline. This will include consideration of:

- The receptors / resources which may be affected, and pathways for effect;
- The sensitivity of the receptor / resource;
- Extent, scale and magnitude of impact (negligible, minor, moderate or major);
- Duration of effect (short-term, medium-term or long-term); permanence (permanent or temporary);
- Nature of effect (i.e. direct, indirect or reversible, adverse, beneficial or neutral);
- Whether the effect occurs in isolation, in combination or cumulatively
- Feasibility and mechanisms for delivering mitigation measures.

7.13.4 Broadly speaking, terminology to describe the sensitivity of receptors and magnitude of impact or change from the baseline will be as follows:

- Very High;
- High;
- Medium;
- Low; and
- Negligible.

7.13.5 Where there is no impact / change, no assessment will be required due to there being no potential for significant effects. Table 7.1 shows the impact magnitude applied:

Table 7.1: Impact magnitude

Magnitude	Description
Major	Adverse: loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements Beneficial: large scale or major improvement of resource quality; extensive restoration; major improvement of attribute quality
Moderate	Adverse: loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements. Beneficial: benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality.

Minor	Adverse: some measurable change in attributes, quality or vulnerability, minor loss of, or alteration to, one (maybe more) key characteristics, features or elements. Beneficial: minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring.
Negligible	Adverse: very minor loss or detrimental alteration to one or more characteristics, features or elements. Beneficial: very minor benefit to, or positive addition of one or more characteristics, features or elements.
No change	No loss or alternation of characteristics, features or elements; no observable impact in either direction

Identification of a Resultant Effect

7.13.6 The method for assessing significance of effects varies between environmental factors but, in principle, the basis for determining the resultant effect generally takes into account the sensitivity of the receptor and magnitude of impact or change from the baseline conditions. A generic matrix that combines the sensitivity of the receptor and the magnitude of impact to identify the result effect is provided within Table 7.2 below:

Table 7.2 Identification of a Resultant Effect

Receptor Sensitivity	Magnitude			
	High	Medium	Low	Negligible
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Minor/Negligible*	Negligible
Negligible	Minor	Negligible	Negligible	Negligible
Professional judgement to be applied*				

Identification of Scale of Effect

7.13.7 The scale of the predicted effect will then be classified according to the following scale. The definitions of the scale used follow either that set out below, or, as specified within the individual topic chapters:

- **Negligible** – effects which are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error, these effects are unlikely to influence decision making, irrespective of other effects.
- **Minor** – These effects may be raised as local issues and may be of relevance in detailed
- design of the project, but are unlikely to be critical in the decision-making process;
- **Moderate** – These effects, if adverse, are likely to be important at a local scale and on their own could have a material influence on decision-making; and

- **Major** – These effects may represent key factors in the decision-making process. Potentially associated with sites and features of national importance or likely to be important considerations at a regional or district scale. Major effects may relate to resources or features which are unique and which, if lost, cannot be replaced or relocated.

Nature of Effect

7.13.8 Negligible effects are defined as imperceptible, the nature of these effects will therefore not be considered to be significant in the context of the EIA. The definition of the nature of resultant minor, moderate or major effect, in terms of being adverse, beneficial or neutral are used throughout the ES, as below:

- **Adverse** - Detrimental or negative effects to an environmental resource or receptor. The quality of the environment is diminished or harmed;
- **Beneficial** - Advantageous or positive effect to an environmental resource or receptor. The quality of the environment is enhanced; and
- **Neutral** - Where the quality of the environment is preserved or sustained or where there is an equal balance or benefit and harm.

Geographic Extent of Effect

7.13.9 Each topic will include detail on the geographic extent of identified effects. Broadly speaking, and at a spatial level, ‘site’ or ‘local’ effects are those affecting the site and neighbouring receptors, while effects upon receptors beyond the vicinity are at a ‘district’ level. Effects beyond East Lindsey district are considered to be at a ‘regional’ level, whilst effects affecting different regions (or nationally) are considered to be at a ‘national’ level.

Effect Duration

7.13.10 Effects that are limited to enabling, construction or decommissioning activities will be classed as ‘temporary’ effects, these can be further classified as being ‘short term’ or ‘medium term’ or ‘long term’ as applicable to each technical assessment, and reliant on the nature of the effect being identified.

7.13.11 Effects that result from the completed and operational Proposed Development may be classed as ‘temporary’ effects for those activities not intending to be permanent. Effects that will remain in a permanent form, or which will be a legacy of decommissioning of the Proposed Development will be classed as ‘permanent’ effects.

7.14 Effect Significance

7.14.1 On identification of an effect, the effect scale, nature, geographic extent and duration and whether the effects are direct or indirect will be considered. Individual topics will set out what is considered to be significant, broadly the following classification will be applied:

- ‘Substantial’ effects are ‘significant’
- ‘Moderate’ or ‘major’ effects could be deemed to be ‘significant’;
- ‘Minor’ effects are ‘not significant’, although they may be a matter of local concern; and
- ‘Negligible’ effects are ‘not significant’ and not a matter of local concern.

7.14.2 The ES will highlight the ‘residual’ effects (those effects which remain following the implementation of suitable mitigation measures) and classifies these in accordance with the terminology defined above.

7.14.3 Where this differs for a particular technical assessment, an explanation will be provided within the methodology section of the relevant technical ES chapter.

7.14.4 ES 'summary of effect' tables will provide an account of the likely significant environmental effects associated with each environmental topic within the ES at the end of each topic chapter.

7.14.5 Likely effects will be described, where applicable, as:

- Adverse / beneficial
- Direct / indirect
- Temporary / permanent
- Reversible / irreversible

7.14.6 To support a consistent approach throughout assessment, a matrix approach will be adopted as a guide to considering magnitude of effects. Professional judgement, where deemed appropriate, will be applied – notably where there is a split significance level. Table 7.3 below depicts the matrix approach.

Table 7.3: Effects Matrix

Sensitivity of Receptor	Magnitude of Impact					
		No change	**Negligible**	**Minor**	**Moderate**	**Major**
	Negligible	Negligible	Negligible	Negligible or minor	Negligible or minor	Minor
	Low	Negligible	Negligible or Minor	Negligible or minor	Minor	Minor or moderate
	Medium	Negligible	Negligible or minor	Minor	Moderate	Moderate or major
	High	Negligible	Minor	Minor or moderate	Moderate or major	Major or substantial
	Very high	Negligible	Minor	Moderate or major	Major or substantial	Substantial

7.15 Opportunities for Enhancement

7.15.1 Opportunities for environmental enhancement will be identified and considered through the design evolution of the Proposed Development. How enhancements have been considered will be set out within the relevant environmental topic chapters of the PEIR and ES. Such opportunities constitute reasonable measures that go beyond the need for mitigation of the effects of the Proposed Development.

7.16 Approach to Cumulative Effects

7.16.1 In considering cumulative effects at Scoping stage, relevant guidance has been considered in the form of Planning Inspectorate's Advice Note: Cumulative Effects Assessment[12]. In doing so an initial screen of projects within the area, either proposed or consented, was undertaken.

7.16.2 This initial screening search included a review of the Lincolnshire Minerals and Waste Local Plan Core Strategy and Development Management Policies (2016), Lincolnshire Minerals and Waste Local Plan Site Locations (2017), East Lindsey Local Plan Core Strategy (2018), East

[12] Planning Inspectorate Guidance: Cumulative Effects Assessment. Accessed April 2025 https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-advice-on-cumulative-effects-assessment#consideration-of-cumulative-effects-in-screening-schedule-2-development

Lindsey Settlement Proposals Development Plan Document (2018) and local Neighbourhood Development Plans.

7.16.3 The EIA Regulations require that, in assessing the effects of a particular development proposal, consideration should also be given to the likely significant effects arising from the "*cumulation with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources*" (Schedule 4, 5e).

7.16.4 Cumulative effects can occur as interactions between the effects associated with several projects in an area (referred to as 'cumulative schemes') which may, on an individual basis be insignificant, but together (i.e., cumulatively), result in a significant effect. These effects could act as several actions on an environmental receptor which may overlap between schemes or act in combination.

7.16.5 There may be instances where projects, in cumulation, may result in a significant impact on receptors which otherwise would not have been significantly impacted by any one individual development. The ES will include consideration of this and whether non-significant effects between projects may combine to result in new receptors on which impact needs to be assessed in cumulative terms.

7.16.6 To be clear, this section addresses **inter-project cumulative effects** – combined residual effects from the Proposed Development, with other projects, on a single receptor.

7.16.7 Cumulative effects is sometimes also used to refer to **intra-project combined effects** – combination and / or interaction of residual effects via various impact pathways from the Proposed Development itself affecting a receptor. This type of cumulation of effects is referred to in the methodology as **inter-related effects** and is addressed elsewhere (see 7.6).

7.16.8 Generally, cumulative schemes are based on existing and/or approved development. Information on these is derived through searches on the local authority planning register or Planning Inspectorate website. As such, those development projects included within the cumulative effects assessment will be nearby and:

- have full planning permission, a resolution to grant permission; or
- have been submitted (applied for) but not yet permitted in some instances and where this is considered appropriate.
- are listed as a project on the Planning Inspectorate website but have not been submitted (applied for) or have been identified within relevant planning policy or other plans or programs as considered appropriate.

7.16.9 These parameters have been set to allow all the schemes coming forward within the area of the site to be subject to an initial screening exercise to determine any that may potentially have a cumulative effect with the Proposed Development and should be considered further within the cumulative effects assessment of the EIA. By applying these parameters, the cumulative effects assessment of the EIA is able to be more focused on relevant schemes (i.e. those with the potential to interact in a cumulative manner).

7.16.10 The Planning Inspectorate Advice Note 7[13] confirms that the ES should include assessment of 'consequential developments' where these are proposed. Consequential developments are those which are proposed as part of the Proposed Development but are intended to be considered and delivered separately. There are no elements of the Proposed Development which are intended to be considered and delivered separately, and therefore no such elements

[13] Planning Inspectorate Advice Note 7: Presentation of the Environmental Statement, Page 7 (2017)

are ‘consequential’ in the context of Advice Note 7. Projects nearby and connected into by the Proposed Development, such as the Grimsby to Walpole Project (LCS), are not consequential and are subject to their own assessment, in the case of Grimsby to Walpole being completed by National Grid.

7.16.11 In accordance with the Planning Inspectorate’s Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment, there is a two-staged approach to the identification of other existing development and / or approved developments of relevance for cumulative or in-combination consideration. These two stages are:

- **Stage 1:** establishing a long list of developments based on appropriate spatial and temporal limits.
- **Stage 2:** applying clear rationale to establish a short list which, in combination with the Proposed Development, have the potential to result in a significant cumulative effect and will be assessed through the EIA in cumulative terms.

Long List (Stage 1)

7.16.12 From the initial screening search of planning policy documents, there are no nearby villages or settlements within the parishes surrounding the site which are making any plans to expand outward, as such, there are not anticipated to be any impacts on nearby proposed residential or commercial urban extensions in the area. The first step to establish the long list is therefore to determine a suitable ‘search area’ for potentially relevant proposals. This ‘search area’ will be determined by considering the Zone of Influence (ZoI) for each environmental factor assessed. The ‘search area’ for the long list will be based on the largest ZoI in terms of distance. For the Proposed Development, the largest ZoI is associated with the landscape and visual environmental factor. This ZoI is likely to be 20km, albeit this will be kept under review during the PEI and EIA stage.

7.16.13 Within the ZoI, a planning application search will be undertaken to identify those developments which could potentially be relevant in cumulative terms, either by introducing new sensitive receptors to assessment or combined impacts with the Proposed Development. This will include consideration of three tiers of projects[14], as below:

Tier 1

7.16.14 Other existing and, or approved development:

- under construction
- permitted applications under the Planning Act or other regimes but not yet implemented
- submitted applications under the Planning Act or other regimes but not yet determined
- all refusals subject to appeal procedures not yet determined

Tier 2

7.16.15 Other existing and, or approved development:

- projects on the Planning Inspectorate’s programme of projects

[14] As set out within Table 2 of the Planning Inspectorate’s Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment. Accessed April 2025 https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-advice-on-cumulative-effects-assessment#consideration-of-cumulative-effects-in-screening-schedule-2-development

Tier 3

7.16.16 Other existing and, or approved development:

- projects on the Planning Inspectorate's programme of projects where a Scoping Report has not been submitted
- identified in the relevant Development Plan and emerging Development Plans, with appropriate weight given as they near adoption, recognising that there will be limited information available on the relevant proposals
- identified in other plans and programmes, as appropriate, which set the framework for future development consents or approvals, where such development is reasonably likely to come forward

7.16.17 Only the following types of developments will be considered for inclusion on the long list, as any development not falling within these types is not likely to give rise to a significant cumulative effect:

- Employment developments;
- Residential developments of 10+ dwellings;
- Minerals and waste applications;
- NSIP developments;
- Transport infrastructure developments (e.g motorways or A roads); and
- Energy infrastructure developments.

7.16.18 Of the above development types, one of the following criteria will also be necessary to make the long list:

- Projects that are under construction but will not be completed prior to the Proposed Development commencing
- Projects with an extant planning permission, granted within the last five years, but which has yet to be implemented
- Planning application has been submitted but, as of yet, has not been consented.
- Where an EIA Scoping Report has been submitted, but for which an application has not yet been submitted (NSIP projects only).

7.16.19 Applying the above criteria, an initial long-list for scoping stage has been developed which is shown at Appendix D.

7.16.20 Following the formation of the long list, eligible other developments identified will require further assessment (Stage 2) to establish a short list of other developments which, in combination with the Proposed Development, have the potential to result in significant cumulative effects.

Short List (Stage 2)

7.16.21 To support a proportionate assessment, a criteria based approach will be used to determine whether to include or exclude a long-list development to the short list and taken forward for further consideration in cumulative terms. The following criteria will be applied:

Temporal scope

7.16.22 The relative construction, operation and decommissioning programmes of the other developments and whether there is potential overlap and interaction with the Proposed Development. Only those projects where there is a potential overlap and interaction will be included within the short list.

Scale and nature of development

7.16.23 The scale and nature of the other developments identified in the ZoI that are likely to interact with the proposed NSIP. Statutory definitions of major development and EIA screening thresholds may be of assistance when considering issues of scale. Developments of major scale, or those of national significance, will be included within the short list.

Other factors

7.16.24 The nature and capacity of the receiving environment to accommodate the development will influence the possibility of significant cumulative effects. Common sensitive receptors exposed to two or more types of residual (post-additional mitigation) effects, with significance of 'slight/minor' or greater, will be taken forward to Stage 2 of the assessment. Consideration of shared receptors will inform whether development will be included within the short list.

Professional Judgement

7.16.25 Professional judgement will supplement the threshold criteria to avoid excluding other existing and, or approved development that may be:

- below criteria limits but has characteristics likely to give rise to a significant effect, or
- below criteria limits but could give rise to a cumulative effect by virtue of its proximity to the proposed NSIP

Documentation

7.16.26 The assessment of long-list and short-list projects will be refreshed at PEIR and EIA stages. This refresh will include a clear record of decision making on cumulative long-list and short-list projects included for assessment and reasoning for inclusion / exclusion based on the above criteria. Views from consultation bodies will also be sought on the criteria applied and those developments included in the long-list and short-list.

7.16.27 Only developments which meet one of the above criteria will be taken forward to Stage 2. Consideration of effects that are deemed individually not to be significant will still be included in the assessment, as the cumulative effect of several non-significant effects could still be significant. Applying the above criteria, the initial stage 2 short-list for future cumulative assessment consideration is set out within table 7.4 below.

Table 7.4: Initial Stage 2 Short List

Development	Planning Reference	Status
Extension to existing Woodthorpe Leisure Park	N/171/00120/22	Granted planning permission in December 2022
National Grid EGL3 and EGL4 Projects (NSIP)	EN0210003	Application for Development Consent programmed for mid-2026
Viking CCS (NSIP)	EN070008	Development Consent Order made (consented) in April 2025
Grimsby to Walpole (NSIP)	EN020036	Application for Development Consent programmed for Spring 2027
Ossian Wind Farm (NSIP)	EN0210006	Application for Development Consent programmed for mid July 2026

Outer Dowsing Offshore Wind (Generating Station) (NSIP)	EN010130	Decision on whether to grant Development Consent due mid-2025

Information Gathering (Stage 3)

7.16.28 For those developments included within the shortlist, and where there is the potential for significant cumulative effects to occur, the Applicant will proceed to information gathering (Stage 3). Information sources used at this stage will include the planning register information provided on the local planning authority or planning inspectorate website. Individual developer project websites may also be useful sources of information. The information may include:

- Proposed design and location information.
- Proposed programme of construction, operation and decommissioning.
- Environmental assessments that set out baseline data and effects arising from the other existing and, or approved development.

7.16.29 The information gathering process will be undertaken at PEIR stage and repeated through the EIA to consider up-to-date information on projects where a significant cumulative effect may occur. The information gathered at Stage 3 will be used to inform Stage 4 (assessment) and will be recorded within the PEIR and ES.

Assessment (Stage 4)

7.16.30 Both the long list and short list will be kept under review through the PEIR and EIA. Through the PEIR and EIA subsequent stages will also be applied, with the applicant also gathering information on the shortlisted developments (Stage 3) and assessing the cumulative effects (Stage 4) to be reported within a future ES. The assessment will move from a qualitative to a more quantitative assessment as the availability of information increases. Professional judgement may be applied to exclude a development from consideration where thresholds are exceeded but where discernible effects are not anticipated.

7.16.31 The topic specific sections of this report have recorded any relevant cumulative considerations specific to their topic area where potentially relevant at this stage (Chapter 8 - 20).

Cumulative Assessment Limitations

7.16.32 It should be noted that for the topics scoped out of the EIA, as set out within Chapter 22, the potential for significant cumulative effects when considering the above identified projects has been taken into account. No scoped out technical topics anticipate any significant cumulative effects. Scoped-in topics will take into account cumulative impacts associated with the above identified projects.

7.16.33 Where baseline data about other developments is incomplete, a precautionary but reasonable approach will be taken based on the best available evidence, with an explanation as to how the Applicant has attempted to source data.

7.16.34 The approach to the assessment of inter-project effects will consider the deviation from the baseline conditions at common sensitive receptors as a result of changes brought about as a result of the Proposed Development in combination with one or more other existing development and / or approved development(s). The assessment of the inter-project effects will be based upon the residual (post-additional mitigation) effects that have been identified in the

various environmental factor assessments for the Proposed Development, as well as available environmental information for the other existing development and / or approved developments.

7.17 Competent Expert and Relevant Expertise

7.17.1 The EIA Regulations require that to ensure the completeness and quality of the ES, '(a) the developer must ensure that the Environmental Statement is prepared by competent experts;' and '(b) the Environmental Statement must be accompanied by a statement from the developer outlining the relevant expertise or qualifications of such experts.' As such, the EIA will be completed by competent experts and a statement relating to the expertise of the organisations and individuals involved in the EIA will be set out within the ES.

8 Landscape and Visual

8.1 Introduction

8.1.1 This chapter of the Scoping Report presents an initial baseline for landscape and visual amenity relevant to the Proposed Development. It identifies the need for surveys to ensure there is appropriate information to accurately characterise the baseline and sets out the Landscape and Visual Study Area. In addition, the chapter provides an overview of the assessment methodology to be followed for the environmental assessment and details the potential effects provisionally identified. The potential effects on the fabric and character of the existing landscape and the influence that the Proposed Development could have on views and the visual amenity of people in and around the vicinity are also considered. The approach and methodology to the Landscape and Visual Impact Assessment (LVIA) is continuously reviewed and updated to comply with current best practice.

8.1.2 Landscape and visual effects are interrelated with other environmental effects but will first be assessed separately and then where appropriate in association with other disciplines, such as ecology. Landscape effects associated with the Project relate to the changes to the fabric, character and quality of the landscape and how it is experienced. Visual effects relate closely to changes to the landscape but also concern changes in people's views as a result of the construction and operation of the Project.

8.1.3 A description of the Project and the parameters to be assessed are set out in Chapter 5.

8.2 Legislative or Policy Requirements and Technical Guidance

8.2.1 EIA is a process carried out which examines available environmental information to ensure that the likely significant environmental effects of certain projects are identified and assessed before a decision is taken on whether a project is granted planning permission. This means that environmental issues can be identified at an early stage and projects can then be designed to avoid or to minimise significant adverse environmental effects, and that appropriate mitigation and monitoring can be put in place. Regulation 5 of the EIA Regulations sets out the EIA process and references the need to assess effects on cultural heritage and landscape among other factors.

8.2.2 The landscape and visual ES chapter will have regard to the suite of energy National Policy Statements, the most recent NPPF, the East Linsey District Council Local Plan 2018[15], Core Strategy and relevant supplementary guidance. Any documentation produced as part of the Mablethorpe, Trusthorpe and Sutton on Sea Neighbourhood Development Order will be reviewed for implications regarding landscape and visual issues.

8.3 Baseline

8.3.1 An initial study of the baseline environment has been undertaken through desk-based research to establish the existing conditions of the landscape and visual resources to inform the options appraisal process, and to inform the ongoing design development of the Project. Desk-based research involves a review of mapping and aerial photography, planning and policy documents, landscape character assessments, and other sources of information relevant to the baseline environment of the Study Area.

[15] East Lindsey District Council Adopted Local Plan 2018 https://www.e-lindsey.gov.uk/localplan2018 (accessed August 2025)

8.3.2 The baseline environment will provide a description of the identified landscape and visual receptors, indicating their key characteristics and value, against which the potential change arising from the development of the Project will be assessed.

8.3.3 Key sources of information for the landscape and visual baseline include:

- Ordnance Survey (OS) mapping;
- Google Earth and the measuring tools within it;
- Natural England website;
- Historic England website;
- GIS databases;
- National, regional, and local planning policy;
- Published landscape character assessments, and
- A review of other developments within the planning system which may have a cumulative effect with the Project.

8.3.4 Consultation will be held with relevant LPAs and statutory consultees early in the LVIA process. This will help to inform detailed baseline survey and data collection; refinement of the location of representative viewpoints that will form the basis of the visual assessment; and, to agree the approach to mitigation measures and landscape reinstatement and or enhancement.

Topography

8.3.5 The majority of the Project Site and surrounding area comprise flat fenland in the range 1 - 5m Above Ordnance Datum (AOD). Strubby Airfield lies at 10 - 12m AOD where the land starts to subtly rise to form the more undulating and elevated Wolds. It is not until around 18km from the Thermal and Electrolysis Site that the land is noticeably elevated at around 100 - 110m AOD. Since this high ground is within the National Landscape, any potential views of the Project and in particular the chimneys will be assessed. Topography is illustrated in Figure 8-1 (see Appendix E).

Landscape Designations

8.3.6 The Project does not lie within a designated landscape either at national or local level but the Lincolnshire Wolds National Landscape lies 5 km to the southwest of the Strubby Airfield part of the Site. The eastern edge of the Lincolnshire Wolds is included within the Study Area due to the potential visual influence of the CCGT chimney. The coastal strip adjacent to the site of the thermal plant is part of the Humber Estuary RAMSAR site and although this is an ecological designation it is acknowledged that valued landscape characteristics are often associated with wildlife sites. Designations are shown on Figure 8-2 (see Appendix E).

Land use

8.3.7 The majority of the Study Area is rural with only small, scattered settlements and a limited road network. Mablethorpe is the nearest large settlement, the northern tip lies 1.6 km west of the TES site although holiday parks occupy much of the intervening land. There are several holiday parks in the study area and windfarms are a notable feature of the landscape.

Landscape Character

National

8.3.8 At the national level, the Project falls entirely within NCA 42: Lincolnshire Coast and Marshes but the Study area extends to NCA43: Lincolnshire Wolds[16] and so the direct impacts on the character of NCA42 will be assessed and the indirect impacts (mainly visual and setting) will be assessed.

East Lindsey Landscape Character Assessment (2009[17])

8.3.9 The Project lies within three landscape character areas, the Thermal and Electrolysis Site and eastern BESS lie within LCA J1 Tetney Lock to Skegness Coastal Outmarsh with the potential electrolysis water extraction pipe crossing underground through LCA K1 the Donna Nook to Gibraltar Point Naturalistic Coast. Strubby Airfield lies within LCA Area I1: Holton Le Clay to Great Steeping Middlemarsh. The local LCA are shown on Figure 8-3 (see Appendix E). The Thermal and Electrolysis Site borders the LCA K1: Donna Nook to Gibraltar Point Naturalistic Coast and is likely to influence it.

8.3.10 Further to the west the higher ground of the Lincolnshire Wolds comprises to the north LCA G1:Binbrook to Tetford Wolds Farmland, and to the south LCA G2: Little Cawthorpe to Skendleby Wolds Farmland.

8.3.11 The key characteristics of the Tetney Lock to Skegness Coastal Outmarsh LCA (J1) are:

- A low lying, drained coastal plain contained to the east by sea embankments, sand dunes and sea defences.
- Mostly flat with some areas of gentle undulations including some saltern mounds.
- Some wide-open views and big skies. Some views enclosed by landform, embankments, sand dunes or trees.
- Extensive network of drains, ditches and dykes with a strong geometric pattern in the northern and central parts of the area.
- Predominantly mixed agricultural landuse with both arable and pasture, and some remnants of ridge and furrow.
- Several important coastal nature reserves with a high level of nature conservation designation with associated wildlife.
- Sparsely scattered settlements set within mature ornamental trees and hedgerows.
- A stretch of coastal resorts from Mablethorpe to Skegness with caravan parks, and new residential and commercial developments on their outskirts.
- An extensive network of raised minor roads with a few larger A roads serving the coastal resorts.
- A predominantly intact and distinctive rural landscape with some man-made influences including a gas terminal, an oil storage facility and several wind farms.

8.3.12 The key characteristics of Holton Le Clay to Great Steeping Middlemarsh LCA (I1) are:

[16] Natural England – National Character Area Profiles https://nationalcharacterareas.co.uk/ (Accessed August 2025)

[17] East Lindsey Landscape Character Assessment 2009 East Linsey District Council https://www.e-lindsey.gov.uk/article/6163/Landscape-Character-Assessment https://nationalcharacterareas.co.uk/ (Accessed August 2025)

- Gently undulating foothills to the Wolds rising from Tetney Lock to Skegness Coastal Outmarsh with views to Binbrook toTetford Wolds Farmland and Little Cawthorpe to Skendleby Wolds Farmland.
- Predominantly arable farmland with medium to large scale fields, some pasture with grazing sheep and cattle, bounded by ditches and dykes.
- Meandering rivers and streams, and the Louth Canal contained by flood embankments, which flow from the Wolds eastwards to the coast.
- Scattered blocks of mixed deciduous woodland throughout but more frequent around the southwestern boundary.
- Frequent scattered villages, hamlets, farmsteads and dwellings include a line of merging villages at the foot of the Wolds.
- Traditional and distinctive historic market towns of Louth, Alford and Burgh le Marsh.
- Scattered scheduled monuments and heritage features such as windmills and water mills, ridge and furrow fields, deserted medieval villages and disused railway tracks.
- A distinctive and tranquil rural landscape with very few minor detractors.

Historic Character of The County of Lincolnshire (Lincolnshire County Council 2011)

8.3.13 This study places the Project within RCA 8: Grazing Marshes, but divides it into sub-zones, with the thermal plant and eastern BESS within Sub-Zone GRM3 the Mablethorpe Outmarsh and Strubby Airfield BESS in GRM1.The effect on the historic aspects of the landscape will be assessed.

8.3.14 The effect of the Project on the visual setting of heritage assets will be undertaken. The scoping for a more detailed assessment on the effect on heritage assets is set out in Chapter 10.

Approach to Assessment

8.3.15 The landscape and visual assessment will be carried out in accordance with The Landscape Institute and Institute of Environmental Management and Assessment (2013), Guidelines for Landscape and Visual Impact Assessment (GLVIA), Third Edition[18]; and Natural England (2014) An Approach to Landscape Character Assessment[19].

8.3.16 A series of Accurate Verified Representation (AVRs) will be produced, following agreement of viewpoints with PINS or the affected LPA's, focusing on the Thermal Plant and BESS/Peaking Plant on Strubby Airfield. The methodology for the preparation and presentation of the visualisations will follow the Landscape Institute, 2019, Technical Guidance Note 06-19: Visual Representation of Development Proposals. AVRs will be produced for winter and summer views.

8.3.17 GLVIA3 places a strong emphasis on the importance of professional judgement in identifying and defining the significance of landscape and visual effects. The LVIA will be undertaken by a competent Landscape Architect with experience in the assessment of similar types of projects. Professional judgement will be used in combination with structured methods and criteria to evaluate landscape and visual value and susceptibility, the resulting sensitivity, magnitude and significance of effect.

8.3.18 The following section summarises the methodology for the LVIA which builds on the general assessment methodology presented in Chapter 7. The assessment seeks to identify effects

[18] Landscape Institute and Institute of Environmental Management and Assessment (2013) 'Guidelines for Landscape and Visual Impact Assessment' (GLVIA) 3rd Edition

[19] Natural England (2014) 'An Approach to Landscape Character Assessment'

which are either so beneficial or so adverse that they should be a significant consideration in determining the application. The levels of effect and their significance are set out in Table 8.1.

Table 8.1 Levels of effect and their significance

Level of effect	
Major adverse	The Proposed Development will cause substantial degradation of the landscape character/landscape features/existing views. These adverse effects are key factors in the decision-making process. These effects are generally, but not exclusively, associated with sites or features of international, national or regional importance that are likely to suffer a most damaging impact and loss of resource integrity. **This is a Significant effect in terms of the ES.**
Moderate – Major adverse	The Proposed Development will cause readily noticeable degradation of the landscape character/landscape features/existing views. These adverse effects are key factors in the decision-making process. These effects are generally, but not exclusively, associated with sites or features of national or regional importance, however, a major change in a site or feature of local importance may also enter this category. **This is a Significant effect in terms of the ES.**
Moderate adverse	The Proposed Development will cause a noticeable degradation of the landscape character/elements/existing views. These adverse effects may be important but, are not likely to be key decision-making factors. The cumulative effects of such factors may influence decision-making if they lead to an increase in the overall adverse effect on a particular resource or receptor.
Minor adverse	The Proposed Development will cause small degradation of the landscape character/elements/ existing views. These adverse effects may be raised as local factors. They are unlikely to be critical in the decision-making process.
Negligible adverse	A barely perceptible Adverse change to the landscape/view.
Neutral	Adverse effects are equally offset by Beneficial effects, but the effects must be of a similar nature and/or the resulting effect, while readily noticeable, is unlikely to be perceived as significantly different to the existing situation, for example a rural landscape replaced with a rural landscape.
Negligible Beneficial	A barely perceptible Beneficial change to the landscape/view.
Minor Beneficial	The Proposed Development will cause a small improvement to the landscape character/elements/ existing views.
Moderate Beneficial	The Proposed Development will cause a noticeable improvement to the landscape character/elements/ existing views.

Moderate- Major Beneficial	The Proposed Development will cause a readily noticeable improvement to the landscape character/elements/ existing views. **This is a Significant effect in terms of the ES.**
Major Beneficial	The Proposed Development will cause substantial improvement in landscape character/elements/existing views. In making a decision about the proposal this advantageous effect may be considered to compensate to some degree for other, non-landscape, adverse effects. **This is a Significant effect in terms of the ES.**

8.3.19 For both Landscape and Visual effects, the level of impact (leading to a determination of significance) are determined by combining the sensitivity of the landscape or viewer with the magnitude of change arising from the Project at the various stages. There are separate criteria for determining sensitivity and magnitude for landscape and visual amenity and these will be set out within the full methodology of the ES.

Criteria for assessing Landscape Effects

8.3.20 The determination of landscape sensitivity requires an assessment of a landscapes value and susceptibility (its ability to absorb a development of the type proposed). The full methodology will be used but Tables 8.2 – 8.7 is a summary of the likely criteria determining sensitivity.

Table 8.2: Criteria for assessing Landscape Sensitivity

Sensitivity	Criteria
High	A landscape area with a particularly distinctive sense of place and character. Landscape characteristic that makes a highly notable contribution to a landscape area. Highly valued for its landscape character. • Low tolerance to the type of proposed development. • Designed landscape of historical importance. • Other strong cultural or heritage associations. • Appreciated as a recreational resource. • Landscape characteristics that cannot be readily replaced. • A wild or well managed quality landscape.
Medium	A landscape area with some distinctive sense of place and character but not nationally rare. Landscape characteristic that makes a positive contribution to a landscape area. Some scenic quality but also some less scenic elements. • Recognisable landscape character that has value. • Some tolerance to the type of proposed development. • A recognisably area or piece of designed landscape. • Possible cultural or heritage associations. • Some appreciation as a recreational resource.

	• Landscape characteristics that could be replaced, but not easily. • A partly wild or partly well managed landscape of medium quality.
Low	A landscape area with no distinctive sense of place or notable character and not locally rare. Landscape characteristic that makes a contribution to a landscape area. • Limited or no scenic quality or elements. • Landscape character is ordinary or weak. • Tolerance to the type of proposed development. • Not a recognisable designed landscape. • No known cultural or heritage associations. • No obvious appreciation as a recreational resource. • Landscape characteristics that could be readily replaced. • Landscape in poor condition.

Table 8.3: Criteria for Judging Levels of Magnitude of change in relation to Landscape Character

Level of Magnitude	Definition
High adverse	• Noticeable alteration to, or significant loss of, key elements, features, characteristics and functions of the baseline condition. • Insertion of a negative feature which is absent from the landscape. • The size, scale and / or geographical extent of change is considered large due to the extent and proportion of loss of, or change to, existing landscape components. • Effects likely to be experienced at a large scale, influencing the character area and / or type within which the change is proposed. • Noticeable alteration to, or loss of, key elements, features, characteristics and functions of the baseline condition, and / or the addition of uncharacteristic, conspicuous elements, features and / activities, would result in noticeable alteration to, or loss of, aesthetic and / or perceptual qualities. • The duration of effect would be considered long-term / permanent and would be very difficult to reverse in practical terms.
Medium adverse	• Partial alteration to, or loss of, key elements, features, characteristics and functions of the baseline condition. • Insertion of a negative feature which is uncommon within the landscape.

	• The size, scale and / or geographical extent of change is considered medium due to the extent and proportion of loss of, or change to, existing landscape components. • Effects likely to be experienced at a moderate scale, influencing the character type within which the change is proposed but at a local level. • Partial alteration to, or loss of, key elements, features, characteristics and functions of the baseline condition, and / or the addition of elements, features and / activities which are not uncharacteristic in the area, would result in partial alteration to, or loss of, aesthetic and / or perceptual qualities. • The duration of effect would be considered long-term / permanent but is potentially reversible.
Low adverse	• Minor or barely discernible alteration to key elements, features, characteristics and functions of the baseline condition. • Insertion of a negative feature which is commonplace within the landscape. • The size, scale and / or geographical extent of change is considered small due to the extent and proportion of loss of, or change to, existing landscape components. • Effects likely to be experienced at a small scale, influencing the landscape within which the change is proposed at a local level. • Minor alteration to, or loss of, key elements, features, characteristics and functions of the baseline condition, and / or the addition of elements, features and / activities which are characteristic in the area, would result in minor alteration to aesthetic and / or perceptual qualities. • The duration of effect may be considered long-term / permanent but is easily reversible; or the duration may be medium-term
Neutral	The proposed development would result in beneficial changes to the landscape (such as introducing woodland) but also some negative features, which on balance results in a Neutral change.
Low beneficial	• Small but noticeable improvements to key elements, features, characteristics and functions of the baseline condition. • Insertion of a feature which makes a positive contribution to landscape character but is not particularly noticeable. • Removal of negative landscape elements but not particularly noticeable • The size, scale and / or geographical extent of improvement is considered small due to the extent and proportion of new landscape components. • Beneficial effects likely to be experienced at a small scale, influencing the local landscape. • Small but noticeable improvements to existing, or addition of new, key elements, features, characteristics and functions of the baseline

	condition would result in discernible improvements in aesthetic and / or perceptual qualities • Improvements are medium- to long-term.

Table 8.4: Matrix for determining the level of effect on landscape character

Magnitude of change	Landscape sensitivity		
	High	Medium	Low
High	Major	Moderate-Major	Moderate
Medium	Moderate-Major	Moderate	Minor
Low	Moderate	Minor	Negligible

Criteria for assessing visual effects

Table 8.5: Sensitivity of Visual Receptors

Level of value	Definition
High	• Receptors (tourists / visitors) within, or looking towards, internationally- or nationally- designated landscapes, areas and features such as World Heritage Sites, National Parks, Areas of Outstanding Natural Beauty, Registered Historic Parks and Gardens, Scheduled Ancient Monuments, Grade I and II* listed buildings and other places where the landscape / feature is the main reason for the visit. • People using popular and well used national trails and other designated routes where the view is likely to be the focus of attention. • People living in residential properties. • People travelling through the landscape on roads, rail or other routes on recognised scenic routes or where there is a distinct awareness of views of their surroundings and their visual amenity. • People walking/cycling on national long distant trails or promoted walks, motorists on designated scenic routes, people walking in nationally designated landscapes
Medium	• Receptors within, or looking towards, undesignated landscapes, areas and features of local importance, and in places where the landscape / feature is not necessarily part of the reason for the visit. • People engaged in outdoor recreation (such as walking local rural footpaths) whose attention is likely to be focused on the landscape and / or particular views, not on national trails or within designated landscapes.

	• People staying in hotels and healthcare institutions who are likely to appreciate and / or benefit from views of their surroundings. • Travellers on roads which have an attractive setting or scenic quality (rural or urban).
Low	• Receptors in commercial and industrial premises, schools, playing fields etc. where the view is not central to the use. • People using main roads, infrequently used / inaccessible public rights of way and likely to be travelling for a purpose other than to enjoy the view • People moving past the view often at high speed (e.g. main roads, motorways and main line railways) and with little or no focus on or interest in the landscape through which they are travelling and significant roadside highway infrastructure (barriers, signs etc.).

Table 8.6: Criteria for Judging Levels of Magnitude of Effect

Level of magnitude	Definition
High	• Substantial, obvious, loss or addition of features in the view. • Major change in the composition of the view • A major proportion of the view may be either blocked or occupied by the proposed development. • The development introduces colours or forms which draw the eye and are not commonplace in the view. • Views may be short-distance and direct. • Prominent position within the landscape, such as on the skyline or open hillside or open floodplain or plateau • Changes in the view may be visible over a large proportion of the view. The proposed development is permanent and irreversible.
Medium	• Readily noticeable loss or addition of features in the view. • Partial alteration to the existing view and/or the introduction of readily noticeable elements in the view. • There is some screening or backgrounding by landform, woodland, and or built form • The colours and forms are largely in keeping with the colours and forms within the surrounding landscape • Views may be middle-distance, direct or oblique. • Views may be filtered by vegetation. • Partial loss of, or change to, sites visual function / contribution • The duration of effect would be considered long-term / permanent but is potentially reversible
Low	• The change in the view would not be readily noticeable.

	• Development would form a minor constituent of the view, being partially-visible, or at a sufficient distance to be a limited component of a view • The duration of effect may be considered long-term / permanent but is easily reversible; or, the duration may be medium-term • A significant part of the development is screened • It does not lie within a particularly prominent location within the landscape • Introduction of features which may already be present in views.
Negligible	The change would be barely perceptible.
Neutral	The proposed development would result in beneficial changes to the view (such as introducing woodland) but also some negative features, which on balance results in a Neutral change.

Table 8.7: Matrix to determine the level of impact on visual amenity

Magnitude of change	Receptor sensitivity		
	High	Medium	Low
High	**Major**	**Moderate-Major**	**Moderate**
Medium	**Moderate-Major**	**Moderate**	**Minor**
Low	**Moderate**	**Minor**	**Negligible**

Geographical Scope

8.3.21 Within this largely flat landscape the Study Area is determined by the height of the tallest element of the Project, which will be the chimney of the CCGT. The exact height of the chimney will be determined through design development and air quality parameters, including choice of fuel (hydrogen or natural gas). For the scoping a worst-case scenario of CCGT chimney up to 110 m height above ground level has been used to determine a preliminary Zone of Visual Influence (ZTV). Since the landscape around the thermal plant is low lying, a chimney of such height will be visible for many kilometres. However, a radius of 20 km has been chosen as the landscape and visual study area since a slender chimney is likely to be difficult to discern beyond 20 km away and will be a feature within a wide panorama. The 20 km covers the eastern edge of the higher ground of the Lincolnshire Wolds.

8.3.22 The two BESS sites also lie within this study area and any structures within these sites are likely to be far lower than the thermal chimneys and so their visual influence is unlikely to exceed the 20 km radius study area. Once more details are known about the structures within all three main sites separate ZTVs will be prepared for each of the tallest elements to determine whether the study area needs to be increased and to determine local effects.

8.3.23 The preliminary ZTV for a worst case CCGT chimney is presented in Figure 8-1.

8.3.24 Effects will be categorised into impacts at a national level, a regional level or local level. For example, an effect on a National Landscape would be a national level effect.

Temporal Scope

8.3.25 Assessments will be made for the construction phase (or individual construction phases), Day 1 of the operational phase and the operational phase after 7 and 14 years (to assess the effect of mitigating tree planting on landscape character and visual amenity).

8.4 Embedded Mitigation and Enhancement Measures

8.4.1 It is anticipated that the Project will include embedded landscape mitigation and enhancement measures such as choice of location, design of structures, colouration of structures, tree and hedge planting and the establishment of habitats as part of meeting Biodiversity Net Gain. At this stage it is too early to be specific about these features but once known and fixed they will be described within the ES and their effect on reducing impacts assessed.

8.5 Scope of Environmental Impact and Effects

8.5.1 The desktop study and ZTV indicate that the likely impacts on the following receptors need to be assessed for both the construction and operational phases, although at this stage it is not an exclusive list.

Landscape Character

8.5.2 The study will assess the effect of the Project on the characters of LCA J1 Tetney Lock to Skegness Coastal Outmarsh, LCA K1: Donna Nook to Gibraltar Point Naturalistic Coast and LCA Area I1: Holton Le Clay to Great Steeping Middlemarsh, G1:Binbrook to Tetford Wolds Farmland and LCA G2: Little Cawthorpe to Skendleby Wolds Farmland.

Landscape Features

8.5.3 Potential loss of grassland, trees, hedges, scrub, ditches.

Visual Amenity

8.5.4 A field survey informed by the ZTVs will be undertaken to identify a set of representative views. These will then be presented to PINS and/or affected LPA's to agree views and for which AVRs should be produced.

8.5.5 The desktop research suggests that views from the following key sensitive receptors will need to be identified and agreed:

- Visitors to the naturalistic coast (beaches, dunes etc.).
- Travellers on adjacent roads such as the A1031, A1104, A517, A1028, B1373, Kent Avenue, streets within Mablethorpe, Mill Road, Saltfleet Road, Stain Lane etc.
- Residents, such as those within the settlements of Mablethorpe, Theddlethorpe, Maltby le Marsh, Beesby, Woodthorpe, Withern, Strubby, Gayton le Marsh etc.
- Residents within more isolated dwellings or at sensitive locations such as along Stain Lane and adjacent to Strubby Airfield.
- Users of tourism facilities, such as caravan parks, campsites, visitor attractions, such as The Grange and Haven Golden Sands leisure parks.
- Users and workers within commercial facilities, such as Woodthorpe Garden Centre.
- Users of Public Rights of Way, particularly those around Maplethorpe and close to the proposed thermal plant.
- Travellers using roads and footpaths which cross the higher ground within the Lincolnshire Wolds National Landscape.

- Residents within properties within the National Landscape which may afford views across the Project area.

8.5.6 The cables between the BESS facilities, the Theddlethorpe TES and the proposed NG substation will be underground and so the landscape and visual effects are likely to be limited to any potential loss of trees or hedges and any reinstatement planting and so only the construction phase in relation to installing cables will be assessed and the landscape and visual effects within the operational phase are scoped out.

8.5.7 A project substation may be built close to the site of a proposed NG substation south of Woodthorpe (the exact location of both is currently unknown) and the landscape and visual effects of this will be assessed as will the combined effects of the two substations.

Historic Landscape

8.5.8 Effects on the character of the historic landscape as a whole (field pattern, boundaries etc.) and specifically the effect on the visual setting of heritage assets, such as remnant WWII heritage assets at Strubby Airfield, Scheduled Monuments and listed buildings.

Tranquillity

8.5.9 The area is an open landscape which is sparsely populated and a holiday destination in which part of the experience is seeking a level of tranquillity. The effect of the Project on tranquillity in terms of aural changes and the effect on rurality, openness, wildness and remoteness will be assessed.

Nightscape

8.5.10 The nearest Dark Sky Reserve is in the Yorkshire Dales and so the Project will not affect any reserves, but it does lie within an area of low light levels as typically associated with a rural landscape. A nighttime photographic survey will be undertaken at each of the sites to determine the baseline light levels in terms of the location and type of main light sources. These will also be plotted on plans. The proposed light sources will be described in terms of location, type, brightness, spectrum, duration and frequency and their effect on the nightscape assessed.

Green Infrastructure

8.5.11 Existing data will be reviewed to see if the Project lies within any published Green Infrastructure corridors or proposed enhancement zones. The impact of the Project on Green Infrastructure will be assessed together with opportunities for mitigation and enhancement.

8.6 Limitations and Uncertainties

8.6.1 Site surveys for landscape and visual amenity will be undertaken in winter and summer to allow the assessment of the likely different effect at different seasons.

8.6.2 The main current limitations at this stage are precise details on the design of the plant and buildings and choice of underground services route but a worst-case scenario will be assessed and refined as more detail becomes available.

8.7 Inter-related Effects

8.7.1 The potential effects of the Project on the visual setting of heritage assets will feed into the Heritage chapter of the ES which will apply these findings to determining the degree of harm or benefit.

8.7.2 The landscape design will mitigate landscape and visual impacts but will contribute to mitigating ecological impacts. The mitigating landscaping and habitat creation will be designed in

consultation with the ecological consultants to address specific impacts and deliver BNG. Changes to the nightscape will inter-relate with some ecological receptors such as bats and so mitigation in terms of avoidance, light type and shielding will be described and assessed.

8.7.3 The mitigating landscaping will be designed in consultation with the drainage engineers to ensure that the Project achieves the require drainage functionality in a sustainable and ecologically beneficial way.

8.7.4 The three main sites are spatially separated and so a receptor may be affected by one or more of the facilities, making it necessary to assess combined effects between sites. Once more information is known about the design of each facility a series of ZTVs will be produced for the main structures at each of the sites to determine combined effects.

8.8 Cumulative Effects

8.8.1 Within the Study Area there are numerous other schemes in the planning system which may result in direct, indirect and sequential landscape and visual effects, particularly in relation to tall structures and buildings. The Landscape and Visual chapter will assess the combined effects of the projects listed in Chapter 7 (the list will be updated throughout the assessment period) in combination with the internal cumulative effects of the Project.

8.9 Summary of Proposed Scope

8.9.1 A summary of the proposed scope of assessment is included at Chapter 22.

8.10 References

1) Department for Communities and Local Government, National Planning Policy Framework December 2024 (NPPF)

2) East Lindsey District Council Adopted Local Plan 2018

https://www.e-lindsey.gov.uk/localplan2018

3) Natural England – National Character Area Profiles https://nationalcharacterareas.co.uk/

4) East Lindsey Landscape Character Assessment 2009 East Linsey District Council https://www.e-lindsey.gov.uk/article/6163/Landscape-Character-Assessment

5) Landscape Institute and Institute of Environmental Management and Assessment (2013) 'Guidelines for Landscape and Visual Impact Assessment' (GLVIA) 3rd Edition

6) Natural England (2014) 'An Approach to Landscape Character Assessment'

9 Terrestrial Ecology and Biodiversity

9.1 Introduction

9.1.1 This section of the EIA Scoping Report provides an overview of existing data available to identify the terrestrial ecological baseline conditions and the potential significant effects of the Proposed Development on ecology and biodiversity during construction, operation, and decommissioning and the proposed scope of assessment methodology to be considered in the EIA Report.

9.1.2 The scope for the EIA covers consideration of potential impacts to sensitive ecological features such as designated sites, habitats of principal importance, and protected or notable species.

9.1.3 This section has been produced by RPS. The RPS ecology division comprises a skilled team of over 80 technical experts providing value-added ecology and biodiversity consultancy services. RPS experience spans a diverse range of projects, from planning applications for residential, industrial and mixed-use developments, to strategic scale assessments in support of large-scale housing developments, energy facilities, transport and infrastructure projects.

9.1.4 This section of the scoping report covers terrestrial ecology and biodiversity features landward from Mean High Water (MHW) as well as ornithology features associated with terrestrial habitats, coastal habitats and nearshore waters. A separate chapter to the scoping report has been prepared for marine ecology that covers habitats seaward of MHW.

9.2 Legislation, Policy and Technical Guidance

9.2.1 Relevant articles of legislation to the assessment of impacts on ecology and biodiversity are as follows:

- The National Planning Policy Framework (NPPF);
- Circular 06/2005 (retained as Technical Guidance within the NPPF);
- Local planning policies (Lincolnshire Local Plan);
- Conservation of Habitats and Species Regulations 2017;
- The Wildlife and Countryside Act 1981 (as amended);
- The Countryside and Rights of Way Act 2000;
- The Natural Environment and Rural Communities Act 2006;
- National / Local Biodiversity Action Plan for Lincolnshire
- Environment Act 2021

9.2.2 Potential impacts of the Proposed Development on identified important ecological features will be assessed in accordance with the Chartered Institute for Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment (CIEEM, 2024), and the collection of baseline data and assessment will be undertaken with reference to the British Standards Institution (2013) Biodiversity – Code of Practice for Planning and Development: BS 42020:2013.

9.3 Baseline

Baseline Environment

9.3.1 A desk study has been undertaken using freely available information on the Multi Agency Geographical Information for the Countryside (MAGIC) database to identify statutory designated nature conservation sites (Sites of Special Scientific Interest (SSSIs), Special Protection Areas

(SPAs), Special Area of Conservation (SACs), Ramsar sites, and National Nature Reserves (NNRs)) within the potential zone of influence of the Proposed Development. A desk study area of 15 km was used for SACs, SPAs and Ramsar sites and 2 km was applied to SSSIs and NNRs.

9.3.2 The desk study data review also included a review of data presented in the publicly available Environmental Statement for the Viking CCS Pipeline DCO, the Order Limits of which partially overlap with the Proposed Development (at the proposed thermal site) (AECOM, 2023).

Statutory Nature Conservation Designations

9.3.3 All of the statutory nature conservation designations identified within the desk study area were coastal, with some overlaps between the boundaries of the SPAs, SACs, Ramsars and SSSIs. The designations collectively cover the majority of the Lincolnshire coastline between the Humber Estuary and The Wash, including coastal and intertidal habitats and nearshore waters.

9.3.4 A summary of the statutory designated nature conservation sites identified within desk study areas is presented in , with their approximate distances from the main elements of the Proposed Development stated.

9.3.5 **Table 9.1**, with their approximate distances from the main elements of the Proposed Development stated.

Table 9.1: Statutory Designated Sites within Desk Study Area

Name	Designation	Qualifying Features	Nearest Distance from Proposed Theddlethorpe TES & Electrolysis Site	Nearest Distance from Proposed BESS at Strubby Airfield	Nearest Distance from Proposed UGC
Internationally Designated Sites within 15 km					
Saltfleetby-Theddlethorpe Dune & Gibraltar Point	SAC	Annex I habitats of the EC Habitats Directive that are a primary reason for site designation are: ▪ Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes") ▪ Fixed coastal dunes with herbaceous vegetation ("grey dunes") ▪ Dunes with Hippopha rhamnoides ▪ Humid dune slacks Annex 1 habitats of the EC Habitats Directive that are present as a qualifying feature but not a primary reason for selection of this site are: ▪ Embryonic shifting dunes	Directly adjacent	7.8 km north-east	1 km east
Humber Estuary	SPA	The site qualifies under article 4.1 of the Directive (79/409/EEC) as it is used regularly by 1% or more of the Great Britain populations of the following species listed in Annex I in any season: ▪ Avocet (Recurvirostra avosetta)	Directly adjacent	7.8 km north-east	1 km east

Name	Designation	Qualifying Features	Nearest Distance from Proposed Theddlethorpe TES & Electrolysis Site	Nearest Distance from Proposed BESS at Strubby Airfield	Nearest Distance from Proposed UGC
		▪ Bittern (Botaurus stellaris) ▪ Hen harrier (*Circus cyaneus*) ▪ Golden plover (Pluvialis apricaria) ▪ Bar-tailed godwit (Limosa lapponica) ▪ Ruff (Philomachus pugnax) ▪ Bittern (Botaurus stellaris) ▪ Marsh harrier (Circus aeruginosus) ▪ Little tern (Sternula albifrons) It qualifies under article 4.2 of the Directive (79/409/EEC) as it is used regularly by 1% or more of the biogeographical populations of the following regularly occurring migratory species (other than those listed in Annex I) in any season: ▪ Shelduck (Tadorna tadorna) ▪ Knot (Calidris canutus) ▪ Dunlin (Calidris alpina) ▪ Black-tailed godwit (*Limosa limosa*) ▪ Redshank (Tringa totanus) The site qualifies under article 4.2 of the Directive (79/409/EEC) as it is used regularly by over 20,000 waterbirds in any season			

Name	Designation	Qualifying Features	Nearest Distance from Proposed Theddlethorpe TES & Electrolysis Site	Nearest Distance from Proposed BESS at Strubby Airfield	Nearest Distance from Proposed UGC
Humber Estuary	Ramsar	The site qualifies under Ramsar criterion 1 by virtue of it being a near-natural estuary following component habitats: ▪ Dune systems and humid dune slacks, ▪ Estuarine waters, ▪ Intertidal mud and sand flats, ▪ Saltmarshes, and ▪ Coastal brackish/saline lagoon. Additionally, it qualifies under Ramsar criterion 3 as it supports a breeding colony of grey seal *(Halichoerus grypus*) and a breeding population of natterjack toad (*Epidalea calamita*) It qualifies under Ramsar criterion 5 for its population of non-breeding waterfowl. It qualifies under Ramsar criterion 6 for its populations of breeding shelduck (*Tadorna tadorna)* and golden plover.	Directly adjacent	7.8 km north-east	1 km east
Humber Estuary	SAC	Annex I habitats of the EC Habitats Directive that are a primary reason for site designation are: ▪ Estuaries ▪ Mudflats and sands not covered by seawater at low tide	5 km north	12.8 km north	6 km north

Name	Designation	Qualifying Features	Nearest Distance from Proposed Theddlethorpe TES & Electrolysis Site	Nearest Distance from Proposed BESS at Strubby Airfield	Nearest Distance from Proposed UGC
		Annex 1 habitats of the EC Habitats Directive that are present as a qualifying feature but not a primary reason for selection of this site are: ▪ Sandbanks which are slightly covered by sea water all the time ▪ Coastal lagoons ▪ Salicornia and other annuals colonising mud and sand ▪ Atlantic salt meadows (Glauco-Puccinellietalia maritimae) ▪ Embryonic shifting dunes ▪ Shifting dunes along the shoreline with *Ammophilia arenaria* (“white dunes) ▪ Fixed coastal dunes with herbaceous vegetation (“grey dunes”) ▪ Dunes with Hippopha rhamnoides Annex II species present as a qualifying feature, but not a primary reason for site selection are: ▪ Sea lamprey (Petromyzon marinus) ▪ River lamprey (Lampetra fluviatilis) ▪ Grey seal			
Greater Wash	SPA	Marine components of the Greater Wash SPA cover a substantial area of the intertidal habitats	0.5 km east	8 km north-east	1.2 km east

Name	Designation	Qualifying Features	Nearest Distance from Proposed Theddlethorpe TES & Electrolysis Site	Nearest Distance from Proposed BESS at Strubby Airfield	Nearest Distance from Proposed UGC
		and nearshore waters off the Lincolnshire coast between Barmston and The Wash estuary. Classified for the protection of non-breeding red-throated diver (Gavia stellata), common scoter (Melanitta nigra) and little gull (Hydrocoloeus minutus), and breeding sandwich tern (Sterna sandvicensis), common tern (Sterna hirundo) and little tern (Sternula albifrons). Designation extends 12 nautical miles offshore for the protection of foraging habitat for little tern and red-throated diver.			
Nationally Designated Sites within 2 km					
Saltfleetby-Theddlethorpe Dunes	SSSI	The site has a range of habitats including flats, dunes, and freshwater marsh, which support a rich variety of flora and fauna. It is home to notable plant assemblages and serves as the most north-easterly breeding site in Britain for the Natterjack Toad (*Epidalea calamita*). The intertidal sands and muds provide extensive feeding and roosting grounds for wildfowl and waders including brent geese *(Brenta bernicla)*, shelduck and dunlin. Habitats also support a range of plant and invertebrate species.	Directly adjacent	7.8 km north-east	1 km east
Lincolnshire Coronation Coast	NNR	Designated for the following important ecological features:	Directly adjacent	7.8 km north-east	1 km east

Name	Designation	Qualifying Features	Nearest Distance from Proposed Theddlethorpe TES & Electrolysis Site	Nearest Distance from Proposed BESS at Strubby Airfield	Nearest Distance from Proposed UGC
		▪ Rich variety of sand dunes, salt marshes, mudflats and freshwater marshes which are of international importance. ▪ Contains five habitats which are Priority Habitats: intertidal mudflats, coastal saltmarsh, coastal sand dunes, coastal and floodplain grazing marsh, and saline lagoons. ▪ Supports many breeding and over-wintering bird species (including redshank, whitethroat (*Sylvia communis*) and golden plover), natterjack toads grey seals, rare/ notable plants and insects including marsh moth (*Athetis pallustris*).			

Habitats

9.3.6 The following UK Priority Habitats are identified on the MAGIC database as being within 1 km of the Proposed Development:

- Intertidal substrate foreshore
- Coastal sand dunes
- Coastal floodplain grazing marsh
- Deciduous woodland
- Hedgerows

9.3.7 A review of aerial photography for the Site indicates that the proposed thermal generation site comprises arable farmland with boundary hedgerows and a network of interconnecting ditches. The thermal generation site is immediately adjacent to the former Theddlethorpe Gas Terminal, which closed in 2018 and has since been demolished. The proposed BESS site occupies arable farmland adjacent to Strubby Airfield. The airfield was formerly an RAF base until its closure in the 1970s and remains in use as an operational airfield for light aircraft and gliders. Two options are being considered for an UGC connection between the thermal generation and BESS, both of which are approximately 7 km in length and both of which cross predominantly arable land with its extensive interconnecting network of drainage ditches.

Protected Species

9.3.8 A review of the Viking CCS Pipeline DCO Environmental Statement (AECOM, 2023), the Order Limits of which partially overlap with the proposed thermal generation site, has been undertaken. This review, alongside a review of aerial photography to identify habitats within the Proposed Development that could support protected species, has identified the following protected species that may be located within the Scoping Boundary for the Proposed Development, and which are likely to require consideration in the assessment of impacts on ecology and biodiversity.

Amphibians and Reptiles

9.3.9 A breeding population of natterjack toad (Epidalea calamita) is known at coastal sand dunes at Saltfleetby/ Theddlethorpe, which are adjacent to the TES site. However, this species has very specialised habitat requirements and is likely to be entirely confined to the sand dunes and dune slacks along the coast, and as there is no suitable habitat for this species within the TES site, proposed BESS site and UGC route corridor, it is unlikely to be impacted. The seawater pipe will cross the dunes using trenchless techniques (e.g. HDD) and therefore there would be no direct impacts to sand dunes habitats supporting natterjack toad.

9.3.10 There are scattered populations of great crested newt (*Triturus cristatus*) within Lincolnshire that may also be present in suitable habitats within the Scoping Boundary. There are no ponds within the proposed TES or proposed BESS site, but there are a number of ponds within the UGC route corridor and within 250 m that may be suitable for this species.

9.3.11 Common lizard (*Zootoca vivipara*), slow worm (*Anguis fragilis*), grass snake (*Natrix helvetica*) and adder (*Vipera berus*) have all been all recorded in the county and may be present in suitable habitats within the Scoping Boundary. However, the majority of the habitats within the Scoping Boundary comprise arable farmland and permanent pasture, which are unlikely to be suitable for most species of reptiles, although the ditch network may support foraging grass snake.

Bats

9.3.12 Two trees on the thermal generation site boundary were assessed as having moderate bat roost potential and two emergence surveys were carried out upon each of them in 2023 for the Viking CCS Pipeline project. No emergences were recorded however common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*), and *Myotis* species were recorded commuting and foraging in the area. Hedgerows and ditches within the Scoping Boundary may be suitable for these species, and mature trees may be present that have suitable features for roosting bats. There are also a small number of buildings within the proposed BESS site that may be of suitability for roosting bats.

Wintering and Passage Waterbirds

9.3.13 Species recorded within the proposed thermal generation site during surveys for the Viking CCS Pipeline project included those that are qualifying features of the adjacent Humber Estuary SPA/ Ramsar such as curlew (*Numenius arquata*), lapwing (*Vanellus vanellus*) and mallard (*Anas platyrhynchos*).

9.3.14 Other species recorded in the fields surrounding the thermal generation site (within approximately 1 km) were oystercatcher (*Haematopus ostralegus*), pink-footed goose (*Anser brachyrhynchus*), redshank, wigeon (*Anas penelope*), teal (*Anas crecca*) and shelduck.

9.3.15 Arable land within the Scoping Boundary may be suitable for important numbers of overwintering/ passage waterbirds and may be functionally linked to the nearby Humber Estuary SPA/ Ramsar.

9.3.16 The coastal habitats and nearshore waters within the footprint of the seawater pipe may be used by important aggregations of waterbirds that are qualifying features of the Humber Estuary SPA/ Ramsar and Greater Wash SPA.

Water Vole and Otter

9.3.17 Surveys undertaken for the Viking CCS Pipeline project recorded water vole (*Arvicola amphibius*) on several ditches within 1 km of the proposed thermal generation site, the nearest being c. 0.1 km from the proposed thermal generation site boundary, and otter (*Lutra lutra*) on several watercourses within c. 2 km. Ditches and watercourses within the UGC corridor are also likely to be suitable for both species.

Badger

9.3.18 This species may be present in suitable habitats within the Scoping boundary.

Brown Hare

9.3.19 There is abundant arable habitat within the Scoping Boundary that may support this species, and it is reasonable to assume that it is relatively widespread in the local area.

Invertebrates

9.3.20 Most of the habitats within the Scoping Boundary comprise intensively farmed arable land and heavily managed drainage ditches, which are unlikely to support any rare or notable terrestrial or aquatic invertebrates. However, some of the more botanically diverse grasslands and coastal dune habitats may support a more interesting invertebrate assemblage. For example, the dunes at Saltfleetby-Theddlethorpe Dunes SSSI are designated for their butterfly, bee and dragonfly populations.

9.3.21 There are no known populations of white-clawed crayfish (*Austropotamobius pallipes*) within the local area, and the ditches within the Scoping Boundary are therefore unlikely to support this species.

Fish and Eels

9.3.22 Ditches within the Scoping Boundary may be suitable to support European eel (*Anguilla anguilla*), which is known to be present in the Humber catchment, and other species of fish.

Invasive non-native Species

9.3.23 The invasive non-native shrimp species (*Crangonyx pseudogracilis/floridanus*) is present in a ditch within the centre of the proposed thermal generation site and may be present within other ditches within the UGC corridor.

Further Baseline Data Collection

Desk Study

9.3.24 Records of locally non-statutory designated nature conservation sites and protected species would be obtained from Lincolnshire Environmental Records Centre (LERC) for a 1 km radius from the Scoping Boundary.

Field Surveys

9.3.25 A summary of the site-specific surveys that are anticipated to be undertaken to inform the ecological impact assessment is provided in Table 9.2. The scope of the surveys will be confirmed following completion of a preliminary ecological appraisal for the Scoping Boundary informed by a UKHabs survey and protected species appraisal, to be undertaken within the Scoping Boundary in spring/ summer 2025. Phase 2 ecology surveys would therefore be undertaken, as seasonality permits, across spring and summer 2026; however, some surveys may commence within the appropriate season in 2025 where access permits.

Table 9.2: Summary of Field Survey Scope

Survey Type	Method	Survey Extent	Timings
Habitats			
UK Habitat Classification Surveys and protected species appraisal.	Habitat survey and mapping to UKHabs classification (UK Hab Ltd, 2023) Preliminary Ecological Appraisal (PEA) in accordance with CIEEM guidance (2024).	Proposed Development and 50 m buffer (where access permits).	2025 -2026
Rare arable weeds	Botanical survey undertaken by appropriately experienced botanist.	Arable habitats identified as potentially botanically diverse within the Proposed Development.	June - September 2026
Hedgerow survey	Surveys to collect sufficient information on species, structure and supporting features (Defra, 2007)	Any hedgerows within the Proposed Development footprint. Hedgerows will be surveyed to determine whether they are important under the Hedgerow Regulations 1997.	April – October 2026
Protected Species			

Survey Type	Method	Survey Extent	Timings
Great crested newt	Habitat Suitability Index (HSI) assessment (English Nature, 2001; ARG UK, 2010). Collection of eDNA samples in accordance with standard methods (Williams, 2013).	eDNA surveys of all ponds identified as potentially suitable for great crested newt within the Proposed Development and 250 m buffer, where access permits.	Mid-April – end-June 2026
	Presence/ absence survey (English Nature, 2001) – minimum of four survey visits	All ponds identified as potentially suitable for great crested newt within the Proposed Development and 250 m buffer, where access permits.	Mid-April – end-June 2026
	Population size class estimate survey – six visits with at least 2 visits between mid-April and mid-May.	All ponds where GCN confirmed present in presence/ absence surveys.	Mid-April – end-June 2026
Bats	Preliminary Roost Features (PRF) (Collins, 2024)	Structures within the footprint of the Proposed Development that may be suitable for roosting bats.	Throughout 2026
	Ground Level Tree Assessments (GLTA) (Collins, 2024)	Trees within the footprint of the Proposed Development that may be suitable for roosting bats.	Throughout 2026
	Aerial inspection (Collins, 2024)	Aerial inspection tree climbing of trees identified within the footprint of the Proposed Development as having bat roost potential.	April – November 2026
	Emergence surveys (Collins, 2024)	Emergence surveys of structures identified within the footprint of the Proposed Development as having bat roost potential.	May – September 2026
	Activity surveys (Collins, 2024)	Walked transects and static detector deployment at identified locations of high value for foraging/ commuting bats.	May – September 2026
Water vole	Habitat suitability appraisal (Dean et al.	Initial walkover survey of all ditches and watercourses within the Proposed Development to	Throughout 2026

Survey Type	Method	Survey Extent	Timings
	2016; Strachan et al. 2011).	identify potential for water voles to be present.	
	Presence/ absence surveys (Dean et al. 2016; Strachan et al. 2011).	All ditches/ watercourses within Proposed Development boundary and up to 250 m buffer either side of crossing points. Two surveys (one in spring and one in autumn).	April/ May and September/ October 2026
Otter	Habitat suitability appraisal (Chanin, 2003)	Initial walkover survey of all ditches and watercourses within the Proposed Development to identify potential for otter to be present.	Throughout 2026
	Presence/ absence survey (Chanin, 2003)	All ditches/ watercourses within Proposed Development boundary and up to 250 m buffer either side of crossing points.	Throughout 2026
Badger	Presence/ absence survey (Harris et al. 1989)	Survey to identify setts within the Proposed Development boundary and 30 m buffer. Camera trapping may be deployed to confirm activity status.	Throughout 2025 and 2026
Breeding birds	Six visits to record breeding assemblage.	Habitat within footprint of permanent infrastructure of the Proposed Development (proposed thermal generation site and proposed BESS site).	Spring/ summer 2026
Wintering birds	Walked transects (monthly)	Habitat within footprint of permanent infrastructure of the Proposed Development (proposed TES and proposed BESS site).	September 2025 to April 2026 and September 2026 to April 2027
	Vantage point surveys (monthly)	Habitats within the UGC route corridor and up to 50 m buffer where visible.	September 2025 to April 2026 and September 2026 to April 2027

Survey Type	Method	Survey Extent	Timings
	Through The Tide Counts (TTTC) (twice monthly)	Coastal and nearshore waters at seawater pipe landfall and up to 100 m buffer where visible from survey location. Daylight surveys undertaken twice per month; one Low Tide to High tide and one High Tide to Low tide.	September 2025 to April 2026 and September 2026 to April 2027
Aquatic invertebrates	Four visits spread across season to collect samples for laboratory identification	All ditches/ watercourses directly impacted within Proposed Development boundary.	May – September 2026
Fish and eels	Electric fishing survey	All ditches/ watercourses directly impacted within Proposed Development boundary.	June – October 2026

9.3.26 The following protected species surveys are proposed to be scoped out from the baseline data collection surveys:

- Reptiles – the ditches have the potential to support grass snake; however, impacts will be temporary and reversible for the construction phase, and the risk of accidental killing/ injury can be adequately managed through appropriate precautionary working methods.
- White-clawed crayfish (*Austropotamobius pallipes*) – the ditches within the Scoping Boundary are considered likely to be unsuitable for this species as they are minor drainage ditches (the species is known in the county on the River Witham, but this is many tens of kilometres south of the Scoping Boundary).
- Terrestrial invertebrates – the habitats impacted are mostly arable farmland and permanent pasture, and these habitats are unlikely to support protected species of invertebrates or notable invertebrate assemblages because they lack variation in ecological niches (e.g. topography).

9.4 Approach to Assessment

9.4.1 Potential impacts of the Proposed Development on identified important ecological features will be assessed in accordance with the Chartered Institute for Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment (CIEEM, 2024).

9.4.2 Where significant adverse effects of the Proposed Development are likely to occur to important ecology features, suitable mitigation or compensatory measures will be identified. Embedded mitigation measures would be taken into account within the assessment and residual effects determined.

9.4.3 A separate Habitats Regulations Assessment (HRA) will be undertaken to examine the likely significant effects of the Proposed Development on internationally designated sites (i.e. SACs, SPAs and Ramsar sites).

9.4.4 A BNG assessment will be undertaken using the statutory Department for Environment, Food and Rural Affairs (Defra) metric to calculate the number of biodiversity units before and after construction of the Proposed Development. An BNG Delivery Plan will be prepared and submitted as part of the DCO application, which will demonstrate how the Proposed Development will deliver a minimum 10% uplift in biodiversity units.

9.4.5 The BNG assessment will be used to inform the requirements for habitat creation and/or enhancement proposed as part of the OLEMP for the Proposed Development.

Assessment Criteria

9.4.6 Assessing the significance of effects on ecological features is a staged process, drawing on Chartered Institute for Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2024).

9.4.7 The approach is to:

- identify important ecological features (i.e. designated sites, habitats, species or ecosystems) which may be impacted;
- provide a scientifically rigorous and transparent assessment of the likely ecological impacts and resultant effects of the Proposed Development. Impacts and effects may be beneficial (i.e. positive) or adverse (i.e. negative);
- facilitate scientifically rigorous and transparent determination of the consequences of the Proposed Development in terms of national, regional and local policies relevant to nature conservation and biodiversity, where the level of detail provided is proportionate to the scale of the development and the complexity of its potential impacts; and
- set out what steps would be taken to adhere to legal requirements relating to the relevant ecological features concerned.

9.4.8 A combination of desk study and field surveys will be completed to identify Important Ecological Features (IEFs) that could be affected by the construction and operation of the Proposed Development. IEFs will be assigned a geographic level of importance based on their conservation status, population / assemblage trends and other relevant criteria.

9.4.9 Potential impacts from the Proposed Development will be identified and characterised (e.g., extent, magnitude, duration, reversibility, timing and frequency).

Magnitude of Impact

9.4.10 The criteria to be used for defining the magnitude of impacts on ecology and biodiversity receptors is provided in Table 9.3 below.

Table 9.3: Impact Magnitude Criteria

Magnitude of Impact	Definition
High	A change in the size or extent of distribution of the habitat or the species (flora or fauna) population that is the interest feature of a specific protected site that is predicted to irreversibly alter the population in the short to long term and to alter the long-term viability of the population and/or the integrity of the protected site. Impacts felt long-term. Impacts predicted to be reversed in the long-term (ie, more than five years) following cessation of the project activity.
Medium	A change in the size or extent of distribution of the habitat or the species population (flora or fauna) that is the interest feature of a specific protected

Magnitude of Impact	Definition
	site that occurs in the short and long-term, but which is not predicted to alter the long-term viability of the population and/or the integrity of the protected site. Impacts felt medium to long term. Impacts predicted to be reversed in the medium-term (ie, no more than five years) following cessation of the project activity.
Low	A change in the size or extent of distribution of the habitat or the species population (flora or fauna) that is the interest feature of a specific protected site that is sufficiently small-scale or of short duration to cause no long-term harm to the feature/population. Impacts present for a short to medium duration. Impacts predicted to be reversed in the short-term (ie, no more than one year) following cessation of the project activity.
Negligible	Very slight change of the habitat or the species population (flora or fauna) that is the interest feature of a specific protected site. Impacts present for a short duration. Impacts predicted to be reversed rapidly (ie, no more than circa six months) following cessation of the project related activity.
No change	No loss or alteration of species (flora or fauna) characteristics, features, or elements; no observable impact either adverse or beneficial.

Sensitivity of Receptors

9.4.11 The criteria to be used for defining the geographical value and the sensitivity of ecology and biodiversity receptors is provided in Table 9.4 below.

Table 9.4: Ecological Value (Sensitivity) Criteria

Ecological Value (Sensitivity)	Definition
International/ European (Very High)	Habitats or species that have high or very high conservation importance, high vulnerability to impact and have no ability to recover. Habitats or species that have very high conservation importance, high vulnerability to impact and have low recoverability.
National (High)	Habitats or species that have high or very high conservation importance, medium or high vulnerability to impact and has medium recoverability. Habitats or species that have high conservation importance, medium vulnerability to impact and has low recoverability. Habitats or species that have medium conservation importance, high vulnerability to impact and has low recoverability.
Regional/ County (Medium)	Habitats or species that have medium conservation importance within the regional/ county context (Lincolnshire/ North East Lincolnshire), low vulnerability to impact and has low to medium recoverability. Habitats or species that have medium conservation importance, low, medium, or high vulnerability to impact and has medium recoverability.
Local (Low)	Habitats or species that have low conservation importance within the local context (Theddlethorpe/ Mablethorpe), low vulnerability to impact and high recoverability.

Ecological Value (Sensitivity)	Definition
	Habitats or species that have low conservation importance, medium or high vulnerability to impact and medium or high recoverability.
Site (Negligible)	Habitats or species that have low conservation importance within the Site context, low vulnerability to impact and medium or high recoverability. Habitats or species that are not vulnerable to impacts.

Significance of Effect

9.4.12 The significance of the effect upon ecology and biodiversity receptors will be determined by taking into account the sensitivity of the receptor and the magnitude of the impact and is based upon expert judgement. A matrix-based approach is not used in accordance with CIEEM guidance (CIEEM, 2024).

9.4.13 For the purpose of this assessment, any effects with a significance level of moderate or above will be considered to be significant in terms of the EIA Regulations. Where the magnitude of impact is 'no change', no effect would arise.

Geographical Scope

9.4.14 The term Zone of Influence (ZoI) is used to describe the geographic extent of potential impacts of a proposed development. The Zone of Influence is determined by the nature of the development and also in relation to designated sites, habitats or species which might be affected by the proposals.

9.4.15 The ZoI for the assessment of ecology and biodiversity will be defined as Proposed Development boundary (which within the DCO application will be referred to as the 'Order Limits') plus the following buffer zones, which vary according to the ecological receptor concerned:

- A buffer of 15 km around the Proposed Development for statutory internationally designated sites for nature conservation, including Special Areas of Conservation (SAC), Special Protection Areas (SPAs) and Ramsar sites;
- A buffer of 2 km around the Proposed Development for statutory nationally designated sites for nature conservation, including Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNRs) and Local Nature Reserves (LNRs);
- A buffer of 1 km around the Proposed Development for non-statutory locally designated sites for nature conservation, including Local Wildlife Sites (LWSs) and Lincolnshire Wildlife Trust Sites (LWTSs); and
- A buffer of 1 km around the Proposed Development for records of UK Biodiversity Action Plan (UK BAP) priority habitats, areas of designated ancient woodland and records of protected or notable species.

Temporal Scope

9.4.16 The assessment will cover the construction and operational phases. Decommissioning impacts are reasonably anticipated to be similar to those during construction, and therefore a specific assessment of decommissioning impacts will not be undertaken.

9.5 Embedded Mitigation and Enhancement Measures

9.5.1 The following measures adopted as part of the Proposed Development are relevant to the assessment for ecology and biodiversity. These measures may evolve (and be further clarified) as the design and EIA process progresses:

- Commitment to using trenchless techniques for the installation of the seawater pipe to avoid direct impacts to sensitive coastal dunes and intertidal habitats.
- Avoidance of impacts through sensitive site selection of to avoid designated sites, ancient woodland and other sensitive habitats/features.
- Consideration of trenchless techniques for watercourse crossings to minimise impacts to aquatic and riparian habitats.
- Consideration of trenchless techniques for sensitive hedgerow crossings to avoid habitat fragmentation effects.
- Commitment to measures included in a Soil Management Plan during construction of the and re-instatement of affected land.
- Seasonal constraints for protected species where applicable (e.g. removal of vegetation outside the nesting bird season).
- Species-specific mitigation measures which will be developed based on the outcome of site specific surveys.
- A Code of Construction Practice (CoCP), which would include measures to mitigate impacts on habitats and species during construction.
- An Outline Landscape and Ecology Management Plan (OLEMP), which would include measures to mitigate impacts on Important Ecological Features and manage/ enhance retained or newly created habitats following construction.
- Relevant European Protected Species Mitigation (EPSM) licences would be obtained as necessary.
- Other species-specific mitigation will be developed where necessary. For example, Precautionary Working Method Statements (PWMS) for reptiles.

9.5.2 Although Biodiversity Net Gain (BNG) is not yet mandatory for Nationally Significant Infrastructure Projects (NSIPs) under the Environment Act 2021, it is assumed that this will come into effect during the pre-consent period of the project. The UK government is currently planning to mandate the delivery of the minimum 10% BNG deliver for NSIPs in November 2025. Therefore, in addition to the mitigation measures described above, a BNG assessment will be undertaken, and measures developed to ensure that the Proposed Development can deliver a minimum 10% net gain to meet future UK legislative requirements.

9.6 Scope of Environmental Impacts and Effects

Construction

9.6.1 The following potentially significant effects resulting from the construction of the Proposed Development have been identified:

- Temporary damage to qualifying and interest features of designated sites through habitat loss, fragmentation, changes in air quality, changes in water quality and hydrological effects.
- Permanent habitat loss and damage, and permanent displacement of protected species due to the construction a thermal and electrolysis facility, BESS and substation.
- Temporary habitat loss and damage, and temporary displacement of protected species due to the UGC construction

- Permanent and temporary damage to habitats supporting protected species as a result of changes in water quality and hydrological effects.
- Noise and visual disturbance to protected species during construction e.g. badgers, bats, wintering/ passage waterbirds.
- Changes in air quality affecting protected species as a result of emissions to air from construction traffic and non-mobile road machinery, and dust deposition during site clearance activities.
- Changes in water quality affecting protected species as a result of accidental pollution to habitats during construction.
- Changes in hydrology affecting habitats and protected species associated with groundwater dependent terrestrial ecosystems.

Operation

9.6.2 Potential impacts during the operational phase of the Proposed Development are largely limited to proposed thermal and electrolysis generation facility and its potential to give rise to noise/ visual disturbance and emissions to air during operation. The following potentially significant effects resulting from the operation of the Proposed Development have been identified:

- Permanent damage to qualifying and interest features of designated sites through changes in air quality as a result of thermal generation stack emissions to air during operation.
- Permanent displacement of protected species from areas in which permanent infrastructure is located, and long-term habitat fragmentation/ isolation.
- Noise and visual disturbance resulting in the displacement of protected species from foraging/ commuting habitats due to plant noise and lighting etc. in the vicinity of permanent infrastructure.

Decommissioning

9.6.3 Future decommissioning would not reasonably result in any impacts on sensitive ecological features other than those identified for construction above, and therefore a separate assessment of decommissioning impacts will not be undertaken.

To be Scoped Out

9.6.4 There would be no direct habitat loss within the boundary of designated sites because no direct impacts would occur within any of the identified designated sites, at European, national or local level. Therefore, no impact pathway would exist because the project has been specifically designed to avoid such areas.

9.6.5 Construction impacts on agricultural land and built-up areas have also been scoped out due to being of low ecological value when considered in isolation. It is recognised that these managed landscapes offer resources for protected and notable species (e.g. badger, bats); this would be captured in any assessment of effects on these species as important ecological features.

9.6.6 Impacts from dust, and pollutants and introduction of invasive species during construction is expected to be managed through the CEMP and therefore no further assessment of these effects is proposed. This would include standard good practice measures to be adopted during the construction phase for environmental legislative compliance such as refuelling vehicles and plant away from watercourses, using silt fencing to control surface water run-off during soil stripping, appropriate storage of waste, fuels and other hazardous materials and appropriate storage and management of soils.

9.6.7 Potential noise and visual impacts during operation of the BESS and UGC are scoped out of the assessment because these would be limited to repair and maintenance activities that would be

short-term, infrequent and small in scale. They would therefore be unlikely to result in significant effects on important ecological features.

9.7 Limitations and Uncertainties

9.7.1 It is assumed that access to all land within the Proposed Development and identified buffers will be available to allow the full survey scope to be delivered. However, it is recognised that this may not be possible, and where land parcels within the Proposed Development are not accessible for survey, robust assumptions will be made and a precautionary approach to the assessment undertaken.

9.7.2 At present, there is no confirmed date from the UK government for the implementation of mandatory biodiversity net gain assessments under the Environment Act 2021 for NSIPs, although it has been previously stated that this will come into effect from November 2025. The approach for the Proposed Development will therefore to be to collect sufficient baseline UKHabs data to inform a calculation of baseline units and post-development units using the statutory Defra metric calculator, assuming that delivery of a minimum 10% net gain will be mandatory for NSIPs at the time the DCO application is submitted to the Planning Inspectorate.

9.8 Inter-related Effects

9.8.1 The following sections of this EIA Scoping Report are also of relevance to the assessment of ecology and biodiversity and will be considered within an inter-related effects chapter:

- Chapter 8: Landscape and visual.
- Chapter 11: Water environment;
- Chapter 12: Ground conditions;
- Chapter 14: Transport and access;
- Chapter 16: Noise and vibration;
- Chapter 15: Air quality;
- Chapter 19: Climate change; and
- Chapter 20: Marine ecology and biodiversity

9.9 Cumulative Effects

9.9.1 The effects of the proposal will be considered cumulatively with relevant developments in the vicinity in consideration of shared sensitive receptors across projects.

9.10 Summary of Proposed Scope

9.10.1 A summary of the proposed scope of assessment is included at Chapter 22.

9.11 References

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10 Archaeology and Heritage

10.1 Introduction

10.1.1 This section covers the potential archaeological resource present on the site and regards the likely impact of the project on standing heritage assets, including, but not limited to, designated assets such as Listed Buildings and Scheduled Monuments, in order to set the scope for a future Environmental Impact Assessment.

10.1.2 The work has been carried out by Jonathon Smith, Ba (hons), Ma, ACIfA. He has been a practicing archaeologist since 2007 and a heritage consultant since 2019. The work has been overseen by Paul Cope-Faulkner, Ma, MCIfA, who has over 30 years' experience delivering heritage projects. Both work for Archaeological Project Services, which has been operating since 1993 and is an accredited organisation with the Chartered Institute for Archaeology.

10.2 Legislative or Policy Requirements and Technical Guidance

10.2.1 The effects of the proposal will be assessed in line with professional guidance issued by the Chartered Institute of Archaeologists[20] and Historic England[21]; national legislation contained in NPPF 16[22] and the Town and Country (Listed Buildings and Conservation Areas) Act 1990[23]; and local guidance in the East Lindsey Local Plan (2018) SP11[24]. In general, these require potential heritage assets to be identified, an assessment made of how they contribute to the historic environment and the potential effects the development could have on them.

10.3 Baseline

Baseline Environment

10.3.1 In order to establish the baseline, four assessments were made:

- Theddlethorpe Flexible Generation: Rapid Heritage Assessment of Proposed Service Corridors.
- Theddlethorpe Flexible Generation: Rapid Heritage Assessment of Stain Lane Battery Site.
- Heritage Desk Based Assessment: Theddlethorpe Flexible Generation at Crook Bank, Theddlethorpe St Helen, Lincolnshire
- Heritage Desk Based Assessment: Theddlethorpe Flexible Generation at Strubby Airfield, Strubby With Woodthorpe, Lincolnshire

10.3.2 Using these reports it is possible to make the following statements about the baseline environment:

[20] CIfA, 2014 Standard and Guidance for Archaeological Desk-based Assessments. https://www.archaeologists.net/sites/default/files/CIfAS%26GDBA_4.pdf

[21] Historic England, 2017 *Good practice Advice Note 3: The Setting of Heritage Assets*. https://historicengland.org.uk/images-books/publications/gpa3-setting-of-heritage-assets/heag180-gpa3-setting-heritage-assets/

[22] NPPF 16, 2019 *Conserving and enhancing the historic environment.* https://www.gov.uk/guidance/national-planning-policy-framework/16-conserving-and-enhancing-the-historic-environment

[23] https://www.legislation.gov.uk/ukpga/1990/8/contents

[24]https://www.e-lindsey.gov.uk/media/9791/Core-Strategy/pdf/Final_Version_of_Core_Strategy_2018.pdf

- The proposed services corridors (both eastern and western options) intersect with the Scheduled Monument known as Moated site 100m south of Stain Farm. This is the site of a medieval hall and is surrounded by cropmarks, which indicate the presence of associated archaeological features that may be important for the interpretation of the Scheduled Monument.
- The proposed battery site at Stain Lane also overlaps with cropmarks associated with the former medieval settlement of Stain.
- Cropmarks associated with medieval elements of Woodthorpe Hall are present just south of the proposed battery site at Strubby Airfield and might be expected to extend into the project area.
- The proposed stacks at the thermal site near Theddlethorpe St Helen will be visible within a wide area of the landscape and potentially compete for dominance with the towers of several Listed churches less than 2 km away. Very sensitive heritage sites may be affected at an even greater distance.

Proposed Approach to Surveys and Further Baseline Data Collection

10.3.3 To assess the potential archaeology present, a geophysical survey will be appropriate to find concentrations of archaeological features. These features can then be targeted with intrusive archaeological evaluations to characterise any deposits present.

10.3.4 To assess the impact of the proposed stacks on the setting of heritage assets, it will be necessary to establish the zone from which the stacks will be visible. In this regard, further analysis will be reliant on the landscape assessment. Once a zone of effect has been defined, an assessment will be made of any monuments or Conservation Areas for which views towards the proposed stacks are important for their setting.

10.4 Approach to Assessment

10.4.1 Assessment Criteria

10.4.2 The assessment will follow the standard matrix of impact magnitude, receptor sensitivity and effect significance, with the following exception: Historic England deem that the effect of developments on setting of the historic environment cannot be captured in a simple matrix and instead set out the following methodology:

- Step 1: identify which heritage assets and their settings are affected,
- Step 2: assess whether, how and to what degree these settings make a contribution to the significance of the heritage asset(s),
- Step 3: assess the effects of the proposed development, whether beneficial or harmful, on that significance,
- Step 4: explore the way to maximise enhancement and avoid or minimise harm,
- Step 5: make and document the decision and monitor outcomes.

10.4.3 The following sources will be used in any assessment to determine the presence of receptors:

- The results of archaeological surveys and evaluation;
- Historical maps held in the Lincolnshire Archives;
- Recent and early edition Ordnance Survey maps;
- The Historic Environment Record, maintained by Lincolnshire County Council;
- Archaeological and historical books and journals;
- Aerial photographs;
- Lidar data;

- A walkover survey of the Site and potentially affected heritage assets;
- The National Heritage List for England;
- East Midlands Regional Landscape Character Assessment;
- Legislative framework for the area

Magnitude of Impact

10.4.4 In the case of archaeology, the magnitude of impact is primarily determined by how much groundworks will destroy or inhibit interpretation of any buried remains present, on a scale of 'total loss' (major negative impact) to 'no effect.'

10.4.5 In the case of standing heritage, the magnitude of impact is primarily determined by how much the project will destroy or inhibit interpretation of the physical structure, on a scale of 'total loss' (major negative impact) to 'positive contribution' (up to major positive impact)

10.4.6 In the case of setting, a statement is made as to how and to what degree the setting contributes to the significance of the historical asset, and how the proposal will alter that setting.

Sensitivity of receptors

10.4.7 Sensitivity is judged based on the importance of the archaeology and/or standing heritage asset in the national context.

- Very high sensitivity: World Heritage Sites.
- Highly sensitive: Listed buildings, Scheduled Monuments, nationally significant archaeology.
- Moderate sensitivity: Conservations areas, registered parks and gardens, regionally significant archaeology, archaeology with potential to contribute to the East Midlands Regional Research Agenda.
- Low sensitivity: An undesignated heritage asset, locally important archaeology
- Very low sensitivity: Very common archaeological features (such as post-medieval ditches and ridge and furrow), or those features with no obvious research interest (such as modern remains)

Significance of Effect

10.4.8 Changes will be deemed as significant when the matrix suggests a moderate adverse/positive effect on the historic environment. Foreseeable examples of significant effects arising from the proposal include major or moderate adverse changes to regionally important archaeology caused by groundworks, or minor adverse changes to a Scheduled Monument caused by groundworks.

10.4.9 In the case of setting, a judgement on significance will be made by considering whether the proposed change will materially affect people's perception of the monument. An example of a foreseeable case which would be deemed significant is a Listed church losing it historical place as a landmark in the skyline through competition with the stacks.

Geographical Scope

10.4.10 Archaeology will be assessed up to 1 km from the project boundary. This limit has been set to provide a large cross-section of known sites in the landscape and as individual historical settlements (such as a Roman villa and its associated farmland) rarely span greater distances.

10.4.11 Owing to the tall stacks which are proposed, the assessment of setting will take a wider radius from the stack's location, based on the view shed suggested by the landscape assessment (provisionally 10km). Views from Louth Conservation Area (15 km away) will be assessed as

the town has a particularly sensitive concentration of historical buildings on the edge of the Wolds ridgeline, with the potential to overlook large areas of landscape.

Temporal Scope

10.4.12 The assessment will cover the construction and operational phases.

10.5 Embedded Mitigation and Enhancement Measures

10.5.1 The scheme includes options for positioning of the service corridor which is likely to be used to safeguard the Scheduled Monument that falls into the development boundary. However, this is not sufficient to scope out consideration of the monument, as related cropmarks may still be affected.

10.6 Scope of Environmental Impacts and Effects

Construction

10.6.1 The matters assessed for the construction phase include:

- The effects of groundworks on the Scheduled Monument and surrounding associated archaeological features; and the potential presence of additional archaeological features in the development area.
- Matters related to setting during the construction phase are considered temporary and unlikely to have a durable effect on any heritage assets.

Operation

10.6.2 The matters assessed for the operation phase include: The effect of the stacks on the setting of nearby churches; and the potential effect of the stacks on monuments in the wider landscape.

10.6.3 At this stage, no further effect on any below-ground asset is expected, so this aspect can be scoped out.

10.7 Limitations and Uncertainties

10.7.1 Archaeology, as a hidden below-ground resource, is always difficult to predict. While every care is taken, the quantity and type of archaeology present on a site may vary from that expected. In order to provide a robust assessment, it will be assumed that the surviving archaeological remains are of potential research interest, unless the data available suggests a contraindication.

10.8 Inter-related Effects

10.8.1 The effects of the proposals on the setting of elements of the historic environment is interrelated with the general effects on the surrounding landscape.

10.9 Cumulative Effects

10.9.1 The effects of the proposal will be considered cumulatively with relevant developments in the vicinity. Cumulative assessment considerations will be limited to those developments within 1 km from the project boundary for archaeology, and informed by the landscape assessment and the views from and to the Proposed Development from sensitive visual receptors identified.

10.10 Summary of Proposed Scope

10.10.1 A summary of the proposed scope of assessment is included at Chapter 22.

11 Water Environment

11.1 Introduction

11.1.1 The Water Environment Environmental Statement (ES) chapter will cover both surface water and groundwater receptors. This includes potential effects relating to water quality, water quantity, morphology and flood risk.

11.1.2 This scoping chapter seeks to:

- provide an initial overview of the baseline hydrological context of the site;
- identify the major likely potential effects on the water environment; and
- set out the proposed approach for assessing the significance of those effects within the ES.

11.2 Legislative or Policy Requirements and Technical Guidance

11.2.1 The Water Environment ES chapter will include a review of relevant legislation and guidance. This will include guidance and policy from key stakeholders for this chapter including the Environment Agency, Lincolnshire County Council and the consenting regime and bylaws overseen by Lindsey Marsh Internal Drainage Board (IDB).

11.3 Baseline

11.3.1 The project covers five main elements. These are:

- Thermal generation facility and electrolysis at the Theddlethorpe Thermal and Electrolysis Site (Theddlethorpe TES);
- Pipelines from the Theddlethorpe TES to new offshore inlet and outlet for the abstraction of sea water for the electrolysis plant and discharge of process water (slightly concentrated brine);
- BESS sited on land at Stain Lane (Stain Lane site);
- BESS and Project Substation sited on land at Strubby Airfield (Strubby Airfield site);
- Connecting cables to link the two sites and then extending southwards to a new National Grid substation.

11.3.2 The study area for this review covers all the land covered by the elements of the project and then extending at least 1 km away from the project boundary in all directions. The study area extends downstream of the site along key pathways to ensure that all potential hydrological receptors are appropriately identified and considered.

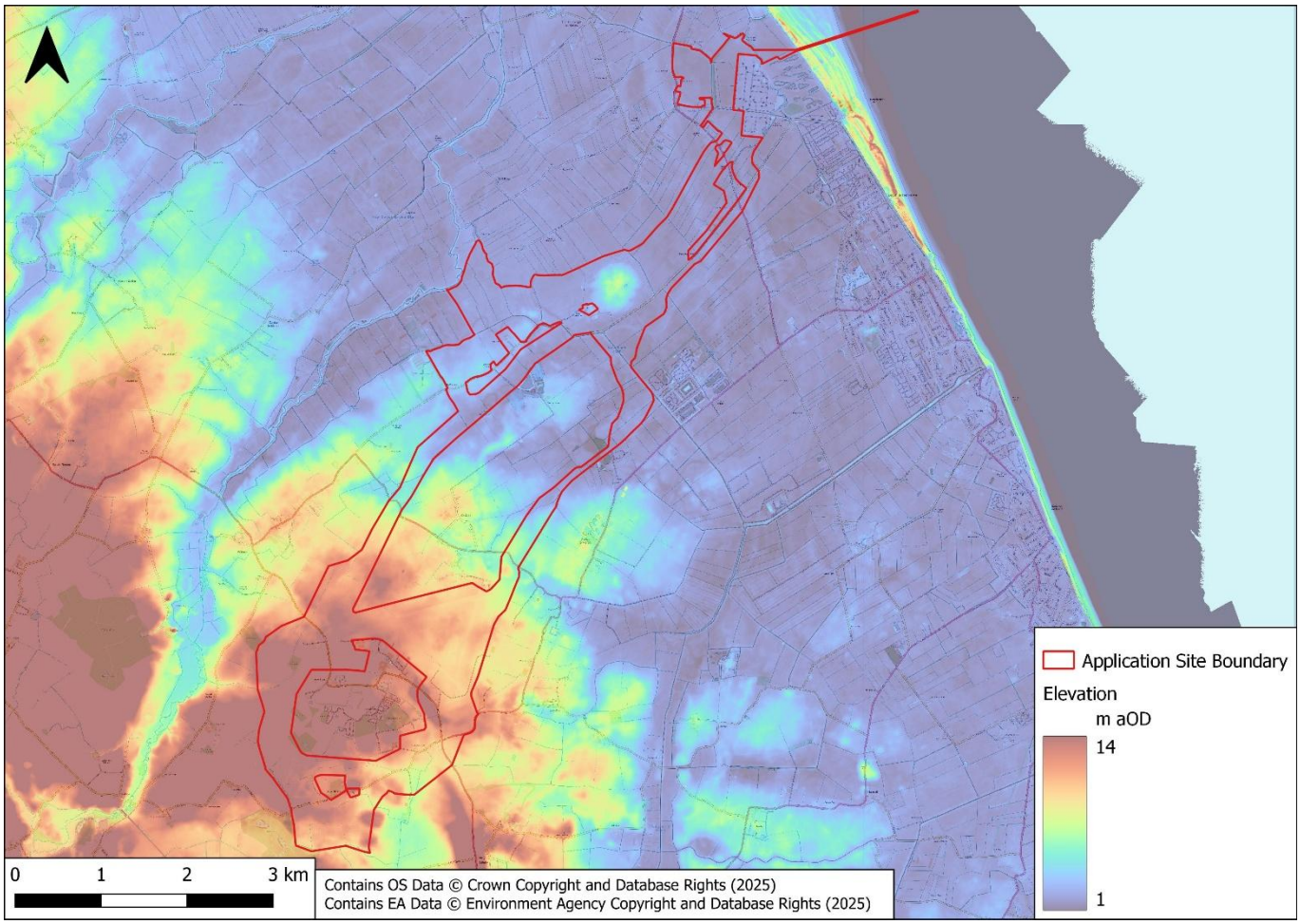
Baseline Overview

11.3.3 The project is located within the Anglian River Basin District, within the Witham Management Catchment and within the Steeping and Eaus Operational Catchment. The project is also located within Anglian Water's Lincolnshire East Water Management Zone. The Proposed Development, future assessment and ES will need to consider regional targets, strategies and pressures relevant to these areas.

Topography

11.3.4 The scheme is located just inland from the Lincolnshire coast. Much of the land along the coast is former marshland, which is flat, low lying and artificially drained. As illustrated in Figure 11-1 ground levels do however gradually rise inland away from the coast. A ridge of raised land is also present along the coastline with lower lying land sited behind.

Figure 11-1: LiDAR Topographic Data



Hydrology

11.3.5 Towards the coast where the ground is flat and low-lying, extensive ditch networks have historically been constructed to drain the land. These pumped drainage networks are managed by the Lindsay Marsh Drainage Board who are the statutory drainage authority in these areas. The networks convey storm flows into one of two larger watercourses locally called the Great Eau and Wold Grift Drain. These channels are labelled on Figure 111-2.

11.3.6 Wold Grift Drain is present to the south of the Proposed Development and the Great Eau (river) is present to the north. Both watercourses flow from the high ground to the west (inland) down towards the coast. The Great Eau discharges into the North Sea via a sluice gate which is used to prevent tidal water backing up through the watercourse and onto low lying land. Flows along Wold Grift Drain are pumped upgradient onto the shoreline and then flow under gravity down into the North Sea.

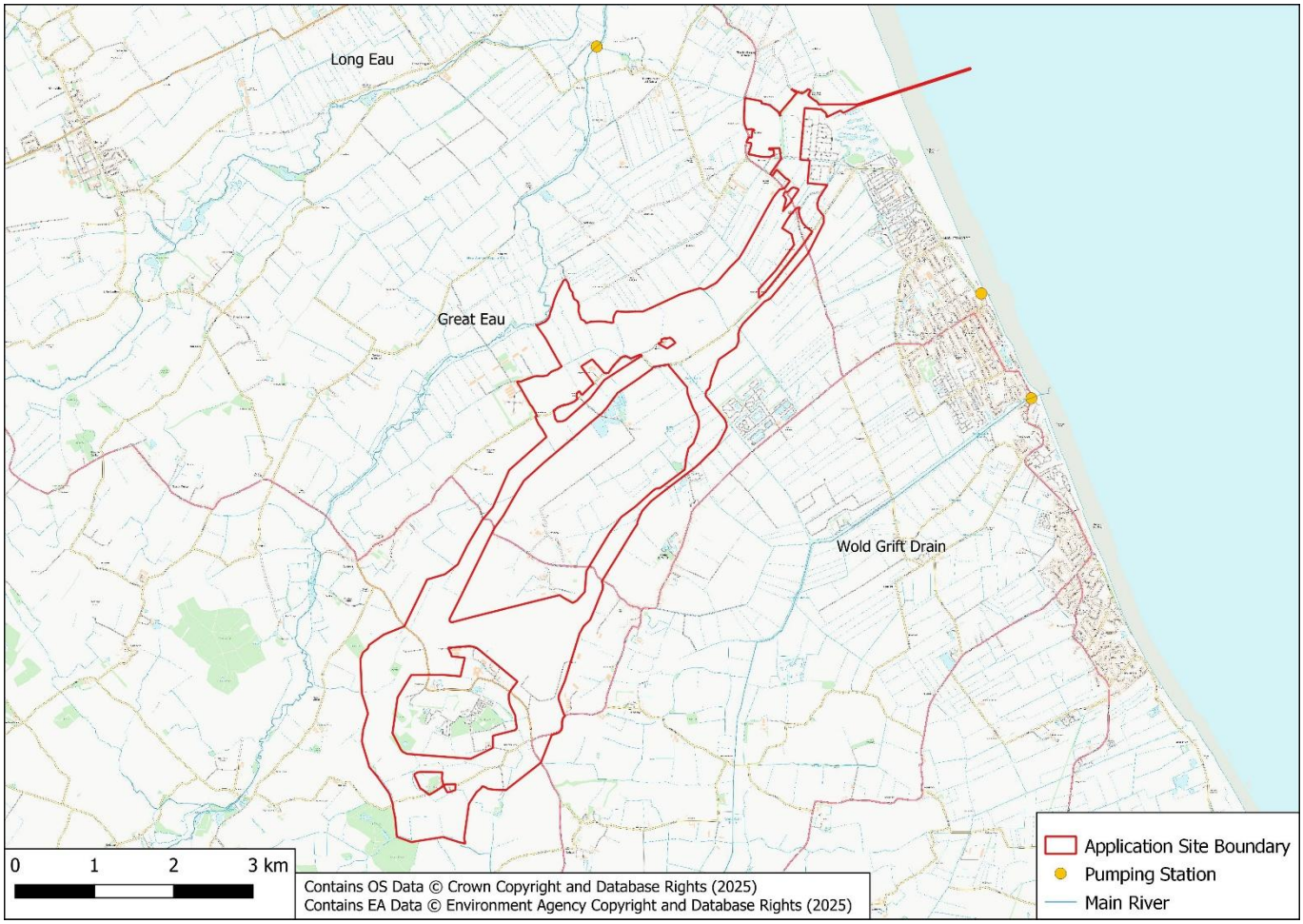
11.3.7 These two channels are designated as Main Rivers. For Main Rivers the Environment Agency are the statutory drainage authority and their approval would be required for any works to the channel or within 8 m of the top of the bank of the river and any flood defences. The application site is remote (>1.5km) from the Wold Drift Drain, but the Stain Lane site extends right up to the embankment along the Great Eau. A standoff will however be applied and no direct works to either of these watercourses is anticipated.

11.3.8 Lindsay Marsh Drainage Board actively manage a number of the major channels within the low-lying areas that are reliant on pumped drainage. These channels, which are Ordinary Watercourses are referred to as '*IDB main drains'*. Approval from the Lindsay Marsh Drainage Board is required for any works to these channels or works within 9m of the top of the channel bank. This includes directional drilling works beneath the channels.

11.3.9 For smaller channels within the area reliant on pumped drainage, the responsibility for ongoing maintenance rests with the riparian owner. These channels, which are Ordinary Watercourses are referred to as '*Pumped riparian drains'*. Approval from the Lindsay Marsh Drainage Board is required for any works directly to these channels.

11.3.10 To the south of the project area where ground levels are higher, water is able to drain under gravity with ditches either flowing to one of the Main Rivers directly or discharging down into the area that is reliant on pumping. Responsibility for ongoing maintenance of such channels rests with the riparian owner and these channels, which are Ordinary Watercourses are referred to as '*Gravity riparian drains'*. Approval from Lincolnshire County Council is required for any works directly to these channels. Where these channels discharge towards the pumped drainage system, approval from the Lindsay Marsh Drainage Board will also be required in relation to changes in storm water discharge.

Figure 111-2: Local Hydrology



Designated Sites

11.3.11 The following designated sites are located within 5km of the site:

- Saltfleetby-Theddlethorpe Dunes & Gibraltar Point Special Area of Conservation (SAC) is located immediately east of the Theddlethorpe TES and is designated due to the ecological status of the sand dunes and established habitat. The pipework to the new inlet and outlets would be routed below ground through the SAC.
- Saltfleetby – Theddlethorpe Dunes Site of Special Scientific Interest (SSSI) is located immediately east of the Theddlethorpe TES and is designated for its established vegetation which are dependent on flats, dunes, salt and freshwater marsh. The pipework to the new inlet and outlets would be routed below ground through the SSSI.
- Humber Estuary Ramsar is located immediately east of the Theddlethorpe TES site and is designated for its ecological status supporting a number of internationally important habitats for bird and seal populations. The pipework to the new inlet and outlets would be routed below ground through the Ramsar site.
- Lincolnshire Coronation Coast National Nature Reserve (NNR) is located immediately east of the Theddlethorpe TES site and is designated for its rich variety of sand dunes, salt marshes, mudflats and freshwater marshes which are of international importance. The pipework to the new inlet and outlets would be routed below ground through the NNR.
- Humber Estuary Special Protection Area (SPA) is located immediately east of the Theddlethorpe TES and is designated due to its estuarine status and condition and

extensive mudflats and sandflats. The pipework to the new inlet and outlets would be routed below ground through this SPA.

- Greater Wash SPA (marine) is located to the east of the Theddlethorpe TES site extending further offshore than the other ecological designations. This is designated for its bird populations. The new inlet and outlet and the parts of the associated pipe work would be within this SPA.

11.3.12 These habitats are on s Greater Wash SPA (marine) is located to the east of the Theddlethorpe TES site extending further offshore than the other ecological designations. This is designated for its bird populations. The new inlet and outlet and the parts of the associated pipe work would be within this SPA.ections of open coast and will be dependent on rainfall (dunes) or sea water (mudflats and coastal marshland) rather than water draining from the site. Storm water runoff from the Theddlethorpe TES will only flow into these designated sites via the extended pumped drainage networks either discharging to the sea via the Great Eau or to the south at a pumping station within Mablethorpe. The Theddletorpe site is cut off hydrogeologically from the designated sites due to the presence of thick deposits of low permeability Tidal Flat Deposits.

11.3.13 While the new pipework to the inlet and outlet will pass through the ecological designated area these would be below ground pipes that are constructed beneath the dunes and intertidal habitat through direction drilling. The new inlet and outlet will however be present within the Greater Wash SPA.

11.3.14 Calceby Marsh SSSI is located c.5km southwest of the Strubby Airfield site and is designated for its biological status. The SSSI is located upgradient of the Strubby Airfield site and upstream along the Great Eau. Potential impacts which may arise from development within the BESS area will not affect Calceby Marsh SSSI. This receptor is therefore scoped out of the assessment.

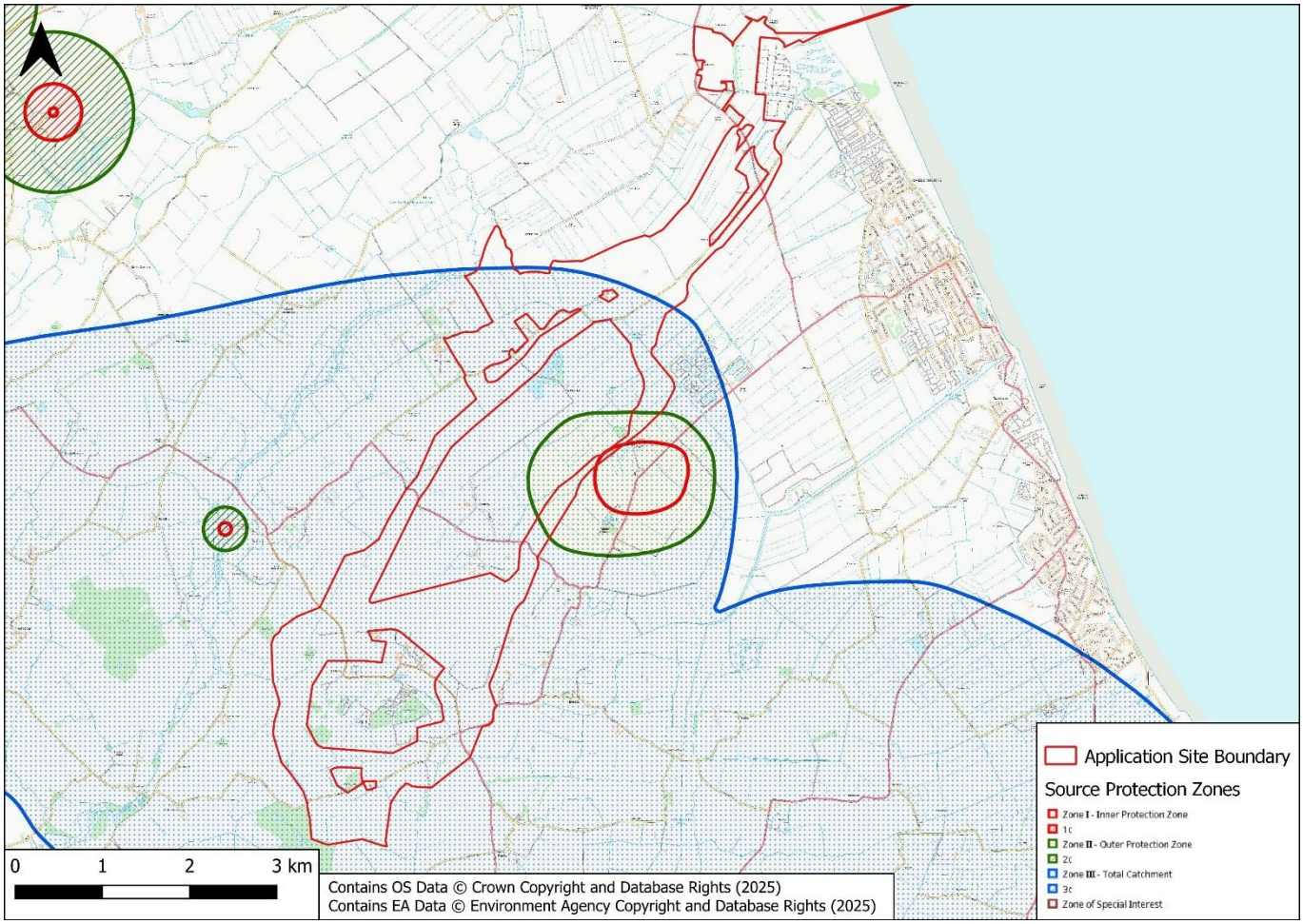
11.3.15 There are no other designated sites within 5km of the site.

Geology and Hydrogeology

11.3.16 The local area is all underlain by Chalk. The Chalk is highly permeable and is designated by the Environment Agency as a Principal Aquifer. These are rock units that are strategically important for water supplies and have high permeability and storage properties.

11.3.17 Water is known to be abstracted from the Chalk locally for water supply. Significant parts of the project area, including most of the Stains Lane site and all of the Strubby Airfield site therefore fall within Source Protection Zone III (total catchment) around these public water supply boreholes. Sections of the cable route (eastern option) also pass through areas designated as Zones I (inner protection zone) and II (outer protection zone). The Source Protection Zones are shown on Figure 111-3.

Figure 111-3: Source Protection Zone



11.3.18 On the low-lying land towards the coast the Chalk is overlain by Tidal Flat Deposits while on the high ground inland the Chalk is overlain by Till. Both types of superficial geology tend to be low in permeability. Correspondingly the Environment Agency has designated the Tidal Flat Deposits as an Unproductive Strata and the Till as a Secondary (undifferentiated) Aquifer.

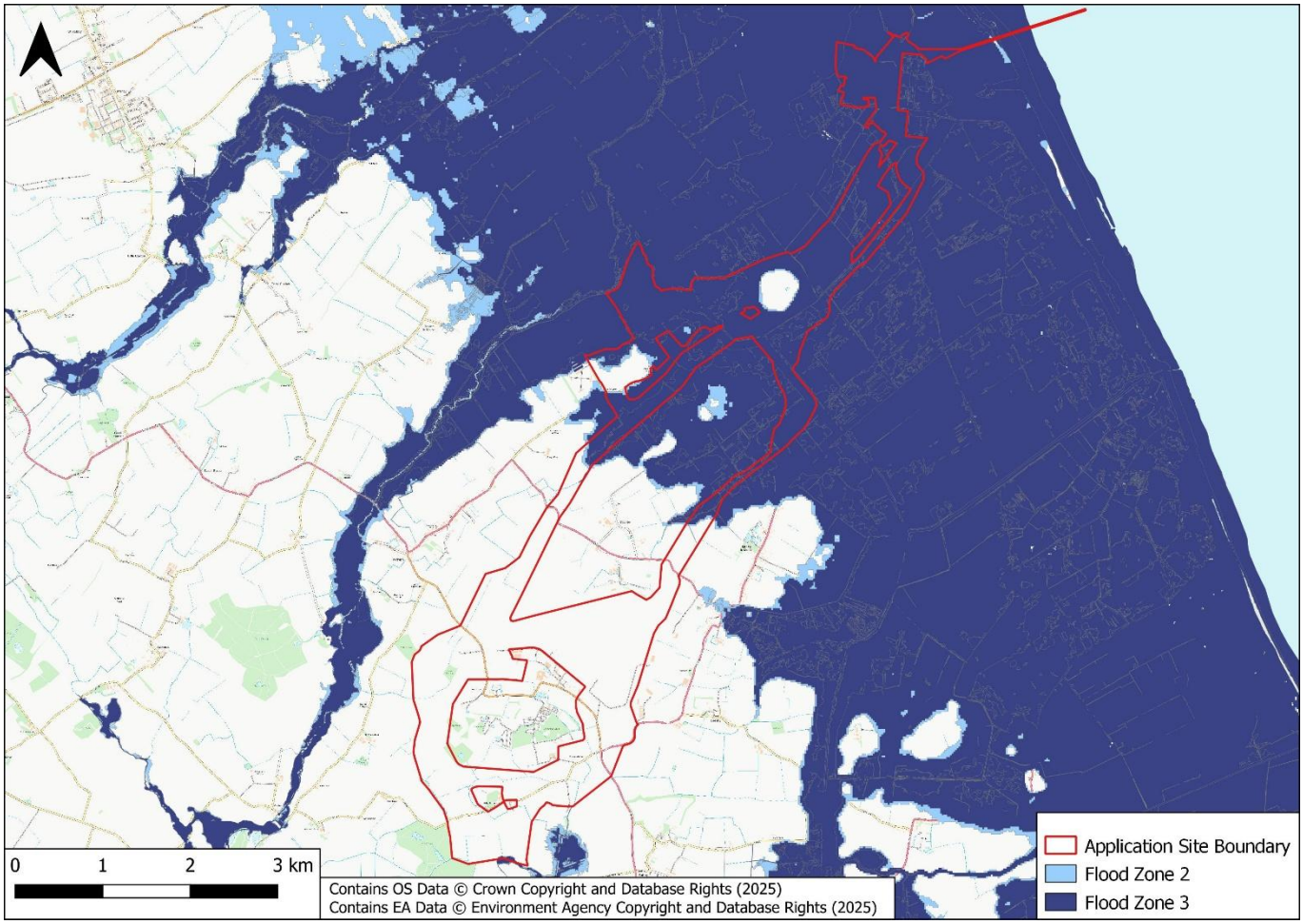
11.3.19 Based on an initial review of local boreholes, the superficial deposits across the study area are thick and will prevent significant infiltration from the surface towards the Chalk Aquifer. This will provide a significant degree of protection to groundwater resources.

Flood Risk

Coastal

11.3.20 The lower areas toward the coast are all susceptible to coastal flooding. As illustrated in Figure 11-4 these parts of the study area are all designated as Flood Zone 3 which indicates that if no flood defences existed the annual probability of coastal flooding would be greater than 1 in 200.

Figure 11-4: Flood Map for Planning



11.3.21 Raised defences are present along the coast and also where Wold Grift Drain and the Great Eau discharge to the sea. These defences consist of earth embankments, sand dunes, wave walls and sluice gates. Based on the Environment Agency asset database and the 2017 East Linsey, Strategic Flood Risk Assessment (SFRA) these defences provide a standard of protection equivalent to (or exceeding) the 1 in 200 annual probability flood.

11.3.22 Based on the Environment Agency 2018 coastal boundary dataset, during a major storm event that coincides with a spring high tide, still water levels along the coast locally could reach 5.11m aOD for the 1 in 200 annual probability event and 5.74m aOD for the 1 in 1000 annual probability event.

11.3.23 Current guidance published by the Environment Agency indicates that through to 2080 (equivalent to a 50 year development lifetime for a scheme completed in 2030) sea levels might rise by 0.68m. This would mean that towards the end of the projected lifetime of the project still water levels along the coast locally could reach 5.79m aOD for the 1 in 200 annual probability event and 6.42m aOD for the 1 in 1000 annual probability event.

11.3.24 Given the projected changes in extreme water levels, overtopping of the existing flood defences could occur during extreme and rare events towards the end of the projected lifetime of the development. Along the open coast, wave action could also result in overtopping and damage to the defences and this type of occurrence could result in a failure of the defences.

11.3.25 Over topping of the coastal defences during extreme events, and / or a failure of the flood defences would result in extensive flooding of the low-lying land towards the coast. Following a data request to the Environment Agency modelling of wave overtopping along the coastline has been obtained for a baseline year of 2006 and a future scenario of 2115. Under the 2016 baseline, no flooding of the site is currently predicted (as water would not overtop the defences) however flooding is predicted to in excess of 1.6m depth across the Theddlethorpe site during a 1 in 200 annual probability event for the 2115 scenario.

11.3.26 Modelling of a breach event has also been undertaken by the Environment Agency and this includes a modelled breach location adjacent to the site. For the 2016 model scenario the simulated flood depths across the Theddlethorpe site during 1 in 200 annual probability event are indicated to be up to 1.6m. For the 1 in 200 annual probability, 2115 scenario these predicted flood depths increase to greater than 1.6m.

11.3.27 The breach model output data provided by the Environment Agency is fairly high level. It can be concluded that any land (including the Strubby Airfield site) above 5.74m aOD (equivalent to the 1 in 200 annual probability coastal water level for a future date of 2080) is not at risk. For lower areas, including the Theddlethorpe and Stain Lane sites, flooding is possible and in areas close to the coastal defences the depths and hazards associated with flooding will be high. Land raise will likely be required to manage this risk but further detailed assessment would be needed to confirm the precise nature of flooding possible towards the end of the projected project lifetime.

Fluvial

11.3.28 During periods when free discharge from the Great Eau and Wold Grift Drain is not possible water will back up in the river channel. For the Great Eau this will occur during any major high tide when the sluice gate is shut. For Wold Grift drain this would occur on any occasion when fluvial flows exceed the capacity of the pumps that lift water up into the sea.

11.3.29 Fluvial flood defences are present along the Great Eau and Wold Grift Drain. These generally comprise of earth embankments. Based on the Environment Agency asset database, the probability of these embankments being overtopped is around 1 in 2.

11.3.30 Based on the 2017 Environment Agency model of Saltfleet and Great Eau, flood levels along the Great Eau for the 1 in 100 annual probability event are estimated at 3.35m aOD. Flood levels for the same event along the Wold Grift drain are estimated at 2.04m aOD. Given the low-lying nature of the wider area fluvial events on either system could result in over topping of the channel. Flood water would then enter the extensive drain network backing up through the network and causing flooding which would initially commence in the lowest fields within the respective catchments. Despite modelling indicating that overtopping of the embankments could be a frequent occurrence, there are no known records of fluvial flooding locally. This might be because the model does not reflect the large volume of storage within the local drainage channels.

11.3.31 Current guidance published by the Environment Agency indicates that through to 2080 (equivalent to a 50 year development lifetime for a scheme completed in 2030) uplifts to peak fluvial flows of 32% (using the higher central allowance) should be considered. Modelling undertaken as part of the Saltfleet & Great Eau study provides outputs for the 1 in 100 annual probability plus 35% climate change event, predicting flood levels of 3.36m aOD along the Great Eau and 2.05m aOD along the Wold Grift Drain. Clearly flood levels in this location are not overly sensitive to peak fluvial flows with negligible change in flood level (0.01m) as a result of climate change.

11.3.32 The fluvial flood modelling undertaken is considered conservative as there are no recent reports of flooding on either system as recorded by the Environment Agency even though the defences only provide a level of protection of 1 in 2 year (50% AEP). Further work is required to understand the discrepancy between model results and observed flooding in the area.

11.3.33 Other residual risks that require consideration as part of the fluvial flood assessment include failure of pumping stations locally which convey fluvial flows into the Main River or the sea.

Other Flood Sources

11.3.34 Long Term Flood Risk Information provided by the Environment Agency includes mapping of surface water flood risk. This mapping indicates that surface water flooding is not widespread locally but will be a concern in some parts of the project area.

11.3.35 Due to the clayey nature of the surface geology, which acts as a barrier to groundwater flow, it is assumed that groundwater flood risk locally is very low.

11.3.36 Long term flood risk information also confirms that no parts of the site are located in areas at risk of flooding from the failure of reservoirs in the upstream catchment.

Theddlethorpe - TES Thermal Generation and Electrolysis Area

11.3.37 The topography across the Theddlethorpe TES is generally flat and low lying. with ground levels falling from approximately 2.5m aOD in the central part of the site around Crook Bank Farmhouse to 1.2m aOD in the southern site, to the west of the Theddlethorpe Gas Terminal. Small ridges of raised ground at approximately 2m aOD are present throughout the site and along the banks of larger ditches.

11.3.38 Bedrock geology beneath the Theddlethorpe TES comprises of the Burnham Chalk Formation which is overlain for the majority by Tidal Flat Deposits (clay and silt). A small strip of Storm Beach Deposits (sand) is present towards the north-eastern boundary of the site. This however does not extend onto or close to the areas where main development would occur (i.e. this does not create a potential pathway from the development area towards the sea and the designated coastal sites).

11.3.39 Rainfall onto the Theddlethorpe TES which does not infiltrate to ground will flow overland into the numerous drains that are present around the perimeter and running across the proposed thermal generation station area. The ditches present within the site are Pumped Riparian Drains and discharge to larger channels around the perimeter of the site that are IDB Managed Drains. These ditches either convey storm flows northwards to a pumping station that lifts water into the Great Eau or they drain southwards to a pumping station within Mablethorpe where flows are pumped to the sea. Further work is required to confirm flow routing locally.

Stain Lane – BESS Area

11.3.40 The Stain Lane site encompasses fields between Stain Lane and an IBD Managed Drain called the Withern Highland Drain and then also fields further to the northeast that extend from the Withern Highland Drain towards the Great Eau (River). Stain Lane runs along a ridge of raised land with a crest at around 4.0m aOD. The ground then slopes down to the course of the Withern Highland Drain at around 2.0m aOD. The land beyond the drain is all low lying with typical elevations between 1.8m aOD and 2.2m aOD.

11.3.41 The Stain Lane site is underlain by bedrock geology of the chalk. This i s composed of the Burnham Chalk Formation across the majority of the land and the Welton Chalk Formation to the

south. On the high ground close to Stain Lane the chalk is overlain by deposits of Glacial Till (diamicton) while on the lower ground the chalk is overlain by Tidal Flat Deposits (clay and silt).

11.3.42 In the event that the soil saturation capacity is exceeded, rainfall falling onto the Staines Lane site will discharge offsite in line with the prevailing topography. Mostly this will direct runoff either directly into the Withern Highland Drain or into this channel via smaller ditches (Pumped Riparian Drains). This system then continues to the east and northeast as West Bank Drain ultimately discharging to the North Sea at a pumping station in Mablesthorpe

11.3.43 Some areas to the north of the Stains Lane site drain into a different network that discharges into the Great Eau via a pumping station further to the north.

11.3.44 A section IDB Managed Channel (unnamed channel) runs north-south through the site along a track called Haalam Bank. It is not clear from the available mapping if this channel drains southwards into the Withern Highland Drain or northern into the other drainage network.

Strubby Airfield - BESS and Project Substation Area

11.3.45 Ground levels across the Strubby Airfield site fall in a north and easterly direction from approximately 19m above Ordnance Datum (aOD) in the south-western part of the site, associated with a topographic peak, to a low of 10m aOD in the eastern extent of the site.

11.3.46 The Strubby Airfield site is underlain by bedrock geology of the Welton Chalk Formation which is overlain by deposits of Glacial Till (diamicton).

11.3.47 In the event that the soil saturation capacity is exceeded, rainfall falling onto the BESS area will discharge offsite in line with the prevailing topography to the north and east into local channels (Gravity Riparian Drains). The routing and connection of drainage local to the site is not clear, but based on the prevailing topography it would appear likely that runoff predominantly routes eastwards into channels that discharge into Wold Grift Drain. Runoff from some areas may however drain to channels that discharge northwards into the pumped drainage networks. Further work is required to confirm flow routing locally.

Cable Route

11.3.48 Ground levels across the proposed cable route inherently fall towards the east/ north-east towards the North Sea.

11.3.49 Along the route the cable will cross a number of IBD Managed Drains as well as Pumped Riparian Drains and Gravity Riparian Drains. The major channels (which are all IDB Managed Drains) that could potentially be crossed are;

- Heading Drain / The Cut (at or close to NGR 548320 387090)
- West Bank Drain (at or close to NGR546530 384540) – western option only
- West Bank Drain (at or close to NGR 546880 38500) – eastern option only
- Scrubby Middle Drain (at or close to NGR 547270 383950) – eastern option only
- Unnamed Drain (at or Close to 544750 382790) – western option only

11.3.50 The cable route is underlain by Chalk bedrock comprising the Ferriby Chalk Formation, Welton Chalk Formation and Burnham Chalk Formation. These are principal aquifers which have high permeability and water storage properties.

11.3.51 Along the majority of the cable route the bedrock geology is overlain by deposits of Glacial Till (diamicton) and Tidal Flat Deposits. These are largely clay based and thus provide a barrier between surface interactions and the underlying bedrock.

11.3.52 Small outcrops of Glaciofluvial Deposits are identified along the cable route. The deposit is designated as a Secondary A aquifer which comprise of permeable layers that can support local water supplies. The Glaciofluvial Deposits may provide a direct connection into the underlying chalk aquifer depending on local lithology.

11.4 Approach to Assessment

Consultation

11.4.1 Key consultees who will be approached for comment with respect to the scheme and the proposed approach for assessing impacts to the Water Environment will include;

- Lincolnshire County Council, Lead Local Flood Authority (LLFA) team,
- Lindsay Marsh Drainage Board
- Environment Agency
- Natural England
- Anglian Water

Surveys and further baseline data collection

Baseline Hydrological Assessment

11.4.2 The baseline hydrological understanding of the study area will be developed and documented with reference to the following data sources:

- Ordnance Survey mapping;
- Ordnance Survey historical mapping;
- British Geological Survey solid and superficial mapped geology;
- British Geological Survey borehole records;
- Cranfield soils mapping;
- Environment Agency LiDAR data;
- Flood Map for Planning;
- Long Term Flood Risk Mapping;
- Environment Agency AIMS asset database;
- Environment Agency historic and recorded flood outline dataset;
- Data on licenced abstractions and discharges from the Environment Agency;
- Data on private water supplies from the Environmental Health team at East Lindsay District Council;
- Detailed flood model outputs supplied by Environment Agency;
- Network data and consultation response from the Linsey Marsh Internal Drainage Board;
- Water Framework Directive assessment data available on the catchment data explorer;
- Meteorological, groundwater level and river level / flow data available from the Environment Agency's Hydrology Data Explorer;
- Historic water quality data available from the Environment Agency's Water Quality Data archive;
- Site specific data including ground level and geological conditions as obtained from the wider project team.

Water Feature Survey

11.4.3 The baseline assessments will be supported by a water feature survey. This will involve hydrologists visiting the site to identify, observe and characterise all key surface water features, watercourse networks, hydraulic structures and flow routes.

Baseline Water Quality Monitoring

11.4.4 A programme of water level and water quality monitoring over a period of at least 12 months will be initiated to help define the baseline condition of watercourses pre-development. The primary purpose of this monitoring will be to provide a dataset against which construction phase monitoring data can be compared.

11.4.5 The extent and scope of this monitoring will be agreed through consultation with key stakeholders.

Detailed Technical Studies

Flood Risk Assessment

11.4.6 The Water Environment ES chapter will be supported by a standalone Flood Risk Assessment (FRA). This will set out the flood risk posed to, and flood impacts arising from, each of the four different elements of the Project.

11.4.7 Areas of the site are located in Flood Zone 3; however, review of the existing flood model outputs has identified deficiencies in the model base and therefore further detailed technical analysis will be undertaken to quantify the current and future flood risk to the Theddlethorpe TES and the Stain Lane site. The nature and detail of the modelling work that will be required will need to be agreed with the Environment Agency but would likely include;

- Coastal overtopping and breach modelling for the projected end of the development lifetime to determine the severity of flooding at the Theddlethorpe site and whether coastal breach flooding could extend inland to the Stain Lane site. This modelling would also seek to confirm that any land raise that is proposed to manage flood risk will not result in adverse impacts on flooding in adjacent areas.
- Fluvial flood modelling for the Great Eau and the local pumped drainage networks to better determine the potential frequency of fluvial flooding (along the Main River) and whether this could realistically result in flooding at the site taking into consideration flood routing along the drain network. If it could, then the modelling would need to confirm how any land raise proposed would impact risks elsewhere.
- Fluvial breach modelling for the Great Eau to determine the potential severity of flooding that might result from a failure of the fluvial embankments close to the Stain Lane site and whether this should restrict development or influence the layout of development on that land.

11.4.8 The FRA will also consider the pipework to the new inlet and outlet and set our sufficient detail for these features, including the approach for their construction (horizontal direction drilling) to allow the risk posed to the coastal flood defences to be assessed.

Surface Water Drainage Strategy

11.4.9 The Water Environment ES chapter will be accompanied by a standalone operational Surface Water Management Plan (SWMP). This will include details of the proposed approach for managing surface water runoff at the site for each part of the Project once completed.

11.4.10 This will be supported by calculations undertaken in Causeway Flow software with supporting plans illustrating how sustainable drainage measures can be provided within the proposed scheme layout in line with the requirements of the Linsey Marsh Drainage Board and the LLFA team at Lincolnshire County Council.

WFD Assessment

11.4.11 The Withern Highland Drain that passes through the Stain Lane site and the section of West Bank Drain which would be crossed by the cable route is part of a surface water body that is formally assessed by the Environment Agency under the Water Framework Directive (WFD) (Trusthorpe Pump Drain Water Body - GB105029061641). In addition, significant engineering activities are being proposed in the catchment of this waterbody. While physical changes to the WFD water body are not required and no change to the WFD status is expected, the potential risks from the Proposed Development will be reviewed within a WFD screening and scoping assessment. This would be provided alongside the Preliminary Environment Information Report.

Water Environment ES chapter

11.4.12 The Water Environment ES chapter will include a review of relevant legislation and guidance. This will include guidance and policy from key stakeholders for this chapter including the Environment Agency and Lincolnshire County Council and the consenting regime and bylaws overseen by the IDB.

Assessment criteria

11.4.13 Where a robust baseline review of the hydrological context is able to demonstrate that water features are hydrologically separated from the site (i.e. located upgradient or separated by a watershed), these would be screened out from the study even if they are within the study area.

11.4.14 Unless stated otherwise the terms used to define magnitude and sensitivity are based on those used in the Design Manual for Roads and Bridges DMRB guidance[25].

Magnitude of impact

11.4.15 A qualitative risk assessment methodology will be used to assess the significance of the potential effects associated with the Proposed Development. This risk assessment will consider two factors. The initial factor is the potential magnitude of change, that could occur. The magnitude of impact is variable from a major to negligible scale, as summarised below.

- Major: Fundamental (long term or permanent) changes to the baseline hydrology, hydrogeology and water quality likely to cause exceedance of statutory objectives and/or breaches of legislation; severe damage to key characteristics, features or elements (adverse);
- Moderate: Material but non-fundamental and short to medium term changes to baseline hydrology, hydrogeology and water quality, not adversely affecting the overall integrity; partial loss of/damage to key characteristics, features or elements with/without exceedance of statutory objectives or with/without breaches of legislation (adverse);
- Minor: Detectable but non-material and transitory changes to the baseline hydrology, hydrogeology and water quality resulting in reversible or minor loss of, or alteration to key characteristics, features or elements (adverse); and

25 Design Manual for Roads and Bridges, LA 113, Sustainability and Environment Appraisal – Road drainage and the water environment, Version 1, March 2020, Highways England, Transport Scotland, Welsh Government and Department for Infrastructure,

- Negligible: Very minor or no perceptible changes to the baseline hydrology, hydrogeology and water quality, resulting in; impact of insufficient magnitude to affect the use/integrity (adverse).

Sensitivity of receptors

11.4.16 The secondary measure used to determine the significance of effect associated with the Proposed Development is the sensitivity of the receptor screened into the assessment.

11.4.17 The sensitivity of receptors is ranked from High to Low and is dependent on the following:

- Importance, rarity and potential for substitution;
- Ecological importance (international, national);
- Chemical and Ecological Status under WFD;
- Receptor as a resource (public abstraction, private supplies);
- Flood Risk; and
- Aquifer Designation.

Significance of effect

11.4.18 The sensitivity of the receptor and the magnitude of impact will then be used to define the significance of the effect in line with significance matrix.

11.4.19 The assessment will consider any mitigation that is incorporated into the scheme design, or that which is considered standard good practice. If after consideration of this incorporated mitigation potentially significant adverse effects are predicted, further mitigation would be proposed and the residual effects assessed and presented.

Geographical scope

11.4.20 The initial study area will be defined by a 1 km buffer from the site, within which all surface water features will be identified.

11.4.21 If significant water features are identified downgradient of the site along a major flow pathway, the spatial scope would be extended in that direction by up to 5 km. This will ensure that any important and potentially sensitive receptors are also considered if there is a viable pathway to these from the development.

Temporal scope

11.4.22 Assessment will be undertaken for the construction, operational and decommissioning phases of the development with consideration given to the effect of the scheme both in isolation and alongside any other consented schemes locally (i.e. cumulative impacts).

11.5 Embedded Mitigation and Enhancement Measures

11.5.1 At this initial stage it is envisaged that the following embedded mitigation would be used to control and manage potential adverse effects on the Water Environment:

- Construction Environmental Management Plan detailing measures for managing pollution risk during the construction phase;
- Operational Procedures that set out measures for managing pollution risk during the operational phase;

- Emergency Flood Response Plan to detail how residual flood risk will be managed with reference to available flood warning services;
- Implementation of watercourse offsets in accordance with LLFA and IDB guidance; or permit applications sought as appropriate. This will include

    - Setting back all development within the Stain Lane site by at least ten metres from the landward toe of the embankment along the Great Eau (Main River),
    - Setting back all development (other than required features such as watercourse crossings and storm water outfalls) by nine metres from IDB Managed Drains as measured from the landward toe of the bank where there is an embankment or wall or the top of the batter where there is no embankment or wall

- Retention of all riparian surface water drains (pumped and gravity) with appropriate offsets, where possible;
- In any cases where retention of minor drains is not possible these would be diverted whilst retaining or enhancing their function in terms of conveyance and storage capacity.
- Restricting the peak rates and volume of runoff from the thermal generation station, the BESS areas and the project substation to greenfield rates;
- Surface Water Drainage Strategy using SuDS and including provision of containment on the stormwater network (for the management of firewater);
- Land raise to thermal generation station to manage residual flood risk associated with breach or overtopping of the coastal defences;
- Horizontal Directional Drilling for watercourse cable crossings (IBD Managed Drains) along the preferred cable route or within the Stain Lane site. There is no requirement for crossings over or beneath Main Rivers;
- Horizontal Directional Drilling for the pipe work to the new marine inlet and outlet. This drilling will extend right beneath the coastal flood defences, the dunes and the intertidal zone; and
- Preferentially seeking to access the fields within the Stain Lane site using existing access routes that do not require new temporary or permanent crossings. If new crossings are unavoidable these would be developed in discussion with the IDB and in line with IDB guidance.

11.6 Scope of Environmental Impacts and Effects

Construction

11.6.1 The major potential adverse environmental effects on the Water Environment during the construction phase are summarised below in Table 11.1

Table 11.1: Potential Adverse Effects to the Water Environment during Construction

Potential Effects	*Receptors*
Pollution arising from construction processes including sediment, oils and cementitious material.	*Chalk Aquifer, Riparian Drains, IDB Managed Drains, Wold Grift Drain, Great Eau (river), Humber Estuary RAMSAR, Saltfleetby – Theddlethorpe Dunes SSSI, Saltfleetby – Theddlethorpe Dunes and Gibraltar Point SAC, Humber Estuary SPA*
Pollution arising from mobilisation of contamination on previously developed land.	*Chalk Aquifer, Riparian Drains, IDB Managed Drains, Wold Grift Drain, Great Eau (river), Humber Estuary RAMSAR, Saltfleetby – Theddlethorpe Dunes SSSI, Saltfleetby –*

	Theddlethorpe Dunes and Gibraltar Point SAC, Humber Estuary SPA
Pollution arising from construction of cable route watercourse crossings (HDD drilling for IDB Managed Drains and trench crossing for smaller Riparian Drains).	*Chalk Aquifer, IDB Managed Drains, Wold Grift Drain, Great Eau (river), Humber Estuary RAMSAR, Saltfleetby – Theddlethorpe Dunes SSSI, Saltfleetby – Theddlethorpe Dunes and Gibraltar Point SAC, Humber Estuary SPA*
Pollution or physical impacts arising from construction of pipework to new marine inlet and outlets (HDD drilling)	*Coastal flood defences, Humber Estuary RAMSAR, Saltfleetby – Theddlethorpe Dunes SSSI, Saltfleetby – Theddlethorpe Dunes and Gibraltar Point SAC, Humber Estuary SPA*
Pollution or physical impacts arising from construction of new marine inlet and outlets	*Greater Ouse SPA*
Impacts on flows and water quality in IDB Managed Drains and Riparian Drains from temporary vehicle crossing (likely to be Bailey bridge style) to enable access along cable route and from temporary construction compounds into main development areas.	*Riparian Drains, IDB Managed Drains, Wold Grift Drain, Great Eau (river)*
Temporary measures during construction to manage flows within channels and discharging surface water to channels could affect the distribution of water.	*Riparian Drains, IDB Managed Drains, Wold Grift Drain, Great Eau (river)*
Some construction activities have the potential to alter surface water runoff and affect local flood risk.	*Riparian Drains, IDB Managed Drains, Wold Grift Drain, Great Eau (river) (and adjacent land)*

11.6.2 It is assumed that any decommissioning impacts and effects would be the same / equivalent to construction impacts and effects.

Operation

11.6.3 The major potential adverse environmental effects on the Water Environment during the operational phase are summarised below in Table 11.2.

Table 11.2: Potential Adverse Effects to the Water Environment during Operation

Potential Effects	*Receptors*
Pollution arising from regular site operations.	*Chalk Aquifer, Riparian Drains, IDB Managed Drains, Wold Grift Drain, Great Eau (river), Humber Estuary RAMSAR, Saltfleetby – Theddlethorpe Dunes SSSI, Saltfleetby – Theddlethorpe Dunes and Gibraltar Point SAC, Humber Estuary SPA*
Pollution arising from major spills or firewater contamination.	*Burnham Chalk Aquifer, Riparian Drains, IDB Managed Drains, Wold Grift Drain, Great Eau (river), Humber Estuary RAMSAR, Saltfleetby – Theddlethorpe Dunes SSSI, Saltfleetby – Theddlethorpe Dunes and Gibraltar Point SAC, Humber Estuary SPA*

Changes in flow patterns resulting from development (altered catchment areas at thermal generation station and BESS areas and customer substation and / or creation of preferential flow pathways along the cable route).	*Riparian Drains, IDB Managed Drains, Wold Grift Drain, Great Eau (river)*
Additional pressure on regional potable water supply network from usage within the scheme.	*Lincolnshire East Water Resource Zone*
Increased flood risk as a direct consequence of new impermeable areas.	*Riparian Drains, IDB Managed Drains, Wold Grift Drain, Great Eau (river) (and adjacent land)*
Increase flood risk arising from build-up of ground level on the Theddlethrope site and also at Stain Lane site, if this is required.	*Riparian Drains, IDB Managed Drains (and adjacent land)*
Changes in flood conveyance resulting from the loss or diversion of channels around thermal generation station, the BESS sites and the customer substation.	*Riparian Drains, IDB Managed Drains (and adjacent land)*
Localised changes in water quality around the new marine outlet	*Greater Ouse SPA*
Localised changes in flow and morphology (scour etc) at and around the new marine inlet and outlet	*Greater Ouse SPA*

11.7 Limitations and Uncertainties

11.7.1 The current review is based on publicly available data obtained from the Environment Agency, Lincolnshire County Council and commercial data supply companies, as well as additional information supplied by stakeholders.

11.7.2 The current understanding is however limited by a lack of detailed information on:

- The connectivity and flow direction within the pumped catchments;
- Flow data for watercourses and drainage channels;
- Water quality data for specific locations (surface and groundwater); and
- Robust flood modelling data.

11.7.3 Moving forward catchment data regarding water quality will be used to inform the assessment supported by a hydrological site walkover and a water feature survey. This will be supported and enhanced by topographic surveys through the project area and discussions with Linsey Marsh Drainage Broad.

11.7.4 Water quality monitoring will be undertaken to establish baseline conditions in key watercourses. The detail of this monitoring will be agreed with stakeholders once flow routing through the drainage networks is better understood, and any existing data sets have been obtained and reviewed.

11.7.5 Additional flood modelling will be undertaken to address key limitations and data gaps. The nature of this modelling will be agreed with stakeholders but will likely target the potential for overtopping or failure of the coastal defences and fluvial flood risk along the Great Eau.

11.7.6 This data, in combination with existing publicly accessible information and data that we will request from stakeholders is considered sufficient to establish the baseline conditions of the Water Environment. Therefore, it is considered that there are no major data limitations that would affect the conclusions of the assessment, and the baseline assessment, once complete, will provide a robust and accurate representation of reality.

11.8 Inter-related Effects

11.8.1 Inter-related effects could arise between the Water Environment Chapter and both the Ecology and Ground Condition Chapters.

11.8.2 The Ecology Chapter will be important in determining the sensitivity of receptors which will be considered within the Water Environment Chapter.

11.8.3 The Ground Conditions Chapter will assess and quantify the risk associated with previously developed land (Theddlethorpe and Strubby Lane sites) which could be contaminated. Data collected and compiled during the preparation of the Ground Conditions Chapter will also be vital to understanding the movement of surface water and groundwater to confirm the current conceptual understanding

11.9 Cumulative Effects

11.9.1 The cumulative assessment within the Water Environment chapter will initially focus on a source pathway receptor model. Any schemes that are in different catchments and / or drain to different receptors will be excluded from further consideration.

11.9.2 Beyond that, a review would be taken to determine situations where residual effects are predicted and, if similar residual effects are identified (even if these are minor), professional judgement will be used to consider if realistically these effects, when considered cumulatively could be deemed significant in EIA terms.

11.9.3 In cases where the residual effects are assessed to be negligible it will however be assumed that no significant cumulative effect is possible.

11.10 Summary of Proposed Scope

11.10.1 A summary of the proposed scope of assessment is included at Chapter 22.

Screened Out Studies

11.10.2 Review of Environment Agency flood model data indicates that the primary fluvial flood risks at the Theddlethorpe site and the Stain Lane site would be derived from the Great Eau and potentially also interaction between the Great Eau and the surrounding pumped drainage networks. Wold Grift Drain is remote from all aspects of the project and extensive areas of open marshland between the watercourse and the development are even lower than the lowest part of the project area. On this basis fresh or updated modelling of flood risk along Wold Grift Drain is scoped out. Risk associated with flooding along Wold Grift Drain will be assessed based on the existing data available.

11.10.3 Given the thick layer of low permeability superficial deposits across the study area the risk posed to groundwater receptors is likely to be low. On this basis, and assuming that no deep excavations, groundwater abstractions or discharges are required, it is considered that there should be no need to progress any groundwater monitoring or quantitative assessment of risk posed to groundwater. These risks will all be assessed qualitatively within the ES.

11.10.4 Given that the proposed abstraction for the proposed electrolysis plant would be from the marine environment it is assumed that this will not have any impact on water resources and no further consideration of the availability of water and / or the impact of the volume of the abstraction is required.

12 Ground Conditions and Land Contamination

12.1 Introduction

12.1.1 The scope of a potential future ground conditions (including geology and hydrogeology) and land contamination assessment has been considered within this Chapter of the Scoping Report.

12.2 Legislation, Planning Policy Context and Guidance National Policy

12.2.1 The overarching NPS for Energy EN-1 states that development of land will affect soil resources, including physical loss of and damage to soil resources, through land contamination and structural damage whilst noting that indirect impacts may also arise from changes in the local water regime, organic matter content, soil biodiversity and soil process (EN-1 Paragraph 5.11.4).

12.2.2 EN-1 states that where pre-existing land contamination may be encountered, that the objective is to ensure that the site is suitable for its intended use and that potential risk should require consideration in accordance with the contaminated land statutory guidance as a minimum[26] (EN-1 Paragraph 5.11.5). This statutory guidance sets out the objectives, risk assessments and definitions relevant to any contaminated land encountered as part of the Proposed Development, including the procedures relevant to controlling further contamination.

12.2.3 Paragraph 5.11.8 of EN-1 sets out that assessment undertaken should consider the risk posed by land contamination where developments are proposed on previously developed land, and that, the applicant should ensure that they have considered the risk posed by land contamination and how it is proposed to address this.

12.2.4 To limit potential land contamination, EN-1 encourages the implementation of a Soil Management Plan to include the sustainable reuse of soil in line with good practice guidance (EN-1 Paragraph 5.11.14).

12.2.5 EN-1 advises that, for developments on previously developed land, applicants should ensure that they have considered the risk posed by land contamination, and where contamination is present, applicants should consider opportunities for remediation where possible (EN-1 Paragraph 5.11.18).

12.2.6 In terms of mineral resources, EN-1 states that applicants should safeguard any mineral resources on the proposed site as far as possible, taking into account the long-term potential of the land use after any future decommissioning has taken place (EN-1 Paragraph 5.11.19).

12.3 Baseline

12.3.1 The study area for the assessment will be set by the Proposed Development Boundary shown at Appendix A, subject to any change to this between scoping and EIA stages. Locations where ground will be disturbed will be those locations where ground condition and contamination effects are most likely, thus occurring at Strubby Airfield (including potential substation location), Stain Lane, the Theddlethorpe TES and the underground cables proposed. However, the entirety of the Proposed Development will be assessed and reviewed as part of the EIA.

[26] Uk Gov Defra Guidance on Environmental Protection Act Contaminated Land Statutory Guidance: https://www.gov.uk/government/publications/contaminated-land-statutory-guidance (Accessed May 2025)

12.3.2 The British Geological Survey (BGS) Map[27] indicates that the Site geology comprises a mix of chalk formations (see Figure 12-1 below). The superficial geology is indicated to comprise tidal deposits within the eastern part of the Proposed Development, with till or glaciofluvial deposits across the remainder of the site. No landfill or 'made land' is known to exist within the Proposed Development Boundary, albeit there is potential to encounter this nearby to the location of the Theddlethorpe TES and BESS locations given previous developments nearby.

12.3.3 There are no SSSI designated specifically for their geological importance within the study area. Further consultation will be required with East Lindsey and Lincolnshire Councils to establish if there are any designated Local Geological Sites present within the study area.

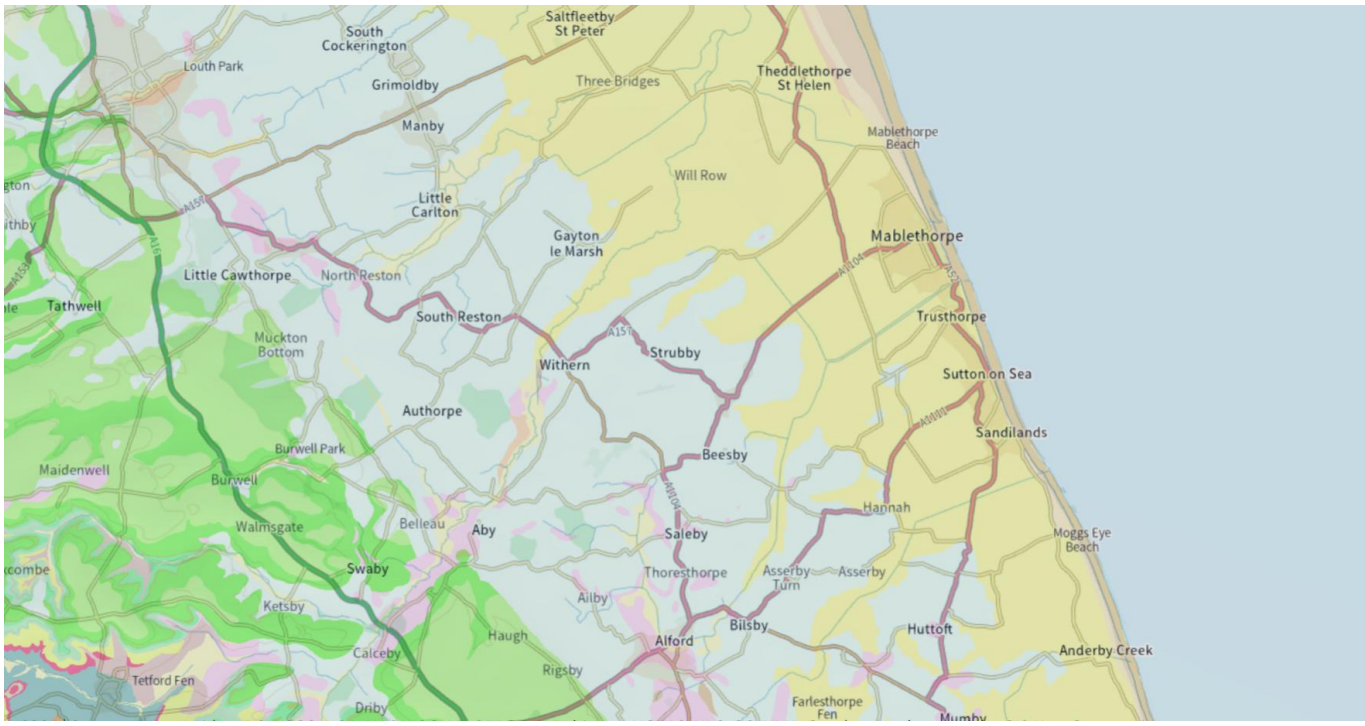
12.3.4 There are sensitive receptors located in proximity to the Site. These comprise the Saltfleetby - Theddlethorpe Dunes SSSI, Humber Estuary SPA, the Humber Estuary Ramsar site and the Saltfleetby-Theddlethorpe Dunes and Gibraltar Point SAC. Groundwater is both a receptor and a pathway for contamination which may provide a link between any contamination at the Proposed Development Site and other receptors. There are residential receptors in proximity to the Proposed Development and employees that work in the surrounding area, including in agricultural operations.

12.3.5 Water is known to be abstracted from the chalk locally for water supply. Significant parts of the project area, including the BESS site, therefore fall within source protection zones around these public water supply boreholes.

12.3.6 Much of the Proposed Development site is undeveloped agricultural land, and the potential for any existing ground contamination that could be mobilised during construction within these areas is considered to be low. However, adjacent to previous industrial uses (at Theddlethorpe) or former airfield (Strubby Airfield) the possibility of mobilising existing ground contamination is more likely to occur given proximity to previous development. Such contamination may have resulted from the spillage, leakage and accumulation of hydrocarbons, process by-products and wastes into soil and/or groundwater, through the construction of or operation of these previous neighbouring uses.

[27] BGS Geology Viewer: https://geologyviewer.bgs.ac.uk/?_ga=2.176490342.2142368038.1747220759-98392432.1747220759 (accessed May 2025)

Figure 12-1 Regional Geology[28]:



Map Colour	Bedrock Geology	Superficial Deposits
	Burnham Chalk Formation	Tidal Flat Deposits - Clay and silt
	Welton Chalk Formation	Till, Devensian - Diamicton. Sedimentary superficial deposit
	Welton Chalk Formation	Glaciofluvial Deposits, Devensian - Sand and gravel

Mineral Resources

12.3.7 Local planning policy does not identify any minerals safeguidarding or consultation areas across the site or study area.

12.4 Approach to Assessment

Assessment Criteria

12.4.1 The baseline understanding of the study area will be developed and documented with reference to the following data sources:

- Ordnance Survey mapping;
- Ordnance Survey historical mapping;

[28] Sourced from the BGS Geology Viewer: https://geologyviewer.bgs.ac.uk/?_ga=2.176490342.2142368038.1747220759-98392432.1747220759 (accessed May 2025)

- British Geological Survey solid and superficial mapped geology;
- British Geological Survey borehole records;
- Data on licenced abstractions and discharges from the Environment Agency;
- Data on private water supplies from the Environmental Health team at East Lindsay District Council;
- Meteorological, groundwater level and river level / flow data available from the Environment Agency's Hydrology Data Explorer;
- Historic water quality data available from the Environment Agency's Water Quality Data archive;
- Site specific data including hydrology and hydrogeological conditions as obtained from the wider project team.

12.4.2 Effects will be considered against the baseline understanding (informed by the above criteria), and potential receptors. The sensitivity of the receptor and the magnitude of impact will then be used to define the significance of the effect in line with significance matrices, as set out within Chapter 7.

12.4.3 A desk-based assessment (Phase 1) will be completed to identify potential contaminative uses at the Proposed Development. This desk-based assessment will identify the potential for land contamination and potential pathways to sensitive receptors and consider the potential for mobilisation of contaminants associated with current and historical land use in and around the Proposed Development.

12.4.4 The results of the desk-based assessment will be used to assess data gaps and uncertainties and, if required, develop a scope for site investigation, which may also be required to assess possible solutions. The requirements for any initial intrusive investigation will be discussed in advance with the East Lindsey District and Lincolnshire County Council's, alongside the Environment Agency. The approach to assessing the potential impacts of the Proposed Development from and to land contamination, will be undertaken by comparing the risk levels at baseline via the preliminary conceptual site model (developed in the Phase I desk study) and the risk levels for the construction, operation and decommissioning stages respectively, to determine the change in risk at each stage.

12.4.5 The significance of the effects of land contamination will be assessed by comparing the difference in risk of each contaminant linkage at baseline to those at construction and operation stages. Where there is shown to be a decrease in contamination risk the Proposed Development will be assessed as having a beneficial effect on the environment in the long term.

12.4.6 If geological designations or mineral designations are present, the assessment of significance will consider the sensitivity or importance of the asset/ resource and the magnitude of potential impact that might occur.

12.4.7 Based on the assessment of the baseline and the identification of any potential impacts, the ES will make recommendations for mitigation measures. These may include the recommendation for an initial intrusive investigation (to address residual data gaps or better delineate identified potential contamination hotspots), quantitative risk assessment, remediation and validation. It will also make recommendations for possible mitigation measures to be employed by contractors, should any previously unidentified contamination be encountered during the construction phase.

12.4.8 The assessment will consider any mitigation that is incorporated into the scheme design, or that which is considered standard good practice. If after consideration of this incorporated mitigation

potentially significant adverse effects are predicted, further mitigation would be proposed and the residual effects assessed and presented.

Geographical scope

12.4.9 For the purposes of determining conditions with respect to geology and land contamination, a study area that extends 250m from the boundary of the Proposed Development Site will be adopted. This will be extended for hydrogeology to 1km from the Proposed Development Site. This is appropriate to assess the local geological and hydrogeological setting, and any influence that potential contaminated land might have on the scheme or local receptors. However, the baseline conditions in terms of soil chemical quality, where available, will be based on information directly within the Proposed Development Site only.

Temporal scope

12.4.10 Assessment will be undertaken for the construction, operational and decommissioning phases of the development.

12.5 Embedded Mitigation and Enhancement Measures

12.5.1 A future Construction Environmental Management Plan (CEMP) will be secured via DCO Requirement. The CEMP will describe construction related mitigation measures, including best practice, to ensure environmental impacts are minimised. The CEMP will include the following measures:

- Good standards of personal hygiene, including welfare facilities on-site and the use of appropriate levels of personal protective equipment (PPE).
- Health, safety and environmental precautions, to reduce the potential for any accidents and incidents.
- Strategy in place should contamination be encountered onsite, including assessment by specialist and appropriate methods to manage encountered contamination.
- Dust control, such as wheel washing, and damping of materials in dry weather.
- Appropriate storage of fuel, chemicals and materials, alongside strategy to deal with any spillages.

12.5.2 Where practicable, measures to minimise negative effects and mitigate effects on existing or planned uses near the site will be achieved through the application of good design principles, including the layout of the project and the protection of soils during construction. All soils would be carefully managed in accordance with the Defra Construction Code of Practice for the Sustainable Use of Soils on Construction Sites[29].

12.6 Scope of Environmental Impacts and Effects

12.6.1 An assessment of potential impacts on existing ground conditions will be undertaken as part of the EIA, including potential impacts associated with the construction and operation of the Proposed Development and how these will be prevented or minimised.

[29] Defra Construction Code of Practice for the Sustainable Use of Soils on Construction Sites: https://www.gov.uk/government/publications/code-of-practice-for-the-sustainable-use-of-soils-on-construction-sites Accessed May 2025.

12.6.2 During construction there is a potential likelihood to mobilise or cause contamination through construction processes, this is of relevance hydrogeology (notably local aquifer) and ground conditions and is therefore scoped-in to assessment.

12.6.3 During operation, the Proposed Development would not have any process discharges to land, surface or groundwater other than runoff. Furthermore, during construction, good practice measures for management and materials storage to avoid spillages would be implemented through a CoCP and CEMP and significant effects on or due to ground contamination during construction are not considered likely. There is not considered to be the potential for significant effects on geology, hydrogeology or ground contamination during operation of the Proposed Development. During operation there is not anticipated to be future ground disturbance so existing ground contamination would not be encountered. However, occurrence of emergency events associated with the Proposed Development will have potential to cause contamination effects specific to the emergency encountered (such as a fire) – the occurrence of an emergency during operation is therefore scoped in to future assessment.

12.6.4 There are no extant mineral operations, areas safeguarded for minerals or areas designated for geological interest on site or area around it. There is no potential for significant effects on geological resources during construction or operation.

12.6.5 The major potential adverse environmental effects are likely to be associated with construction only, as summarised below in Table 11.1

Table 112.1: Potential Adverse Effects during Construction

Potential Effects	*Receptors*
Pollution arising from construction processes including from spillages	Chalk aquifer, people and businesses, environmental habitats
Pollution arising from mobilisation of existing contamination	Chalk aquifer, people and businesses, environmental habitats

12.6.6 It is assumed that any decommissioning impacts and effects would be the same / equivalent to construction impacts and effects.

12.7 Limitations and Uncertainties

12.7.1 The current review is based on publicly available data which may be subject to review, update or revision. Whilst there are no current data limitations, a more detailed review of ground conditions will be necessary to provide an accurate baseline, this will be undertaken to inform the EIA.

12.8 Inter-related Effects

12.8.1 Inter-related effects could arise between the Ground Conditions chapter and the Ecology, Soils and Human Health chapters. All of which will be important in determining the sensitivity of receptors for the future EIA.

12.8.2 Data collected and compiled during the preparation of the Ground Conditions Chapter will be vital to understanding the movement of surface water and groundwater which will be of relevance to the Water Environment Chapter. There is also potential inter-related effects from the storage of soils and contamination, and the agriculture and soils chapter of the ES, including on the quality of soils and how stored soils may be used across the Proposed Development site.

12.9 Cumulative Effects

12.9.1 The effects of the Proposed Development will be considered cumulatively with relevant nearby developments in consideration of shared receptors across projects, as set out within Chapter 7 of this report.

12.10 Summary of Proposed Scope

12.10.1 A summary of the proposed scope of assessment is included at Chapter 22.

13 Agriculture and Soils

13.1 Introduction

13.1.1 The study area for the assessment will be set by the Scoping Boundary shown at Appendix A. The study area will be refined as the Proposed Development design progresses and, for the purpose of the ES, will be the Order Limits. This will include all land subject to the DCO application.

13.1.2 As the main locations for the Proposed Development, the impacts to agricultural land and soils will primarily occur on land that is located at Strubby, Stain Lane and on land adjacent to the decommissioned Theddlethorpe Gas Terminal. The location of proposed underground cable, following construction, will see the restoration of agricultural land and soils. Whilst the impacts on agricultural land and soils from the cable route are likely to be temporary in nature, the full route including cable corridor will be assessed and reviewed as part of the EIA as is reflected within this Scoping Report.

13.2 Legislation, Planning Policy Context and Guidance

National Policy

13.2.1 The overarching NPS for Energy (EN-1) states that applicants should seek to minimise impacts on 'Best and Most Versatile Land' (BMV land) (grades 1, 2 and 3a), by preferably using land in areas of poorer quality (grades 3b, 4 and 5) (EN-1 Paragraphs 5.11.12 to 5.11.14). EN-2 does not include any policy considerations around BMV, aside from noting that gas related developments will have a large footprint given their nature (Paragraph 2.4.1). EN-3 (Paragraph 2.10.29) states:

> *'While land type should not be a predominating factor in determining the suitability of the site location applicants should, where possible, utilise suitable previously developed land, brownfield land, contaminated land and industrial land. Where the proposed use of any agricultural land has been shown to be necessary, poorer quality land should be preferred to higher quality land avoiding the use of "Best and Most Versatile" agricultural land where possible. 'Best and Most Versatile agricultural land is defined as land in grades 1, 2 and 3a of the Agricultural Land Classification."*

13.2.2 NPS EN- 3, goes onto state in paragraphs 2.10.31 to 2.10.32

> *"It is recognised that at this scale, it is likely that applicants' developments will use some agricultural land. Applicants should explain their choice of site, noting the preference for development to be on suitable brownfield, industrial and low and medium grade agricultural land. Where sited on agricultural land, consideration may be given as to whether the proposal allows for continued agricultural use and/or can be co-located with other functions (for example, onshore wind generation, storage, hydrogen electrolysers) to maximise the efficiency of land use."*

13.2.3 Paragraph 2.10.34 of NPS EN-3 encourages applicants to develop and implement a Soil Resources and Management Plan to inform the construction, operation and decommissioning phases of the development.

13.2.4 Paragraph 187b of the NPPF sets out that planning decisions should contribute to and enhance the natural and local environment by recognising the wider benefits from natural capital and

ecosystem services, including the economic and other benefits of best and most versatile agricultural land.

Local Policy

13.2.5 Local Plan policy SP10 (design) states that the council will support well designed sustainable development, which maintains and enhances the character of towns, villages and the countryside. Where possible supporting the use of brownfield land for development, unless it is of high environmental value, seeking to use areas of poorer quality agricultural land in preference to that of a higher quality.

13.3 Baseline

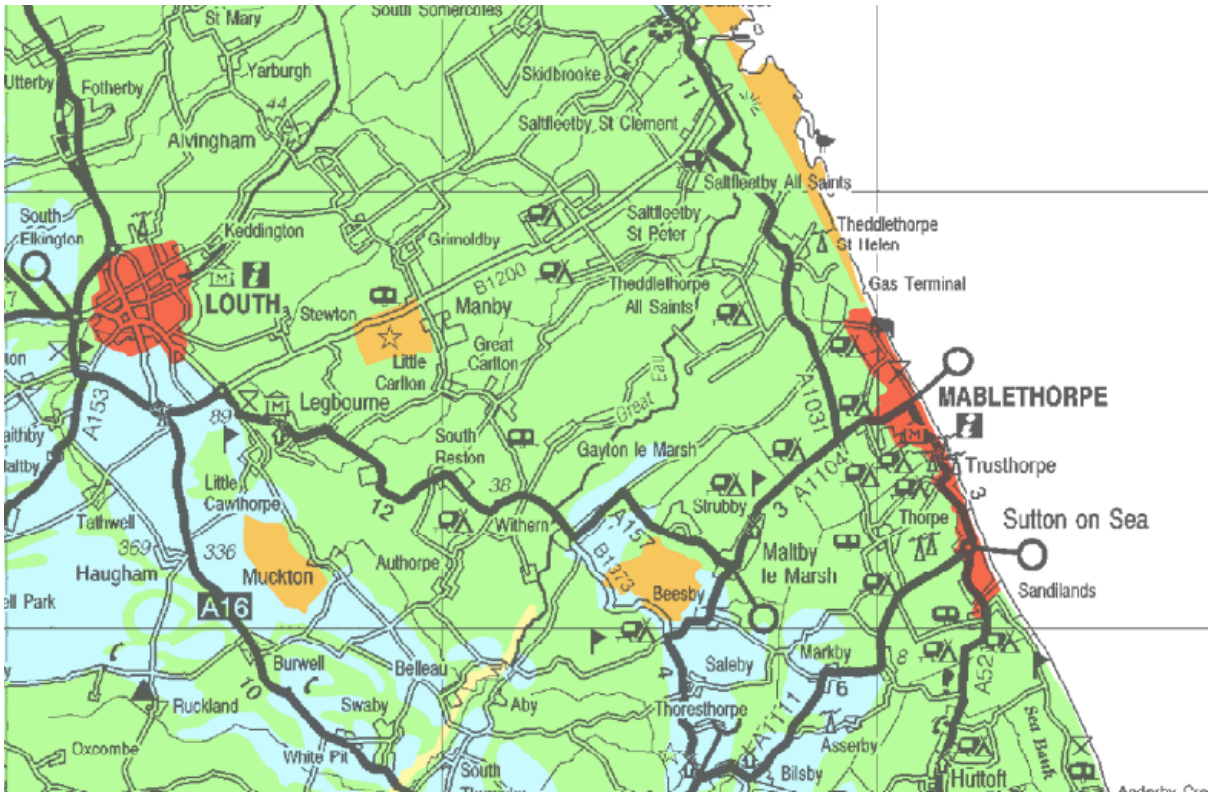
13.3.1 Agricultural Land Classification (ALC) is a grading system designed to enable the assessment and comparison of agricultural land in England and Wales. It considers a combination of climate, topography and soil characteristics and their unique interactions to determine the limitation of land, which can affect the range and yields of crops that be grown, the consistency of yields, and the cost of production.

13.3.2 The grading system classifies land from Grade 1 to Grade 5, with the highest grade being Grade 1 land, which gives the highest yields, requires the least input, can grow the most diverse range of crops, and produces the most consistent yields. The classification system is set out as follows:

- Grade 1 – ‘excellent quality’ agricultural land;
- Grade 2 – ‘very good quality’ agricultural land;
- Grade 3a – ‘good quality’ agricultural land;
- Grade 3b – ‘moderate quality’ agricultural land;
- Grade 4 – ‘poor quality’ agricultural land; and
- Grade 5 – ‘very poor quality’ agricultural land.

13.3.3 Grades 1 to 3a are defined as ‘Best and Most Versatile’ Land (BMV land). Natural England has prepared a Provisional ALC at a 1:250,000 scale, where all of England has been previously classified from Grade 1 to Grade 5 on the basis of desk study. The online desk study identifies large swathes of land covering and surrounding the Proposed Development Boundary as being classified as BMV land (see Figure 13-1).

Figure 13-1: Agricultural Land Quality Map Extract[30]



Grade	Description
1	Excellent
2	Very Good
3	Good to Moderate
4	Poor
5	Very Poor

Non-Agricultural Land

- Other land primarily in non-agricultural use
- Land predominantly in urban use

13.4 Approach to Assessment

13.4.1 A desk-based assessment (Phase 1) will be completed to identify the likely grade of land and soil quality. This will form the baseline understanding of the EIA study area and will be

[30] Source: Natural England ALC Maps: https://publications.naturalengland.org.uk/category/5954148537204736 (Accessed May 2025).

developed and documented in consideration of Natural England ALC maps[31] and the boundary for the Proposed Development (the future order limits).

13.4.2 A Phase 2 site specific survey will then be undertaken to establish specific grade of agricultural land and soil nature across the Proposed Development site. The extent of survey will be developed in discussion with stakeholders such as Natural England so that a representative and accurate picture of land grade and soil is established for the purpose of consideration as part of the EIA.

13.4.3 Effects will be considered against the soil and land grade to determine significance of effect in EIA terms, including on Best and Most Versatile (BMV) land.

13.5 Embedded Mitigation and Enhancement Measures

13.5.1 Where practicable, measures to avoid or reduce damage to land and soils would be incorporated into the future design for the project.

13.5.2 An Outline Soil Resources and Management Plan will be produced that will identify best practice methods for the stripping, storage and replacement of soils during construction, and will be secured by a requirement in the DCO. This will cover the full Proposed Development including areas of temporary land take and land which will be restored following construction (such as underground cable installation). The management plan will also ensure that all soils would be carefully managed in accordance with the Defra Construction Code of Practice for the Sustainable Use of Soils on Construction Sites[32].

13.6 Scope of Environmental Impacts and Effects

13.6.1 The Proposed Development will result in the development of agricultural land for energy infrastructure. This involves a change in land use from what is currently predominantly arable cultivation, to developable areas. The main areas affected would be land on where the thermal, BESS and substation elements will be located. The land allocated for the cable route will be refined through the development of the proposal to the point of submission. The large swathe will be assessed, but will be limited to much narrower easement as set out within Chapter 5. The cable easement will remain in place following construction to allow access should any maintenance works be required, however the land within this easement will be restored and can be farmed, enabling continued agricultural use.

13.6.2 The elements of the Scheme with the potential to result in significant loss or damage to agricultural land are:

1) Access tracks, which would be removed at decommissioning albeit topsoils would have been lost from beneath the tracks;
2) BESS and substation elements which could be removed at decommissioning, but topsoils would have been lost across the footprint of the facility;
3) Location of the Theddlethorpe TES and associated infrastructure at Theddlethorpe, and;

[31] Natural England ALC Maps: https://publications.naturalengland.org.uk/category/5954148537204736 (Accessed May 2025).

[32] Defra Construction Code of Practice for the Sustainable Use of Soils on Construction Sites: https://www.gov.uk/government/publications/code-of-practice-for-the-sustainable-use-of-soils-on-construction-sites Accessed May 2025.

4) Areas of planting such as woodland and hedgerows, which would be permanent and retained following decommissioning of the Proposed Development

13.6.3 Cumulatively, the footprint of the elements where there is potential for significant loss or damage to agricultural land is limited compared to the overall footprint of the Proposed Development. Whilst the scheme would take affected agricultural land temporarily out of arable production, the effects of this would be assessed for the operational phase of the Proposed Development, recognising that construction and decommissioning effects would be short-term and relate to potential impacts on soils, rather than agricultural productivity. It is therefore proposed that the effects on land are **scoped in** for the operational phase, and **scoped out** for construction and decommissioning.

13.6.4 The potential impacts and effects of the Scheme on land and soils relate to:

- Potential impacts on agricultural land use and the loss of BMV land;
- Potential impacts on the quality of soil resources; and
- Potential impacts on soil resources.

13.6.5 The construction of the Scheme has the potential to result in soil compaction that would harm its structure, and therefore its potential future function, quality and resilience. In addition, there is the potential for impacts resulting from mixing of different soil horizons (i.e. topsoil with subsoil), changes in the stoniness of soils, and changes to nutrient values and soil fertility. During operation there will not be further soil disruption as the components of the Proposed Development will already be in place. There is however the potential for the loss of soil quality within stored soil during the operation of the Proposed Development, limiting its future use. Ongoing maintenance associated with the Proposed Development is not anticipated to have an impact on soils. It is therefore proposed that impacts on soils are **scoped in to the construction and decommissioning phases of the Scheme, and scoped in to the operational phase.**

13.6.6 The impact of the Proposed Development on land and soils will be considered in the above context and assessed against the impact matrices set out within Chapter 7.

13.7 Limitations and Uncertainties

13.7.1 The current review of the baseline conditions of the Proposed Development site is based on publicly available data rather than site survey and has been used to provide context. A more detailed review of agricultural land and soil will be necessary to provide an accurate baseline, this will be undertaken to inform the EIA.

13.8 Inter-related Effects

13.8.1 There is the potential for inter related effects to occur between the Agriculture and Soils Chapter of the ES and the Ecology and Ground Condition Chapters.

13.8.2 The Ecology chapter of the ES, and effects on soil habitats, will be relevant to agriculture and soils, most notably on practices for soil storage and reuse. The Ground Condition chapter of the ES has the potential for inter related effects through the potential for contamination, soil storage is also relevant to how soils are used alongside existing and future potential quality of agricultural land on the Proposed Development site.

13.9 Cumulative Effects

13.9.1 The effects of the Proposed Development will be considered cumulatively with relevant developments in the vicinity in consideration of shared sensitive soil and agricultural receptors across projects, in accordance with the approach set out in Chapter 7 of this report.

13.10 Summary of Proposed Scope

13.10.1 An assessment of the agricultural land and soils will be included with the ES. This assessment will consider the agricultural land quality of the Site and the potential impacts and effects on the agricultural productivity of the land and its soils.

13.10.2 A summary of the proposed scope of assessment is included at Chapter 22.

14 Transport and Access

14.1 Introduction

14.1.1 This chapter sets out the proposed approach to the assessment of potential effects of the Proposed Development on transport and access matters during construction and operational phases of the Proposed Development.

14.1.2 The transport and access issues relating to the Proposed Development will be examined in a Transport and Access Chapter as part of the EIA (EIA). This will be supported by technical appendices and figures as appropriate, including a Transport Assessment (TA) and Abnormal Indivisible Load (AIL) Route Survey Report (where appropriate).

14.1.3 The TA will include a framework Construction Traffic Management Plan (CTMP) to identify practical measures to reduce the impact of construction traffic and activities for all road users. A Staff Travel Plan will also be outlined to promote sustainable travel practices.

14.1.4 This chapter has been prepared by Pell Frischmann Consultants Limited. Pell Frischmann is familiar with the study area and has extensive experience in the preparation of EIA transport reviews and the production of TA studies.

14.2 Legislative or Policy Requirements and Technical Guidance

14.2.1 The following policy and guidance documents will be used to inform the Transport and Access Chapter:

- National Policy Statement Overarching Energy (EN1) (2023);
- National Policy Statement for Oil and Gas Supply and Storage (EN4);
- National Planning Policy Framework (NPPF);
- Lincolnshire Local Transport Plan;
- Environmental Assessment of Traffic and Movement (Institute of Environmental Management and Assessment (IEMA), 2023); and
- Design Manual for Roads and Bridges (DMRB).

14.3 Baseline

Baseline Environment

14.3.1 The study area for the assessment will be defined by the preferred abnormal load and general construction traffic routes to the site during construction as well as traffic flows associated with the operational phase.

14.3.2 Construction materials required at the site will include the delivery of bulk materials such as aggregate, sand and ready-mix concrete in addition to deliveries of turbines / engines, plant, electrical infrastructure, battery storage equipment and high voltage generation and transmission equipment. Staff working at the construction site will arrive and depart by car.

14.3.3 The likely routes affected by construction traffic will include the following:

- B1373 at Woodthorpe;
- Rye Lane, to the south of Woodthorpe;
- A1104 to the south of Saleby;
- A1104 at Alford;
- A1104 at Maltby;

- A157 at Strubby;
- Stain Lane to the northeast of Withern;
- A1104 at Pinewood; and
- A1031 at Theddlethorpe.

14.3.4 During the operational phase, traffic including staff working at the Theddlethorpe TES (will access and egress via the site access junctions. Whilst the exact number of staff employed is yet to be determined, it is anticipated that there could be up to 116 full-time equivalent (FTE) staff employed at the site (albeit potentially in shifts) during operation and it is predicted that these operational traffic movements will predominantly use the A1031 and A1104 from existing population centres.

14.3.5 It is expected that the majority of abnormal loads required on site will be delivered to site from the north from the Port of Entry (PoE) at Immingham, or by alternative means such as a beach landing. A detailed Route Survey Report will accompany the Development Consent Order (DCO) application submission documents and will review the access route(s) in detail and will consider the vertical and horizontal constraints along with a review of weight restrictions. The AIL assessments will consider the largest loads for the various components, potentially including the electrolysers, CCG Turbine and electrical infrastructure.

14.3.6 A full review of Public Rights of Way (PROW), Bridleways and National Cycle Network (NCN) routes will be detailed in the DCO submission. Information on potential interactions based upon routes identified in the Lincolnshire PROW Plan and Sustrans NCN route map will be detailed, along with any necessary mitigation proposals.

Proposed Approach to Surveys and Further Baseline Data Collection

14.3.7 Traffic data for use in the assessment will be obtained from the Department for Transport (DfT) Road Traffic Database and from recent survey data that is in the public domain. Additional traffic survey data for the roads detailed in the baseline description will be collected through Automatic Traffic Count (ATC) surveys.

14.3.8 A detailed scoping discussion on traffic data to be used in the assessment will be held with road officers prior to the assessment commencing.

14.3.9 We would propose to use National Road Traffic Forecasts (NRTF) Low growth assumptions to determine future year traffic flows. This will enable the likely impacts during the year of construction to be assessed.

14.3.10 In addition to reviewing the physical links, consideration of road accidents in the study area would be reviewed for a five-year period using data from the online resource, www.crashmap.co.uk.

14.4 Approach to Assessment

Assessment Criteria

14.4.1 Potential impacts that may arise during the assessment may include the following for users of the road network and those residents along the access routes:

- Severance;
- Driver delay;
- Pedestrian delay;
- Pedestrian amenity;
- Fear and intimidation;
- Accidents and safety; and

- Hazardous and abnormal loads.

14.4.2 Changes in traffic flow will be considered against the above criteria to determine significant effects.

Magnitude of Impact

14.4.3 The following rules taken from the IEMA guidance would be used as a screening process to define the scale and extent of the assessment:

- Rule 1: Include highway links where traffic flows are predicted to increase by more than 30% (or where the number of HGVs is predicted to increase by more than 30%); and
- Rule 2: Include any other specifically sensitive areas where traffic flows are predicted to increase by 10% or more.

14.4.4 Increases below these thresholds are generally considered to be insignificant given that daily variations in background traffic flow may fluctuate by this amount. Changes in traffic flow below this level predicted as a consequence of the Proposed Development will therefore be assumed to result in no discernible environmental impact and as such no further consideration will be given to the associated environment effects.

14.4.5 The estimated traffic generation of the Proposed Development will be compared with baseline traffic flows, obtained from existing traffic survey data, in order to determine the percentage increase in traffic.

Sensitivity of Receptors

14.4.6 Potentially significant environmental effects will be assessed where the thresholds as defined above are exceeded. Suitable mitigation measures will be proposed, where appropriate. This assessment will consider the construction and operational traffic associated with the Proposed Development.

14.4.7 The IEMA guidance provides details on how the sensitivity of receptors should be assessed. Using that as a base, professional judgement was used to develop a classification of sensitivity for users based on the characteristics of roads and locations. This is summarised in Table 14.1.

14.4.8 Where a road passes through a location, users are considered subject to the highest level of sensitivity defined by either the road or the location characteristics.

Table 14.1: Classification of receptor sensitivity

Sensitivity of receptor	Criteria
High	Where the road is a minor rural road, not constructed to accommodate frequent use by HGVs. Includes roads with traffic control signals, waiting and loading restrictions, traffic calming measures. Where a location is a large rural settlement containing a high number of community and public services and facilities.
Medium	Where the road is a local A or B class road, capable of regular use by HGV traffic. Includes roads where there is some traffic calming or traffic management measures.

Sensitivity of receptor	Criteria
	Where a location is an intermediate sized rural settlement, containing some community or public facilities and services.
Low	Where the road is Trunk or A-class, constructed to accommodate significant HGV composition. Includes roads with little or no traffic calming or traffic management measures. Where a location is a small rural settlement, few community or public facilities or services.
Negligible	Where roads have no adjacent settlements. Includes new or existing strategic trunk roads that would be little affected by additional traffic and suitable for Abnormal Loads, and new strategic trunk road junctions capable of accommodating Abnormal Loads. Where a location includes individual dwellings or scattered settlements with no facilities.

Significance of Effect

14.4.9 The impacts on receptors within the study area will be reviewed during the construction phase, with a peak construction period assessment undertaken. This will review the maximum impact and presents a robust assessment of the effects of construction traffic on the local road network. A similar assessment for the operational phase will also be undertaken.

14.4.10 A comparison between receptor sensitivity and the magnitude of impact will be undertaken. The resultant effect will be determined from the appropriate effects matrix detailed below in Table 14.2.

Table 14.2: Significance of Effect Matrix

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

14.4.11 Significance is categorised as major, moderate, minor or negligible. Effects judged to be of major or moderate significance will be considered to be significant in accordance with the EIA Regulations and would be the focus of further mitigation where feasible.

14.4.12 Where an effect could be one of major/moderate or moderate/minor significance, professional judgement will be used to determine which option should be applicable, as these effects can be

classed as significant. Effects judged to be of minor or negligible significance will be considered not significant.

Geographical Scope

14.4.13 The study area outlined in the baseline environment encompasses the geographical limit for the study, with each major road link considered within the assessment.

Temporal Scope

14.4.14 The assessment will focus on the peak month for construction delivery activities. The operational access review will assume a typical day with the arrival and departure of up to 116 staff members.

14.4.15 No further consideration of seasonal changes is proposed.

14.5 Embedded Mitigation and Enhancement Measures

14.5.1 Mitigation measures that are likely to be embedded in the assessment are:

- Production of a Construction Traffic Management Plan;
- The design of suitable access junction arrangements with full consideration given to the road safety of all road users;
- A Staff Sustainable Access Plan; and
- A Framework Abnormal Load Transport Management Plan.

14.5.2 Additional mitigation will be included, where feasible, should the assessment reveal effects that are significant following the application of standard mitigation measures.

14.6 Scope of Environmental Impacts and Effects

Construction

14.6.1 The impacts for road users (pedestrians, cyclists, equestrians and drivers) and those living along the links within the study area will be considered during the construction phase. The assessment would be based on the worst-case traffic flows at the peak of construction activity.

14.6.2 No road junction capacity assessments will be undertaken as the likely scale of the temporary construction phase is highly unlikely to result in junction capacities being exceeded.

Operation

14.6.3 The impacts for the same receptors as used in the construction phase will be considered during the operational phase.

14.7 Limitations and Uncertainties

14.7.1 The assessment will be based upon an indicative construction programme and will consider peak traffic effects to ensure that a worst-case scenario has been considered. There are no other significant limitations to considering the potential transport impacts.

14.8 Inter-related Effects

14.8.1 The transport effects of the assessment will also be considered in the noise and air quality assessment due to potential for traffic movements to create potentially significant effects in those wider subject areas.

14.8.2 The transport data from the study will also be used in the carbon balance calculations for the Proposed Development.

14.9 Cumulative Effects

14.9.1 A cumulative assessment will take place based on the criteria set out at Chapter 7. This will include consideration of nearby other developments which have planning consent, a publicly available Transport Assessment or Transport Statement and would have a significant impact on the study network roads (i.e. over 30% increase in traffic flows), during the years of construction or operation. These traffic flows would be included into the baseline flows used within the cumulative assessment for the Proposed Development.

14.10 Summary of Proposed Scope

14.10.1 A summary of the proposed scope of assessment is included at Chapter 22.

15 Air Quality

15.1 Introduction

15.1.1 This chapter of the Scoping Report has been produced by the Savills Air Quality team within the Environment and Infrastructure department. The team is led by Dan Smyth, who has over 30 years of experience as an environmental and air quality specialist.

15.1.2 The following air quality effects have been considered as part of the scoping exercise:

- Construction phase dust emissions;
- Construction and operational phase road traffic vehicle emissions; and
- Operational phase process emissions.

15.1.3 The topic of air quality will be scoped into the EIA, and construction phase dust emissions and operational phase process emissions are proposed to be scoped into the assessment.

15.1.4 The volume of traffic generated during the construction phase and operational phase is not yet confirmed. The scoping in/out of traffic emissions will therefore be confirmed when traffic generation figures are established in the course of the EIA. For the purpose of the Scoping Report, it is assumed that construction traffic may exceed the screening thresholds for assessment, but operational traffic will be below these. The pollutants of relevance to assess from traffic are oxides of nitrogen (NO_x) expressed as nitrogen dioxide (NO_2) levels and particulate matter (PM).

15.1.5 At this early stage of design for the Proposed Development, there is flexibility in the choice of turbine facility, gas turbines, CCGT or gas reciprocating engines. There is also flexibility in the choice of fuel source, between natural gas, hydrogen or a mix between the two. There is an option for the hydrogen to be supplied by an electrolysis plant (with its water supplied from a desalination plant), or for the hydrogen to be sourced from a future third-party pipeline. The main pollutant released with the use of both natural gas and hydrogen fuel is NO_x expressed as NO_2. For natural gas fuel, there is the potential for carbon monoxide (CO) at very low levels; and depending on the technique used to control NO_x, there could also be ammonia slip (NH_3) in the exhaust. Neither natural gas nor hydrogen combustion releases significant particulate matter.

15.1.6 There is also the option of a carbon capture plant to be installed together with the CCGT. The carbon capture process results in some additional trace gases entering the flue gas stream, including amines and amine degradation products. The scope and methodology of assessment provided below ensures that all scenarios could be assessed depending on the options progressed to the statutory consultation and application stages.

15.2 Legislative or Policy Requirements and Technical Guidance

Legislative Context

15.2.1 Air Quality Standards and Objectives are established through a range of legislation and policy guidelines as set out below.

<u>The Air Quality Standards Regulations (2010)</u>

15.2.2 European Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008, sets legally binding Europe-wide limit values for the protection of public health and sensitive habitats. The Directive was transposed into domestic law by the Air Quality Standards

Regulations (2010)[33] in England, Scotland, Wales and Northern Ireland in June 2010, which continue to apply post-Brexit.

15.2.3 The pollutants included are sulphur dioxide (SO_2), nitrogen dioxide (NO_2), oxides of nitrogen (NO_x), particulate matter of less than 10 micrometres (µm) in aerodynamic diameter (PM_{10}), particulate matter of less than 2.5 µm in aerodynamic diameter ($PM_{2.5}$), lead (Pb), carbon monoxide (CO), benzene, ozone (O_3), polycyclic aromatic hydrocarbons (PAHs), cadmium (Cd), arsenic (As), nickel (Ni) and mercury (Hg).

UK Air Quality Strategy

15.2.4 The Environment Act 1995 established the requirement for the government to produce a National Air Quality Strategy (AQS), setting out air quality standards, objectives, and measures for improving ambient air quality every five years. The most recent AQS for England was published in April 2023[34] and sets out a framework for reducing hazards to health from air pollution and ensuring that international commitments are met in the UK.

15.2.5 The AQS sets standards and objectives for 10 main air pollutants in order to protect health, vegetation and ecosystems. The air quality standards are long-term benchmarks for ambient pollutant concentrations which represent negligible or zero risk to health, based on scientific and medical evidence. Objectives are policy targets expressed as a concentration that should be achieved, all the time or for a percentage of the time, by a certain date. These are general concentration limits, above which sensitive members of the public (e.g. children, the elderly and the unwell) might experience adverse health effects.

15.2.6 The limit values and objectives relevant to this assessment are summarised in Table .1.

Table 15.1: Summary of relevant objectives of the Air Quality Standards Regulations 2010

Pollutant	Objectives	Concentration measured as
Nitrogen dioxide (NO_2)	200 µg/m^3 not to be exceeded more than 18 times a year	1 hour mean
	40 µg/m^3	Annual mean
Particulate Matter (PM_{10})	50 µg/m^3 not to be exceeded more than 35 times a year	24 hour mean
	40 µg/m^3	Annual mean
Particulate Matter ($PM_{2.5}$)	20 µg/m^3	Annual mean
Carbon monoxide (CO)	10 mg/m^3	Maximum daily running 8 hour mean

[33] HM Government (2010): The Air Quality Standards Regulations (2010), https://www.legislation.gov.uk/uksi/2010/1001/contents, accessed 03/02/25.

[34] Defra (2023): Air Quality Strategy for England, https://www.gov.uk/government/publications/the-air-quality-strategy-for-england, accessed 03/02/25.

The Environment Act 2021

15.2.7 The Environment Act (2021)[35] established a legally binding duty on the government to set at least two new air quality targets, one of which must be in respect of the annual mean level of $PM_{2.5}$ in ambient air. In response to this, Defra has set two new legally-binding long-term targets to reduce concentrations of $PM_{2.5}$. The two new targets have been implemented in the Environmental Targets (Fine Particulate Matter) (England) Regulations 2023[36], which sets a target of 10 µg/m³ for $PM_{2.5}$ to be met by 2040 and a reduction in average population exposure by 35% by 2040, compared to a 2018 baseline. These targets are not limit values, which are legally binding parameters that must not be exceeded, such as those under the Air Quality Standards Regulations. Instead, target values are to be attained where possible by taking all necessary measures not entailing disproportionate costs. As such, the objectives stated in Table remain the most up-to-date objectives, hence will be the criteria used in the EIA.

Environment Assessment Levels

15.2.8 Environmental Assessment Levels (EALs) for other pollutants are presented by the Environment Agency within the Environmental Management Guidance (Air Emissions Risk Assessment for your Environmental Permit)[37], which was last updated on 21 May 2024. The relevant EALs are presented in Table below.

Table 15.2: Summary of relevant Environment Assessment Levels from the Environment Agency Air Emissions Risk Assessment for your Environmental Permit Guidance

Pollutant	Environment Assessment Level	Concentration measured as
Ammonia (NH_3)	2,500 µg/m³	1 hour mean
	180 µg/m³	Annual mean
Formaldehyde	100 µg/m³	30 minute mean
	5 µg/m³	Annual mean
Mono-ethanolamine (MEA)	400 µg/m³	1 hour mean
	100 µg/m³	24 hour mean
N-nitrosodimethylamine (NDMA)	0.0002 µg/m³	Annual mean

15.2.9 The Environment Agency has recently consulted on the development of EALs for the amine-based carbon capture process[38], with consultation closing on 13 March 2025. These EALs are

[35] HM Government (2021): Environment Act 2021, https://www.legislation.gov.uk/ukpga/2021/30/contents, accessed 03/02/25.
[36] HM Government (2023): The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023, https://www.legislation.gov.uk/uksi/2023/96/contents/made, accessed 03/02/25.
[37] Environment Agency (2016): Air emissions risk assessment for your environmental permit, https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit, accessed 03/02/25.
[38] Environment Agency (2025): Development of Environmental Assessment Levels (EALs) for the amine-based carbon capture process, https://consult.environment-agency.gov.uk/environment-and-business/development-of-environmental-assessment-levels-eal/consultation/subpage.2025-01-09.9697996905/, accessed 31/01/25.

expected to be those that will be used within the assessment of air quality impacts of the carbon capture facility.

15.2.10 For the remainder of this chapter, these limit values, objectives and assessment levels are collectively referred to as Air Quality Assessment Levels (AQALs).

National Policy

15.2.11 Planning policy for energy generating NSIPs is contained in the Overarching NPS for Energy (EN-1)[39]. In terms of air quality, it states that "*where the project is likely to have adverse effects on air quality the applicant should undertake an assessment of the impacts of the proposed project as part of the ES"* (Paragraph 5.2.8).

15.2.12 Paragraph 5.2.9 goes on to state that the ES should describe:

- "existing air quality con concentrations and the relative change in air quality from existing levels;
- any significant air quality effects, mitigation action taken and any residual effects, distinguishing between the project stages and taking account of any significant emissions from any road traffic generated by the project;
- the predicted absolute emissions, concentration change and absolute concentrations as a result of the proposed project, after mitigation methods have been applied; and
- any potential eutrophication impacts"

15.2.13 Planning guidance for natural gas-fired electricity generating infrastructure is contained within NPS EN-2[40], which may also be important and relevant to hydrogen gas-fired electricity generating infrastructure. With regards to air quality, paragraph 2.6.5 states:

"Natural gas generating stations are likely to emit nitrogen oxides (NOx). To meet the requirements of the Government's legislation on industrial emissions, including Schedule 15 to the Environmental Permitting Regulations 2016 and the Best Available Techniques Conclusions for Large Combustion Plant, natural gas generating stations must apply a range of mitigation to minimise NOx and other emissions."

15.2.14 In terms of mitigation, paragraph 2.5.1 states that "*mitigations for air quality and greenhouse gas emissions will depend on the type and design of a generating station. However, Selective Catalytic Reduction (SCR) – which reduces NOx by the injection of a suitable reagent into flue gas over a catalyst – will have additional adverse impacts for noise and vibration, release of dust and handling of potentially hazardous materials, for example the ammonia used as a reagent*". The Secretary of State, in consultation with the EA, should "*be satisfied that any adverse impacts of mitigation measures for emissions proposed by the applicant have been described in the ES and taken into account in the assessments"* (paragraph 2.5.2).

15.2.15 The National Planning Policy Framework (NPPF)[41] sets out the planning policies for England whereby conserving and enhancing the natural environment is a central theme.

[39] Defra (2023): Overarching National Policy Statement for Energy (EN-1), https://assets.publishing.service.gov.uk/media/65bbfbdc709fe1000f637052/overarching-nps-for-energy-en1.pdf, accessed 03/02/25.

[40] Department for Energy Security and Net Zero (2024): National Policy Statement for natural gas electricity generating infrastructure (EN-2), https://assets.publishing.service.gov.uk/media/65a787fc640602000d3cb7c0/nps-natural-gas-electricity-generating-infrastructure-en2.pdf, accessed 03/02/25.

[41] Ministry of Housing, Communities and Local Government (2024): National Planning Policy Framework, https://www.gov.uk/government/publications/national-planning-policy-framework--2, accessed 03/02/25.

15.2.16 Paragraph 187 of the NPPF states that:

> *"Planning policies and decisions should contribute to and enhance the natural and local environment by… (e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans…"*

15.2.17 Paragraph 199 of the NPPF states that:

> *"Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan*."

Local Policy

15.2.18 There are no policies that specifically relate to air quality within the East Lindsey Local Plan 2018. However, a key objective for the plan period is to deliver a high quality environment, which includes minimising air pollution.

15.2.19 Whilst not policy, the most recent Air Quality Annual Status Report (ASR)[42] states that air quality assessments will be required for new developments that have the potential for significant change in emissions associated with an increased level of traffic or new combustion processes. In addition, any new industrial process will be regulated in line with the Environmental Permitting (England and Wales) Regulations 2016 (as amended).

Guidance and Best Practice

15.2.20 The following guidance and best practice is proposed to be followed for the assessment of air quality:

- Planning Practice Guidance[43]
- EPUK and IAQM Land-Use Planning and Development Control: Planning for Air Quality[44]
- IAQM Guidance on the assessment of dust from demolition and construction[45]; and
- Defra Local Air Quality Management (LAQM) Technical Guidance 2022 (TG22)[46].

[42] East Lindsey District Council (2024): Air Quality Annual Status Report (ASR), https://www.e-lindsey.gov.uk/article/5413/Air-Quality-in-East-Lindsey, accessed 03/02/25.

[43] Ministry of Housing, Communities and Local Government (2019): Air Quality Guidance, https://www.gov.uk/guidance/air-quality--3, accessed 03/02/25.

[44] EPUK and IAQM (2017): Land-Use Planning & Development Control: Planning for Air Quality, https://iaqm.co.uk/text/guidance/air-quality-planning-guidance.pdf, accessed 03/02/25.

[45] IAQM (2024): Guidance on the assessment of dust from demolition and construction, https://iaqm.co.uk/wp-content/uploads/2013/02/Construction-Dust-Guidance-Jan-2024.pdf, accessed 03/02/25.

[46] Defra (2022): Local Air Quality Management Technical Guidance (TG22), https://laqm.defra.gov.uk/wp-content/uploads/2022/08/LAQM-TG22-August-22-v1.0.pdf, accessed 03/02/25.

15.3 Baseline

Baseline Environment

15.3.1 Air quality in the area surrounding the Proposed Development is good as East Lindsey contains only three significant urban areas (Louth, Horncastle and Skegness), with the majority of the district considered rural. Air pollutant concentrations in 2023 were significantly below the air quality objectives, as stated within the most recent ASR. As a result, there are currently no Air Quality Management Areas (AQMAs) declared within East Lindsey District Council's administrative area. The monitoring data indicates that there are no areas where the air quality objectives are likely to be exceeded and, therefore, East Lindsey District Council is not planning to declare an AQMA in the coming years.

15.3.2 The Air Pollution Information System (APIS) website provides information on baseline pollutant levels at European and UK designated ecological sites. This shows that baseline levels of nitrogen dioxide concentration and nutrient nitrogen or acid gas deposition are likely to exceed the habitat-specific Critical Levels and Critical Loads at ecological sites relevant to the assessment, as is common for most of the UK.

15.3.3 With regard to ammonia (NH_3) background concentrations, the UK AIR website contains details from the UKEAP: National Ammonia Monitoring Network for the Saltfleetby-Theddlethorpe Dunes site, which is approximately 4.15 km from the Proposed Development[47]. During 2024, the calculated annual mean concentration was 1.025 µg/m^3, which is well below the AQAL for NH_3 presented in Table .

Proposed Approach to Surveys and Further Baseline Data Collection

15.3.4 Air quality monitoring data in proximity to the site will be obtained from publicly available sources including East Lindsey District Council, Air Pollution Information System (APIS) and the Department for Environment, Food and Rural Affairs (Defra). There is very little baseline monitoring data available in the UK for pollutants specific to carbon capture plants (amines, nitramines, nitrosamines and aldehydes). As there are no other known existing sources, or proposed future sources, of these pollutants in the vicinity of the Proposed Development, and these compounds have a relatively short lifetime in the atmosphere (so are only present in detectable concentrations close to existing sources), in the first instance it will be assumed that baseline concentrations of these pollutants are zero.

15.3.5 The cumulative development search will include any other proposed developments that may include amine or amine product emissions and modify that baseline position where necessary.

15.3.6 The baseline concentrations of combustion source pollutants will be identified through the use of the most recent East Lindsey Air Quality Annual Status Report (ASR)[48] and the Defra background mapping data for local authorities[49]. Background concentrations and nitrogen and acid deposition for European and UK designated ecological sites will be obtained from APIS using the most applicable habitat type, as advised by the ecology consultant. Finally, background concentrations

[47] UK AIR (n.d.): UKEAP: National Ammonia Monitoring Network, https://uk-air.defra.gov.uk/data/non-auto-data?uka_id=UKA00973&view=data&network=namn&year=2024&pollutant=default#view, accessed 11/02/25.
[48] East Lindsey District Council (2024): Air Quality Annual Status Report (ASR), https://www.e-lindsey.gov.uk/article/5413/Air-Quality-in-East-Lindsey, accessed 03/02/25.
[49] Defra (2024): Background Mapping data for local authorities, https://uk-air.defra.gov.uk/data/laqm-background-home, accessed 03/02/25.

of NH_3 will be sourced from the most recent UKEAP: National Ammonia Monitoring Network data, available on the UK AIR website[50].

15.4 Approach to Assessment

Assessment Criteria

Construction Phase Dust Emissions

15.4.1 Dust from construction processes contains a range of particle sizes, types and compositions. These can cause annoyance from soiling, and long-term exposure can potentially have morbidity or mortality effects. Dust deposition can also affect habitat at designated ecological sites within the area of impact. Consistent with the IAQM guidance on the assessment of dust from demolition and construction, a risk-based dust assessment will be undertaken.

Vehicle Emissions

15.4.2 For the assessment of vehicle emissions, both during the construction and operational stage, the expected traffic flows will be screened against the criteria provided by EPUK and IAQM (guidance referenced above) to determine if a quantitative air quality assessment is required. The relevant criteria for vehicle emissions is as follows:

- A change in light duty vehicle (LDV) flows of:
    - More than 100 AADT within or adjacent to an AQMA; or
    - More than 500 AADT elsewhere.
- A change in heavy duty vehicle (HDV) flows of:
    - More than 25 AADT within or adjacent to an AQMA; or
    - More than 100 AADT elsewhere.

15.4.3 Should an assessment of vehicle emissions be required, air quality impacts will be modelled using the ADMS-Roads dispersion model, developed by Cambridge Environmental Research Consultants (CERC). The approach to be taken will be confirmed with the Environmental Health Officer (EHO) prior to the assessment being undertaken.

Process Emissions – Human Health

15.4.4 A quantitative assessment of air quality impacts arising from the thermal generating facility will be undertaken, utilising the latest version of CERC's ADMS dispersion model. Modelling will be undertaken for a range of scenarios, focussing on emissions of NO_x, CO, NH_3 (if applicable) and amines, nitrosamines, nitramines and aldehydes (if applicable) as pollutants of concern.

15.4.5 For those pollutants subject to an AQAL, the criteria for the assessment of process emissions on human health will be taken from the EPUK and IAQM 2017 guidance. For those subject to an EAL, the criteria are expected to be taken from the EA's emerging guidance, referenced above.

[50] UK AIR (n.d.): UKEAP: National Ammonia Monitoring Network, https://uk-air.defra.gov.uk/data/non-auto-data?uka_id=UKA00973&view=data&network=namn&year=2024&pollutant=default#view, accessed 12/02/25.

Process Emissions – Ecology

15.4.6 For the assessment of process emissions and (if necessary) vehicle emissions on designated ecological sites, the predicted impacts will be compared to the relevant Critical Levels for the protection of ecosystems and the habitat specific Critical Loads for deposition.

15.4.7 Deposition rates from the plume for nutrient nitrogen, acid gas and ammonia will be calculated based on deposition velocities specific to the nature of landform and vegetation.

15.4.8 Critical Levels are maximum atmospheric concentrations of pollutants and are specified within relevant European air quality directives and corresponding UK air quality regulations for all sensitive habitat types. Critical Loads refer to the quantity of pollutant deposited, below which significant harmful effects on sensitive elements of the environment do not occur, according to present knowledge of the sensitivity of specific habitat types.

15.4.9 The IAQM 2020 guidance on the 'assessment of air quality impacts on designated nature conservation sites'[51] and the EA 'Air Emissions Guidance'[52] provide thresholds for screening insignificant effects and for further evaluating effects based on the process contribution and predicted environmental concentration (including background) which will be used in the assessment.

15.4.10 The air pollutant modelling information will also be provided to inform the applicant's shadow Habitats Regulations Assessment (HRA) for the Proposed Development.

Stack Height Determination

15.4.11 The stack release height (including absorber tower if applicable) will be determined ultimately through consideration of best available techniques (BAT) for the Environmental Permit application. To establish a Rochdale envelope parameter for the EIA, modelling of a range of stack heights will be undertaken to identify the point at which the incremental reductions in ground-level pollutant concentrations become disproportionate to the increasing height.

15.4.12 In the case of gas reciprocating engines, this will give consideration to the multiple exhaust stacks likely to be required by the engines, or any combined flues if applicable.

15.4.13 In the case of the electrolysis plant, an enclosed ground flare for hydrogen safety may be required. The release height of this is likely to be set by the flare design rather than a stack height determination exercise, but this would be confirmed when undertaking the assessment.

Magnitude of Impact

Construction Phase Dust Emissions

15.4.14 As a conservative approach that represents best practice, the magnitude of construction activities will be classed as large. Site-specific mitigation measures would then be recommended based on a high-risk site.

[51] IAQM (2020): A guide to the assessment of air quality impacts on designated nature conservation sites, https://iaqm.co.uk/text/guidance/air-quality-impacts-on-nature-sites-2020.pdf, accessed 04/02/25.

[52] EA (2025): Air emissions risk assessment for you environmental permit, https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit, accessed 04/02/25.

Vehicle Emissions and Process Emissions

15.4.15 The magnitude of impact will be the predicted change in pollutant concentration at a sensitive receptor location relative to the Air Quality Assessment Level (AQAL).

Sensitivity of receptors

Construction Phase Dust Emissions

15.4.16 As a conservative approach that represents best practice, surrounding human health receptors will be classed as highly sensitive. The sensitivity to dust of habitats at designated sites will be informed by the ecological assessment. Site-specific mitigation measures would then be recommended based on a high-risk site.

Vehicle Emissions and Process Emissions

15.4.17 The sensitivity of the receptor to change in air pollutant concentration will be indicated by the baseline long-term average concentration at that location. Receptors with a higher baseline concentration, with less headroom to exceedance on an AQAL, are therefore considered to be more sensitive to changes in air quality concentrations; this is reflected in significance criteria as set out below.

15.4.18 For the assessment of ecological impacts, the sensitivity of the receptors will be determined by the ecology assessment and shadow HRA with regard to designated sites and protected species.

Significance of Effect

Construction Phase Dust Emissions

15.4.19 The IAQM guidance states that the significance of effects should be judged following the assessment of the risk of dust impacts and the implementation of recommended mitigation measures. The recommended mitigation measures will be at the level required to ensure that the residual significance of effect is ‘not significant’.

Vehicle Emissions and Process Emissions

15.4.20 For long-term (annual mean) impacts, the change in concentration relative to the applicable AQAL will be considered at each receptor to determine an impact descriptor, as outlined in Table 15..3, reproduced from the EPUK and IAQM (2017) guidance.

15.4.21 When describing air quality impacts at a sensitive receptor, the change in magnitude of the concentration is then also considered in the context of the absolute concentration (total of baseline plus proposed development contribution) and any potential exceedance of the long-term AQAL at the sensitive receptor.

Table 15.3: Impact description for individual sensitive receptors

Concentration with development	% change in concentration relative to Air Quality Assessment Levels (AQAL)			
	1%	2-5%	6-10%	>10%
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Moderate
95-102% of AQAL	Slight	Moderate	Moderate	Substantial
103-109% of AQAL	Moderate	Moderate	Substantial	Substantial

15.4.22 The above criteria and matrix are for assessing long-term impacts. In relation to short-term impacts, paragraph 6.39 of the EPUK and IAQM (2017) guidance states:

"*Where such peak short term concentrations from an elevated source are in the range 11-20% of the relevant AQAL, then their magnitude can be described as small, those in the range 21-50% medium and those above 51% as large. These are the maximum concentrations experienced in any year and the severity of this impact can be described as slight, moderate and substantial respectively, without the need to reference background or baseline concentrations. That is not to say that background concentrations are unimportant, but they will, on an annual average basis, be a much smaller quantity than the peak concentration caused by a substantial plume and it is the contribution that is used as a measure of the impact, not the overall concentration at a Receptor. This approach is intended to be a streamlined and pragmatic assessment procedure that avoids undue complexity*."

15.4.23 Therefore, the following descriptors for assessing the impact magnitude resulting from short term impacts will be applied in this assessment:

- 10% or less – negligible;
- 11-20% – slight;
- 21-50% – moderate; and
- 51% or greater – substantial.

15.4.24 As with the long-term impact assessment, the short-term impact assessment then goes on to consider the absolute concentration and any potential exceedance of the short-term AQAL at the sensitive receptor.

15.4.25 For both long- and short-term effects, the assessment of significance of effect from the Proposed Development overall (considering all receptors together) is principally made through professional judgement, taking into consideration the varying impact magnitude and effect significance predicted at individual receptors as set out above. Guidance is provided on the factors that need to be considered when reaching this judgement, namely:

- the existing and future air quality in the absence of the development;
- the extent of current and future population exposure to the impacts; and
- the influence and validity of any assumptions adopted when undertaking the prediction of impacts.

15.4.26 In assigning significance levels to the likely effects, the following terms will be used:

- Substantial – only adverse effects are normally assigned this level of significance. They represent key factors in the decision-making process with regard to planning consent;
- Moderate – these beneficial or adverse effects are considered to be very important considerations and are likely to be material in the decision-making process;
- Slight – these beneficial or adverse effects may be raised as local factors. They are unlikely to be critical in the decision-making process, but may be important in enhancing the subsequent design of the project; and
- Negligible – no effects or those that pose a very small risk in comparison to normal risks in everyday life, or are beneath levels of perception, or are within normal bounds of variation or within the margin of forecasting error.

15.4.27 Effects assessed as **moderate or above** will be considered to be **significant** in this assessment.

15.4.28 The assessment of significance of effect on habitats and protected species will be made in the ecology chapter and (as applicable) the shadow HRA, informed by the results of the air pollutant modelling, unless they are screened out as 'negligible' using the criterion above.

Geographical Scope

15.4.29 For the construction phase the study area is up to 250 m from the site boundary and up to 50 m from roads within 250 m of the site, based on the IAQM guidance on the assessment of dust from demolition and construction.

15.4.30 The study area for vehicle emissions will be those road links with changes in traffic flow above the thresholds for assessment, within the study area selected for the assessment of transport; and for modelling of air pollutant emissions from vehicles, will be typically 200 m laterally from the road links, as stated in the DMRB[53].

15.4.31 The study area for process emissions will be limited to the areas where there is a potential significant air quality effect. It is proposed to model process emissions across a 15 x 15 km output with a variable resolution grid (starting at 50 m resolution) to capture both the maximum contribution from the Proposed Development and reasonable maximum-case extent of dispersion with potential for significant effects (including area for potential ecological effects as discussed below). If necessary, though, this modelling area may be extended in the case of the possible carbon capture plant emissions, if there are other carbon capture plants proposed with amine emissions in a wider area.

15.4.32 In addition, the impact of emissions will be assessed at a number of representative human and ecological sensitive receptor points. For assessing human-health impacts, such representative receptors will be selected where the public is regularly present and likely to be exposed over the averaging period of the objective. LAQM TG22 provides examples of exposure locations and these are summarised in Table 15.1.

Table 15.1: Example of where Air Quality Objectives apply

Averaging period	Objectives should apply at:	Objectives should generally not apply at:
Annual mean	All locations where members of the public might be regularly exposed. Building facades of residential	Hotels, unless people live there as their permanent residence. Gardens of residential properties. Kerbside sites (as opposed to locations at the building façade), or any other location

[53] National Highways (2024)L LA 105 – Air Quality, https://www.standardsforhighways.co.uk/search/af7f4cda-08f7-4f16-a89f-e30da703f3f4, accessed 12/02/25.

	properties, schools, hospitals, care homes etc.	where public exposure is expected to be short-term.
24-hour mean and 8-hour mean	All locations where the annual mean AQAL would apply, together with hotels. Gardens of residential properties.	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short-term.
1-hour mean	All locations where the annual mean and 24- and 8-hour mean AQALs apply. Kerbside sites (for example, pavements of busy shopping streets). Those parts of car parks, bus stations and railway stations etc. which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more. Any outdoor locations where members of the public might reasonably be expected to spend one hour or longer.	Kerbside sites where the public would not be expected to have regular access.
15-minute mean	All locations where members of the public might reasonably be expose for a period of 15-minutes or longer.	

15.4.33 The EA 'Air Emissions Guidance' outlines the ecological receptors to be assessed, namely:

- Special Protection Areas (SPAs), Special Areas of Conservation (SACs), or Ramsar sites within 10 km of the Proposed Development; and
- Sites of Special Scientific Interest (SSSIs), National Nature Reserves (NNRs), Local Nature Reserves (LNRs), local wildlife sites and ancient woodlands within 2 km of the Proposed Development.

15.4.34 For natural-gas fuelled combustion plants (or those with a similarly low sulphur content of fuel, which includes hydrogen) of >500 MW_{th}, the EA's guidance also states that the screening distance to identify European designated sites and SSSIs may need to be extended to 15 km, which is applicable to the Proposed Development.

15.4.35 The screening distance for other locally- and nationally-designated sites is 2 km.

15.4.36 The following ecological receptors listed in have been identified and will be included within the assessment of process emissions. Distances are given from the approximate location of the expected process emissions stack, at the Theddlethorpe Thermal and Electrolysis Site.

15.4.37 No additional sites within a relevant distance of other parts of the site boundary for construction dust or vehicle emissions assessment have been identified. When the road links affected by relevant changes in traffic flows are confirmed as the EIA is progressed, any additional sites within the study area for vehicle emissions will also be identified at that stage.

Table 15.5: Ecological receptors within 15 km of the approximate likely stack locations at Theddlethorpe

Name and designation	Approximate distance from likely stack location (km)

Humber Estuary (Ramsar)	0.6
Humber Estuary (SPA)	0.6
Saltfleetby-Theddlethorpe Dunes & Gibraltar Point (SAC)	0.6
Saltfleetby-Theddlethorpe Dunes (SSSI)	0.6
Humber Estuary (SAC)	5.7
Humber Estuary (SSSI)	5.7
Sea Bank Clay Pits (SSSI)	8.4
Sea Bank Clay Pits (SSSI)	8.8
Muckton Wood (SSSI)	12
Swaby Valley (SSSI)	13.6
Calceby Marsh (SSSI)	13.5
Chapel Point to Wolla Bank (SSSI)	14.4
Lincolnshire Coronation Coast (NNR)	0.6

Temporal Scope

15.4.38 The assessment will assess the impact of the Proposed Development on air quality during the construction and operational phases and for long-term and short-term averaging periods, as set out above.

15.5 Embedded Mitigation and Enhancement Measures

15.5.1 The Proposed Development will be designed to minimise air quality effects. In particular, the following mitigation measures will be embedded into the design:

- During construction, mitigation measures recommended for a high-risk site, as outlined in IAQM guidance on the assessment of dust from demolition and construction, will be implemented to minimise generation of dust and significant impacts resulting from dust;
- The height of the stack(s) will be chosen to be an optimum height to allow appropriate dispersion of stack emissions and avoid significant air quality effects where possible; and
- The operation of the Proposed Development will comply with emission limits specified in the Environmental Permit.

15.6 Scope of Environmental Impacts and Effects

Construction

15.6.1 Construction activities and traffic movements have the potential to result in emissions of exhaust gases and dust, resulting in adverse effects.

15.6.2 An assessment of the potential effects of dust arising from construction activities will be scoped into the assessment, following the EPUK and IAQM guidance set out above.

15.6.3 It is anticipated that traffic flows may exceed the threshold for the assessment of exhaust gas emissions outlined above. This will be reconfirmed at the PEIR preparation stage on the basis of the traffic modelling to be undertaken. For the purpose of this Scoping Report, the assessment of construction vehicle emissions has been scoped in, where these exceed the specified thresholds.

Operation

15.6.4 During the operational phase, it is anticipated that traffic flows will fall below the threshold for the assessment of exhaust gas emissions, although this will also be reconfirmed at the PEIR preparation stage. For the purpose of this Scoping Report, the assessment of operational vehicle emissions has been scoped out subject to remaining below those thresholds.

15.6.5 Process emissions will be scoped into the assessment. This is expected to involve modelling and assessing a number of scenarios for PEIR and potentially for ES stage, to encompass the flexibility sought in fuel and technology options.

15.6.6 At this stage, the operational impact scenarios expected to be modelled are a combination of one or more of the following, depending on which is applicable for the development proposals taken forwards to the EIA stage:

- natural gas-fuelled combined-cycle flexible generation plant stack emissions with carbon capture plant abatement;
- natural gas-fuelled reciprocating engine flexible generation plant stack emissions without carbon capture plant abatement;
- hydrogen-fuelled combined cycle flexible generation plant stack emissions;
- hydrogen-fuelled reciprocating engine flexible generation plant stack emissions; and

15.6.7 electrolysis plant hydrogen flare emissions.

15.6.8 However, should any of these choices be removed in the course of the EIA process, whether due to ongoing design, commercial considerations, environmental impact and consideration of alternatives, or consultation feedback, then the scope will be amended accordingly for PEIR or final ES stage to remove non-relevant scenarios.

15.6.9 As noted above, the scope of impacts includes human health and ecological receptors. Human health impacts will be reported in the Air Quality PEIR and ES Chapter (plus consideration of inter-related effects in the Population and Health PEIR and ES Chapter). Results of the air pollutant modelling will inform the assessment of habitat and species effects in the Ecology PEIR and ES Chapter and shadow HRA.

15.7 Limitations and Uncertainties

15.7.1 All air quality assessment tools, whether models or monitoring measurements, have limitations. The choices that the practitioner makes in setting-up the model, choosing the input data, and selecting the baseline monitoring data will have an impact on the data produced.

15.7.2 The atmospheric dispersion model itself has limitations, due to a model inherently being a simplified version of the real situation: however, it uses a sophisticated set of mathematical equations to approximate the complex physical and chemical atmospheric processes taking place as a pollutant is released and as it travels to a receptor.

15.7.3 Each of the data inputs for the model will also have some uncertainty associated with them. Where it will be necessary to make assumptions, these will be made towards the upper end of the range informed by an analysis of relevant, available data to provide a conservative worst-case assessment. Where necessary to validate the conservative nature of assumptions, sensitivity analyses will also be performed which can consider the effect of varying model assumptions.

15.8 Inter-related Effects

15.8.1 Construction dust and process emissions have an inter-related effect on population health and wellbeing, for example from the combination of air pollutant, noise and traffic impacts. These will be assessed in the Population and Health PEIR and ES Chapter.

15.8.2 The effect of emissions on ecological receptors has potential inter-related effects. The inter-related effect of air quality impacts with habitat impacts will be assessed in the Ecology PEIR and ES Chapter.

15.9 Cumulative Effects

15.9.1 During the construction phase, there is the potential for cumulative effects where there are other sources of dust located within 500 m of the Proposed Development (the IAQM indicative maximum radius of effects for an individual construction site being 250 m). There is also the potential for cumulative effects at sensitive receptors in cumulative developments within 200 m of road links with changes in flow above the threshold for assessment; and for cumulative effects due to other developments with road-traffic generation that contributes to the road links assessed.

15.9.2 For the operational phase, the zone of influence for sensitive receptors introduced by cumulative developments is considered to be within the 15 km modelling study area for Proposed Development point source emissions. This may be extended, if considered appropriate, to include overlap in impacts with other sources of amine emissions (i.e. from other carbon capture plants).

15.9.3 The zone of influence for air pollutant emissions from other point sources is considered to be up to a further 5 km to allow for potential overlap between the area affected by another substantial scale point-source emitter outside the main 15 km modelling area, but subject to the specific modelling area and impact results published by any other point source emitters identified within that search distance, which may indicate a lesser area of impact and enable them to be excluded.

15.9.4 The EIA Scoping Report gives a longlist of cumulative developments that will potentially require consideration for the assessment of cumulative effects.

15.10 Summary of Proposed Scope

15.10.1 A summary of the proposed scope of assessment is included at Chapter 22.

15.10.2 The effects scoped in or out of further air quality assessment are as follows:

16 Noise and Vibration

16.1 Introduction

16.1.1 This chapter of the EIA Scoping Report has been produced by the Savills Acoustics, Noise and Vibration Team, all of whom are corporate members, fellows or associate members of The Institute of Acoustics (IOA) (the UK's professional body for those working in acoustics, noise and vibration). The Team is also a member of the Association of Noise Consultants (ANC).

16.1.2 Generally, but dependent upon the specific circumstances, an assessment of noise and vibration effects associated with the construction and operation of this type of development is not scoped out of the EIA process. However, for this development, the following aspects could potentially be scoped out as they are unlikely to result in significant effects:

- depending on the construction methodology, an assessment of construction vibration effects may reasonably be scoped out, particularly if percussive/impact piling will not be required;
- an assessment of operational road traffic noise effects, on the basis that there would be only negligible road traffic movements associated with the operation of the facilities; and
- an assessment of operational vibration effects, on the basis that there would no, or only negligible, vibration sources included, and;
- depending on the exact construction methodology and consideration of marine 'noise sensitive receptors' (NSRs) that may be affected, an assessment of underwater noise effects associated with the construction of the sea water pipeline could potentially be scoped out.

16.1.3 Further justification for the aspects proposed to be scoped out is provided in below with a summary provided at Chapter 22 to this Report.

16.2 Legislative or Policy Requirements

National Policy Statements for Energy

16.2.1 Planning policy for energy generation Nationally Significant Infrastructure Projects (NSIPs), specifically in relation to noise and vibration, is contained in the Overarching National Policy Statement (NPS) for Energy (EN-1)[54] and the NPS for Natural Gas Electricity Generating Infrastructure (EN-2)[55].

16.2.2 NPS EN-1 and NPS EN-2 include guidance on what matters are to be considered in the assessment. With regard to NPS EN-1 paragraph:

- 5.12.6 identifies the elements that should be included in the noise assessment;
- 5.12.8 refers to noise impacts from ancillary activities associated with the development, such as increased road traffic movements;
- 5.12.9 refers to the need to assess operational and construction noise using the principles of the relevant British Standards (BS) and other guidance; and
- 5.12.10 refers to the need to consult the Environment Agency as necessary and in particular with regard to assessment of noise on protected species or other wildlife.

[54] Department for Energy Security & Net Zero. Overarching National Policy Statement for Energy (EN-1). 2023.
[55] Department for Energy Security & Net Zero. National Policy Statement for Natural Gas Electricity Generating Infrastructure (EN-2). 2023.

16.2.3 With regard to NPS EN-2, paragraph 2.6.14 refers to considerations and potential sources of noise relevant to fossil fuel electricity generating infrastructure. Reference is made to the noise assessment requirement as set out in Section 5.12 of EN-1.

Control of Pollution Act

16.2.4 Section 60, Part III of the Control of Pollution Act 1974 (CoPA)[56] refers to the control of noise (including vibration) on construction sites. It provides legislation by which local planning authorities can control noise from construction sites, by stopping activities if necessary, to prevent noise disturbance occurring. In addition, it recommends that guidance provided by British Standard (BS) BS 5228:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites – Parts 1and2'[57], is implemented to ensure compliance with Section 60. BS 5228 is an approved Code of Practice under the CoPA. While legislative controls can, where appropriate, be disapplied through a DCO, at this scoping stage, the CoPA and its reference to the relevant British Standards has informed the approach to assessment.

16.2.5 Section 61, Part III of the CoPA refers to prior consent for work on construction sites. It provides a method by which consent to undertake construction works may be applied for in advance. If consent is given, and the stated method and hours of work are complied with, then action under Section 60 cannot be taken.

16.2.6 Section 72, Part III of the CoPA refers to 'best practicable means' (BPM), which is defined as:

> *"reasonably practicable, having regards among other things to local conditions and circumstances, to the current state of technical knowledge and to the financial implications'. While 'Means' includes 'the design, installation, maintenance and manner and periods of operation of plant and machinery, and the design, construction and maintenance of buildings and acoustic structures."*

16.2.7 If BPM is applied, then it can provide a defence against prosecution by the consenting body.

16.2.8 With regard to the operation of the facilities, Part 3 of the Environmental Protection Act 1990 (the EPA)[58] contains the main legislation relating to statutory nuisance. A statutory nuisance is 'an unlawful interference with a person's use or enjoyment of land or some right over, or in connection with it'. Noise emitted from premises so as to be prejudicial to health or a nuisance constitutes a statutory nuisance.

16.3 Technical Guidance

16.3.1 The following is a list of relevant British Standards (BSs) and other documents which, as far as practicable, the noise and vibration assessment will be undertaken in accordance with.

- BS 7445-2:1991 'Description and measurement of environmental noise — Part 2: Guide to the acquisition of data pertinent to land use'[59];
- BS 5228:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites' – Part 1: Noise;

[56] The Stationery Office Limited. Control of Pollution Act, Chapter 40, Part III. 1974.

[57] British Standards Institution. British Standard 5228-1:2009+A1:2014. Code of practice for noise and vibration control on construction and open sites - Part 1: Noise & British Standard 5228-1:2009+A1:2014. Code of practice for noise and vibration control on construction and open sites - Part 2: Vibration. 2014.

[58] The Stationery Office Limited. Environmental Protection Act, Chapter 43, Part III. 1990.

[59] British Standards Institution. British Standard 7445-2:1991 Description and measurement of environmental noise - Part 2: Guide to the acquisition of data pertinent to land use. 1991.

- BS 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'[60]; and
- Design Manual for Roads and Bridges, LA111 'Noise and Vibration' (DMRB)[61].

16.4 Baseline

Baseline Environment

16.4.1 The location of the Theddlethorpe Thermal and Electrolysis Site (Theddlethorpe TES) and the nearest residential dwelling 'noise sensitive receptors' (NSRs) are in a predominantly rural area, approximately 3 km north-west of Mablethorpe town centre. Whilst rural today, the site is adjacent to the former Theddlethorpe Gas Terminal, which closed in 2018, with the Gas Terminal largely cleared since.

16.4.2 Based on the above, it is considered likely that baseline sound levels at the nearest residential NSRs to the Theddlethorpe TES will be relatively low as is typical for rural locations away from transport links and sites of commercial/industrial activity, albeit would have been historically higher and influenced by sound of an industrial character.

16.4.3 Similarly, the locations of the Stain Lane BESS facility and the Strubby Airfield BESS and project substation facility and the nearest residential dwelling NSRs, are in predominantly rural areas, approximately 3 and 4 km west of Mablethorpe town centre respectively. On this basis, it is considered likely that baseline sound levels at the nearest residential NSRs to the BESS facilities will be relatively low as is typical for rural locations away from transport links and sites of commercial/industrial activity.

Proposed Approach to Baseline Sound Level Surveys

16.4.4 In order to quantify baseline sound levels at the nearest residential NSRs to the Proposed Development sites, a sound level survey will be undertaken that will comprise deployment of up to 12 unattended sound level surveys (four at each location) over a period of up to 7 days, covering at least one weekend period.

16.4.5 Preferably, access to identified survey locations for the deployment of the survey equipment will be agreed in advance of the survey work commencing. If this cannot be facilitated, then the 'fall back' option would be to arrive on the day of survey deployment and attempt to agree access in person. If access cannot be agreed on the day, a series of attended short-term surveys would be undertaken during the daytime (07:00 to 19:00 hours), evening (19:00 to 23:00 hours) and night-time (23:00 to 07:00 hours) periods.

16.4.6 In order to quantify baseline sound levels at the nearest residential NSRs to the Service Corridors linking the three sites, a sound level survey will be undertaken that will comprise the undertaking of up to ten 1-hour attended sound level surveys during the daytime period.

16.4.7 Measured data will take account of weather conditions during the survey to obtain a dataset from which representative baseline environmental noise levels for the assessment will be derived, commensurate with BS 7445-2.

[60] British Standards Institution. British Standard 4142:2014+A1:2019. Methods for rating and assessing industrial and commercial sound. 2019.

[61] Highways England. Design Manual for Roads and Bridges, LA111 'Noise and Vibration' (2020).

16.5 Approach to Assessment

Assessment Method Overview

16.5.1 The significance of an effect is determined based on the magnitude of an impact and the sensitivity of the receptor affected by the impact. This section describes the proposed criteria that will be applied in the noise and vibration assessment to characterise the magnitude of potential impacts and sensitivity of receptors.

16.5.2 Based on project information at this stage, is it not expected that an assessment of underwater construction noise impacts on marine NSRs associated with the construction of the possible sea water pipeline is likely to be required, as this construction is expected to use land-based horizontal directional drilling (HDD). However, this will be reviewed as further information becomes available ahead of the PEIR stage, if assessment is necessary, the methodology will be agreed with the relevant statutory consultees at the time.

16.5.3 The following sections therefore focus on terrestrial noise assessment.

Magnitude of Impact

Construction Noise

16.5.4 The magnitude of construction noise impacts at residential NSRs will be determined in accordance with Annex E of BS 5228 1:2009+A1:2014. The criteria for assessing noise impact from construction works will be based on Example Method 2 contained within Annex E.3.3 of BS 5228-1:2009+A1:2014.

Construction Traffic

16.5.5 The magnitude of construction road traffic noise impacts will be determined in accordance with the DMRB classification of magnitude of noise impacts in the short-term. These DMRB criteria best reflect the temporary nature of the construction impacts and allow for a robust, worst case assessment of response to construction traffic noise albeit the DMRB mostly relates to traffic on new trunk roads and motorways rather than increases in traffic on existing roads.

Operational Noise

16.5.6 The calculation of specific sound levels at the nearest residential NSRs, associated with the operation of the Proposed Development, will be made using the methodology in ISO 9613-2:2024 'Acoustics — Attenuation of sound during propagation outdoors Part 2: Engineering method for the prediction of sound pressure levels outdoors'[62].

16.5.7 The calculation will be based on information provided regarding the Proposed Development. Where acoustic data for specific proposed plant and/or activity is unknown, the assessment will include assumptions based on professional judgement and experience of assessing the operational of similar projects.

16.5.8 The magnitude of impact of the noise effects associated with the operation of the Proposed Development will be determined based upon the general methodology contained within BS 4141:2014+A1:2019.

[62] International Standard ISO 9613-2:2024. Acoustics — Attenuation of sound during propagation outdoors Part 2: Engineering method for the prediction of sound pressure levels outdoors.

Sensitivity of Receptors

16.5.9 There is no nationally adopted guidance on how the sensitivities of NSRs should be determined. Therefore, for this assessment, the sensitivity of classes of receptor is defined through consideration of the vulnerability, recoverability and value/importance of that receptor class. The criteria for defining noise sensitivity are outlined below:

- Very High: Subject to particular circumstances.
- High: Schools, churches and concert halls etc. Designated sites of ecological significance (SPA/SSSI/Ramsar etc.).
- Medium: Residential properties, hotels, hospitals, nursing homes and care homes and sites of historic or cultural importance.
- Low: Area used primarily for leisure, including PRoW, sports facilities, offices and retail businesses.
- Negligible: All other areas such as those used primarily for industrial or agricultural purposes.

Significance of Effect

16.5.10 The significance of the effect with regards to noise will be determined by correlating the magnitude of the impact and the sensitivity of the receptor.

16.5.11 A significance of no change is considered to be below the 'no observed effect level' (NOEL). A significance of negligible or minor is considered to be below the 'lowest observed adverse effect level' (LOAEL). A significance of moderate is considered to be between the LOAEL and the 'significant observed adverse effect level' (SOAEL). A significance of major or substantial is considered to be above the SOAEL.

16.5.12 For the purpose of the assessment, any effects with a significance level of minor or less will be considered to be not significant in EIA terms. Effects with a significance level of moderate will not automatically considered to be significant. Further consideration of the assessment outcome will be given where a **moderate** effect is predicted before a determination of whether an effect is significant/not significant in EIA terms. Effects with a significance level of **major** will be considered to be significant in EIA terms.

Geographical Scope

16.5.13 Noise and vibration levels decrease over distance. As the design of the Proposed Development will include mitigation measures to avoid significant effects at the nearest NSRs, the geographic scope of the noise and vibration assessment, for Site-based activity, will be limited to an area up to and including the nearest NSRs.

16.5.14 With regard to offsite activity, i.e. construction traffic movements on the local road network, the geographic scope of the noise and vibration assessment will include sections of road for which road traffic movements are anticipated to increase by at least 10% above baseline. This is on the basis that an increase of less than 10% would result in a negligible increase in noise.

Temporal Scope

16.5.15 The temporal scope of the noise and vibration assessment will include the construction and operational phases of the Proposed Development.

16.5.16 At this stage the consent is not expected to be time-limited. As such, a decommissioning assessment is proposed to be scoped out.

16.6 Embedded Mitigation and Enhancement Measures

16.6.1 The likelihood for adverse noise and/or vibration effects associated with the construction and operation of the Proposed Development will be minimised through the implementation of embedded, or inherent, mitigation.

16.6.2 At the construction stage, activities will be undertaken following 'best practicable means' (BPM), with modern and well maintained plant utilised. A 'construction and environmental management plan' (CEMP), or similar, will be drafted in advance of works commencing.

16.6.3 In the event that significant noise and/or vibration effects are predicted to occur with the embedded mitigation, the requirement for further mitigation measures will be considered.

16.6.4 This may include measures such as temporary barriers during the construction phase and attenuated stacks, or installation of permanent barriers or plant enclosures during the operational phase.

16.7 Scope of Environmental Impacts and Effects

Construction

16.7.1 Construction of the Proposed Development, both on-site activity and off-site road traffic movements, has the potential to result in high levels of noise and/or vibration at NSRs, resulting in adverse effects. As such an assessment of construction noise effects will be scoped in to the assessment.

16.7.2 However, depending on the proposed construction methodology, significant vibration effects are considered unlikely, particularly if percussive/impact piling is not required, as the nearest residential NSRs are likely to be >50 m from potential construction vibration sources. At this stage, percussive or impact piling is not expected to be required. Whilst the Service Corridors may pass closer than 50 m (depending on final route), construction activity for trenching and cable laying is unlikely to be significantly vibration-generating.

16.7.3 On this basis, a construction vibration assessment is proposed to be scoped out of this assessment. The requirement for any percussive / impact piling will be reviewed at PEIR stage and assessment of vibration from this, if applicable, would be undertaken.

16.7.4 Where construction road traffic movements are anticipated to increase the total flow by at least 10%, a construction road traffic noise assessment will be scoped in and undertaken.

16.7.5 Depending on the exact construction methodology and consideration of marine NSRs that may be affected, an assessment of underwater noise effects associated with the construction of the possible sea water pipeline could be scoped out. This is considered likely at this stage as this construction is expected to use land-based horizontal directional drilling (HDD). However, this will be reviewed as further information becomes available ahead of the PEIR stage and the appropriate scope of any assessment will be agreed with the relevant statutory consultees at the time.

Operation

16.7.6 Operation of the Proposed Development, both on-site activity and off-site road traffic movements, has the potential to result in high levels of noise and/or vibration at NSRs, resulting in adverse effects. As such, an assessment of operational noise effects will be scoped in to the assessment.

16.7.7 However, significant vibration effects are considered unlikely, as no/negligible vibration sources are proposed and the nearest residential NSRs are likely to be >50 m from potential vibration

sources. On this basis, an assessment of operational vibration effects is proposed to be scoped out of this assessment.

16.7.8 Furthermore, on the basis that there are expected to be low operational road traffic movements, below the threshold for assessment, an assessment of operational road traffic noise effects is proposed to be scoped out of this assessment. This will be reviewed at PEIR stage based on operational traffic modelling, and assessment of traffic on road links that surpass the threshold would be undertaken if required.

Decommissioning

16.7.9 At this stage the consent is not expected to be time-limited. As such, a decommissioning assessment is proposed to be scoped out.

16.8 Limitations and Uncertainties

16.8.1 To ensure transparency within the EIA process, the following limitations and assumptions have been identified.

Construction Methodology

16.8.2 Depending on the availability of the proposed construction methodology and acoustic data of proposed noise generating plant, the assessment may be undertaken based on assumed data, informed through professional judgement and experience. If this is necessary, assumptions will err on the side of caution, to allow for a robust assessment.

Operational Sound Source Data

16.8.3 A quantitative assessment will be undertaken based on source levels provided by the plant manufacturer and measurement data on similar types of equipment. Where necessary, assumptions will be made based on the maximum design envelope parameters.

Prediction Methods and Assessment

16.8.4 There are uncertainties in any prediction methodology. International Organization for Standardisation (ISO) 9613 Part 2 provides a method for predicting acoustic propagation outdoors. The method is applicable in practice to a great variety of sound sources and environments. It is applicable (directly or indirectly) to most situations including industrial sound sources, construction activities and many other ground-based sound sources.

16.8.5 The estimated accuracy for values of the average downwind sound pressure level is stated as +/-3 dB for a mean source/receptor height of up to five metres and source/propagation separation distance of up to 1 km. For a mean source height between 5 and 30 m, the estimated accuracy is given as +/-1 dB for a source/propagation separation distance of 0 to 100 m and +/- 3 dB for a source/propagation separation distance of >100 m. This is a standard approach and is considered to be an acceptable prediction methodology.

16.8.6 With regard to subjective response, the noise standards adopted for the assessment will have been based upon the subjective response of the majority of the population or will be based upon the most likely response of the majority of the population. This is considered to be the best that can be achieved in a population of varying subjective response which will vary dependent upon a wide range of factors.

16.9 Inter-related Effects

16.9.1 Noise and vibration impacts can inter-relate with other impacts affecting human health and protected species, which will be assessed in the Ecology and Population and Health PEIR chapters respectively, based on data from the noise modelling and assessment.

16.10 Cumulative Effects

16.10.1 Both Intra-Project and Inter-Project cumulative effects will be considered within the assessment and reported in the ES. This assessment will be completed through communication with stakeholders to identify relevant projects and between the environmental topic teams to identify shared receptors.

16.10.2 The assessment of cumulative effects on NSRs will be based upon consideration of the effects of the Proposed Development on residential dwellings and other NSRs together with the likely effects of other developments that are under construction, those that are consented but not yet operational and those that are currently at the application stage (and for which sufficient detail is available upon which to develop an assessment).

16.10.3 The assessment of cumulative effects will be based on the same assessment criteria for the individual development.

16.11 Summary of Proposed Scope

16.11.1 A summary of the proposed scope of assessment is included at Chapter 22.

17 Socio-Economic

17.1 Introduction

17.1.1 This chapter of the ES Scoping Report has been produced by Savills, authored by Gabriel Baudard, a member of the Savills Economics team with five years' experience. It presents the proposed scope of assessment for socio-economics effects.

17.1.2 Socio-economic effects are proposed to be scoped in the EIA. The consideration of socio-economic conditions of the EIA considers issues such as employment, economic, demographic changes, accessibility, housing, and community infrastructure effects.

17.1.3 Socio-economics in the context of EIA can be considered broadly in two parts:

- the impact of the construction phase of the Proposed Development, generally considered to be short to medium term;
- the impact of the operational phase of the Proposed Development once complete and fully operational, generally considered to be medium to long term.

17.2 Legislative and Planning Context

17.2.1 There is no legislation specifically relevant to undertaking an assessment of Socio-economic effects. There are a range of policy and evidence-base documents relevant to the undertaking of the socio-economic assessment at the national, regional and local level. In particular:

- National Planning Policy Framework (NPPF) (December 2024);
- National Planning Practice Guidance (NPPG);
- National Policy Statement EN-1;
- National Policy Statement EN-2;
- UK Government Clean Power 2030 Action Plan: A new era of clean electricity (December 2024);
- DBT Invest 2035: the UK's modern industrial Strategy (November 2024)
- East Lindsey Local Plan: Core Strategy 2016-2031.

17.2.2 The National Planning Policy Framework emphasises that planning policies and decisions should help build a strong and competitive economy, identifying the need to support economic growth and productivity and to address the challenges of the future. They should enable national industrial strategy, including the promotion of clean energy industries. The NPPF indicates that planning policy should account for the need of new, expanded or upgrades infrastructure needed to support the growth of high-value industries.

17.2.3 The National Planning Policy Guidance on Renewable and low carbon energy expands on the NPPF. It emphasises how important renewable and low carbon technologies are to stimulate investment in new jobs and businesses.

17.2.4 The Department for Business and Trade run a consultation in November 2024 on its 'Invest 2035: the UK's modern industrial strategy'. The document emphasises the importance of renewable technologies to drive growth while ensuring economic security and resilience. The strategy therefore identifies clean energy industries as a major growth driver in the UK, however it notes significant barriers to overcome, including lack of investment and skills shortage. Delivering

cheap, reliable and decarbonised energy is critical to attract investment and enable the growth of other high-value sectors such as advanced manufacturing and digital technologies.

17.2.5 The UK Government's commitment to supporting the energy sector was reiterated in its December 2024 'Clean Power 2030 Action Plan'. This outlines the government's plan to fasten the development and deployment of clean energy, highlighting the opportunities to develop the skills of the workforce and the capabilities of UK's supply chains.

17.2.6 National Policy Statement (NPS) EN-1 also emphasises the importance of decarbonised energy for sustainable economic development and growth. The Statement also includes specific guidance on matters that should be considered in the socio-economic impacts assessment, including opportunities to create jobs and training, the contribution to developing low carbon industries, the provision of additional local services, indirect impacts in relation to support services and supply chain, effects on tourism, impact on local populations flux, and wider cumulative effects with other projects.

17.2.7 National Policy Statement (NPS) EN-2 outlines the role that natural gas energy generation will play in ensuring the energy system remains reliable and affordable during the transition to low carbon energy. For the delivery of natural gas generating infrastructure, the Statement does not highlight further socio-economic impacts for consideration beyond those outlined in NPS EN-1.

17.2.8 The East Lindsey Local Plan: Core Strategy 2016-2031 (adopted 2018) supports sustainable development and aims to grow employment in the district. It identifies low skills as a challenge to building a diverse economy and recognises the need and opportunities to raise skill levels as part of new developments. The Local Plan also highlights the importance of tourism and the leisure economy for the district, most specifically in Mablethorpe.

17.2.9 The East Lindsey Local Plan is currently being reviewed. The Plan has progressed to Regulation 18 stage, with an Issues and Options consultation carried out in 2021/22. No further updates have been announced by the Council since then.

17.3 Technical Guidance

17.3.1 The main guidance documents used for the assessment of socio-economic impacts will be those published by the Housing and Communities Agency (HCA, former Homes England), the Ministry for Housing, Communities and Local Government (MHCLG), and His Majesty's Treasury. This includes the following documents:

- 2014 HCA Additionality Guide 4th Edition[63];
- MHCLG 2023 Appraisal Guide[64];
- HM Treasury 2022 Green Book[65].

[63] HCA (2014) Additionality Guide, Fourth Edition; Available from: https://assets.publishing.service.gov.uk/media/5a7ec4b9e5274a2e87db1c92/additionality_guide_2014_full.pdf

[64] MHCLG (2023) Department for Levelling Up, Housing & Communities DLUHC Appraisal Guide, Available from: https://www.gov.uk/government/publications/dluhc-appraisal-guide/dluhc-appraisal-guide

[65] HM Treasury (2022) The Green Book: Central Government Guidance on Appraisal and Evaluation; Available from: https://assets.publishing.service.gov.uk/media/6645c709bd01f5ed32793cbc/Green_Book_2022__updated_links_.pdf

17.4 Baseline

Baseline Environment

17.4.1 Based on the 2021 Census, the district (East Lindsey) has a population of 142,900 people. Population data by age group reveals that in 2021, the proportion of the working age residents (16-64) in the district was 54.8%. The proportion is significantly lower than the working age percentage for both the East Midlands at 62.3%, and Great Britain, which is at 62.9%.[66]

17.4.2 Based on the ONS's Annual Population Survey,[67] the economic activity rate for those of working age (16-64) in the district is 70.5%; and the East Midlands is 78.2%. Great Britain's economic activity rate is 78.5%. Inversely, a significantly higher proportion of residents are economically inactive in the district (29.5%) than in the East Midlands (21.8%) or Great Britain (21.5%).The employment rate for the district (68.3%) is significantly lower than the Great Britain average rate (75.4%) and also lower than the employment rate in the East Midlands (74.9%). However, model-based unemployment in the district (3.5%) is lower than unemployment in Great Britain (3.9%), both also lower than the East Midlands (4.1%). The number of unemployed people aged 16-64 in the district is 2,100.

17.4.3 The review of baseline environment considers the employment and Gross Value Added of three industrial sectors in the Study Area. Those are based on the ONS's Standard Industrial Classification (SIC) codes.

17.4.4 The construction sector (Sector F) employs around 2,000 people and makes up 4.4% of the total labour force in the district, slightly higher than the East Midlands (4.3%) but slightly lower than Great Britain, where 4.8% of workers are employed in the construction sector.[68] The GVA of the sector in the district is projected to be £131 million in 2025.[69]

17.4.5 The energy sector (Sector D) employs around 35 people and makes up 0.1% of the total labour force in the district, which is lower than both the East Midlands (0.5%) and Great Britain (0.4%).[70] The GVA of the sector in the district is projected to be £3.1 million in 2025.[71]

17.4.6 The professional, scientific and technical activities sector (M) employs around 1,500 people and makes up 3.3% of the total labour force in the district, significantly lower than the East Midlands (7.4%) and Great Britain (9.2%).[72] The GVA of the sector in the district is projected to be £79 million in 2025.[73]

17.4.7 According to the ONS's Annual Population Survey, the qualifications level of people aged 16-64 in the district is significantly lower than in Great Britain and the East Midlands for all qualification levels. 36% of people aged 16-64 in East Lindsey have achieved qualification level of RFQ4 and above compared to 42% in Great Britain and 40% in the East Midlands. The latest data from the APS does not provide information on the proportion of working age residents with other or no

[66] ONS (2021) National Census, available from: https://www.ons.gov.uk/datasets/create
[67] ONS (2024) Annual Population Survey; data for the 12 months to March 2025, https://www.nomisweb.co.uk/reports/lmp/la/1946157149/report.aspx?town=east%20lindsey
[68] ONS (2024) Business Register and Employment Survey, available from https://www.nomisweb.co.uk/
[69] Oxford Economics 2025 Local Authority Forecasts, with subscription from https://www.oxfordeconomics.com/
[70] ONS (2024) Business Register and Employment Survey, available from https://www.nomisweb.co.uk/
[71] Oxford Economics 2025 Local Authority Forecasts, with subscription from https://www.oxfordeconomics.com/
[72] ONS (2024) Business Register and Employment Survey, available from https://www.nomisweb.co.uk/
[73] Oxford Economics 2025 Local Authority Forecasts, with subscription from https://www.oxfordeconomics.com/

qualifications in East Lindsay, as the sample size is too small to provide reliable estimates or too disclosive. However, the proportion of residents with RFQ1 qualifications and above (92.3%%) is higher than for the East Midlands (88.4%) and Great Britain (88.9%). This suggests a lower proportion of residents with no or other qualifications in the district than in the region or nation[74].

17.4.8 Based on the 2019 Indices of Multiple Deprivation (IMD) from the MHCLG[75], East Lindsey has an IMD rank of 30 out of 317, where a rank of 1 denotes the most deprived Local Authority. These suggest that the district generally sits in the highest decile in terms of IMD ranking, and is significantly more deprived than average. In particular, employment deprivation is significant and higher than the overall score, with East Lindsey having a rank of 25 in the employment domain.

Proposed Approach to Surveys and Further Baseline Data Collection

17.4.9 Baseline data will be collected from published documents and from other EIA topics where relevant. No field survey for socio-economics is required.

17.4.10 Baseline information on the socio-economic conditions of the area will be collated from a variety of sources including:

- Office for National Statistics 2021 Census Data;
- Other datasets produced by the ONS, including but not limited to the Annual Population Survey, the Business Register and Employment Survey;
- Datasets and research produced by the Central Government, including but not limited to the Department for Business and Trade (DBT); the Department for Energy Security and Net Zero (DESNZ), the Department for Science Innovation and Technology (DSIT); and the former Department for Business, Energy and Industrial Strategy (BEIS);
- Oxford Economics Local Authority Forecasts;
- Evidence-base from East Lindsay District Council and Lincolnshire County Council;
- Where relevant the baseline will refer to other technical reports and EIA topics prepared as part of the DCO application.

17.4.11 The baseline will set out the characteristics of the local economy and workforce, such as economic activity, unemployment rates, skills and qualifications, and occupation profile. It will also assess the characteristics of the existing population e.g. age and levels of deprivation. Where applicable, these factors will be considered for the existing population in comparison to the regional and national population.

Future Baseline

17.4.12 East Lindsey's construction sector (F) is forecast to employ 4,300 people in 2035, compared to 184,000 in the East Midlands and 2.6 million in Great Britain[76]. East Lindsey's construction sector (F) is forecast to generate £150 million in GVA in 2035, with the East Midlands generating £11.8 billion and Great Britain generating £177.5 billion[77].

[74] ONS (2024) Annual Population Survey; data for the 12 months to March 2025, https://www.nomisweb.co.uk/reports/lmp/la/1946157149/report.aspx?town=east%20lindsey

[75] MHCLG (2019) Indices of Multiple Deprivation, available from: https://www.gov.uk/government/statistics/english-indices-of-deprivation-2019

[76] Oxford Economics 2025 Local Authority Forecasts with subscription from https://www.oxfordeconomics.com/

[77] Ibid

17.4.13 East Lindsey's energy sector (D) is forecast to employ 40 people in 2035, compared to 13,000 in the East Midlands and 130,000 in Great Britain[78]. East Lindsey's energy sector (D) is forecast to generate £4.0 million in GVA in 2035, with the East Midlands generating £2.3 billion and Great Britain generating £36.7 billion[79].

17.4.14 East Lindsey's professional, scientific and technical activities sector (M)) is forecast to employ 2,300 people in 2035, compared to 216,000 in the East Midlands and 4.1 million in Great Britain[80]. East Lindsey's professional, scientific and technical activities sector (M) is forecast to generate £90.6 million in GVA in 2035, with the East Midlands generating £10.1 billion and Great Britain generating £247.5 billion[81].

17.5 Approach to Assessment

Assessment Method Overview

17.5.1 There is no specific legislation or guidance on the methods that should be used to assess the socio-economic effects of the Proposed Development. Quantitative assessment will be used where possible and significance criteria will be produced to ensure that there is a consistent identification of effects applied during the assessment. Due to the complexity of socio-economic issues and the numerous interactions that can occur with neighbouring and more distant communities, it is not always possible to predict the precise nature or scale of each impact. Qualitative assessment, based on professional judgement, will therefore also be used where necessary and justified.

17.5.2 The methodology for assessing socio-economic impacts will involve the following key stages.

17.5.3 The stages of the overall methodology include:

- Review of planning policy – consider compliance of the Proposed Development with relevant local and national policies;
- An analysis of the current state of the local, wider area and regional economy including economic activity, unemployment, labour productivity (in terms of Gross Value Added (GVA) per worker), skills and occupation profile of residents and the labour force, to define receptor sensitivity;
- Impact assessment – this will consider the scale, magnitude, duration and significance of the potential effects during the construction phase and then the operational phase of the Proposed Development. The assessment will consider the net additional effects beyond baseline conditions.
- Assessment of mitigation measures, cumulative and residual effects.

17.5.4 The assessment of socio-economic effects will be determined with reference to receptor sensitivity and impact assessment. Receptor sensitivity and impact magnitude in the context of socio-economic issues are further defined in the following tables (Tables 17.1 and 17.2).

[78] Ibid
[79] Ibid
[80] Ibid
[81] Ibid

Magnitude of Impact

17.5.5 Magnitude of impact can be either defined as high, medium, low, or negligible, as outlined in **Table 17.1**.

17.5.6 The magnitude of impact is determined with reference to planning policy, best practice guidance and relevant contextual factors. For example, employment generation of 100 new jobs could have a high impact in a settlement of 1,000 residents but low impact in a larger settlement of 100,000 residents.

Table 17.1 Definition of Impact Magnitude for Socio-economics

Magnitude	Evidence for Scale of Magnitude
High	The impact will result in significant changes to baseline conditions, or will be highly likely to affect large numbers of people and/or businesses over the long term. It is considered to be an important consideration, and likely to be material in the decision-making process.
Medium	The impact will result in some changes to baseline conditions, and is likely to affect a moderate number of people and/or businesses over a medium duration. The change may be important, but may be a key decision-making factor.
Low	The impact will result in a perceptible difference from baseline conditions, and is likely to affect to a small number of people and/or businesses over a short duration. The impact is unlikely to be critical in decision-making process.
Negligible / No Change	The impact does not result in variation beyond baseline conditions and is unlikely to measurably affect people and/or businesses.

Sensitivity of Receptors

17.5.7 Receptor sensitivity can be either defined as high, medium, low or negligible, as outlined in **Table 17.2**.

Table 17.2 Definition of Receptor Sensitivity for Socio-economics

Sensitivity	Evidence for Level of Sensitivity
High	Evidence of direct and significant socio-economic challenges relating to receptor. Accorded a very high priority in local, regional or national economic and regeneration policy.
Medium	Some evidence of socio-economic challenges linked to receptor, which may be indirect. Change relating to receptor has high priority in local, regional and national economic and regeneration policy.
Low	Little evidence of socio-economic challenges relating to receptor. Receptor is accorded a medium priority in local and regional economic and regeneration policy.
Negligible	No evidence of socio-economic challenges relating to receptor. Receptor is not a priority in local, regional and national economic and regeneration policy.

Significance of Effect

17.5.8 The level of significance of an effect will be determined through professional judgement of factors such as the sensitivity of the receptor group and the magnitude of the impact (the amount of

change). The level of significance is also determined with reference to planning policy, best practice guidance and relevant contextual factors.

17.5.9 **Major** and **moderate adverse** and **beneficial effects** are considered to be significant.

17.5.10 Minor adverse and negligible effects are considered not to be significant.

Geographical Scope

17.5.11 The concept of an impact area is standard in EIA practice, however, there is no standard measure. For socio-economic impact assessments, this is further complicated by the mobility and network of potential receptors. The following Study Areas and geographical scope are considered:

- National level: the Proposed Development's contribution to the energy sector will result in wider economic benefits at the national level, by generating Gross Value Added and fostering investment. Additionally, given the nature of the Proposed Development, its construction and operation will be expected to require specialist skillset and a specialised supply chain that will be available and supported at the national level.
- Regional level, Lincolnshire or East Midlands: for non-specialist skills and supply chains, the Proposed Development is likely to also result in employment and economic development benefits at the regional level. As reflected in the baseline environment above, the district may suffer from a shortage of workforce and skills to meet the need of the Proposed Development, likely to need to pool labour from the wider region.
- Local level, East Lindsay District: this would be considered the relevant study area for the assessment of impact on tourism, on the need for housing and on local community assets.

Temporal Scope

17.5.12 Potential impacts and effects upon socio-economic receptors will be assessed in relation to temporary and permanent impacts. As a general rule, temporary impacts relate to the construction phase of development and permanent impacts relate to the occupation/operational phase. The temporal scope includes:

- Short term – Temporary effects related to a specific construction event of no more than a year's duration – such as the construction of an individual building or a specific element of infrastructure such as a section of road.
- Medium term – Temporary effects of longer duration, such as those arising over an extended period of construction ranging from one year to the full construction period.
- Long term – Permanent effects arising from the operation of the Proposed Development or from the permanent presence or removal of physical features.

17.5.13 Unless otherwise stated, the assessment of permanent and long term effects will assume that the Proposed Development is fully complete and operational.

17.6 Embedded Mitigation and Enhancement Measures

17.6.1 The Construction Environmental Management Plan (CEMP) will include good-practice measures which are anticipated to mitigate any adverse impact from construction on existing businesses, employment land, residents and community assets.

17.6.2 The preparation and implementation of an Employment and Skills Plan could be explored at a future stage, in order to maximise the potential employment, training and economic development opportunities for local residents and businesses.

17.7 Scope of Environmental Impacts and Effects

Construction

17.7.1 The construction of the Proposed Development has the potential to generate a range of socio-economic impacts identified, including those identified in the NPS for Energy EN-1, some of which are likely to be significant.

Employment and Training Opportunities

17.7.2 The construction of the Proposed Development is likely to generate significant employment opportunities, both locally, regionally and nationally. This would be anticipated to not only require the involvement of 'traditional' construction trades and labourers, but also of specialist and skilled workers within the energy and professional, scientific and technical activities sectors. Given potential labour shortages for such skills at the local level, specialist are likely to be drawn from the wider region and nation but also abroad. Components of the Proposed Development are also likely to be manufactured off-site to be assembled on-site, which would generate wider employment regionally and nationally.

17.7.3 In addition, this is likely to result in training and upskilling opportunities for the workforce to be employed during construction, including low-skilled, unemployed or economically inactive, and vulnerable groups in the district and region. This will directly benefit the nation's industrial strategy to grow the availability of skilled labour in the renewable and clean energy sector.

17.7.4 Finally, the construction activities will also be expected to result in further indirect employment impacts off-site, benefiting support services and the supply chain required to deliver the Proposed Development.

17.7.5 In light of the above, the Proposed Development's effect on employment and training opportunities during the construction phase is **proposed to be scoped in**.

17.7.6 The method for estimating the employment to be generated by the Proposed Development is likely to be derived from estimates of its capital costs in comparison to labour productivity statistics by industrial sector from the ONS and other government datasets. At the early stage of development design for the DCO application and given the range of technology choices, it is unlikely that sufficient design information can be established to make a meaningfully detailed quantitative estimate of the construction costs.

17.7.7 The approach to estimating indirect impacts on supply chains and local services will likely rely on ONS and other government datasets and research on input-output tables and multipliers for the relevant industrial sectors likely to be required for the construction of the development.

Economic Development

17.7.8 Investment in the Proposed Development and the provision of new skilled employment opportunities will result in the wider development of low-carbon industries locally, regionally and nationally. The construction of the Proposed Development therefore has the potential to beneficially contribute towards the nation's industrial strategy with regards to growing the energy sector. The method of quantifying the impacts of the Proposed Development will likely rely on

measures of labour productivity (Gross Value Added per worker), drawing on data and research by the ONS and relevant government departments.

17.7.9 On this basis, the assessment of construction impacts on economic development is **proposed to be scoped in**.

Temporary Disruptions to Socio-economic Receptors

17.7.10 The construction activities associated with the on-site delivery of the Proposed Development may cause temporary disruptions on a range of receptors:

- Existing residents;
- Existing businesses and employment uses;
- Existing community assets;
- Public Rights of Ways (PRoWs) and other access routes;
- Tourist attractions and accommodations.

17.7.11 On-site construction activities and additional construction traffic may result in noise or air pollution which may have adverse impact on existing residents, tourists and businesses in proximity to the sites. This may deter some local residents and tourists to access businesses, community assets and tourist attractions, resulting in a loss of business activity, social cohesion and community benefits. Inversely, the presence of construction workers locally may result in additional activity for some businesses. Nevertheless, these effects are likely to be extremely localised in proximity to the sites, of short duration during the hours of construction, and reversible upon completion of the construction phase. This is therefore unlikely to result in significant adverse impacts.

17.7.12 A review of PRoWs within East Lindsey indicates that there are no PRoW within the sites. A public footpath borders the southern boundary of the site in Theddlethorpe, while a public bridleway is located to the east of the Strubby site.

17.7.13 Despite the potential for temporary disruptions, the CEMP to be prepared and implemented during the construction phase would be expected to identify best practicable measures to adequately mitigate, reduce and remove any adverse impact resulting from construction activities.

17.7.14 Furthermore, the assessment of those potential impacts is expected to be considered within other Chapters, including:

- Air quality;
- Noise and Vibration;
- Transport and Access;
- Population and Human Health;
- Landscape and Visual.

17.7.15 In light of the above, the assessment of temporary disruptions on socio-economic receptors as a result of the construction phase is **proposed to be scoped out**.

Demographic Change

17.7.16 As identified above, a portion of the employment generated by the Proposed Development would be generated off-site in the preparation of components of the development to be assembled off-site. This suggests that the on-site employment would only represent a proportion of total employment generated. The on-site construction activities may however require some specialist

and skilled workers to travel to the local area on a temporary basis. This may require the provision of temporary accommodation, or may put pressure on the local housing market. The scale of the demand would be determined by comparing the level of skilled labour availability locally to the specific needs of the Proposed Development. On this basis, the assessment of demographic change and demand for housing during the construction phase is **proposed to be scoped in**.

Provision of Local Services

17.7.17 Any demographic change demonstrated above may result in additional pressure on local social infrastructure, such as community centres or healthcare facilities. This is however expected to be temporary in nature, with the usage of community infrastructure to return to its baseline level upon completion of construction phase. Additionally, workers required to temporarily relocate would likely choose to reside in a range of locations throughout the district and county, which would disperse the impact on local services rather than put pressure in given localities. The resulting effect is therefore unlikely to be significant. Additionally, the impact on healthcare infrastructure would be anticipated to be considered as part of the Population and Human Health Chapter. On this basis, the assessment of impacts on local services during the construction phase is **proposed to be scoped out**.

Operation

Employment and Training Opportunities

17.7.18 The operation and maintenance of the Proposed Development is likely to generate significant employment opportunities, both locally, regionally and nationally. This would be anticipated to require specialist and skilled workers within the energy and professional, scientific and technological sectors. Given potential labour shortages for such skills at the local level, specialist are likely to be drawn from the wider region and nation but also abroad.

17.7.19 In addition, the Proposed Development is likely to result in training and upskilling opportunities for the workforce to be employed during operation, including low-skilled, unemployed or economically inactive, and vulnerable groups in the district and region. This will directly benefit the nation's industrial strategy to grow the availability of skilled labour in the renewable and clean energy sector.

17.7.20 Finally, the activities to operate and maintain the development will also be expected to result in further indirect employment impacts off-site, benefiting support services and supply chain required to the delivery of the Proposed Development.

17.7.21 In light of the above, the Proposed Development's effect on employment and training opportunities during the operation phase is **proposed to be scoped in**.

17.7.22 The method for estimating the employment to be generated by the Proposed Development is likely to be derived on estimates of its running and maintenance costs in comparison to labour productivity statistics by industrial sector from the ONS and other government dataset. At this stage, running and maintenance costs are not known, nor are the specific industrial activities required for the operation.

17.7.23 The approach to estimating indirect impacts on supply chains and local services will likely rely on ONS and other government dataset and research on input-output tables and multipliers for the relevant industrial sectors likely to be required for the operation of the development.

Economic Development

17.7.24 Investment in the operation and maintenance of the Proposed Development and the provision of new skilled employment opportunities will result in the wider development of low-carbon industries locally, regionally and nationally. The Proposed Development therefore has the potential to beneficially contribute to the nation's industrial strategy with regards to growing the energy sector. The method of quantifying the impacts of the Proposed Development will likely rely on measures of labour productivity (Gross Value Added per worker), drawing on data and research by the ONS and relevant government departments.

17.7.25 Inversely, the Proposed Development may result in permanent loss of economic activity associated with the agricultural land required for the delivery of the Proposed Development.

17.7.26 On this basis, the assessment of operational impacts on economic development is **proposed to be scoped in**.

Tourism

17.7.27 Once completed the Proposed Development has the potential to have an effect on tourist attractions and tourist accommodations, through visual impacts of development on nearby receptors. This would however be anticipated to be assessed as part of the 'Archaeological and Cultural heritage' and 'Landscape and visual' Chapters. On that basis the assessment of operational impacts on tourism are **proposed to be scoped out**.

Demographic Change

17.7.28 As identified above, the operation and maintenance of the Proposed Development may require some skilled workers to relocate in closer proximity to the site from the region or nation, subject to labour availability locally. This may may put pressure on the local housing market. The scale of the demand would be determined by comparing the level of skilled labour availability locally to the specific needs of the Proposed Development. On this basis, the assessment of demographic change and demand for housing during the operation phase is **proposed to be scoped in**.

Provision of Local Services

17.7.29 Any demographic change demonstrated above may result in additional pressure on local social infrastructure, such as community centres or healthcare facilities. Workers required to relocate during the operation phase would likely choose to reside in a range of locations throughout the district and the county, which would disperse the impact on local services rather than put pressure in given localities. The resulting effect is therefore unlikely to be significant. Additionally, the impact on healthcare infrastructure would be anticipated to be considered as part of the Population and Human Health Chapter. On this basis, the assessment of impacts on local services during the operation phase is **proposed to be scoped out**.

Decommissioning

17.7.30 At this stage the consent is not expected to be time-limited, so the Scoping Report seeks to scope out a decommissioning assessment overall, as discussed in the introductory chapters. This is on the basis that impacts are unlikely to be greater than construction and there will be good-practice committed mitigation measures taken in design to facilitate dismantling / re-use in future if required.

17.7.31 As discussed in the construction section of this chapter, at the early stage of development design for the DCO application and given the range of technology choices, it is unlikely that sufficient design information can be established to make a meaningfully detailed quantitative estimate of the decommissioning costs. This would therefore preclude quantitative assessment of decommissioning effects from employment generation within the construction sector.

17.7.32 Further assessment of decommissioning-phase effects for employment generation is therefore **proposed to be scoped out**.

17.8 Limitations and Uncertainties

17.8.1 Due to the nature of the assessment, estimation of employment and Gross Value Added (GVA) benefits is subject to a range of uncertainties. Estimates are based on good practice principles, established guidance and official datasets. There will though remain a degree of uncertainty around estimates. It is estimated that actual quantified impacts will likely be within a range of +/- 20% of figures given to reflect any potential margins of error, as is standard practice with this type of estimates.

17.8.2 Many figures are given based on current rates and values and could be significantly higher in real terms given the long timescale before completion and anticipated growth in the economy. The economic analysis and conclusions presented in this assessment also assume that there are no major macro-economic shocks to the UK economy.

17.8.3 It is assumed that those limitations and uncertainties above would not compromise the outcomes of the assessment.

17.9 Inter-related Effects

17.9.1 There is the potential for interaction between socio-economics and the following other topic areas:

- Transport and Access;
- Landscape and Visual; and
- Population and health.

17.10 Cumulative Effects

17.10.1 Assessment of the cumulative schemes will be undertaken within an identified Zone of Influence to be agreed. At this stage a ZoI of 30 km is proposed for the assessment of socio-economics effects on employment, economic development, and demographic change. The assessment of cumulative effects would be expected to focus primarily on the larger committed schemes. A ZoI of 20-30 km is estimated to represent an appropriate catchment for potential economies of scale from relevant cumulative developments for the generation of economic activity. The list of cumulative schemes will be kept under review as the project progresses, adjusted to only include relevant scheme for the assessment of socioeconomic effects.

17.11 Summary of Proposed Scope

17.11.1 A summary of the proposed scope of assessment is included at Chapter 22.

18 Population and Health

18.1 Introduction

18.1.1 This chapter of the ES Scoping Report will identify the potential population and health impacts associated with construction and operation of the Proposed Development. The proportionality of the assessment, and further detail on what specific health determinants are proposed to be assessed are outlined in the following sections.

18.1.2 This chapter of the ES Scoping Report has been produced by the Savills Health and Social Impact Assessment team. Senior members of the team are acknowledged as co-authors of the recently published IEMA guidance on 'Effective Scoping for Human Health in EIA' and 'Determining Significance for Human Health in EIA'.

18.2 Legislative or Policy Requirements and Technical Guidance

18.2.1 There is no specific legislation which drives the scope and approach to the population and health assessment. Relevant technical guidance comprises IEMA's Effective Scoping of Human Health in EIA and Determining Significance for Human Health in EIA.

18.2.2 In relation to the assessment of electric and magnetic fields (EMF), the following information and guidance is relevant to the assessment of population and health:

- ICNIRP Guidelines for Limiting Exposure to Time-varying Electric, Magnetic and Electromagnetic Fields (Up to 300 GHz); and
- Power Lines: Demonstrating compliance with EMF public exposure guidelines – A voluntary Code of Practice.

18.2.3 Promoting healthy and safe communities is a central theme of the National Planning Policy Framework (NPPF), whereby the NPPF states that planning policies and decisions should aim to achieve healthy, inclusive and safe places which promote social interaction (including opportunities for meetings between people who might not otherwise come into contact with each other), are safe and accessible, and enable and support healthy lives (paragraph 96).

18.2.4 National Policy Statement (NPS) EN-1 and EN-5 include guidance on matters that should be considered in the context of the human health assessment. These are summarised in Table 18.1 and Table 18.2, respectively. NPS EN-1 also highlights a number of factors relating to the determination of an application and in relation to mitigation, which will be discussed in the PEIR and ES. NPS EN-2, EN-3 and EN-4 do not include any mention of health or wellbeing in the context of the population and health ES scope.

18.2.5 The National Planning Practice Guidance (PPG) supports the NPPF and provides guidance across a range of topic areas, including 'healthy and safe communities'. It is recognised in the NPPG that the design and use of the built and natural environments, including green infrastructure are major determinants of health and wellbeing, whereby a "healthy place" is one which:

- supports and promotes healthy behaviours and environments and facilitates a reduction in health inequalities for people of all ages;
- will provide the community with opportunities to improve their physical and mental health, and support community engagement and wellbeing;
- is inclusive and promotes social interaction; and

- meets the needs of children and young people to grow and develop, as well as being adaptable to the needs of an increasingly elderly population and those with dementia and other sensory or mobility impairments.

Table 18.1: Summary of NPS EN-1 provisions relevant to population and health EIA scoping

Summary of NPS EN-1 provision	How this will be considered
Where the proposed project has an effect on humans, the ES should assess these effects for each element of the project, identifying any potential adverse health impacts, and identifying measures to avoid, reduce or compensate for these impacts as appropriate.	A dedicated population and health chapter is proposed to be provided as part of the ES.
The impacts of more than one development may affect people simultaneously, so the applicant should consider the cumulative impact on health in the ES where appropriate.	Consistent with EIA Regulations and best practice, cumulative effects on health will be considered.
Opportunities should be taken to mitigate indirect impacts, by promoting local improvements to encourage health and wellbeing, this includes potential impacts on vulnerable groups within society and impacts on those with protected characteristics under the Equality Act 2010, i.e. those groups which may be differentially impacted by a development compared to wider society as a whole.	Where relevant and appropriate, enhancement measures that support health and wellbeing would be delivered. Consistent with the IEMA Guide on Determining Significance for Human Health in EIA, impacts on vulnerable groups (including individuals with protected characteristics) will be assessed.
For many air pollutants there is not a threshold below which there is no health impact so it is important that energy infrastructure schemes consider not just how a scheme may impact statutory air quality limits, objectives or targets but also measures to mitigate all emissions in order to minimise human exposure to air pollution, especially for those who are more susceptible to the impacts of poor air quality.	The non-threshold nature of air pollutants is acknowledged and informs the proposed operational assessment of potential health effects from changes to air quality, whereby the focus is on the change in annual mean pollutant concentration rather than whether it remains below a specific threshold. Consistent with the IEMA Guide on Determining Significance for Human Health in EIA, impacts on vulnerable groups (in the context of air quality) will be assessed.

Table 18.2: Summary of NPS EN-5 provisions relevant to population and health EIA scoping

Summary of NPS EN-5 provision	How this will be considered
All overhead power lines produce EMFs. These tend to be highest directly under a line and decrease to the sides at increasing distance. Although putting cables underground eliminates the electric field, they still produce magnetic fields, which are highest directly above the cable. EMFs can have both direct and indirect effects on human health.	The proposed transmission infrastructure comprises underground cables and as such, magnetic fields will need to be assessed.
To prevent these known effects, the International Commission on Non-Ionizing Radiation Protection (ICNIRP) developed health protection guidelines in 1998 for both public and	The ICNIRP guidelines will form the basis to the population and health assessment relating to magnetic fields.

Summary of NPS EN-5 provision	How this will be considered
occupational exposure. These are expressed in terms of the induced current density in affected tissues of the body, 'basic restrictions', and in terms of measurable 'reference levels' of electric field strength (for electric fields), and magnetic flux density (for magnetic fields). The relationship between the (measurable) electric field strength or magnetic flux density and induced current density in body tissues requires complex dosimetric modelling. The reference levels are such that compliance with them will ensure that the basic restrictions are not reached or exceeded. Exceeding the reference levels does not necessarily mean that the basic restrictions will not be met; this would be a trigger for further investigation into the specific circumstances.	

18.2.6 Relevant local policy documents comprise the East Lindsey Local Plan. However, there is no local policy directly relevant to population and health in the context of the Proposed Development.

18.3 Baseline

Baseline Environment

18.3.1 Table , overleaf, outlines existing health circumstance within the study area (local and wider), using district, regional and national averages as relevant comparators.

18.3.2 For the relevant study area, the following colour coding has been applied to aid analysis:

- better than the national average – green;
- worse than the national average – orange; and
- equal to the national average – blue

18.3.3 As shown, socio-economic circumstance in the local and wider study areas is generally worse than the national average. Exceptions to this relate to unemployment, which is better than the national average, and long-term unemployment, which is equal to the national average.

18.3.4 Local health circumstance in the local study area is worse than the national average for the vast majority of indicators analysed. The exceptions to this are emergency hospital admissions for all causes, smoking prevalence at 15 years, and the prevalence of overweight (including obesity) children in Year 6.

18.3.5 Disparities are noted between the wards that make up the local study area, whereby Mablethorpe has the highest level of deprivation.

Table 18.3: Local health circumstance summary

Indicator	Date	Ward study area	East Lindsey district	Lincolnshire	England
Deprivation and socio-economic circumstance					
Index of Multiple Deprivation (IMD) score	2019	35.1	29.9	20.3	21.7
Income deprivation (%)	2019	22.7	16.2	12	12.9
Child poverty (%)	2019	31	22	16.4	17.1
Older people in poverty (%)	2019	19.1	15.2	12.4	14.2
Households in fuel poverty (%)	2020	17.8	15.6	14.2	13.2
Unemployment (%)	2021-22	4.1	4.8	4.3	5
Long term unemployment (crude rate per 1,000)	2021-22	1.9	1.9	2	1.9
Physical health					
Life expectancy at birth for males (years)	2016-20	77.7	78.1	79.2	79.5
Life expectancy at birth for females (years)	2016-20	82.6	81.8	82.8	83.2
Emergency hospital admissions for all causes (SAR)	2015-16 to 2019-20	92.5	91.6	87.1	100
Emergency hospital admissions for coronary heart disease (SAR)	2015-16 to 2019-20	123.9	93.9	81.8	100

Indicator	Date	Ward study area	East Lindsey district	Lincolnshire	England
Emergency hospital admissions for stroke (SAR)	2015-16 to 2019-20	120.8	113.9	99.2	100
Emergency hospital admissions for Myocardial Infarction (heart attack) (SAR)	2015-16 to 2019-20	121.6	100.3	87.8	100
Emergency hospital admissions for Chronic Obstructive Pulmonary Disease (COPD) (SAR)	2015-16 to 2019-20	105.1	105.4	90.1	100
Incidence of all cancer (SIR)	2015-19	111.9	101.4	98.8	100
Deaths from all causes all ages (SMR)	2016-20	126.8	110.9	104	100
Deaths from all cancer all ages (SMR)	2016-20	120.5	109.4	103.4	100
Deaths from circulatory disease all ages (SMR)	2016-20	137.2	118.8	110.5	100
Deaths from coronary heart disease all ages (SMR)	2016-20	146	122.2	110.2	100
Deaths from stroke all ages (SMR)	2016-20	100.7	111.3	102.3	100
Deaths from respiratory diseases all ages (SMR)	2016-20	132.6	108.8	97.2	100
Deaths from causes considered preventable under 75 years (SMR)	2016-20	148.5	116.7	98.5	100
Mental health and behavioural risk factors					
Emergency hospital admissions for intentional self-harm (SAR)	2016-17 to 2020-21	122.6	96.2	80.2	100

Indicator	Date	Ward study area	East Lindsey district	Lincolnshire	England
Hospital admissions for alcohol attributable conditions (narrow definition) (SAR)	2016-17 to 2020-21	115.2	107.4	94.7	100
Smoking prevalence at 15 years (regular) (%)	2014	4.6	5.6	5.6	5.4
Reception: prevalence of overweight (including obesity) (%)	2017-18 to 2019-20	25.0	25.8	24.9	22.6
Reception: prevalence of obesity (including severe obesity) (%)	2017-18 to 2019-20	15.4	11.6	10.7	9.9
Year 6: prevalence of overweight (including obesity) (%)	2017-18 to 2019-20	32.8	36.9	36.7	35.8
Year 6: prevalence of obesity (including severe obesity) (%)	2017-18 to 2019-20	25.5	22.5	22.5	21.6

Key:

	Better than the national average
	Equal to the national average
	Worse than the national average

Proposed Approach to Surveys and Further Baseline Data Collection

18.3.6 A desktop study will be undertaken to establish the local population and health circumstance for the ES. This will involve the collection and interpretation of published third party data, contrasted against regional and national data. The following open-source websites and datasets are anticipated to be used to develop the population, health and socio-economic baseline:

- Office for Health Improvement and Disparities (OHID) Local Health, public health for small geographic areas;
- OHID Fingertips; and
- Office for National Statistics.

18.3.7 Data collection and interpretation will build upon the snapshot summary presented in Table .3, for example through analysis of trend data and a wider range of indicators.

18.3.8 No site surveys are required for the assessment of population and health.

Future Baseline

18.3.9 Consistent with national trends, the health of the population living within the study area is likely to improve over the lifetime of the Proposed Development. This will be the case with or without the Proposed Development.

18.3.10 While this is the case, any improvement is challenging to predict with high confidence and unlikely to be substantial. On this basis, proposed to use present-day statistics for the purpose of this assessment, offering a precautionary approach.

18.4 Approach to Assessment

Assessment Criteria and Methodology

18.4.1 As stated in the IEMA Guide to Effective Scoping of Human Health in EIA, “where an EIA is undertaken and there is also a requirement for HIA, projects should normally meet the HIA requirement through the EIA Report health chapter”.

18.4.2 On this basis, it is proposed to embed the principles and methods of HIA within the regulatory EIA requirements, which includes the application of significance criteria.

18.4.3 Consistent with the IEMA Guide to Effective Scoping of Human Health in EIA, the broad determinants of health considered are those outlined in Table 188. and Table 188., which encompasses conventional health impacts such as disease, accidents and risk, along with wider health determinants vital to achieving good health and wellbeing such as employment and local amenity. It addresses both physical and mental health outcomes and also considered equality and social impacts where possible.

18.4.4 The following assessment criteria is taken from IEMAs Guide on Determining Significance for Human Health in EIA.

Magnitude of Impact

18.4.5 The health magnitude methodology criteria shown in Table 188 is proposed to be used to inform the assessment of significance.

Table 188.4: Population and health magnitude methodology criteria

Category/level	Indicative criteria
High	High exposure or scale; long-term duration; continuous frequency; severity predominantly related to mortality or changes in morbidity (physical or mental

Category/level	Indicative criteria
	health) for very severe illness/injury outcomes; majority of population affected; permanent change; substantial service quality implications.
Medium	Low exposure or medium scale; medium-term duration; frequent events; severity predominantly related to moderate changes in morbidity or major change in quality-of-life; large minority of population affected; gradual reversal; small service quality implications.
Low	Very low exposure or small scale; short-term duration; occasional events; severity predominantly related to minor change in morbidity or moderate change in quality-of-life; small minority of population affected; rapid reversal; slight service quality implications
Negligible	Negligible exposure or scale; very short-term duration; one-off frequency; severity predominantly relates to a minor change in quality-of-life; very few people affected; immediate reversal once activity complete; no service quality implication.

Note: replicated from IEMA Guide on Determining Significance for Human Health in EIA

Sensitivity of Receptors

18.4.6 Within a defined population, individuals will range in level of sensitivity due to a series of factors such as age, socio-economic deprivation and the prevalence of any pre-existing health conditions which could become exacerbated. These individuals can be considered particularly vulnerable to changes in environmental and socio-economic factors (both adversely and beneficially) whereby they could experience disproportionate effects when compared to the general population.

18.4.7 As an example, the elderly, young children and individuals with chronic pre-existing respiratory conditions would be more sensitive to adverse changes to air quality, with the potential for emergency admission to hospital more likely than for someone of working age who has good respiratory health. On the other hand, an individual who has been unemployed for a long period of time would benefit more from employment opportunities generated by the Proposed Development in comparison to an individual who is already employed.

18.4.8 The health sensitivity methodology criteria shown in Table 18.5 is proposed to be used to inform the assessment of significance.

Table 18.5: Population and health sensitivity methodology criteria

Category/level	Indicative criteria
High	High levels of deprivation (including pockets of deprivation); reliance on resources shared (between the population and the project); existing wide inequalities between the most and least healthy; a community whose outlook is predominantly anxiety or concern; people who are prevented from undertaking daily activities; dependants; people with very poor health status; and/or people with a very low capacity to adapt.
Medium	Moderate levels of deprivation; few alternatives to shared resources; existing widening inequalities between the most and least healthy; a community whose outlook is predominantly uncertainty with some concern; people who are highly limited from undertaking daily activities; people providing or requiring a lot of care; people with poor health status; and/or people with a limited capacity to adapt.
Low	Low levels of deprivation; many alternatives to shared resources; existing narrowing inequalities between the most and least healthy; a community whose outlook is predominantly ambivalence with some concern; people who are slightly limited from

Category/level	Indicative criteria
	undertaking daily activities; people providing or requiring some care; people with fair health status; and/or people with a high capacity to adapt.
Very low	Very low levels of deprivation; no shared resources; existing narrow inequalities between the most and least healthy; a community whose outlook is predominantly support with some concern; people who are not limited from undertaking daily activities; people who are independent (not a carer or dependant); people with good health status; and/or people with a very high capacity to adapt.

Note: replicated from IEMA Guide on Determining Significance for Human Health in EIA

18.4.9 Consistent with IEMA Guide on Determining Significance for Human Health in EIA, vulnerable groups will also been considered in the population and health assessment. The presence of vulnerable groups will be determined generally through the baseline information collected, and more specifically through a spatial analysis exercise using OS AddressBase data to identify specific vulnerable receptors. A uniformly 'high' sensitivity classification will be considered in the context of these receptors.

Significance of Effect

18.4.10 The significance of an effect is determined based on the sensitivity of a receptor and the magnitude of an impact. The method employed for this assessment is presented in Table .6.

18.4.11 Where a range of significance levels are presented, the final assessment for each effect is based upon expert judgement. In all cases, the evaluation of receptor sensitivity, impact magnitude and significance of effect has been informed by professional judgement and is underpinned by narrative to explain the conclusions reached.

Table 18.6: Significance matrix

		Sensitivity			
		High	Medium	Low	Very low
Magnitude	High	Major	Major/moderate	Moderate/minor	Minor/negligible
	Medium	Major/moderate	Moderate	Minor	Minor/negligible
	Low	Moderate/minor	Minor	Minor	Negligible
	Negligible	Minor/negligible	Minor/negligible	Negligible	Negligible

Note: replicated from IEMA Guide on Determining Significance for Human Health in EIA

18.4.12 Table provides a description of each significance level. For this assessment, any effects with a significance level of minor or less are not considered to be significant in terms of the EIA Regulations.

Table 18.7: Significance conclusion and reasoning related to public health

Category/level	Indicative criteria
Major (significant)	The narrative explains that this is significant for public health because: Changes, due to the project, have a substantial effect on the ability to deliver current health policy and/or the ability to narrow health inequalities, including as evidenced by referencing relevant policy and effect size (magnitude and sensitivity levels), and as informed by consultation themes among stakeholders, particularly public health stakeholders, that show consensus on the importance of the effect. Change, due to the project, could result in a regulatory threshold or statutory standard being crossed (if applicable). There is likely to be a substantial change in the health baseline of the population, including as evidenced by the effect size and scientific literature showing there is a causal relationship between changes that would result from the project and changes to health outcomes. In addition, health priorities for the relevant study area are of specific relevance to the determinant of health or population group affected by the project.
Moderate (significant)	The narrative explains that this is significant for public health because: Changes, due to the project, have an influential effect on the ability to deliver current health policy and/or the ability to narrow health inequalities, including as evidenced by referencing relevant policy and effect size, and as informed by consultation themes among stakeholders, which may show mixed views. Change, due to the project, could result in a regulatory threshold or statutory standard being approached (if applicable). There is likely to be a small change in the health baseline of the population, including as evidenced by the effect size and scientific literature showing there is a clear relationship between changes that would result from the project and changes to health outcomes. In addition, health priorities for the relevant study area are of general relevance to the determinant of health or population group affected by the project.
Minor (not significant)	The narrative explains that this is not significant for public health because: Changes, due to the project, have a marginal effect on the ability to deliver current health policy and/or the ability to narrow health inequalities, including as evidenced by effect size of limited policy influence and/or that no relevant consultation themes emerge among stakeholders. Change, due to the project, would be well within a regulatory threshold or statutory standard (if applicable); but could result in a guideline being crossed (if applicable). There is likely to be a slight change in the health baseline of the population, including as evidenced by the effect size and/or scientific literature showing there is only a suggestive relationship between changes that would result from the project and changes to health outcomes. In addition, health priorities for the relevant study area are of low relevance to the determinant of health or population group affected by the project.
Negligible (not significant)	The narrative explains that this is not significant for public health because: Changes, due to the project, are not related to the ability to deliver current health policy and/or the ability to narrow health inequalities, including as evidenced by effect size or lack of relevant policy, and as informed by the project having no responses on this issue among stakeholders. Change, due to the project, would not affect a regulatory threshold, statutory standard or guideline (if applicable). There is likely to be a very limited change in the health baseline of the population, including as evidenced by the effect size and/or scientific literature showing there is an

Category/level	Indicative criteria
	unsupported relationship between changes that would result from the project and changes to health outcomes. In addition, health priorities for the relevant study area are not relevant to the determinant of health or population group affected by the project.

Note: replicated from IEMA Guide on Determining Significance for Human Health in EIA

Geographical Scope

18.4.13 The Proposed Development is located entirely within East Lindsey district, where the indicative DCO Order Limits pass through the wards of Mablethorpe, Withern and Theddlethorpe, and Legbourne.

18.4.14 Environmental health determinants (such as changes to air quality and noise exposure) are likely to have a local impact where the potential change in hazard exposure is limited by physical dispersion characteristics. As a result, the study area for health-specific baseline statistics relating to human health effects is proposed to focus on the wards of Mablethorpe, Withern and Theddlethorpe, and Legbourne (the local study area), with district, county/regional and national averages used as relevant comparators.

18.4.15 Wider socio-economic health determinants (such as employment and related income generation) have a wider geographic scope of influence than environmental health determinants, due to the willingness to commute significant distances to work. While ward-level data will be collected for context, the focus for socio-economic baseline data is on district-level data (the wider study area), with county/regional and national averages used as comparators.

18.4.16 The study area defining the relevant sensitive receptors identified for assessment purposes is proposed to remain consistent with the inter-related technical disciplines assessed within the ES, which the human health topic relies upon.

Temporal Scope

18.4.17 It is proposed to assess the construction and operation phases of the Proposed Development.

18.5 Embedded Mitigation and Enhancement Measures

18.5.1 Embedded mitigation and enhancement measures adopted as part of the construction and operation of the Proposed Development will generally focus on precursors to health and wellbeing outcomes, thereby providing an opportunity for intervention to prevent any adverse health outcome.

18.5.2 During construction, best practice measures detailed within a dedicated CEMP will control the generation or release of environmental pollutants with the potential to cause adverse population and human health outcomes. Similarly a CTMP will be in place to manage construction traffic impacts on pedestrians and road users.

18.5.3 During operation, such mitigation measures are embedded within the design of the Proposed Development itself e.g. through the application of BAT and requirements under an Environmental Permit to operate.

18.6 Scope of Environmental Impacts and Effects

Construction

18.6.1 Table 188..8 outlines all determinants of health outlined in IEMAs Guide to Effective Scoping of Human Health in EIA, providing the justification for all matters to be scoped in and out of the construction and operational phases of the Proposed Development.

Table 188.8: Determinants to be scoped in/out during the construction phase

Category	Determinant of health	Justification
Health related behaviours	Physical activity	**Scoped in** – while the Proposed Development would primarily be built on agricultural land, which is not publicly accessible, access to some public rights of way (PRoW) would be affected. The impacts and mitigation associated with this (to maintain access to PRoW) would be included in the population and human health chapter. In addition, there may be indirect impacts on the amenity of PRoW and open space, whereby the deterrence of using such resources and spaces will also be considered.
	Risk taking behaviour (i.e. use of alcohol, cigarettes, non-prescribed drugs, problem gambling and communicable illness)	Scoped out – risk taking behaviour during construction is generally associated with a large non-home based workforce who temporarily relocate to the area surrounding the Proposed Development and may contribute to a change in the social/cultural environment locally, which includes risk taking behaviour. At this stage, it is considered likely that construction workers would commute on a daily basis. Should evidence be found to the contrary and construction workers would require temporary accommodation, this would be scoped in.
	Diet and nutrition	Scoped out – while the Proposed Development results in the loss of agricultural land, this would not have a material impact on growth of food or access to food.
Social environment	Housing	Scoped out – the Proposed Development does not include the provision of any residential development. As such, there would be no direct impact on housing. Furthermore, it is not anticipated that there would be any temporary indirect impacts on the demand for housing from the construction workforce, who are assumed at this stage to commute on a daily basis. Should evidence be found to the contrary and construction workers would require temporary accommodation, this would be scoped in.
	Relocation	Scoped out – no dwellings would be demolished due to the Proposed Development, and therefore no relocation would be required.
	Open space, leisure and play	**Scoped in** – while the Proposed Development would primarily be built on agricultural land, which is not publicly accessible, access to some PRoW would be affected. The impacts and mitigation associated with this (to maintain access to PRoW)

Category	Determinant of health	Justification
		would be included in the population and human health chapter. In addition, there may be indirect impacts on the amenity of PRoW and open space, whereby the deterrence of using such resources and spaces will also be considered.
	Transport modes, access and connections	**Scoped in** – the Proposed Development would generate changes in transport nature and flow rate on existing transport infrastructure (associated with the delivery of construction materials and worker travel to/from the site). The population and health effects associated with changes in transport and access during the construction phase would be scoped into the ES to more effectively communicate the themes most relevant to health and wellbeing (i.e. severance, pedestrian and cyclist amenity, fear and intimidation and risk of road traffic accidents/injury). The population and health topic would draw from and build upon key outputs from the Traffic and Transport Chapter in order to carry out the assessment and reach a conclusion regarding the significance of effect in population and health terms.
	Community safety (e.g. crime and injury risk)	Scoped out – the site during the construction phase would be secure, and subject to security measures to deter the potential for anti-social behaviour and/or crime. In addition, any contractors hired would be subject to the Considerate Contractors Scheme to reduce any impacts on the local community, while the safety of construction workers themselves would be ensured through relevant measures required under the Health and Safety at Work Act.
	Community identity, culture, resilience and influence	Scoped out – construction of the Proposed Development may impact the visual environment (including due to night lighting). Such changes are considered relatively unavoidable, but temporary in nature, and would be assessed as part the Landscape and Visual Chapter. Conclusions from the Landscape and Visual Chapter would feed into the assessment of amenity and how this might impact the use of PRoW and open space (see “physical activity” and “open space, leisure and play” determinants).
	Social participation, interaction and support	Scoped out – the Proposed Development would not result in the loss of any community/non-residential resources and therefore would not impact on social participation, interaction and support.
Economic environment	Education and training	Scoped out – while there is the potential for education and training opportunities during construction of the Proposed Development, this would be addressed by the Socio-economics Chapter where appropriate and necessary. Impacts on non-residential receptors such as education facilities will be considered as part of the assessment of vulnerable groups.

Category	Determinant of health	Justification
	Employment and income	**Scoped in** – the construction phase would generate temporary direct employment opportunities (primarily for construction workers), with associated indirect employment opportunities from supply chain activity (indirect) and local spending on goods and services by employees (induced). Having a consistent income and being in long-term employment are two of the most important wider determinants of health. As such, the population and human health effects associated with changes in socio-economic factors during the construction phase would be scoped into the ES to communicate the population and health benefits associated with this. The population and health topic would draw from and build upon key outputs from the Socio-economics Chapter in order to carry out the assessment and reach a conclusion regarding the significance of effect in population and health terms.
Bio-physical environment	Climate change mitigation and adaptation	**Scoped in** – in addition to being addressed within the Climate Change Chapter, as part of the EIA Regulations, each topic (including population and human health), will consider the implications of climate change on the conclusions reached in the assessment. The population and health topic will therefore consider how the future impacts of climate change might alter the assessment conclusions.
	Air quality	**Scoped in** – the construction phase is anticipated to contribute to local and temporary changes in air quality (dust, particulate matter and nitrogen dioxide) associated with on-site construction activities and additional traffic movements required for the delivery of construction materials and worker travel to/from the site. Embedded mitigation measures would be implemented in order to reduce the generation of dust and release of air pollutants, outlined within a Construction Environmental Management Plan (CEMP), Construction Traffic Management Plan (CTMP) and Travel Plan. While this is the case, this determinant will be scoped into the ES to further communicate how known hazards are addressed to prevent any material risk to human health. The population and human health topic would draw from and build upon key outputs from the Air Quality Chapter in order to carry out the assessment and reach a conclusion regarding the significance of effect in population and health terms.
	Water quality or availability	Scoped out – changes in water quality and availability will be adequately dealt with in the Water Environment Chapter. Water to be used for potential electrolysis plant (hydrogen production) would be desalinated seawater, therefore not affecting freshwater quality or availability No further health assessment is considered necessary.
	Land quality	Scoped out – the potential health impacts from ground conditions (e.g. exposure to contaminated land) will be included

Category	Determinant of health	Justification
		as part of the Ground Conditions chapter scope. No further health assessment is considered necessary.
	Noise and vibration	**Scoped in** – the construction phase is anticipated to contribute to local and temporary changes in noise exposure associated with on-site construction activities and additional traffic movements required for the delivery of construction materials and worker travel to/from the site. Embedded mitigation measures, contained within a CEMP, would also contribute to a reduction of noise impacts. While this is the case, this determinant will be scoped into the ES to more effectively communicate the magnitude and distribution of potential impacts, and the resultant significance of effect on population and health, if any. The population and human health topic would draw from and build upon key outputs from the Noise and Vibration Chapter in order to carry out the assessment and reach a conclusion regarding the significance of effect in population and health terms.
	Radiation	Scoped out – construction of the Proposed Development would not include any sources of ionising or non-ionising radiation (i.e. magnetic fields).
Institutional and built environment	Health and social care services	Scoped out – on the basis that the construction workforce are anticipated to be home-based and would commute on a daily basis, there would be no impact on health and social care services, which would only occur with a temporary non-home-based workforce.
	Built environment (project land uses and how the project affects the built features of the environment that contribute to health)	Scoped out – the Proposed Development would not impact the built environment until operational. Impacts on non-residential receptors such as healthcare facilities and care homes will be considered as part of the assessment of vulnerable groups.
	Wider societal infrastructure and resources (energy, transport, waste management, water, and communication and IT infrastructure)	Scoped out – the Proposed Development would not impact the built environment until operational.

Operation

18.6.2 Table 188.9 outlines all determinants of health outlined in IEMAs Guide to Effective Scoping of Human Health in EIA, providing the justification for all matters to be scoped in and out of the construction and operational phases of the Proposed Development.

Table 188.9: Determinants to be scoped in/out during the operation phase

Category	Determinant of health	Justification
Health related behaviours	Physical activity	**Scoped in** – as the transmission infrastructure would comprise underground cabling only, there would be no operational impact on access to PRoW or open space (directly or indirectly). The Thermal Plant, CCGT / reciprocating engines, and BESS infrastructure would be assessed for their direct and indirect impacts (i.e. through amenity) on access to PRoW and open space for physical activity.
	Risk taking behaviour (i.e. use of alcohol, cigarettes, non-prescribed drugs, problem gambling and communicable illness)	Scoped out – the Proposed Development industrial in nature whereby anyone on-site would be part of the workforce who would commute to/from the site on a daily basis. As the workforce would remain on-site during the day, there is limited potential for external impacts on risk taking behaviour.
	Diet and nutrition	Scoped out – while the Proposed Development results in the loss of agricultural land, this would not have a material impact on growth of food or access to food.
Social environment	Housing	Scoped out – the Proposed Development does not include the provision of any residential development. As such, there would be no direct impact on housing. Furthermore, it is not anticipated that there would be any indirect impacts on the demand for housing from the operational workforce, which based on the understanding of similar facilities, is anticipated to be relatively small.
	Relocation	Scoped out – no dwellings would be demolished due to the Proposed Development, and therefore no relocation would be required.
	Open space, leisure and play	**Scoped in** – as the transmission infrastructure would comprise underground cabling only, there would be no operational impact on access to PRoW or open space (directly or indirectly). The Thermal Plant, CCGT / reciprocating engines, BESS infrastructure would be assessed for their direct and indirect impacts (i.e. through amenity) on access to PRoW and open space for physical activity.
	Transport modes, access and connections	Scoped out – once operational the Proposed Development is expected to have limited impact on transport movements, which would be for operational staff arrival/departure, occasional contractor access for maintenance periods, and occasional delivery of reagents for the carbon capture process (if required). On the basis that this would not meet the threshold for detailed assessment in the Traffic and Transport Chapter, consideration from a population and health perspective is also scoped out.

Category	Determinant of health	Justification
	Community safety (e.g. crime and injury risk)	Scoped out – once operational, the site would be sufficiently secure to deter trespassing, anti-social behaviour and crime. Furthermore, the safety of operational workers would be ensured through relevant measures required under the Health and Safety at Work Act. Management of accident and disaster risk, including fire safety for the BESS, will be assessed within the ES with appropriate mitigations and controls incorporated into the project design as necessary.
	Community identity, culture, resilience and influence	Scoped out – operation of the Proposed Development may impact the visual environment (including due to night lighting). Such changes would be assessed as part of the Landscape and Visual Chapter. Conclusions from the Landscape and Visual Chapter would feed into the assessment of amenity and how this might impact the use of PRoW and open space (see "physical activity" and "open space, leisure and play" determinants).
	Social participation, interaction and support	Scoped out – the Proposed Development would not result in the loss of any community/non-residential resources and therefore would not impact on social participation, interaction and support.
Economic environment	Education and training	Scoped out – while there is the potential for education and training opportunities during construction of the Proposed Development, this would be addressed by the Socio-economics Chapter where appropriate and necessary. Impacts on non-residential receptors such as education facilities will be considered as part of the assessment of vulnerable groups.
	Employment and income	Scoped out – based on the understanding of similar facilities, the operational workforce is anticipated to be relatively small. On this basis, the population and health benefits associated with employment would be limited and would only deliver benefits at the individual level.
Bio-physical environment	Climate change mitigation and adaptation	**Scoped in** – in addition to being addressed within the Climate Change Chapter, as part of the EIA Regulations, each topic (including population and human health), will consider the implications of climate change on the conclusions reached in the assessment. The population and health topic will therefore consider how the future impacts of climate change might alter the assessment conclusions.
	Air quality	**Scoped in** – the Proposed Development would include point sources of air pollution associated with the various energy infrastructure provided. As such, the population and human health effects associated with changes to air quality from the Proposed Development would be scoped into the ES to assess the magnitude and

Category	Determinant of health	Justification
		distribution of such changes for existing residents and any other sensitive receptors in the surrounding area. The population and human health topic would draw from and build upon key outputs from the Air Quality Chapter in order to carry out the assessment and reach a conclusion regarding the significance of effect in population and health terms.
	Water quality or availability	Scoped out – changes in water quality and availability will be adequately dealt with in the Water Environment Chapter. No further health assessment is considered necessary.
	Land quality	Scoped out – the potential health impacts from ground conditions (e.g. exposure to contaminated land) will be included as part of the Ground Conditions Chapter scope. No further health assessment is considered necessary.
	Noise and vibration	**Scoped in** – the Proposed Development, albeit flexible in nature to meet network demand, could theoretically be operational 24 hours a day, 7 days a week, with associated impacts on noise. As such, the human health effects associated with changes to noise exposure from operational development would be scoped into the ES to assess the magnitude and distribution of such changes for existing residents and any other sensitive receptors in the surrounding area. The population and human health topic would draw from and build upon key outputs from the Chapter 7: Noise and Vibration in order to carry out the assessment and reach a conclusion regarding the significance of effect in population and health terms.
	Radiation	**Scoped in** – the Proposed Development includes electricity transmission infrastructure with the potential to generate non-ionising radiation (i.e. electric and magnetic fields, EMF). Based on the cable design, the population and health assessment will calculate the worst-case electric and magnetic fields to ensure that these are compliant with ICNIRP guidelines for public exposure. As the burial of underground cables provides complete shielding of electric fields, and no new overhead lines are proposed, assessment of electric fields will be scoped out.
Institutional and built environment	Health and social care services	Scoped out – the Proposed Development is for an industrial development whereby anyone on-site would be part of the workforce who would commute to/from the site on a daily basis. As such, there would be no material impact on access to health and social care services.
	Built environment (project land uses and how the project affects	Scoped out – while the Proposed Development comprises man-made structures that technically form part of the built environment, these built structures are industrial in nature and

Category	Determinant of health	Justification
	the built features of the environment that contribute to health)	would not impact any built features of the environment that contribute to health.
	Wider societal infrastructure and resources (energy, transport, waste management, water, and communication and IT infrastructure)	Scoped out – the Proposed Development would deliver energy infrastructure, would contribute to economic development and a low carbon economy. However, these impacts would be dealt with in the relevant topic chapters and it is not considered necessary to provide additional analysis from a population and health perspective.

18.7 Limitations and Uncertainties

18.7.1 The population and health assessment will draw from and build upon the technical outputs from several inter-related technical topics to investigate changes in environmental and socio-economic conditions directly attributable to the Proposed Development. As a consequence, the limitations of the supporting assessments, and the conservative assumptions applied to address them, are inherent to the assessment of health.

18.7.2 While this is the case, it is considered that the information available provides a suitable basis for a robust assessment of population and health for ES assessment purposes.

18.8 Inter-related Effects

18.8.1 The population and health assessment will consider both project lifetime effects and receptor-led effects.

18.8.2 Project lifetime effects occur where there is an interaction between population and health effects that occur during the construction and operation phases, which lead to a greater inter-related effect.

18.8.3 Receptor-led effects may occur where different health determinants interact spatially or temporally to create a greater inter-related overall population and health effect on a receptor than is predicted for each determinant individually.

18.9 Cumulative Effects

18.9.1 The Zone of Influence (ZoI) for population and health cumulative effects will be dependent on the health determinant being assessed, and remains consistent with the ZoI used for each of the inter-related technical aspects which inform the assessment of population and health.

18.10 Summary of Proposed Scope

18.10.1 A summary of the proposed scope of assessment is included at Chapter 22.

19 Climate Change

19.1 Introduction

19.1.1 This chapter of the ES Scoping Report has been produced by Savills, authored by Tom Dearing, a Chartered Environmentalist with fourteen years' experience. It presents the proposed scope of assessment for climate change effects.

19.1.2 Climate change in the context of EIA can be considered broadly in two parts:

- the impact of greenhouse gas emissions (GHGs) caused directly or indirectly by the Proposed Development, which contribute to climate change; and
- the potential impact of changes in climate on the Proposed Development, which could affect it directly or could modify its other environmental impacts.

19.1.3 Assessment of GHG emission impacts is proposed to be scoped in.

19.1.4 Assessment of climate risks to the Proposed Development is also proposed to be scoped in: flood risk will be assessed (including a climate change allowance) in the Water Environment chapter and further climate risks will be assessed in a risk matrix in the Climate Change chapter.

19.1.5 Assessment of inter-related effects due to climate change in the future baseline is proposed to be scoped in. Specific inter-related effects with climate change will be assessed where applicable in each other environmental topic chapter, and the effects will be summarised in the Climate Change chapter.

19.2 Legislative or Policy Requirements

19.2.1 Key climate change legislation is the Climate Change Act 2008 (as amended in 2019)[82] and the Carbon Budget Orders 2016 and 2021, which set the applicable five-yearly carbon budgets for the UK in support of achieving net zero GHG emissions by 2050.

19.2.2 The UK's Nationally Determined Contribution (NDC) under the Paris Agreement (as re-affirmed in the Glasgow Pact) commits the UK to reducing economy-wide GHG emissions by at least 68% by 2030 compared to 1990 levels[83]. At COP29 in November 2024, the UK pledged to make its next NDC (to be formally confirmed in early 2025) an 81% reduction on 1990 levels by 2035[84] and this was confirmed in the UK's formal submission to the UN Framework Convention on Climate change (UNFCC) in January 2025[85].

19.2.3 Related legislation and policy concerns the necessary steps and infrastructure investment required to achieve this net zero goal, in the areas of decarbonising energy generation, establishing a circular economy with sustainable resource management, and implementing

[82] Climate Change Act 2008 (c. 27) as amended by The Climate Change Act 2008 (2050 Target Amendment) Order 2019, https://www.legislation.gov.uk/ukpga/2008/27/contents, accessed 02/10/24

[83] UK Government (2022): United Kingdom of Great Britain and Northern Ireland's Nationally Determined Contribution, https://assets.publishing.service.gov.uk/media/633d937d8fa8f52a5803e63f/uk-nationally-determined-contribution.pdf, accessed 08/01/25

[84] Prime Minister's National Statement at COP29: 12 November 2024, https://www.gov.uk/government/speeches/prime-ministers-national-statement-at-cop29-12-november-2024, accessed 09/01/25

[85] UK Government (2025): United Kingdom of Great Britain and Northern Ireland's 2035 Nationally Determined Contribution, https://unfccc.int/sites/default/files/2025-01/UK%27s%202035%20NDC%20ICTU.pdf, accessed 20/03/25

carbon capture and sequestration. It also concerns the need for the UK to adapt and improve resilience to the risks of a changing climate.

19.2.4 Progress on the Net Zero Strategy policies was captured in early 2023 by the Powering Up Britain: Net Zero Growth Plan policy paper[86], which includes a target to fully decarbonise the UK's power system by 2035. The Net Zero Strategy (Build Back Greener), as revised in 2022 after court challenge, set out the UK's plans to achieve net zero emissions by 2050[87]. Part of this strategy reaffirms the importance of carbon capture and storage (CCS) in decarbonising power generation, with the aim to use CCS technology to capture and store 20-30 $MtCO_2$ per year by 2030. This is reflected in the March 2023 Carbon Budget Delivery Plan[88], which makes clear that carbon capture clusters for the power sector are important for delivery of carbon reductions in the Sixth Carbon Budget period.

19.2.5 The UK Hydrogen Strategy[89] sets out the approach to developing the hydrogen sector in the UK to meet the ambition of 10 GW of low carbon hydrogen production capacity by 2030. A 2025 update to this strategy confirms hydrogen's power sector role in supporting low-carbon flexible generation[90]. The British Energy Security Strategy[91] notes the need for flexible generation and storage to support the UK's continued renewables roll-out. Clean Power 2030[92] sets a goal of bringing the carbon intensity of electricity generation in the UK market to well below 50g CO_2e/kWh by 2030.

19.2.6 While not itself policy, the recommendations to the government made by the Climate Change Committee are also relevant and will be considered in the ES, including the recommendations for the Seventh Carbon Budget[93], progress reports for the UK, and the UK climate change risk assessment.

19.2.7 Under s.56 of the Climate Change Act 2008, the UK publishes a five-yearly national climate risk assessment, the latest being from 2022[94]. This is developed based on advice from the Climate

[86] DESNZ (2023): Powering Up Britain: The Net Zero Growth Plan, https://assets.publishing.service.gov.uk/media/642556c560a35e000c0cb167/powering-up-britain-net-zero-growth-plan.pdf, accessed 03/10/24

[87] DESNZ and BEIS (2022): The Net Zero Strategy (Build Back Greener), https://www.gov.uk/government/publications/net-zero-strategy, accessed 02/10/24.

[88] HM Government (2023): Carbon Budget Delivery Plan, https://assets.publishing.service.gov.uk/media/6424b2d760a35e000c0cb135/carbon-budget-delivery-plan.pdf, accessed 22/10/24; ruled unlawful in 2024 in [2024] EWHC 995 (Admin) but not yet re-issued – the new plan is due by October 2025

[89] HM Government (2021): UK Hydrogen Strategy, https://assets.publishing.service.gov.uk/media/64c7e8bad8b1a70011b05e38/UK-Hydrogen-Strategy_web.pdf, accessed 27/01/25

[90] DESNZ (2025): Hydrogen Strategy Update to the Market: July 2025, https://assets.publishing.service.gov.uk/media/6880b2139fab8e2e86160efe/hydrogen-update-to-the-market-2025.pdf, accessed 18/08/25

[91] DESNZ and BEIS (2022): British Energy Security Strategy, https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy, accessed 27/01/25

[92] HM Government (2024): Clean Power 2030 Action Plan, https://www.gov.uk/government/publications/clean-power-2030-action-plan, accessed 18/08/25

[93] Climate Change Committee (2025): Seventh Carbon Budget, https://www.theccc.org.uk/wp-content/uploads/2025/02/The-Seventh-Carbon-Budget.pdf, accessed 26/02/25

[94] Defra (2022): UK Climate Change Risk Assessment 2022, https://www.gov.uk/government/publications/uk-climate-change-risk-assessment-2022, accessed 09/10/24

Change Committee[95]. The response to climate risks through resilience and adaptation actions are set out in the National Adaptation Programme (NAP), with the most recent being NAP3 published in 2023[96]. The national priority risk areas identified (most relevant to the Proposed Development) are risks to infrastructure networks (water, energy, transport, ICT) from cascading failures; risks to energy generation from reduced water availability; and risks to energy from high and low temperatures, high winds, lightning.

National Policy Statement (NPS) EN-1 includes guidance on matters that should be considered in the climate change assessment. These are summarised in Legislative Context

19.2.8 Air Quality Standards and Objectives are established through a range of legislation and policy guidelines as set out below.

The Air Quality Standards Regulations (2010)

19.2.9 European Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008, sets legally binding Europe-wide limit values for the protection of public health and sensitive habitats. The Directive was transposed into domestic law by the Air Quality Standards Regulations (2010) in England, Scotland, Wales and Northern Ireland in June 2010, which continue to apply post-Brexit.

19.2.10 The pollutants included are sulphur dioxide (SO_2), nitrogen dioxide (NO_2), oxides of nitrogen (NO_x), particulate matter of less than 10 micrometres (µm) in aerodynamic diameter (PM_{10}), particulate matter of less than 2.5 µm in aerodynamic diameter ($PM_{2.5}$), lead (Pb), carbon monoxide (CO), benzene, ozone (O_3), polycyclic aromatic hydrocarbons (PAHs), cadmium (Cd), arsenic (As), nickel (Ni) and mercury (Hg).

UK Air Quality Strategy

19.2.11 The Environment Act 1995 established the requirement for the government to produce a National Air Quality Strategy (AQS), setting out air quality standards, objectives, and measures for improving ambient air quality every five years. The most recent AQS for England was published in April 2023 and sets out a framework for reducing hazards to health from air pollution and ensuring that international commitments are met in the UK.

19.2.12 The AQS sets standards and objectives for 10 main air pollutants in order to protect health, vegetation and ecosystems. The air quality standards are long-term benchmarks for ambient pollutant concentrations which represent negligible or zero risk to health, based on scientific and medical evidence. Objectives are policy targets expressed as a concentration that should be achieved, all the time or for a percentage of the time, by a certain date. These are general concentration limits, above which sensitive members of the public (e.g. children, the elderly and the unwell) might experience adverse health effects.

19.2.13 The limit values and objectives relevant to this assessment are summarised in Table .1.

Table 15.1: Summary of relevant objectives of the Air Quality Standards Regulations 2010

Pollutant	Objectives	Concentration measured as

[95] Climate Change Committee (2021): Independent Assessment of UK Climate Risk (CCRA3), https://www.theccc.org.uk/publication/independent-assessment-of-uk-climate-risk/, accessed 09/10/24

[96] Defra (2023): The Third National Adaptation Programme (NAP3) and the Fourth Strategy for Climate Adaptation Reporting, https://www.gov.uk/government/publications/third-national-adaptation-programme-nap3#full-publication-update-history, accessed 09/10/24

Nitrogen dioxide (NO_2)	200 µg/m^3 not to be exceeded more than 18 times a year	1 hour mean
	40 µg/m^3	Annual mean
Particulate Matter (PM_{10})	50 µg/m^3 not to be exceeded more than 35 times a year	24 hour mean
	40 µg/m^3	Annual mean
Particulate Matter ($PM_{2.5}$)	20 µg/m^3	Annual mean
Carbon monoxide (CO)	10 mg/m^3	Maximum daily running 8 hour mean

The Environment Act 2021

19.2.14 The Environment Act (2021) established a legally binding duty on the government to set at least two new air quality targets, one of which must be in respect of the annual mean level of $PM_{2.5}$ in ambient air. In response to this, Defra has set two new legally-binding long-term targets to reduce concentrations of $PM_{2.5}$. The two new targets have been implemented in the Environmental Targets (Fine Particulate Matter) (England) Regulations 2023, which sets a target of 10 µg/m³ for $PM_{2.5}$ to be met by 2040 and a reduction in average population exposure by 35% by 2040, compared to a 2018 baseline. These targets are not limit values, which are legally binding parameters that must not be exceeded, such as those under the Air Quality Standards Regulations. Instead, target values are to be attained where possible by taking all necessary measures not entailing disproportionate costs. As such, the objectives stated in Table remain the most up-to-date objectives, hence will be the criteria used in the EIA.

Environment Assessment Levels

19.2.15 Environmental Assessment Levels (EALs) for other pollutants are presented by the Environment Agency within the Environmental Management Guidance (Air Emissions Risk Assessment for your Environmental Permit), which was last updated on 21 May 2024. The relevant EALs are presented in Table below.

Table 15.2: Summary of relevant Environment Assessment Levels from the Environment Agency Air Emissions Risk Assessment for your Environmental Permit Guidance

Pollutant	Environment Assessment Level	Concentration measured as
Ammonia (NH_3)	2,500 µg/m^3	1 hour mean
	180 µg/m^3	Annual mean
Formaldehyde	100 µg/m^3	30 minute mean
	5 µg/m^3	Annual mean
Mono-ethanolamine (MEA)	400 µg/m^3	1 hour mean
	100 µg/m^3	24 hour mean
N-nitrosodimethylamine (NDMA)	0.0002 µg/m^3	Annual mean

19.2.16 The Environment Agency has recently consulted on the development of EALs for the amine-based carbon capture process, with consultation closing on 13 March 2025. These EALs are expected to be those that will be used within the assessment of air quality impacts of the carbon capture facility.

19.2.17 For the remainder of this chapter, these limit values, objectives and assessment levels are collectively referred to as Air Quality Assessment Levels (AQALs).

National Policy

19.2.18 Planning policy for energy generating NSIPs is contained in the Overarching NPS for Energy (EN-1). NPS EN-1 also highlights a number of factors relating to the determination of an application and in relation to mitigation, which will be discussed in the PEIR and ES.

Table 19.1: Summary of NPS EN-1 provisions relevant to climate change EIA scoping

Summary of NPS EN-1 provision	How this will be considered
Greenhouse gas emissions	
Paragraph 5.3.4 states that "*all proposals for energy infrastructure projects should include a GHG assessment as part of their ES*".	Assessment of GHG emissions is proposed to be scoped in, as set out in this chapter.
Paragraphs 5.3.5 and 5.3.6 concern mitigation, stating that the GHG assessment should be used to drive down GHG emissions and minimise these at every stage of the project, so far as possible for the technology and while meeting objectives for a secure, reliable and affordable energy supply. This includes looking for opportunities within the Proposed Development *"to embed nature-based or technological solutions to mitigate or offset the emissions of construction and decommissioning"*.	The purpose of the Proposed Development is to reduce power sector GHG emissions by providing flexible generation (with carbon capture or using low-carbon hydrogen) and energy storage as a balancing service to support renewables. Additional embedded mitigation and recommended further mitigation for each project stage will be explored in the EIA process.
Paragraph 5.3.7 states that "*Steps taken to minimise and offset emissions should be set out in a GHG Reduction Strategy, secured under the Development Consent Order. The GHG Reduction Strategy should consider the creation and preservation of carbon stores and sinks including through woodland creation, hedgerow creation and restoration, peatland restoration and through other natural habitats".*	A GHG Reduction Strategy will be set out in the DCO application. This is anticipated to comprise construction-stage measures secured through the CEMP and any further mitigation that may be secured through DCO Requirements.
Climate change adaptation	
Paragraph 4.10.9 states: "*The ES should set out how the proposal will take account of the projected impacts of climate change, using government guidance and industry standard benchmarks such as the Climate Change Allowances for Flood Risk Assessments, Climate Impacts Tool, and British Standards for climate change adaptation, in accordance with the EIA Regulations*."	An assessment of climate risks is proposed to be scoped in, including flood risk with climate change allowance per Environment Agency guidance.

Paragraph 4.10.10 goes on to state "*Applicants should assess the impacts on and from their proposed energy project across a range of climate change scenarios, in line with appropriate expert advice and guidance available at the time.*"	To provide a conservative assessment, the climate projections data used will for the 'business as usual' (high emissions global emissions) pathway RCP8.5.

19.2.19 The revised National Planning Policy Framework (NPFF) 2024[97] states with regard to climate change that the core planning principle of the NPPF is that the planning system should:

> *"…support the transition to net zero by 2050 and take full account of all climate impacts including overheating, water scarcity, storm and flood risks and coastal change. It should help to: shape places in ways that contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and improve resilience; encourage the reuse of existing resources, including the conversion of existing buildings; and support renewable and low carbon energy and associated infrastructure."* (*paragraph 161*).

19.2.20 'Low-carbon' technologies are defined in the NPFF at page 77-78 as *"…those that can help reduce emissions (compared to conventional use of fossil fuels).*"

19.2.21 In paragraphs 161 (quoted above) and 162, the NPPF refers to the need for planning to provide climate adaptation and resilience:

> *"Plans should take a proactive approach to mitigating and adapting to climate change, taking into account the long-term implications for flood risk, coastal change, water supply, biodiversity and landscapes, and the risk of overheating and drought from rising temperature."* (paragraph 162).

19.2.22 The East Lindsey Local Plan: Core Strategy (July 2018)[98] is the relevant local authority planning policy. This includes, as part of its vision, "*a commitment to tackling the causes and effects of global climate change through local action*" (page 17). A number of strategic policies supporting sustainable development, biodiversity and renewable energy, and referencing risks for development including coastal, pluvial and fluvial flooding, support that aim.

19.3 Technical Guidance

19.3.1 The main guidance used for the assessment of GHG emissions will be the Institute of Sustainability and Environmental Professionals (ISEP[99], formerly the Institute of Environmental Management and Assessment, IEMA) guide to 'Assessing Greenhouse Gas Emissions and Evaluating their Significance'[100].

97 DLUHC (2024): National Planning Policy Framework., https://assets.publishing.service.gov.uk/media/675abd214cbda57cacd3476e/NPPF-December-2024.pdf, accessed 06/01/25

98 East Lindsey District Council (2018): East Lindsey Local Plan Core Strategy, Adopted July 2018, https://www.e-lindsey.gov.uk/media/9791/Core-Strategy/pdf/Final_Version_of_Core_Strategy_2018.pdf?m=1546595473230, accessed 27/01/25

99 guidance published under the former name of IEMA is still referred to as 'IEMA guidance' in this report

100 IEMA (2022): Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance, https://www.iema.net/resources/blog/2022/02/28/launch-of-the-updated-eia-guidance-on-assessing-ghg-emissions, accessed 02/10/24.

19.3.2 The main guidance used for the assessment of climate risks will be the IEMA 'Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation, 2020'[101].

19.3.3 Other technical guidance of relevance is expected to include:

- the Greenhouse Gas Protocol suite of documents (WRI and WBCSD, 2004)[102];
- Valuation of Energy Use and Greenhouse Gas: Supplementary guidance to the HM Treasury Green Book (BEIS, 2023)[103] or future update to this;
- UK Government GHG Conversion Factors for Company Reporting (DEZNZ and BEIS, 2025)[104] or annual update to this;
- UK Green Building Council (UKGBC) guidance on 'A Framework for Measuring and Reporting of Climate-related Physical Risks to Built Assets'; and
- The principles of PAS 2080 Section 7 (BSI, 2023)[105].

19.4 Baseline

Baseline Environment

19.4.1 The current physical site baseline for GHG emissions is the existing largely greenfield site. Land within the application boundary comprises mainly arable farmland with occasional treelines and hedgerows in the service corridor. It is neighboured by businesses including poultry farms, leisure parks and Strubby airfield and gliding club. There is also a corridor for the potential seawater pipeline, which would pass under the coastal nature reserve, inter-tidal area and a short distance of seabed.

19.4.2 While agricultural activity does cause direct and indirect greenhouse emissions or in some cases sequestration (for example from livestock manure, fuel and fertiliser use, and changes in soil carbon stocks from grass or crop growth), these are of a low intensity per hectare relative to industrial or other developed land uses. Nor is it a significant carbon store, as the land does not include peat deposits or extensive woodland, so soil and vegetation carbon stocks that may be subject to disturbance are relatively minor. Marine sediment is a carbon stock that could be subject to disturbance.

19.4.3 The baseline with regard to GHG emissions from energy generation is represented by the present-day annual average carbon intensity of grid-connected generation in the UK. However, variations in this as marginal generators (which can have higher carbon intensity) are used to meet peak demands or surplus low-carbon renewable generation is available at times of low demand are also relevant and will be considered.

[101] IEMA (2020): Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation, https://www.iema.net/resources/reading-room/2020/06/26/iema-eia-guide-to-climate-change-resilience-and-adaptation-2020, accessed 02/10/24.
[102] WRI and WBCSD (2004): The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard. Revised edition, Washington and Geneva: WRI and WBCSD.
[103] DESNZ (2023): Valuation of Energy Use and Greenhouse Gas: Supplementary guidance to the HM Treasury Green Book, https://www.gov.uk/government/publications/valuation-of-energy-use-and-greenhouse-gas-emissions-for-appraisal, accessed 02/10/24.
[104] DESNZ and BEIS (2025): UK Government GHG Conversion Factors for Company Reporting, https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting , accessed 18/08/25.
[105] BSI (2023): PAS 2080:2023 Carbon management in buildings and infrastructure, https://www.bsigroup.com/siteassets/pdf/en/insights-and-media/insights/brochures/pas_2080.pdf, accessed 03/10/24.

19.4.4 The current climatic baseline is the regional climate and weather patterns, recorded in Met Office data, but in the context of trends in global climate changes affecting the UK climate, which are sufficiently well understood to be considered part of the known baseline. The future baseline with climate change will be assessed where relevant in each environmental topic chapter.

Proposed Approach to Surveys and Further Baseline Data Collection

19.4.5 Baseline data collection will be from published documents and surveys for other EIA topics. No field survey for climate change is required.

Future Baseline

19.4.6 The future physical site baseline for GHG emissions is assumed to be the continuation of primarily agricultural land use, which is expected to remain a *de minimis* source of GHG emissions and not be significant to the assessment of Proposed Development impacts. Areas of brownfield land that may be developed for the Thermal Plan also do not have active GHG-emitting activities.

19.4.7 The future baseline with regard to GHG emissions from energy generation is likely to be a progressive decarbonisation of the power sector. Scenarios for this will be considered in the assessment where necessary.

19.4.8 The potential future baseline for climatic conditions will be shown in the probabilistic climate change projections used in the climate risk assessment. This changing baseline will also affect the future baseline for other receptors, particularly the water environment, ecological receptors and landscape receptors, which is an inter-related effect of climate change.

19.5 Approach to Assessment – GHG Emissions

Assessment Method Overview

19.5.1 In overview, GHG emissions will be estimated by applying published emissions factors to activities in the baseline and to those required for the Proposed Development. The emissions factors relate a given level of activity, a physical or chemical process, or amount of fuel, energy or materials used to the mass of GHGs released as a consequence.

19.5.2 The assessment will consider (a) the direct and indirect GHG emissions arising from the Proposed Development, (b) any GHG emissions that it displaces or avoids, compared to the current or future baseline, and hence (c) the net impact on climate change due to these changes in GHG emissions overall.

19.5.3 The GHG emissions considered in this assessment will be those that are relevant to each activity from the 'Kyoto basket'[106] of global warming gases expressed as their CO_2-equivalent global warming potential (GWP). This will be denoted by CO_2e units in emissions factors and calculation results. GWPs used will typically the 100-year factors in the Intergovernmental Panel on Climate Change Sixth Assessment Report[107] or as otherwise defined for national reporting under the United Nations Framework Convention on Climate Change (UNFCCC).

19.5.4 The main emission sources within the boundary of the assessment will be:

- the 'embodied carbon' of materials used in construction, transport of materials to site and use of construction plant;

[106] carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), nitrogen trifluoride (NF_3), hydrofluorocarbons, perfluorocarbons and sulphur hexafluoride (SF_6).

[107] Table 7.15 in IPCC (2021): Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)].

- residual (uncaptured) direct combustion emissions of natural gas fuel used for electricity generation;
- the supply chain emissions of natural gas and / or hydrogen fuel used;
- the emissions from generating electricity used by the desalination and electrolysis plants, in that scenario
- production, transport and treatment of capture plant, desalination plant and/or electrolysis plant process inputs and outputs (chemical consumables and waste);
- off-site construction and operation of a CO_2 transport and sequestration network to provide capacity to manage CO_2 from the Proposed Development in that scenario, as an indirect downstream effect, using a representative scenario; and
- the net change in GHG emissions from grid-connected electricity generation sources due to the displacement effect of net electricity exported by the Proposed Development.

19.5.5 These are discussed further in section 15.6.

Magnitude of Impact

19.5.6 As GHG emissions can be quantified directly and expressed based on their GWP, the magnitude of impact will be reported numerically as tCO_2e rather than requiring a descriptive scale.

Sensitivity of Receptors

19.5.7 GHG emissions have a global effect rather than directly affecting any specific local receptor to which a level of sensitivity can be assigned. The global atmospheric mass of the relevant GHGs and consequent warming potential, expressed in tCO_2e, will therefore be treated as a single receptor of **high** sensitivity. It is considered to be of high sensitivity given the importance of the global climate as a receptor, the limited and decreasing capacity to absorb further GHG emissions without severe climate change resulting, and the cumulative contribution of GHG emission sources.

Significance of Effect

19.5.8 The IEMA assessment guidance for GHG emissions describes five levels of significance for emissions resulting from a development, each based on whether the GHG emission impact of the development will support or undermine a science-based 1.5°C-compatible trajectory towards net zero.

19.5.9 To aid in considering whether effects are significant, the guidance recommends that GHG emissions should be contextualised against pre-determined carbon budgets and applicable existing and emerging policy and performance standards, especially where a budget is not available or not meaningfully applicable at the scale of development assessed. It is a matter of professional judgement to integrate these sources of evidence and evaluate them to determine significance.

19.5.10 Taking the guidance into account, the following will be considered in contextualising the Proposed Development's GHG emissions:

- the magnitude of GHG emissions as a percentage of the UK's national carbon budgets and Carbon Budget Delivery Plan;
- comparing the GHG emissions intensity of the Proposed Development with current baseline emissions intensity for electricity generation and projections or policy goals for future changes in that baseline; and,
- whether the Proposed Development contributes to, and is in line with, the applicable UK policy for GHG emissions reductions in the energy sector, where this policy is consistent with science-based commitments to limit global climate change to an internationally-agreed level.

19.5.11 Effects from GHG emissions will be described as adverse, negligible or beneficial based on the following definitions, which closely follow the examples in Box 3 of the IEMA guidance.

- **Major Adverse**: the Proposed Development's GHG impacts would not be compatible with the UK's net zero trajectory. Its GHG impacts would not be mitigated, or would be compliant only with do-minimum standards set through regulation. The Proposed Development would not provide further emission reductions required by existing national and local policy for projects of this type. A project with major adverse effects is locking in emissions and does not make a meaningful contribution to the UK's trajectory towards net zero
- **Moderate Adverse**: the Proposed Development's GHG impacts would not be fully compatible with the UK's net zero trajectory. Its GHG impacts would be partially mitigated and may partially meet the applicable existing and emerging policy requirements, but it would not fully contribute to decarbonisation in line with national and local policy goals for projects of this type. A project with moderate adverse effects falls short of fully contributing to the UK's trajectory towards net zero.
- **Minor Adverse**: the Proposed Development's GHG impacts would be compatible with the UK's 1.5°C trajectory and would be fully consistent with up-to-date or emerging policy and good practice emissions reduction measures. A project with minor adverse effects is fully in line with measures necessary to achieve the UK's trajectory towards net zero.
- **Negligible**: the Proposed Development would achieve emissions mitigation that goes well beyond existing and emerging policy compatible with the 1.5°C trajectory, such that radical decarbonisation or net zero is achieved well before 2050. A project with negligible effects provides GHG performance that is well 'ahead of the curve' for the trajectory towards net zero and has minimal residual emissions.
- **Beneficial**: the Proposed Development would result in emission reductions from the atmosphere, whether directly or indirectly, compared to the without-project baseline. As such, the net GHG emissions would be below zero. A project with beneficial effects substantially exceeds net zero requirements with a positive climate impact.

19.5.12 **Major** and **moderate adverse** and **beneficial effects** are considered to be significant.

19.5.13 Minor adverse and negligible effects are considered not to be significant.

Geographical Scope

19.5.14 GHG emissions have a global effect rather than directly affecting any specific local receptor. The impact of GHG emissions occurring due to the Proposed Development on the global atmospheric concentration of the relevant GHGs, expressed in CO_2e, will therefore be considered within this assessment. As GHG impacts are global and cumulative with all other sources, no specific geographical study area is defined for the identification of receptors or assessment of effects.

19.5.15 However, GHG emissions caused by an activity are often categorised into 'scope 1', 'scope 2' or 'scope 3' emissions, following the guidance of the WRI and the WBCSD Greenhouse Gas Protocol suite of guidance documents[102].

- Scope 1 emissions: released directly by the entity being assessed, e.g. from combustion of fuel at an installation;
- Scope 2 emissions: caused indirectly by consumption of imported energy, e.g. from generating electricity supplied through the national grid to an installation; and
- Scope 3 emissions: caused indirectly in the wider supply chain, e.g. in the upstream extraction, processing and transport of materials consumed or the downstream transport and use of products from an installation, or processing of waste.

19.5.16 This assessment will seek to include emissions from all three scopes, including the full CCS chain and hydrogen supply chain (as applicable) where this is reasonably possible from the information and emissions factors available. This is in line with the 2024 Supreme Court judgement in the 'Finch' case on the requirement to assess direct and indirect effects caused by a development where this causality is inevitable and the assessment can be made without straying into "*speculation and conjecture*".

19.5.17 The majority of GHG emissions are likely to occur within the territorial boundary of the UK and hence within the scope of the UK's national carbon budgets. However, in recognition of the climate change effect of GHG emissions (wherever occurring) and the need, as identified in national policy, to avoid carbon leakage overseas when reducing UK emissions, potential scope 3 GHG emissions that may physically occur outside the UK will be considered where relevant. This is again in line with the judgment in Finch that GHG assessment shouldn't stop at national boundaries or not take into account developments (such as carbon transport facilities) that may have already been consented.

Temporal Scope

19.5.18 The temporal scope of GHG emissions will be the construction and operational phases. The time-integrated warming effect of GHGs will be assessed through the use of 100-year GWPs as discussed above.

19.6 Approach to Assessment – Climate Risk

Assessment Method Overview

19.6.1 Potential climatic conditions at the Proposed Development site will be considered based on the Met Office Hadley Centre UKCP18 probabilistic projections. Projections for the global emissions pathway RCP8.5 will be used as a worst-case approach, as this is a high-emissions scenario assuming 'business as usual' emissions growth globally with little additional mitigation. This will include both average conditions and the 'extreme values' dataset.

Magnitude of Impact and Sensitivity of Receptors

19.6.2 A risk assessment matrix approach will be used to evaluate the potential impact of climatic hazards, consequence, likelihood and resulting risk profile to the Proposed Development and its workforce.

19.6.3 Descriptive scales will be used to characterise the probability and consequence of each hazard, each then assigned a rating from which a resulting risk score will be determined multiplicatively.

19.6.4 Receptor sensitivity will not be directly defined, but rather a range of risk consequences from 'minor' to 'severe' will be used, the definitions of which will be formulated with regard to the sensitivity of buildings, operations and site workers to hazards.

Significance of Effect

19.6.5 The scale of risk ratings will range from 'very low' to 'very high'. Risk ratings greater than **'moderate'** will be considered to be significant.

Geographical Scope

19.6.6 The primary study area will be the 25 km grid square in which the Proposed Development is located, as provided by the UKCP18 dataset for probabilistic projections. This will include consideration of the coastal environment. Secondarily, the broader trends of climate risk for the UK will also be referenced as this is relevant to the off-site fuel supply and electricity export networks required for the Proposed Development's operation.

19.6.7 It is not considered possible to quantitatively assess climatic changes and potential risks for a wider off-site CO_2 transport and sequestration network, as the potential study area for this would be extremely large (encompassing much of the UK's east coast, the North Sea, Norway, or potentially beyond). However, this will be discussed qualitatively to the extent possible in the climate risk assessment.

Temporal Scope

19.6.8 The assessment will use probabilistic climate change projections for the time periods 2030-2059 and 2070-2099 to consider the initial period of operation and then longer-term risks out to the end of the century. This encompasses the likely initial operating life of the Proposed Development and also risks in the longer term should that be applicable to an extended operating life.

19.7 Embedded Mitigation and Enhancement Measures

19.7.1 The primary embedded mitigation for GHG emissions is that the Proposed Development will use either carbon capture, low-carbon hydrogen fuel, or a combination of these for the flexible thermal generation plant(s).

19.7.2 In addition, the purpose of the Proposed Development is to provide either energy storage. flexible generation or a combination of these to support the UK's net zero transition, which requires these types of balancing technologies to facilitate continued expansion of intermittent renewable energy generation.

19.7.3 With respect to climate change risks, the flood risk assessment (with climate allowance) will be used to inform the drainage design for the development such that flood attenuation to manage on- and off-site risk forms part of the development design.

19.7.4 The Construction Environmental Management Plan (CEMP) will include good-practice measures drawn from HSE guidance for managing workforce health and safety during outdoor construction work[108], to mitigate the risks particularly from potentially more intense summer heatwave events.

19.7.5 The CEMP will also include good practice measures for using efficient construction plant and managing construction waste to minimise GHG emissions during site work.

19.8 Scope of Environmental Impacts and Effects – GHG Emissions

Construction

19.8.1 The main impact from construction will be the 'embodied carbon' in construction materials used, i.e. the indirect GHG emissions from the supply chain for those materials, particularly for concrete, metals and the major engineered components of the development. This encompasses life-cycle stages A1-A5, the extraction and processing, manufacturing, delivery to site and installation of materials and products.

19.8.2 Based on previous experience and other published studies of energy generation and storage infrastructure, the construction-stage GHG emissions are likely to be a relatively minor component of the overall lifecycle impact of the development, considering ongoing emissions and benefits during its lifetime. At the early stage of design expected for the DCO application, with flexibility to be retained for technology choices in the development, it is likely that only limited information can be established concerning the quantum of materials and products required.

19.8.3 The order of magnitude of construction-stage GHG emissions will be estimated based on available published life cycle assessment studies or environmental product declarations for key

[108] HSE (undated): Outdoor Working, https://www.hse.gov.uk/temperature/employer/outdoor-working.htm, accessed 28/01/25

technology options, materials or components. Where necessary a screening approach will be used, in line with the IEMA guidance, to consider whether these are likely to be individually greater than 1% and collectively greater than 5% of the total lifecycle development emissions.

19.8.4 The focus of the assessment will be on the opportunities to further investigate and manage construction-stage GHG emissions through lifecycle carbon assessment at the detailed design stage, constituting recommended further mitigation.

19.8.5 Direct GHG emissions from on-site construction activities (e.g. fuel consumption for transport and by construction plant, and other energy and water use on site) are judged to be non-material to the assessment, regulated by other legislation, and are not proposed to be assessed quantitatively. These will be reported qualitatively and mitigated via measures in the CEMP.

19.8.6 The Proposed Development does not encompass construction or operation of a CO_2 transport and sequestration solution, off-site hydrogen supply solution or electricity import and export solution beyond the Order Limits boundary. Nevertheless, use of one or more of these networks in some form is essential to the Proposed Development and as such an attributable proportion of emissions are considered to be an indirect but causal impact to be included within this assessment. These will be assessed based on available published studies of carbon intensity, such as for the Viking CCS project, National Grid's assets, and hydrogen supply in the UK, as representative scenarios where applicable.

Operation

19.8.7 The Proposed Development's net impact during operation will be the balance of GHG emissions from its activities and GHG emissions avoided in the future baseline of alternative electricity generation.

19.8.8 The main source of direct GHG emissions from operation will be the residual uncaptured CO2 from natural-gas fired generation, if natural gas is used as the fuel for the thermal generation facility. The main sources of indirect emissions from operation will be the upstream supply chain for natural gas and/or hydrogen fuel supply, the upstream supply chain for electricity used in the electrolysis plant (if this is part of the development) and the downstream energy use and CO2 leakage from a CO2 transport and sequestration network (if natural gas-fired generation with CCS as well or instead of hydrogen-fired generation is used).

19.8.9 The supply chain for amines and other reagents required for CCS (if applicable) will be a minor source of GHG emissions if this is used. Amines are not a GHG so these do not cause a direct GWP impact. Hydrogen gas does have small secondary GWP effects but any fugitive hydrogen emissions from the electrolysis plant (if applicable) would be a de-minimis source.

19.8.10 Heat and power required by CCS equipment (if used) is expected to be supplied from the Proposed Development, so this impact would be captured in the fuel use emissions and in the calculation of net electricity exported to the grid.

19.8.11 It is likely that GHG emissions from the operational workforce commuting and from potable water use, wastewater treatment and waste management from the Proposed Development will be de minimis impacts, not material to the assessment, but this will be confirmed through a screening calculation for the PEIR. If a desalination plant to supply water to an electrolysis plant does form part of the Proposed Development, this would not affect freshwater availability as water would be taken from and returned to the sea. Electricity use would be assessed as set out above.

19.8.12 As noted above, potential use of off-site networks for CO2, hydrogen and electricity is considered to be an indirect but causal impact to be included within this assessment, and will be assessed (if applicable) based on available published studies of carbon intensity.

19.8.13 In the future baseline without the Proposed Development, GHG emissions are likely to be incurred from alternative generation sources, which could include more extensive use of legacy combined-cycle gas turbine (CCGT) power generation to meet peak electricity demand periods or to provide firm power during times of low renewable energy generation. Displacement of such marginal sources by the Proposed Development would therefore avoid GHG emissions in the future baseline.

19.8.14 This will be assessed through a representative future baseline scenario based on the developer's market knowledge, published energy market projections and UK government energy sector policy. If necessary, it will include exploration of sensitivities to assumptions in that scenario.

Decommissioning

19.8.15 At this stage the consent is not expected to be time-limited so the Scoping Report seeks to scope out a decommissioning assessment overall, as discussed in the introductory chapters. This is on the basis that impacts are unlikely to be greater than construction and there will be good-practice committed mitigation measures taken in design to facilitate dismantling / re-use in future if required.

19.8.16 As discussed in the construction section of this chapter, at the early stage of development design for the DCO application and given the range of technology choices, it is unlikely that sufficient design information can be established to make a meaningfully detailed quantitative estimate of construction materials. This would also preclude quantitative assessment of decommissioning effects from re-use, recycling or disposal of those materials.

19.8.17 In some cases, available published life-cycle studies for technologies (such as the BESS, if applicable) may include information on the decommissioning stage. This will be referenced in the assessment of net GHG emission effects where it is available.

19.8.18 However, qualitatively, it is very likely that future decommissioning effects (taking into account the committed mitigation and the UK's decarbonisation trajectory) will be lesser than construction phase effects, which will be assessed with mitigation to reduce whole-life carbon impacts recommended where applicable.

19.8.19 Further assessment of decommissioning-phase effects for GHG emissions is therefore proposed to be scoped out.

19.9 Scope of Environmental Impacts and Effects – Climate Risk

Construction

19.9.1 During construction, the main potential avenues of climate risk are considered to be:

- extreme weather such as heatwave or freezing conditions affecting health, safety and wellbeing for the workforce on site;
- extreme weather such as storms, prolonged or high intensity rainfall, freezing or fog conditions disrupting the construction work programme, for example through waterlogged or frozen ground or unsafe conditions for cranes and working at height; and
- extreme weather causing disruption to supply chains or delivery of materials and equipment, within or outside the UK.

19.9.2 It would be possible for the construction programme to commence within the next five years and complete over a relatively short duration, i.e. in the near future. Initial review of Met Office climate

projections data (summarised in the UKCP18 Science Overview Report[109]) indicates that the influence of climate change is starting to be felt in the UK's weather, particularly in seasonal average temperature and precipitation changes, but also peak temperatures. This represents an intensification of the existing variability in UK weather patterns, but with a limited rate of further change during a 'near-future' construction period.

19.9.3 The CEMP will include good practice measures drawn from HSE advice to manage workforce health and safety during hot and cold weather, as referenced in Section 15.5. The UK construction industry is adapted to the UK's existing variability in weather, working safely, and providing contingency for programme disruption.

19.9.4 Flood risk including coastal change, as applicable, will be assessed in the Water Environment ES chapter and technical Flood Risk Assessment with appropriate allowances for climate change.

19.9.5 As such, it is not considered that the limited rate of climate change during the construction period is likely to introduce new or significantly greater risks or that further mitigation measures would be identified. Further assessment of climate risk during construction is therefore proposed to be scoped out of the climate change chapter.

Operation

19.9.6 In operation, the main potential avenues of climate risk are considered to be:

- surface water, river or coastal flooding exacerbated by higher peak rainfall or by storm surge conditions;
- extreme weather causing physical risk to buildings and structures;
- potential reduction in availability of sustainable potable or raw water supply for cooling;
- hotter conditions affecting the energy efficiency, cooling demand and necessary heat tolerance of equipment;
- soil shrinking and swelling affecting foundations, transmission cable and pipeline routes (depending on soil conditions);
- extreme weather risks to workforce health, safety and wellbeing;
- potential for extreme weather causing disruption to off-site infrastructure required for development operation (electricity, fuel and CO_2 networks, telecommunications, workforce access).

19.9.7 Due to the expected lifetime of the Proposed Development (with no fixed decommissioning date) and the greater magnitude of plausible climate changes indicated by the CP18 projections for this period, there is considered to be potential for significant effects prior to mitigation. Assessment of climate risks during operation is therefore proposed to be scoped in.

19.9.8 Flood risk will be assessed in the Water Environment ES chapter and technical Flood Risk Assessment with appropriate allowances for peak rainfall intensity, sea level rise and storm surge. This will be cross-referred to but not repeated in the climate risk assessment.

Decommissioning

19.9.9 As noted above, at this stage the consent is not expected to be time-limited so the Scoping Report seeks to scope out a decommissioning assessment overall.

[109] Met Office (2018, updated 2019): UKCP18 Science Overview Report, https://www.metoffice.gov.uk/pub/data/weather/uk/ukcp18/science-reports/UKCP18-Overview-report.pdf, accessed 28/01/25

19.9.10 The climate risk assessment will include climate projections to the end of the century, encompassing the likely time period of decommissioning should that occur. It is not considered that new or greater risks would be identified for a decommissioning phase, over those that will be considered in the assessment of ongoing operation in future.

19.9.11 Further assessment of decommissioning-phase effects for GHG emissions is therefore proposed to be scoped out.

19.10 Limitations and Uncertainties

19.10.1 The main uncertainties for GHG emissions concern the construction materials and works, the future carbon intensity of electricity generation in the UK market, and the operation of wider carbon transport and sequestration and/or hydrogen supply networks linked to the Proposed Development (if applicable).

19.10.2 Construction-stage GHG emissions will be estimated insofar as possible using a screening approach, but the main means of managing this uncertainty is likely to be acknowledging the potential contribution of the construction stage to the lifecycle total GHG emissions, and where appropriate as mitigation, recommending further lifecycle carbon analysis at the detailed design stage, which could be secured by a DCO requirement where appropriate.

19.10.3 There is uncertainty inherent in the use of emission factors to estimate the GHG emissions from activity data, particularly where the carbon intensity of activities is likely to reduce over time in line with the UK's decarbonisation strategy. To mitigate this, emission factors used in national GHG reporting and verified LCA studies will be used where available. Either present-day or projected future emission factors, applied to the opening year of the Proposed Development, will be used depending on which is the conservative position.

19.10.4 The net balance of GHG emissions will be sensitive to the sources of fuel for the flexible generation facility, generator sources of electricity for the BESS (if applicable), and to the comparison with marginal alternative generation displaced in the baseline. The representative scenario(s) assessed will draw from the developer's market expectations and national policy.

19.10.5 The Proposed Development may need to use CO_2 transport and sequestration and/or hydrogen supply networks that are yet to be developed, which is a source of uncertainty about upstream and downstream scope 3 emissions. If applicable, these will be estimated using available published studies of the GHG emissions from operation of those networks including generation of hydrogen fuel, to establish a scenario that is representative of the reasonably likely operation of such networks.

19.10.6 With regard to climate risks, there is uncertainty both in the magnitude and timing of future changes in global and UK climate, and in the level of risk this creates. A high magnitude of change scenario (RCP8.5) and the high end of probabilistic projections will therefore be used in the risk assessment, for mid-century and end of century time periods.

19.10.7 While uncertainty cannot be eliminated, these approaches will allow an evidenced judgement to be made concerning whether net impacts are likely to be adverse or beneficial and whether the resulting effects are likely to be significant. Where necessary the assessment will consider scenarios or sensitivities to any areas of uncertainty. The approach is intended to be conservative as regards the net total GHG emissions and as regards potential climatic risks.

19.11 Inter-related Effects

19.11.1 Climate change could cause inter-related effects, in which it exacerbates or ameliorates the effects of the Proposed Development on sensitive receptors.

19.11.2 Inter-related effects are effects that interact spatially and/or temporally, resulting in multiple effects, or effects of a greater significance, upon a single receptor. The inter-related effects of climate change can be considered in two categories:

- climate change altering the sensitivity of receptors or the baseline environment, thereby increasing the significance of effects; and
- climate change modifying an impact pathway, i.e. by changing the magnitude or spatial extent and introducing new receptors.

19.11.3 The characterisation of future baseline conditions for each topic chapter in the PEIR and ES will take into account the likely effects of climate change, as far as these are known at the time of undertaking the EIA. An assessment of inter-related effects with climate change will be made for each applicable EIA topic in the future baseline section.

19.11.4 This will be based on information available from the Met Office Hadley Centre's UK Climate Projections project (UKCP18), which provides information on plausible changes in climate for the UK, and on published documents such as the UK Climate Change Risk Assessment published by the Climate Change Committee.

19.11.5 Inter-related effects with climate change will be summarised in a chapter or appendix, drawing together the evidence from other environmental topic chapters. The summary will be qualitative only, not aiming to be determinative of significance levels, which will be assessed in the applicable ES topic chapters, but will identify where there is the potential for inter-related effects to increase or decrease the significance of effects reported alone.

19.12 Cumulative Effects

19.12.1 All developments that emit GHGs have the potential to impact the atmospheric mass of GHGs as a receptor, and so may have a cumulative impact on climate change. Consequently, cumulative effects due to other specific local development projects are not proposed to be predicted individually but will be taken into account when considering the impact of the Proposed Development by defining the global atmospheric mass of GHGs as a high sensitivity receptor.

19.12.2 Similarly, the cumulative effect of all other developments globally on predicted future climatic conditions, and hence the risk assessment and resilience/adaptation measures, will be taken into account through use of the RCP8.5 scenario in the probabilistic climate change projections, so a separate cumulative assessment is not required.

19.12.3 The Proposed Development's interaction with other specific existing and Proposed Developments for fuel supply, electricity import and export, and carbon dioxide export, will form part of the assessment of net GHG emissions and of climate risks as described in the approach section, above, and so will not require further assessment as a separate cumulative development scenario.

19.13 Summary of Proposed Scope

19.13.1 A summary of the proposed scope of assessment is included at Chapter 22.

20 Marine Environment and Biodiversity

20.1 Introduction

20.1.1 This section of the EIA Scoping Report provides and overview of existing data available to identify the marine ecological baseline conditions and the potential significant effects of the Proposed Development on marine ecology and biodiversity during construction, operation, and decommissioning and the proposed scope of assessment methodology to be considered in the EIA report.

20.1.2 Marine ecology and biodiversity receptors considered for this section include benthic habitats and species, fish and shellfish and marine mammals (e.g. whales, dolphins and seals).

20.1.3 The scope for the EIA covers consideration of potential impacts to sensitive marine ecological features such as designated sites, habitats of principal importance, and protected or notable species.

20.1.4 This section has been produced by Tetra Tech RPS Energy (TTRPSE) Marine Ecology and HRA team. TTRPSE is a global technical consultancy focussed on the energy sector, predominantly EIAs for offshore developments. The Marine Ecology and HRA team comprises a skilled team of approximately 70 technical experts specialising in benthic ecology, fish and shellfish ecology, marine mammals, commercial fisheries, marine consenting and compliance.

20.2 Legislation, Policy and Technical Guidance

20.2.1 Relevant articles of legislation to the assessment of impacts on marine ecology and biodiversity are as follows:

20.2.2 Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended);

- Marine and Coastal Access Act 2009;
- The National Planning Policy Framework (NPPF);
- Circular 06/2005 (retained as Technical Guidance within the NPPF);
- East Inshore Marine Plan 2014;
- Local planning policies (Lincolnshire Local Plan);
- Conservation of Habitats and Species Regulations 2017;
- The Wildlife and Countryside Act 1981 (as amended);
- National / Local Biodiversity Action Plan for Lincolnshire;
- Environment Act 2021

20.2.3 Potential impacts of the Proposed Development on identified Important Ecological Features (IEFs) will be assessed in accordance with the Chartered Institute for Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment (CIEEM, 2024) .

20.3 Study Area

20.3.1 Theddlethorpe is located on the east coast of the United Kingdom, within the East Lindsey district of Lincolnshire.

20.3.2 To identify benthic habitats and species that could potentially be impacted by the Proposed Development, the benthic ecology study area has been defined as the Proposed Development Red Line Boundary (RLB), plus a buffer of 15 km radius from the seawater intake and brine outfall, including intertidal habitats up to the High Water Mean (HWM). The benthic ecology

study area encompasses the Zone of Influence (ZoI) of impacts to benthic ecology, based on experience and the mean tidal excursion ellipses from the UK Renewables Atlas (ABPmer, 2024) of tidal excursions within the area, and a precautionary buffer.

20.3.3 For the fish and shellfish species that could potentially be impacted by the Proposed Development, the fish and shellfish study area has been defined as the Proposed Development RLB plus a buffer of 100 km radius from the seawater intake and brine outfall, including intertidal habitats up to HWM. The fish and shellfish study area encompasses the ZoI of impacts to fish and shellfish ecology, including underwater noise. The extent of the study area is due to fish species within United Kingdom (UK) waters being highly mobile and capable of relocating across broad spatial ranges. In contrast, although many shellfish species may exhibit mobility, many are sessile or have limited movement, and their distribution is more closely tied to specific habitat characteristics and local environmental conditions. The study area provides a wider geographical context and allows for the identification of all relevant fish and shellfish receptors with the potential to be affected by the Proposed Development.

20.3.4 For the marine mammal species that that could potentially be impacted by the Proposed Development, a study area has been defined based on the Proposed Development RLB, plus a buffer of 100 km radius from the seawater intake and brine outfall, including intertidal habitats up to HWM. The marine mammal study area encompasses the ZoI of impacts to marine mammals. The extent of the marine mammal study area is due to marine mammals being highly mobile and covering vast distances within their ranges of distribution. The study area provides a wider geographical context and allows for the identification of all marine mammal receptors with the potential to be affected by the Proposed Development

20.4 Data Sources

20.4.1 An initial desk-based review of literature and data sources (Table 20.1) has been undertaken, identifying those that provide coverage of the marine ecology and biodiversity study areas, which are proposed for the Marine Ecology and Biodiversity assessment.

Table 20.1 Summary of Proposed Data Sources to Inform Marine Ecology and Biodiversity

Title	Year	Source	Citation
Benthic Ecology			
A big data approach to macrofaunal baseline assessment, monitoring and sustainable exploration of the seabed	2017	Centre for Environment, Fisheries and Aquaculture (Cefas)	Cooper and Barry (2017)
European Marine Observation and Data Network (EMODNet) broad-scale habitat map for Europe (EUSeaMap)	2025	EMODnet	EMODnet (2025)
Marine Protected Area Mapper	2025	Joint Nature Conservation Committee (JNCC)	JNCC (2025)
National Biodiversity Network (NBN) Atlas	2025	NBN Atlas	(NBN Atlas, 2025)

Title	Year	Source	Citation
OneBenthic Portal – Open Science Database	2025	Cefas	Cefas (2025)
Department for Environment, Food and Rural Affairs (Defra) Magic Map	2025	Defra	Defra (2025)
British Geological Survey (BGS) GeoIndex Offshore portal for marine habitats data	2025	BGS	BGS (2025)
The Humber Regional Environmental Characterisation (REC) Study: A multidisciplinary study of the geology, biology, and archaeology of an 11,000 km^2 area off the east coast of England	2021	The Marine Aggregate Levy Sustainability Fund	Tappin et al. (2011)
Fish and Shellfish Ecology			
Fisheries Sensitivity Maps	1998	Coull, et al.	Coull et al. (1998)
North Sea Elasmobranchs: distribution, abundance and biodiversity	2005	Daan et al.	Daan et al. (2005)
Spawning and nursery grounds of selected fish species in UK waters	2012	Ellis et al.	Ellis et al. (2012)
Updating Fisheries Sensitivity Maps in British Waters	2014	Aires et al.	Aires et al. (2014)
Marine Protected Area Mapper	2025	JNCC	JNCC (2025)
International Council for the Exploration of the Sea (ICES) Database on Trawl Surveys (DATRAS)	2025	ICES	ICES (2025b)
ICES Eggs and Larvae Database	2025	ICES	ICES (2025a)
UK Sea Fisheries Annual Statistics Report 2022	2024	Marine Management Organisation (MMO)	MMO (2023)
UK Sea Fisheries Annual Statistics Report 2023	2025	MMO	MMO (2025)
The Humber Regional Environmental characterisation (REC) Study: A multidisciplinary study of the geology, biology, and archaeology of an 11,000 km^2 area off the east coast of England	2021	The Marine Aggregate Levy Sustainability Fund	Tappin et al. (2011)
Marine Mammals			
Atlas of Cetacean distribution in northwest European waters	2003	JNCC	(Reid et al., 2003)
August Seal Counts - England	2025	Natural Environment Research Council (NERC) and	SMRU (2025)

Title	Year	Source	Citation
		Sea Mammal Research Unit (SMRU)	
Estimates of cetacean abundance in European Atlantic waters in summer 2016 from the SCANS-III aerial and shipboard surveys.	2021	SMRU, University of St Andrews	Hammond et al. (2021)
Estimates of cetacean abundance in European Atlantic waters in summer 2022 from the SCANS-IV aerial and shipboard surveys.	2023	Institute for Terrestrial and Aquatic Wildlife Research, University of Veterinary Medicine Hannover	Gilles et al. (2023)
Distribution maps of Cetacean and seabird populations in the North-East Atlantic.	2020	Journal of Applied Ecology	Waggitt et al. (2020)
Sympatric Seals, Satellite Tracking and Protected Areas: Habitat-Based Distribution Estimates for Conservation and Management	2022	Frontiers in Marine Science	Carter et al. (2022)
JNCC Report 734: Review of Management Unit boundaries for cetaceans in UK waters (2023)	2023	JNCC	IAMMWG (2023)
Joint Nature Conservation Committee (JNCC) Report 544: Harbour Porpoise Density.	2015	JNCC	Heinänen and Skov (2015)
Map view – inventory of the Cetaceans database sightings and effort.	2025	JCDP	Joint Cetacean Data Programme (JCDP) (2025)
The Humber Regional Environmental Characterisation (REC) Study: A multidisciplinary study of the geology, biology, and archaeology of an 11,000 km2 area off the east coast of England	2021	The Marine Aggregate Levy Sustainability Fund	Tappin et al. (2011)
Marine mammals from the southern North Sea: feeding and ecology data from δ13C and δ15N measurement	2003	Marine Ecology Progress Series	Das (2003)

20.5 Baseline Environment

20.5.1 This section describes the key biological aspects of the marine environment within the marine ecology and biodiversity study areas, based on existing available information. Designated sites with qualifying features within the relevant study area are shown in Table 20.2.

Table 20.2: Statutory Designated Sites within Marine Ecology and Biodiversity Study Areas

Name	Designation	Relevant Qualifying Features	Distance to Proposed Development (km)
Benthic Ecology			
Humber Estuary	Special Area of Conservation (SAC)	Annex I habitats of the EC Habitats Directive that are a primary reason for site designation are: ▪ Estuaries ▪ Mudflats and sands not covered by seawater at low tide Annex 1 habitats of the EC Habitats Directive that are present as a qualifying feature but not a primary reason for selection of this site are: ▪ Sandbanks which are slightly covered by sea water all the time ▪ Coastal lagoons ▪ Salicornia and other annuals colonising mud and sand ▪ Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) ▪ Embryonic shifting dunes ▪ Shifting dunes along the shoreline with *Ammophilia arenaria* (“white dunes”) ▪ Fixed coastal dunes with herbaceous vegetation (“grey dunes”) ▪ Dunes with *Hippopha rhamnoides*	6
Fish and Shellfish Ecology			
Humber Estuary	SAC	Annex II species present as a qualifying feature, but not a primary reason for site selection are: ▪ Sea lamprey (*Petromyzon marinus*)	6
Marine Mammals			
Humber Estuary	SAC	Annex II species present as a qualifying feature, but not a primary reason for site selection: ▪ Grey seal (*Halichoerus grypus*)	6
The Wash and North Norfolk Coast	SAC	Annex II species that are a primary reason for site designation are: ▪ Harbour Seal (*Phoca vitulina*)	29
Southern North Sea	SAC	Annex II species that are a primary reason for site designation are: ▪ Harbour porpoise (*Phocoena phocena*)	39

20.6 Benthic Ecology

20.6.1 Limited information is available for the characterisation of the benthic ecology study area.

20.6.2 The seabed within the benthic ecology study area has been characterised using the European Nature Information System (EUNIS) 2007 classification mapped in EMODnet (2025). Much of the nearshore coastline within the benthic ecology study area remains unmapped in EMODnet but is described as high energy infralittoral or circallitoral seabed. The majority of the of the subtidal seabed within the benthic ecology study area is classified as high energy circalittoral coarse sediment (A5.14), with small patches of high energy circalittoral fine sand or circalittoral muddy sand (A5.25 or A5.26) and high energy infralittoral coarse sediment (A5.13).

20.6.3 Data from the OneBenthic Baseline Tool (Cefas, 2025) indicates that four macrofaunal assemblage cluster types (A2a, B1b, C1a and D2c) are predicted within the benthic ecology study area. A2a is dominated by polychaete families: Sabellariidae, Spionidae, Polynoidae, Terebellidae, Phyllodocidae, Lumbrineridae, Pholoidae, Cirratulidae, Capitellidae and Syllidae, as well as Nemertea, porcelain crabs (Porcellanidae) and bivalve molluscs of the Semelidae family. B1b is dominated by the polychaete families Spionidae, Syllidae, Serpulidae, Terebellidae, Phyllodocidae, Capitellidae, Glyceridae, Polynoidae and Cirratulidae, as well as Nemertea, squat lobsters (Galatheidae), brittle stars (Amphiuridae) and bivalve molluscs of the family Glycymerididae. C1a is dominated by polychaete families: Spionidae, Terebellidae, Serpulidae, Syllidae, Capitellidae, Cirratulidae, Lumbrineridae, Sabellariidae and Glyceridae, as well as the phylum Nemertea. D2c is defined by a more limited polychaete family assemblage: Nephtyidae, Spionidae and Opheliidae.

20.6.4 The Humber Estuary SAC, which is approximately 6 km from the Proposed Development, is the only protected area designated for benthic habitats or species within the benthic ecology study area. However, the Proposed Development is within the Greater Wash Special Protected Area (SPA), marine elements of which cover a substantial area of intertidal habitats and nearshore waters, subtidal sandbanks and biogenic reef, including Sabellaria reefs and mussel beds. Sabellaria reefs are included on the UK BAP Priority Habitat list and The Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR) list of threatened and/or declining species and habitats. Sabellaria reefs are also designated as an Annex I Habitat under the EU Habitats Directive. No Sabellaria reefs have been mapped within the benthic ecology study area EMODnet (2025).

20.7 Fish and Shellfish Ecology

20.7.1 A review of available data in the fish and shellfish ecology study area shows that the area is known to host a wide range of pelagic and demersal fish populations which occupy both inshore and offshore waters, depending on the species, season and life stage. Spawning and nursey data from Coull et al. (1998) and Ellis et al. (2012) show that several species have spawning and nursey areas that coincide with the fish and shellfish ecology study area (Table 20.3).

Table 20.3 Fish and Elasmobranch Species Spawning and Nursery Grounds within the Fish and Shellfish Ecology Study Area

Common Name	Species	Spawning	Nursery
Anglerfish	*Lophius piscatorius*	N/A	Low intensity
Blue whiting	*Micromesistius poutassou*	N/A	Low intensity

Common Name	Species	Spawning	Nursery
Cod	*Gadus morhua*	Low intensity	High and low intensity
Herring	*Clupea harengus*	Undefined intensity	High and low intensity
Lemon sole	*Microstomus kitt*	Undefined intensity	Undefined intensity
Mackerel	*Scomber scombrus*	N/A	Low intensity
Plaice	*Pleuronectes platessa*	High intensity	Low intensity
Sandeel	*Ammodytidae*	Low intensity	Low intensity
Sole	*Solea solea*	Low intensity	Low intensity
Sprat	*Sprattus sprattus*	Undefined intensity	Undefined intensity
Spurdog	*Squalus acanthias*	N/A	Low intensity
Thornback ray	*Raja clavata*	N/A	Low intensity
Whiting	*Merlangius merlangus*	N/A	High and low intensity

20.7.2 Additionally, elasmobranch species that have been recorded within the fish and shellfish ecology study area during four research cruises between 1965 and 2005 by Daan et al. (2005) are listed in Table 20.4.

Table 20.4 Elasmobranch Species Recorded within the Fish and Shellfish Ecology Study Area

Common Name	Species
School shark	*Galeorhinus gaelus*
Small-spotted catshark	*Scyliorhinus canicular*
Smooth-hound sp.	*Mustelus* sp.
Thorny skate	*Amblyraja radiata*
Cuckoo ray	*Leucoraja naevus*
Common skate	*Dipturus batis*
Spotted ray	*Raja montagui*

20.7.3 Of the fish species which potentially occur within the fish and shellfish ecology study area, anglerfish, blue whiting, cod, herring, mackerel, plaice, sandeel, sole, spurdog, whiting and common skate are included within the UK Biodiversity Action Plan (BAP) priority species list. The International Union for Conservation of Nature (ICUN) lists common skate as critically endangered, cod, spurdog and thorny skate as vulnerable, and Thornback ray as near threatened. OSPAR lists cod, common skate, spotted ray, thornback ray and spurdog on the list of threatened and/or declining species and habitats.

20.7.4 The Humber Estuary SAC, which is approximately 6 km from the Proposed Development, is the only protected area with a qualifying feature Annex II fish species (sea lamprey Petromyzon marinus) within the fish and shellfish ecology study area.

20.8 Marine Mammals

20.8.1 Marine mammals in UK waters comprise cetaceans (dolphins, whales and porpoises) and pinnipeds (seals). Cetaceans have the potential to range widely, with some undertaking large-scale seasonal migrations to other parts of Europe or the rest of the world. The species of cetaceans and pinnipeds present in the marine mammal study area will be based on habitat preferences and fine-scale distribution.

20.8.2 Regularly occurring cetaceans in the central and southern North Sea within the marine mammal study area include the harbour porpoise Phocoena phocena, white-beaked dolphin Lagenorhynchus albirostris, and minke whale Balaenoptera acutorostrata (Das, 2003, Reid et al., 2003). Occasional or rare species include common bottlenose dolphin Tursiops truncatus and the Atlantic white-sided dolphin Lagenorhynchus acutus (Reid et al., 2003). Data indicates that the most likely species to be present in the vicinity of the Proposed Development is the harbour porpoise with persistent high-density winter, and possibly high-density summer areas falling within the marine mammal benthic ecology study area (Heinänen and Skov, 2015).

20.8.3 Two species of seals (grey seal Halichoerus gryphus and harbour (common) seal Phoca vitulina) are found within the costal and inshore waters of the marine mammal study area (Das, 2003, SMRU, 2025). Seal tracking data recorded by Carter et al. (2022) indicates that both seal species are likely to be within the vicinity of the Proposed Development.

20.8.4 Of the marine mammal species which potentially occur in the marine mammal study area, harbour porpoise, white-beaked dolphin, minke whale, common bottlenose dolphin and harbour seal are included within the UK BAP priority species list. OSPAR lists harbour porpoise on the list of threatened and/or declining species and habitats.

20.8.5 Within the marine mammal study area, there are two SACs designated for marine mammal features; The Wash and North Norfolk Coast SAC, which is designated for harbour (common) seal and the Southern North Sea SAC, which is designated for harbour porpoise. These sites are approximately 9 km and 39 km from the Proposed Development, respectively. Additionally, the Humber Estuary SAC has grey seal present as a qualifying feature Annex II species (but not a primary reason for site selection) and is approximately 6 km from the Proposed Development.

20.9 Approach to Assessment

20.9.1 Potential impacts of the Proposed Development on identified IEFs will be assessed in accordance with the CIEEM Guidelines for Ecological Impact Assessment (CIEEM, 2024).

20.9.2 Where significant adverse effects of the Proposed Development are likely to occur to important ecology features, suitable mitigation or compensatory measures will be identified. Embedded mitigation measures would be taken into account within the assessment and residual effects determined.

20.9.3 A separate Habitats Regulations Assessment (HRA) will be undertaken to examine the likely significant effects of the Proposed Development on internationally designated sites (i.e. SACs, SPAs and Ramsar sites).

20.10 Assessment Criteria

20.10.1 Assessing the significance of effects on ecological features is a staged process, drawing on CIEEM Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2024).

20.10.2 The approach is to:

- identify IEFs (i.e. designated sites, habitats, species or ecosystems) which may be impacted;
- provide a scientifically rigorous and transparent assessment of the likely ecological impacts and resultant effects of the Proposed Development. Impacts and effects may be beneficial (i.e. positive) or adverse (i.e. negative);
- facilitate scientifically rigorous and transparent determination of the consequences of the Proposed Development in terms of national, regional and local policies relevant to nature conservation and biodiversity, where the level of detail provided is proportionate to the scale of the development and the complexity of its potential impacts; and
- set out what steps would be taken to adhere to legal requirements relating to the relevant ecological features concerned.

20.10.3 IEFs that could be affected by the construction and operation of the Proposed Development will be identified from the marine ecology and biodiversity baseline. IEFs will be assigned a geographic level of importance based on their conservation status, population / assemblage trends and other relevant criteria.

20.10.4 Potential impacts from the Proposed Development will be identified and characterised (e.g., extent, magnitude, duration, reversibility, timing and frequency).

20.11 Magnitude of Impact

20.11.1 The criteria to be used for defining the magnitude of impacts on ecology and biodiversity receptors is provided in Table 20.5 below.

Table 20.5: Impact Magnitude Criteria

Magnitude of Impact	Definition
High	A change in the size or extent of distribution of the habitat or the species (flora or fauna) population that is the interest feature of a specific protected site that is predicted to irreversibly alter the population in the short to long term and to alter the long-term viability of the population and/or the integrity of the protected site. Impacts felt long-term. Impacts predicted to be reversed in the long-term (i.e. more than five years) following cessation of the project activity.
Medium	A change in the size or extent of distribution of the habitat or the species population (flora or fauna) that is the interest feature of a specific protected site that occurs in the short and long-term, but which is not predicted to alter the long-term viability of the population and/or the integrity of the protected site. Impacts felt medium to long term. Impacts predicted to be reversed in the medium-term (i.e., no more than five years) following cessation of the project activity.
Low	A change in the size or extent of distribution of the habitat or the species population (flora or fauna) that is the interest feature of a specific protected site that is sufficiently small-scale or of short duration to cause no long-term harm to the feature/population. Impacts present for a short to medium duration. Impacts predicted to be reversed in the short-term (i.e., no more than one year) following cessation of the project activity.
Negligible	Very slight change of the habitat or the species population (flora or fauna) that is the interest feature of a specific protected site. Impacts present for a

Magnitude of Impact	Definition
	short duration. Impacts predicted to be reversed rapidly (i.e., no more than circa six months) following cessation of the project related activity.
No change	No loss or alteration of species (flora or fauna) characteristics, features, or elements; no observable impact either adverse or beneficial.

20.12 Sensitivity of Receptors

20.12.1 The criteria to be used for defining the geographical value and the sensitivity of ecology and biodiversity receptors is provided in Table 20.6 below.

Table 20.6: Ecological Value (Sensitivity) Criteria

Ecological Value (Sensitivity)	Definition
International/ European (Very High)	Habitats or species that have high or very high conservation importance, high vulnerability to impact and have no ability to recover. Habitats or species that have very high conservation importance, high vulnerability to impact and have low recoverability.
National (High)	Habitats or species that have high or very high conservation importance, medium or high vulnerability to impact and has medium recoverability. Habitats or species that have high conservation importance, medium vulnerability to impact and has low recoverability. Habitats or species that have medium conservation importance, high vulnerability to impact and has low recoverability.
Regional/ County (Medium)	Habitats or species that have medium conservation importance within the regional/ county context (Lincolnshire/ North East Lincolnshire), low vulnerability to impact and has low to medium recoverability. Habitats or species that have medium conservation importance, low, medium, or high vulnerability to impact and has medium recoverability.
Local (Low)	Habitats or species that have low conservation importance within the local context (Theddlethorpe/ Mablethorpe), low vulnerability to impact and high recoverability. Habitats or species that have low conservation importance, medium or high vulnerability to impact and medium or high recoverability.
Site (Negligible)	Habitats or species that have low conservation importance within the Site context, low vulnerability to impact and medium or high recoverability. Habitats or species that are not vulnerable to impacts.

20.13 Significance of Effect

20.13.1 The significance of the effect upon marine ecology and biodiversity receptors will be determined by taking into account the sensitivity of the receptor and the magnitude of the impact and is based upon expert judgement. A matrix-based approach is not used in accordance with CIEEM guidance (CIEEM, 2024).

20.13.2 For the purpose of this assessment, any effects with a significance level of moderate or above will be considered to be significant in terms of the EIA Regulations. Where the magnitude of impact is 'no change', no effect would arise.

20.14 Temporal Scope

20.14.1 The assessment will cover the construction and operational phases. Decommissioning impacts are reasonably anticipated to be similar to those during construction, and therefore a specific assessment of decommissioning impacts will not be undertaken.

20.15 Embedded Mitigation and Enhancement Measures

20.15.1 The following measures adopted as part of the Proposed Development are relevant to the assessment for marine ecology and biodiversity. These measures may evolve (and be further clarified) as the design and EIA process progresses:

- The seawater intake and outlet pipeline will be subsurface and installed via Horizontal Directional Drilling (HDD) until out past the Mean Low Water Spring (MLWS) in order to avoid impacts associated with trenching across the foreshore on marine habitats and species.
- The use of a Marine Mammal Observers (MMOs), pre-watch survey and exclusion zone to reduce the risk of underwater noise associated with the construction of the intake and outfall on marine mammals.
- Vessel Management Plan which will include a code of conduct for vessel operators which will manage vessel speed, and routes to reduce the risk of collision with marine mammals.

20.16 Scope of Environmental Impacts and Effects

20.16.1 A range of potential impacts on marine ecology and biodiversity have been identified which may occur during the construction and operation phases of the Proposed Development.

20.16.2 Future decommissioning would not reasonably result in any impacts on sensitive ecological features other than those identified for construction, and therefore a separate assessment of decommissioning impacts will not be undertaken.

20.16.3 The impacts that have been scoped in to, or out of, the assessment are outlined in Table 20.7 and Table 20.8, respectively, together with justification.

Table 20.7 Marine Ecology and Biodiversity Impacts Proposed to be Scoped into the EIA

Potential Effect	Justification (Including Consideration of Embedded Mitigation Measures)
Construction: Benthic Ecology	
Temporary habitat loss/disturbance	Temporary habitat loss and/or disturbance to benthic subtidal communities will be limited by the Proposed Development's design including HDD installation for the outfall and intake. This method significantly reduces the footprint of seabed disturbance. Nonetheless, a small area of subtidal seabed will be temporarily disturbed during activities such as HDD breakout and installation of any pipeline protection.

Potential Effect	Justification (Including Consideration of Embedded Mitigation Measures)
Long term habitat loss/disturbance	The installation of permanent infrastructure associated with the seawater intake and brine outfall will result in long term loss of subtidal habitat, where seabed is replaced by artificial hard substrate. This infrastructure is likely to be in the form of mattress protection, with the amount/extent of seabed loss currently unknown. While the overall footprint is likely to be relatively small, these structures will alter the physical characteristics of the seabed and may lead to changes in the associated benthic communities.
Construction: Fish and Shellfish Ecology	
Effects associated with underwater noise emissions from construction of intake and outfall infrastructure on fish (including larvae)	Activities such as HDD involved in the construction of the intake and outfall have the potential to generate underwater noise, which may result in effects (including auditory injury and disturbance) on fish receptors within the fish and shellfish ecology study area.
Temporary habitat loss/disturbance	As for Benthic Ecology.
Long term habitat loss/disturbance	As for Benthic Ecology.
Construction: Marine Mammals	
Effects associated with underwater noise emissions from construction of intake and outfall infrastructure	Activities such as HDD involved in the construction of the intake and outfall have the potential to generate underwater noise, which may result in effects (including auditory injury and disturbance) on marine mammal receptors within the marine mammal study area. Mitigation measures will be applied to reduce these risks (e.g. the use of a MMO, pre-watch survey and exclusion zones).
Increased underwater noise from vessels	There will be limited vessel traffic associated with the Proposed Development during construction. Until details are known, this impact is scoped in on a precautionary basis.
Increased vessel activity which may result in collision risk	Potential increased vessel traffic during the construction phase has the potential to increase the risk of collisions with marine mammals. Although there is only expected to be only a minor uplift in vessel numbers associated with the Proposed Development, this impact is scoped in on a precautionary basis. Mitigation measures including a Vessel Management Plan will include a code of conduct for vessel operators which will manage vessel speed, and routes will reduce any risk of this impact to negligible. However, until details of specific vessels to be used are known, this impact is scoped in on a precautionary basis.
Changes to prey availability	Changes in prey abundance and distribution during construction phase may have an indirect impact on marine mammals. Therefore, this impact is scoped in on a precautionary basis.
Operation: Benthic Ecology	

Potential Effect	Justification (Including Consideration of Embedded Mitigation Measures)
Effects associated with the discharge of brine during operation of the outfall	Brine discharge is expected to cause localised increases in salinity. Increased salinity may affect osmoregulation in subtidal benthic fauna. Modelling will be performed to predict the extent of the impact, which will be used in the assessment.
Long term habitat loss/disturbance	The installation of permanent infrastructure associated with the seawater intake and brine outfall will result in long term loss of subtidal habitat, where seabed is replaced by artificial hard substrate. This infrastructure is likely to be in the form of mattress protection, with the amount/extent of seabed loss currently unknown. While the overall footprint is likely to be relatively small, these structures will alter the physical characteristics of the seabed and may lead to changes in the associated benthic communities.
Introduction and colonisation of hard structures	The installation of anthropogenic structures will represent a change from sedimentary to hard substrate, which is expected to be colonised by a range of hard substrate species. This is expected to result in a change of species composition and potentially a localised increase in biodiversity.
Operation: Fish and Shellfish Ecology	
Effects from entrainment and impingement associated with the operation of the intake structure	Fish and some shellfish are free-moving receptors that could be found within range of the intake structure, and therefore an impact–receptor pathway exists. Depending on the intake velocity and size of individuals, many may be able to avoid impingement and entrainment, however smaller individuals may be entrained into the intake pipe or impinged against the mesh screen.
Effects associated with the discharge of brine during operation of the outfall	As for Benthic Ecology
Long term habitat loss/disturbance	As for Benthic Ecology
Operation: Marine Mammals	
Changes to prey availability	Changes in prey abundance and distribution during operational phase may have an indirect impact on marine mammals. Therefore, this impact is scoped in on a precautionary basis.

Table 20.8 Marine Ecology and Biodiversity Impacts Proposed to be Scoped out of the EIA

Potential Effect and Receptor	Justification (Including Consideration of Embedded Mitigation Measures)
Construction: Benthic Ecology	

Potential Effect and Receptor	Justification (Including Consideration of Embedded Mitigation Measures)
All impacts to benthic intertidal ecology	Intertidal benthic habitats have been scoped out of further assessment due to the avoidance of impact through the Proposed Development design and outfall distance of approximately 0.66 km from MLWS. The use of HDD ensures that no construction activities will occur within the intertidal zone. As a result, no physical disturbance or habitat loss is anticipated in this area.
Effects associated with the discharge of brine during operation of the outfall	Salinity effects are scoped out for the construction phase as no brine is discharged during this period, only during the operational phase. Therefore, there is no pathway for salinity-related impacts on benthic subtidal receptors during construction.
Increased Suspended Sediment Concentrations (SSCs) and associated deposition	Activities such as HDD punchout are expected to generate sediment plumes, resulting in temporary and localised increases in SSCs and subsequent deposition. However, given the short-term and spatially limited nature of these effects during the construction phase, potential impacts to subtidal benthic receptors are considered negligible and have therefore been scoped out of further assessment.
Resuspension of contaminated sediments	This effect is closely linked to increases in SSCs. The level of sediment resuspension expected during construction is limited and temporary. Therefore, this effect has been scoped out of further assessment.
Increased risk of introduction and spread of Invasive Non-Native Species (INNS)	Vessel movements during the construction present a recognised vector for the introduction and spread of INNS. Transfer mechanisms include hull fouling, ballast water discharge, and equipment contamination. Additionally, the installation of artificial hard structures (e.g. intake and outfall infrastructures) introduce novel substrates that may facilitate colonisation and establishment of INNS. Adherence to the International Maritime Organization (IMO) biofouling guidelines, compliance with available guidelines on mitigating the introduction and spread of INNS, alongside adherence to standard protocols embedded within the Environmental Management Plan (EMP) will collectively minimise the risk of INNS introduction and spread. Therefore, this impact has been scoped out of further assessment.
Introduction and colonisation of hard structures	While anthropogenic hard structures (e.g. intake and outfall infrastructure) will be introduced during construction, colonisation by marine organisms will occur gradually over time. As such, this effect is only anticipated during the operational phase and is therefore scoped out for the construction phase.
Accidental pollution during construction	There is a risk of accidental pollution from vessels and equipment during construction. This risk will be minimised through the use of good industry practice for vessels and the application of relevant guidelines for the prevention of pollution at sea (such as those from the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention), International Maritime Organisation (IMO), and the International Convention for the Prevention of Pollution from Ships (MARPOL)). Thus, it is unlikely that accidental pollution will occur.

Potential Effect and Receptor	Justification (Including Consideration of Embedded Mitigation Measures)
Effect of heat from brine discharge	This effect is scoped out for the construction phase, there is no expected thermal increase of discharged brine and no brine is discharge during this period. Therefore, there is no potential pathway for thermal effects on benthic receptors.
Effects from entrainment and impingement associated with the operation of the intake structure	The intake will not be operational during construction, therefore no impact-receptor pathway for further assessment.
Construction: Fish and Shellfish Ecology	
Effects on shellfish receptors associated with underwater noise emissions from construction of the intake and outfall infrastructure	No impact-receptor pathway and therefore scoped out from further assessment.
Effects from entrainment and impingement associated with the operation of the intake structure	The intake is not operational during the construction phase, therefore there is no impact-receptor pathway, and this impact is scoped out for the construction phase.
Effects associated with the discharge of brine during operation of the outfall	As for Benthic Ecology
Effect of heat from brine discharge	As for Benthic Ecology
Increases in SSCs and associated sediment deposition	As for Benthic Ecology
Resuspension of sediment-bound contaminants	As for Benthic Ecology
Increased risk of introduction and spread of INNS	As for Benthic Ecology
Introduction and colonisation of hard structures	The introduction of anthropogenic hard structures on the seabed will represent a change from sedimentary to hard substrate, which is expected to be colonised by hard substrate benthic species and therefore a change in species composition. However, the effect is considered negligible for fish and shellfish receptors due to the small scale of habitat change and the availability of extensive alternative habitat in the surrounding area. Therefore, this impact is scoped from further assessment.

Potential Effect and Receptor	Justification (Including Consideration of Embedded Mitigation Measures)
Accidental pollution during construction	As for Benthic Ecology
Construction: Marine Mammals	
Effects on marine ecology receptors associated with the discharge of brine during operation of the outfall	As for Benthic Ecology
Effects on marine mammal receptors from entrainment and impingement associated with the operation of intake	The intake is not operational during the construction phase, therefore there is no impact-receptor pathway, and this impact is scoped out for the construction phase.
Disturbance to seal haul-out sites	The closest seal haul-out sites are found at Donna Nook. This is approximately 26 km north of the Proposed Development and therefore no potential for disturbance and this impact has been scoped out from further assessment.
Increases in SSCs and associated sediment deposition	As for Benthic Ecology
Accidental pollution during construction	As for Benthic Ecology
Operation: Benthic Ecology	
All impacts associated with benthic intertidal ecology	Intertidal benthic habitats have been scoped out of further assessment due to the avoidance of impact through the Proposed Development design and outfall distance of approximately 0.66 km from MLWS. The use of HDD ensure that no construction activities will occur within the intertidal zone. As a result, no physical disturbance or habitat loss is anticipated in this area.
Temporary habitat loss/disturbance	There will be no further temporary habitat loss and/or disturbance during the operation phase, therefore this effect is scoped out.
Increased SSCs and associated deposition	No activities during the operational phase are expected to cause significant increases in SSCs and this impact has therefore been scoped out of further assessment.
Resuspension of contaminated sediments	This effect is closely linked to increases in SSCs. During the operational phase, no activities are proposed that would cause significant sediment resuspension. As such, the potential for resuspension of sediment-bound contaminants is considered negligible. Therefore, this effect has been scoped out for the operation phase.

Potential Effect and Receptor	Justification (Including Consideration of Embedded Mitigation Measures)
Increased risk of introduction and spreads of INNS	As for the construction phase.
Effect of heat from brine discharge Receptor: Benthic Subtidal Ecology	This effect is scoped out for the operation phase as the temperature of the returned brine will not be elevated beyond that of the surrounding seawater. Therefore, there is no potential pathway for thermal effects on benthic receptors.
Effects on benthic receptors from entrainment and impingement associated with the operation of intake	Sessile communities therefore no impact-receptor pathway for further assessment.
Operation: Fish and Shellfish Ecology	
Effects associated with underwater noise emissions from construction of intake and outfall infrastructure	There is no expected significant underwater noise generated during the operational phase of the Proposed Development. No impact-receptor pathway for shellfish. Therefore, this effect is scoped out for further assessment.
Temporary habitat loss/disturbance Receptor: Fish and Shellfish Ecology	As for Benthic Ecology
Increases in SSCs and associated sediment deposition	As for Benthic Ecology
Resuspension of sediment-bound contaminants	As for Benthic Ecology
Increased risk of introduction and spread of INNS	As for Benthic Ecology construction phase.
Introduction and colonisation of hard structures	As for construction phase.
Operation: Marine Mammals	
Increased underwater noise from vessels	During the operational phase there will be occasional ongoing visits to and from the site (e.g. for site inspections). However, there will be only a very minor uplift in vessel numbers associated with the Proposed Development, resulting in a negligible risk of this impact.

Potential Effect and Receptor	Justification (Including Consideration of Embedded Mitigation Measures)
Increased vessel activity which may result in collision risk	Potential increased vessel traffic during all phases of the Proposed Development has the potential to increase the risk of collisions with marine mammals. However, there is expected to only be a minor uplift in vessel numbers associated with the Proposed Development. Mitigation measures including a Vessel Management Plan will include a code of conduct for vessel operators which will manage vessel speed, and routes will reduce any risk of this impact to negligible.
Effects on marine ecology receptors associated with the discharge of brine during operation of the outfall	Modelling to confirm the dispersion of brine will be performed, but it is expected to be over a small area in comparison to the habitat available to marine mammals. Marine mammals are highly mobile and so can easily move away. It is unlikely this impact will pose any adverse impacts to marine mammal receptors. As such, this impact has been scoped out of further assessment.
Underwater noise emissions from construction and operation of intake and outfall	There is likely no significant underwater noise generated during the operational phase of the Proposed Development. Therefore, this effect is scoped out for further assessment.
Effects on marine mammal receptors from entrainment and impingement associated with the operation of intake	Marine mammals are large receptors and as such will not be susceptible to entrainment. Their size and swim speed reduces the likelihood of impingement, making it negligible. As such, this impact has been scoped out of further assessment.
Disturbance to seal haul-out sites	The closest seal haul-out sites are found at Donna Nook. This is approximately 26 km north of the Proposed Development and therefore there is no potential for disturbance and this impact has been scoped out from further assessment.
Increases in SSCs and associated sediment deposition	As for Benthic Ecology

20.17 Inter-related Effects

20.17.1 The following sections of this EIA Scoping Report are also of relevance to the assessment of marine ecology and biodiversity and will be considered within an inter-related effects chapter:

- Chapter 11: Water environment; and
- Chapter 19: Climate change

20.18 Cumulative Effects

20.18.1 The effects of the proposal will be considered cumulatively with relevant developments in the vicinity in consideration of shared sensitive receptors across projects.

20.19 Summary of Proposed Scope

20.19.1 This scoping exercise has identified the key marine receptors (benthic ecology, fish and shellfish ecology and marine mammals) within the relevant study areas for the Proposed Development.

20.19.2 A range of potential impacts on the marine ecology receptors were identified, which could occur during the construction and operation of the Proposed Development. Potentially significant effects which have been scoped in for assessment are as follows:

- Effect on marine ecology receptors (benthic ecology and fish and shellfish ecology) from temporary and long term habitat loss and/or disturbance;
- Effects on marine ecology receptors (fish ecology including fish larvae and marine mammals) associated with underwater noise emissions from construction of intake and outfall infrastructure;
- Effects on marine mammals from increased noise from vessels;
- Effects on marine mammals from increased vessel activity which may result in a collision risk;
- Effects on marine ecology receptors (benthic ecology and fish and shellfish ecology) associated with the discharge of brine during operation of the outfall;
- Effects on benthic subtidal ecology associated with the introduction and colonisation of hard structures;
- Effects on fish and shellfish ecology from entrainment and impingement associated with the operation of the intake structure; and
- Effects on marine mammals from changes to prey availability.

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21 Other Environmental Topics

21.1.1 The aim of the scoping stage is to focus the EIA on those environmental aspects that may be significantly affected by the Scheme. The following sections provide a summary of other environmental topics which have not been covered in the previous assessment chapters but have been considered during the preparation of this Scoping Report.

21.1.2 An initial review has determined that the effects associated with these topics will not be significant and so it is proposed to scope these topics out of detailed assessment within the ES.

21.2 Light

21.2.1 Lighting will be required during the construction and operation stages of the Proposed Development would be designed to reduce unnecessary light spill outside of the Site boundary, in accordance with a lighting strategy that will accompany the Application for development consent. Potential disturbance of habitats and protected species through lighting impacts will be considered during construction, operation and decommissioning of the Proposed Development and mitigated through design where possible.

21.2.2 The Civil Aviation Authority will be consulted to review the lighting requirements for the proposed stacks.

21.3 Arboriculture

21.3.1 No significant effects on arboriculture have been identified or are predicted likely at this stage. Further separate assessment is proposed to be scoped out of the EIA.

21.4 Radiation

21.4.1 This Scoping Report has considered the International Commission on Non-Ionizing Radiation Protection (ICNIRP) guidelines published in 1998 (Ref 1). Assumptions were made regarding the type of infrastructure that is to be implemented as part of the Proposed Development.

21.4.2 Electromagnetic Fields (EMF) are associated with the generation, transmission, distribution and use of electricity. In the instance of the Proposed Development the most likely source of EMFs will be the underground cables and associated infrastructure connecting the Proposed Development to the National Grid. EMFs and non-ionising radiation will be assessed within the EIA as part of the population and health chapter, a separate assessment on radiation is therefore proposed to be scoped out of the EIA.

21.5 Heat

21.5.1 The process of combustion and operation of thermal equipment will produce excess heat beyond that which is necessary to power the turbines. This excess heat will require cooling during operation. The BESS facilities and the flexible thermal generation facility will have cooling systems exchanging heat to air, as described in the Project Description. There are several cooling system technology choices available and further details will be determined through the EIA process and provided in the application. Noise and energy consumption impacts of the cooling systems will be assessed in the EIA.

21.5.2 The underground electricity cables will cause very localised heating of the trench fill material and soil immediately above and adjoining. This is ordinarily very minor and does not prevent agricultural use. Any heating impact on soils, agriculture and habitat will be assessed in the respective topic chapters.

21.5.3 No other significant effects from heat are considered likely and further separate assessment is proposed to be scoped out of the EIA.

21.6 Waste and Materials

21.6.1 Waste is defined as per the Waste Framework Directive (2008/98/EC) as *"any substance or object which the holder discards or intends or is required to discard"* and this definition is transposed into law in England and Wales by The Waste (England and Wales) Regulations 2011.

21.6.2 Waste will be generated during the construction of the Proposed Development, and subsequently during operation and maintenance. Materials will be required for the construction of the Proposed Development.

21.6.3 The generation of waste during construction, operation and decommissioning of the Proposed Development has the potential to cause impacts on the capacity of the waste infrastructure in the region.

21.6.4 As a producer of waste, the Applicant has a Duty of Care to ensure that its waste is managed effectively and in full compliance with applicable regulations and guidance. The EIA Regulations require an estimate, by type and quantity, of expected residues and emissions including quantities and types of waste produced during the construction and operation phases, where relevant. Such information will be provided including:

- proposals for maintaining a materials balance of cut and fill volumes;
- compliance with the waste hierarchy (e.g. with respect to re-use, recycling or recovery before disposal; and
- impacts on relevant plans and policies (waste and materials) including available landfill capacity of the region.

21.6.5 It is proposed that information on types and quantities of waste will be provided in the ES, and measures included in the Framework CEMP to manage construction waste in accordance with the waste hierarchy. On this basis, it is proposed that a standalone chapter will not be provided and will be scoped out of the ES.

21.7 Major Accidents and Disasters

21.7.1 The EIA Regulations (Schedule 4 paragraph 8) requires that the ES includes a description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and / or disasters which are relevant to the project concerned. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.

21.7.2 It is recognised that disasters can occur as a result of both natural disasters, such as: sea level rise, earthquakes or flood events; or through human intervention e.g., conflict and war, political influences etc.

21.7.3 In relation to major accidents the EIA Regulations refer to Directive 2012/18/EU (the control of major-accident hazards involving dangerous substances). This directive defines major accidents as:

> *"an occurrence such as a major emission, fire, or explosion resulting from uncontrolled developments in the course of the operation of any establishment covered by this Directive,*

and leading to serious danger to human health or the environment, immediate or delayed, inside or outside the establishment, and involving one or more dangerous substances."

21.7.4 The Scheme is located within a politically, geologically, and meteorologically stable part of Europe. Accordingly, the Scheme is not at material risk from, for example, civil unrest, war, earthquakes, or extreme weather conditions (hurricanes etc.).

21.7.5 In terms of any vulnerabilities specific in this location (i.e., on the Site) small sections of the Site lie within an area of flood risk (Flood Zone 3) and implications through sea level rise. The Water Environment Chapter describes how a Flood Risk Assessment will be undertaken to ensure that the Scheme is designed to ensure that critical components of infrastructure would not be affected by extreme flood events and that the Scheme will not exacerbate flood risk elsewhere.

21.7.6 The Site is crossed by a number of utilities, the location of these are being taken into consideration through the design development process, including account of easement and separation distances required to be maintained by the owners and operators of the various infrastructure. The buffers are designed to safeguard the utilities that cross the Site from damage or disruption. Where necessary safe working practices with the utility operators will be agreed prior to undertaking works. All works would be undertaken in accordance with the Health and Safety at Work Act 1974, Safety at Work Regulations 1999, CDM Regulations 2015 and the Pipelines Safety Regulations 1996. Based on the proposed approach to the design and the mitigation that would be implemented during construction, there would not be a significant likelihood of damage to the utilities at the Site.

21.7.7 The electrical infrastructure, in the form of inverters, transformers and cabling, would be subject to regular routine maintenance and inspection such that it will not pose a significant risk to creating an accident.

21.7.8 Risks specific to the thermal element of the project will be considered within the ERA accompanying the Environmental Permit application; this includes accidental releases associated with the CCP and/or those associated with the transport and storage of fuel for a hydrogen fired gas turbine.

21.7.9 In addition, it is likely that the amounts of process chemicals/ substances that may be stored on-site will trigger the need for the Proposed Development to accord with the Control of Major Accident Hazards Regulations 2015 (COMAH) for which, depending upon the nature of the potential hazard, the following documents may be required in the form of a major accident prevention policy (MAPP) and/ or a Safety Report.

21.7.10 In light of the above, it is considered that the risks of major accidents is suitably assessed, regulated and controlled by other legislative frameworks, therefore, the assessment of major accidents is not proposed for specific assessment within the EIA. However, accidental events such as the potential for fuel spillages and abnormal air emissions, and how the risk of these events will be minimised, will be discussed in the relevant chapters of the ES. Accidental events will be covered by a brief risk assessment in the ES, which will include reference to the Applicant's overarching principles of emergency management.

21.7.11 The assessment will encompass a screening of major accident events, but also natural events (disasters) that could meet the definition of a major accident for the purposes of the EIA Regulations, (e.g. events arising from natural sources such as extreme weather (storm, flood, temperature) and ground-related hazard events (subsidence, landslide, earthquake). Where risks are identified that have the potential to result in a significant adverse effect on an environmental receptor, design mitigation necessary to reduce the risk to as low as reasonably practicable shall be identified.

21.7.12 The risk of contamination in light of an accident is considered within the Ground Conditions Chapter.

21.8 Aviation

21.8.1 It is proposed to scope out impacts on aviation based on the height of the stacks and buildings associated with the Proposed Development as these are anticipated to be comparable to the heights of structures and stacks consented within the region such as the Keadby Power Stations. On this basis, the Applicant considers that a stand-alone chapter is not required.

21.8.2 The Civil Aviation Authority (CAA) will however be consulted on the Proposed Development to review any requirements for aviation lighting on the stack(s)and enable the Proposed Development to be charted in future. Should taller stacks or cranes be required than currently expected the need for an aviation assessment will be reviewed accordingly.

22 Summary and Conclusion

22.1.1 This Scoping Report presents the proposed scope and approach to undertaking EIA for the Proposed Development, representing a request under the EIA Regulations for a Scoping Opinion to be provided. More detail and an explanation of the proposed approach to the assessment of each topic is provided within the various chapters of this report.

22.1.2 The remainder of this chapter presents scoped-in and scoped out matters for future assessment and to inform scoping, on topic-by-topic basis, including tables which provide the impact pathways that are proposed to be scoped in to the EIA for further assessment.

Landscape

22.1.3 Landscape and visual will be a topic included in the EIA. Table 22.1 provides those landscape and visual matters proposed to be scoped in to the EIA. Table 22.2 provides those landscape and visual matters proposed to be scoped out of the EIA.

Table 22.1: Summary of Landscape and Visual matters proposed to be scoped in to EIA

Potential Impact Pathway	Justification
Construction	
Loss of landscape features due to construction	Loss of features can affect landscape character and the extent of visibility across a landscape.
Temporary landscape and visual effects associated with the construction processes, e.g. cranes, plant and machinery, vehicle movements, stockpiled materials. Construction activities associated with the laying of underground cable	Typically a facility is more visually intrusive during construction than a completed project.
Temporary landscape and visual effects arising from the contractor's compound.	For a project of this size the contractor's compound is likely to be significant in size and the offices, machinery and stockpiled materials within it.
Potential cumulative effects with other projects.	Projects being constructed at the same time can result in cumulative landscape and visual effects.
Operation	
Permanent effect on landscape character areas due to the introduction of new features.	It is a largely rural landscape and so the introduction of new industrial facilities is likely to influence the landscape character of the Site and surrounding LCA.
Permanent visual effects to sensitive receptors.	The facilities will introduce new visible industrial facilities within the landscape, visible from a range of receptors including residents, travellers and tourists.
Potential permanent visual effect on the setting of the Lincolnshire Wolds.	It is likely that aspects of the proposed facilities will be visible from distant but elevated ground within the National Landscape.

Potential effect on the visual setting of heritage assets.	It is likely that the proposed facilities will lie within the setting of some heritage assets.
Potential temporary visual effects associated from plumes generated by the facility.	Under certain occasional weather conditions the facility may generate visible plumes, for example when water vapour from the cooling system condenses, resulting in a temporary visual effect.
Mitigation and enhancement effects	Associated with any mitigating earthworks, habitat creation, tree and hedge planting.
Tranquillity	The Project has the potential to affect tranquillity both aurally and as a result of increased industrialisation.
Lighting effects in terms of the effect on the nightscape.	Certain aspects of the facilities will be lit and the effect of the number of light sources, intensity, colour and duration on the nightscape will be assessed.
Green Infrastructure	It is likely that the Project can contribute to green infrastructure and this will be assessed.
Potential cumulative effects with other projects.	Other schemes can have cumulative landscape and visual effects with the Project.

Table 22.2: Summary of Landscape and Visual matters proposed to be scoped out of EIA

Potential Impact Pathway	Justification
Construction	
None	All construction activities are likely to have landscape and visual effects.
Operation	
Residential Visual Amenity	A Residential Visual Amenity Assessment determines whether a Proposed Development has such a large visual impact on residents that the function of the property as a dwelling is compromised and so is contrary to public interest. At the thermal site the nearest dwelling is 400m distant and its setting is protected by tree cover planted to screen the adjacent former gas terminal and so it is considered that any visual effects will fall below the threshold. While there is a dwelling within 100m of the Strubby Airfield Site it is unlikely that any significant infrastructure will be located nearby due to a variety of constraints. If, however, a final scheme results in a potential effect on RVA then a study will be undertaken.
Landscape and visual affects along the cable corridor	The cables will be underground and so will have no landscape or visual effects.

Terrestrial Ecology and Biodiversity

22.1.4 Terrestrial ecology and biodiversity will be a topic included in the EIA. Table 22.3 provides those landscape and visual matters proposed to be scoped in to the EIA. Table 22.4 provides those landscape and visual matters proposed to be scoped out of the EIA.

Table 22.3: Summary of Terrestrial Ecology and Biodiversity matters proposed to be scoped in to EIA

Potential Impact Pathway	Justification
Construction	
Damage to designated sites	Temporary damage to qualifying and interest features through habitat loss, fragmentation, changes in air quality, changes in water quality and hydrological effects. Waterbird species associated with the nearby SPA/ Ramsars may utilise land within and adjacent to the construction zone ("functionally linked land") and may therefore be displaced.
Damage to UK Priority Habitats	Permanent and temporary damage through habitat loss, fragmentation, changes in air quality, changes in water quality and hydrological effects.
Permanent habitat loss/ damage and displacement of protected species.	Permanent loss of habitat supporting protected species. Displacement of protected species from habitats within footprint of permanent infrastructure (TES, BESS and project substation).
Temporary habitat loss/ damage and displacement of protected species.	Displacement of protected species from habitats temporarily impacted e.g. UGC route corridor and temporary construction laydown areas. Temporary damage to habitats supporting protected species due to changes in water quality and hydrological effects.
Killing/ injury and disturbance to protected species	Potential for killing, injury and disturbance to protected species in the absence of appropriate mitigation.
Noise and visual disturbance to protected species	Potential for disturbance and displacement of protected species from foraging, commuting and resting habitats e.g. badgers, bats, wintering/ passage waterbirds.
Changes in air quality	Emissions to air from construction traffic and non-mobile road machinery has the potential to adversely affect habitats supporting protected species.
Changes in water quality	Potential for accidental pollution to watercourses to adversely affect protected species that may be present e.g. water vole, otter.

Changes in hydrology	Potential for hydrological effects to habitats within the zone of influence of construction activities.
Operation	
Damage to designated sites as a result of changes in air quality	Potential for damage to sensitive habitats as a result of stack emissions from the operational thermal facility.
Permanent displacement of protected species and long-term habitat fragmentation/ isolation	Protected species would be permanently displaced from areas in which permanent operational infrastructure is located.
Noise and visual disturbance to protected species	Potential for disturbance and displacement of protected species from foraging, commuting and resting habitats e.g. badgers, bats, wintering/ passage waterbirds in the vicinity of permanent operational infrastructure.

Table 22.4: Summary of Terrestrial Ecology and Biodiversity matters proposed to be scoped out of EIA

Potential Impact Pathway	Justification
Construction	
Direct impacts on designated sites	There is no potential for direct impacts to habitats within designated sites, as they are all located outside the Proposed Development boundary.
Permanent and temporary loss of agricultural land	Habitats are of low ecological value and would be mostly reinstated post-construction (with the exception of the location of permanent infrastructure associated with the TES, BESS and project substation).
Fugitive dust emissions during site clearance activities resulting in smothering of vegetation	This will be controlled through the implementation of the CEMP, and no smothering of habitats is therefore likely to occur.
Operation	
Noise and visual disturbance from BESS and UGC	Limited to occasional repair and maintenance activities that would be short-term, infrequent and small in scale.

Archaeology and Heritage

22.1.5 Archaeology and heritage will be a topic included in the EIA. Table 22.5 provides those archaeology and heritage matters proposed to be scoped in to the EIA. Table 22.6 provides those archaeology and heritage matters proposed to be scoped out of the EIA.

Table 22.5: Summary of Archaeology and Heritage matters proposed to be scoped in to EIA

Potential Impact Pathway	Justification
Construction	

Groundworks – including excavation of foundations, services and landscaping	All groundworks will have the potential to encounter and destroy sub-surface archaeology, especially in proximity to the Scheduled Monument.
Operation	
Tall stacks	May compete with existing tall historical structures, such as nearby church spires, and potentially affect the setting of designated buildings/monument which draw significance from the existing landscape.

Table 22.6: Summary of Archaeology and Heritage matters proposed to be scoped out of EIA

Potential Impact Pathway	Justification
Construction	
Changes in setting	Temporary changes to setting are generally not considered detrimental
Operation	
Damage to archaeology	Once the site is constructed, there are unlikely to be further changes that would impact the below-ground archaeology present.

Water Environment

22.1.6 Water environment will be a topic included in the EIA. Table 22.7 provides those water environment matters proposed to be scoped in to the EIA. Table 22.8 provides those water environment matters proposed to be scoped out of the EIA.

Table 22.7: Summary of Water Environment matters proposed to be scoped in to EIA

Potential Impact Pathway	Justification
Construction	
Pollution – general construction	Construction activities such as earthworks and the use on storage of oils could result in pollution of surface and groundwater.
Pollution – historic contamination	During construction and historic contamination exposed material could become mobilised and result in pollution of adjacent waterbodies.
Pollution – watercourse crossings	Directional drilling or trench crossings could give rise to water pollution.
Pollution – pipework	Directional drilling through the foreshore and marine environment could give rise to water pollution.
Pollution - offshore	The construction of the new marine inlet and outlet could give rise to water pollution.

Water resources	Temporary measures during construction to manage flows within channels and discharging surface water to channels could affect the distribution of water.
Flood risk - inland	Some construction activities have the potential to alter runoff and affect local flood risk. This includes temporary changes in land cover and temporary vehicle crossings.
Flood risk - coastal	The HDD drilling of pipework beneath the coastal defences has the potential to destabilise the defences and increase the risk of tidal inundation to inland areas.
Operation	
Pollution – storm runoff	The water quality of storm runoff draining from and through developed sites can be affected by the land use with pollutants including low levels of oils, metals and sediments being washed into watercourses.
Pollution – emergency events	Major spills or events such as fires can give rise to contaminated flows that can enter the drainage system and discharge to ground or adjacent channels.
Pollution – effluent discharge	Minor changes in water quality (small and localised uplift in salinity) at and around the marine outlet
Water Resources – flow patterns	Any permanent changes in flow patterns resulting from the development including channel diversions and the creation of new preferential flow pathways need to be assessed.
Water Resources – water usage	Any water usage by the completed development, either in terms of industrial process or usage by staff will be supplied from potable mains supply. This usage could however still have an effect on regional water resources.
Morphology – marine inlet and outlet	Localised changes in flow patterns and sea bed morphology in the area at and around the new marine inlet and outlet
Flood Risk – storm runoff	Any uplifts in the rate or volume of storm water runoff could exacerbate flood risk locally.
Flood Risk – building up of development platform	If it is confirmed that land raise is required to manage fluvial flood risk and/ or residual risk associated with overtopping or breach of coastal defences, then it is possible that this land raise could exacerbate flood risk elsewhere due to changes in flood storage or conveyance.

Table 22.8: Summary of Water Environment matters proposed to be scoped out of EIA

Potential Impact Pathway	Justification
Impact on Calceby Marsh SSSI	This potential receptor is located more than 1km from the project area and is up gradient and so flows from the site will drain away from the SSSI.
Screened out Studies Review of Environment Agency flood model data indicates that the primary fluvial flood risks at the Theddlethorpe TES site and the Stain Lane site would be derived from the Great Eau and potentially also interaction between the Great Eau and the surrounding pumped drainage networks. Wold Grift Drain is remote from all aspects of the project and extensive areas of open marshland between the watercourse and the development are even lower than the lowest part of the project area. On this basis fresh or updated modelling of flood risk along Wold Grift Drain is scoped out. Risk associated with flooding along Wold Grift Drain will be assessed based on the existing data available. Given the thick layer of low permeability superficial deposits across the study area the risk posed to groundwater receptors is likely to be low. On this basis, and assuming that no deep excavations, groundwater abstractions or discharges are required, it is considered that there should be no need to progress any groundwater monitoring or quantitative assessment of risk posed to groundwater. These risks will all be assessed qualitatively within the ES. Given that the proposed abstraction for the proposed electrolysis plant would be from the marine environment it is assumed that this will not have any impact on water resources and no further consideration of the availability of water and / or the impact of the volume of the abstraction is required.	

Ground Conditions and Land Contamination

22.1.7 Ground conditions and land contamination will be a topic included in the EIA. Table 22.9 provides those ground conditions and land contamination matters proposed to be scoped in to the EIA. Table 22.10 provides those ground conditions and land contamination matters proposed to be scoped out of the EIA.

Table 22.9: Summary of Ground Conditions and Land Contamination matters proposed to be scoped in to EIA

Potential Impact Pathway	Justification
Construction	
General construction activities, with accidental spillages or leakages of fuels or chemicals during construction.	Construction activities, such as earthworks and the use or storage of chemicals, could result in pollution exposure or spillages and contamination. Measures within the CEMP will be designed to control the potential construction related risks associated during construction.
Historic contamination mobilisation	During construction, exposure and mobilisation of historic ground material could see previously unknown historic contamination being exposed and mobilised. Measures within the CEMP will be designed to control the potential construction related risks associated with encountering any unknown contamination during construction.
Operation	

Emergency events including leakages of fuels or chemicals during operation.	Major spills or events (such as fires) during operation may give rise to contamination.

Table 22.10: Summary of Ground Conditions and Land Contamination matters proposed to be scoped out of EIA

Potential Impact Pathway	Justification
Construction	
Exposure to contamination through direct contact, ingestion and inhalation by construction workers, adjacent users and adjacent residents during construction and operation.	Measures within the CEMP will control the potential direct contact risks associated with encountering any unknown contamination during construction.
Impact on mineral resource.	No mineral deposits or safeguarded minerals areas are designated in the proximity of the Proposed Development or which may be impacted.
Operation	
Encountering non-recorded land contamination during operation	Once the site is constructed there are unlikely to be further changes that would mobilise land contamination not previously encountered as further ground disturbance is not expected during operation.

Agriculture and Soils

22.1.8 Agriculture and soils will be a topic included in the EIA. Table 22.11 provides those agriculture and soils matters proposed to be scoped in to the EIA. Table 22.12 provides those agriculture and soils matters proposed to be scoped out of the EIA.

Table 22.11: Summary of Agriculture and Soils matters proposed to be scoped in to EIA

Potential Impact Pathway	Justification
Construction	
Disruption of soils (all parts of the Proposed Development during construction)	Disruption of soils during construction, through excavation or compacting, may lead to loss of soil quality unless suitable measures are incorporated within project design to mitigate such effects.
Operation	
Loss of agricultural land (notably Best and Most Versatile BMV)	The Proposed Development will lead to temporary or permanent loss of agricultural land which may be of high grade (BMV). The loss of agricultural land will therefore be scoped into the assessment for the operation phase.
Loss of soil quality over time	Storage and reuse of soils may lead to the degrading of soil quality through storage and over time during operation.

Table 22.12: Summary of Agriculture and Soils matters proposed to be scoped out of EIA

Potential Impact Pathway	Justification
Construction	
Loss of agricultural land (notably Best and Most Versatile BMV)	The loss of agricultural land is not associated with construction or decommissioning which are relatively short terms activities. The loss of agricultural land is therefore to be scoped out of the assessment for the construction phase.
Operation	
Operation (Cable route), impact of agricultural land and soils following construction.	Land above the cable route will be restored following construction and is therefore not likely to be impacted during the operation of the Proposed Development. Impacts of the operation of the cable route on agricultural land and soils will, for this reason, be scoped out of the EIA.

Transport and Access

22.1.9 Transport and access will be a topic included in the EIA. Table 22.13 provides those transport and access matters proposed to be scoped in to the EIA.

Table 22.13: Summary of Transport and Access matters proposed to be scoped in to EIA

Potential Impact Pathway	Justification
Construction	
Users of the public road network used by construction traffic	Potential for significant traffic flows during construction phase.
Users of PROW / Bridleways affected by construction activities	Potential for significant traffic flows during construction phase.
Residents of settlements and individual properties located along construction traffic routes	Potential for significant traffic flows during construction phase.
Operation	
Users of the public road network used by operational traffic	Potential for significant traffic flows during operational phase.
Residents of settlements and individual properties located along traffic routes used by operational traffic	Potential for significant traffic flows during operational phase.

Air Quality

22.1.10 Air quality will be a topic included in the EIA. Table 22.14 provides those air quality matters proposed to be scoped in to the EIA. Table 22.15 provides those air quality matters proposed to be scoped out of the EIA.

Table 22.14: Summary of air quality matters proposed to be scoped in to EIA

Potential Impact Pathway	Justification
Construction	
Dust emissions	Potentially significant without appropriate control measures.
Vehicle emissions	Traffic movements will potentially exceed the EPUK and IAQM thresholds for assessment, although this will be reconfirmed during EIA preparation stage.
Operation	
Process emissions	Source of a potentially significant air quality effect.

Table 22.15: Summary of air quality matters proposed to be scoped out of EIA

Potential Impact Pathway	Justification
Construction	
n/a	n/a
Operation	
Vehicle emissions	Traffic movements are not anticipated to exceed the EPUK and IAQM thresholds for assessment, although this will be reconfirmed during EIA preparation stage.

Noise and Vibration

22.1.11 Noise and vibration will be a topic included in the EIA. Table 22.16 provides those noise and vibration matters proposed to be scoped in to the EIA. Table 22.17 provides those noise and vibration matters proposed to be scoped out of the EIA.

Table 22.16: Summary of noise and vibration matters proposed to be scoped in to EIA

Potential Impact Pathway	Justification
Construction	
Site activity noise	Potential for high levels of construction activity noise to affect medium or high sensitivity NSRs.
Road traffic noise	If construction traffic flows greater are than 10% of baseline road traffic flows, potential for high levels of noise to affect medium or high sensitivity NSRs.

Operation	
Site activity noise	Potential for high levels of operational activity noise to affect medium or high sensitivity NSRs.

Table 22.17: Summary of noise and vibration matters proposed to be scoped out of EIA

Potential Impact Pathway	Justification
Construction	
Site activity vibration	No significantly high vibration levels at source and relatively large distance between vibration activity and NSRs; low risk for adverse vibration impact. Cumulative construction would not increase vibration levels.
Impact on marine NSRs	Depending on the exact construction methodology and consideration of marine NSRs that may be affected, an assessment of underwater noise effects associated with the construction of the possible sea water pipeline could be scoped out. This is considered likely at this stage as this construction is expected to use land-based horizontal directional drilling (HDD). However, this will be reviewed as further information becomes available ahead of the PEIR stage and the appropriate scope of any assessment will be agreed with the relevant statutory consultees at the time.
Operation	
Road traffic noise	Low operational road traffic flows of less than 10% of baseline are anticipated. This will be confirmed through operational traffic modelling for the PEIR. Assessment of road traffic noise for road links above the threshold would be undertaken if required.

Socio Economic

22.1.12 Socio-economics will be a topic included in the EIA. Table 22.18 provides those socio-economics matters proposed to be scoped in to the EIA. Table 22.19 provides those socio-economics matters proposed to be scoped out of the EIA.

Table 22.18: Summary of socio-economic matters proposed to be scoped in to EIA

Potential Impact Pathway	Justification
Construction	
Construction employment and training	The construction of the Proposed Development will contribute to growing the number of jobs and improving skills in a high-growth and critical sector for the UK economy. This includes jobs locally, regionally and nationally, as well as indirect jobs in the supply chain. It will provide

	upskilling opportunities to local low-skilled or unemployed workers as well as vulnerable groups.
Economic development	The construction of the Proposed Development will foster the wider economic development of low-carbon industries.
Demographic change and housing	Subject to labour availability the Proposed Development may require the temporary relocation of some workers, which may either require the provision of temporary accommodation or put pressure on the housing market.
Operation	
Operation employment and training	The operation of the Proposed Development will contribute to growing the number of jobs and improving skills in a high-growth and critical sector for the UK economy. This includes jobs generated indirectly in the supply chain and support services. It will provide upskilling opportunities to local low-skilled or unemployed workers as well as vulnerable groups.
Economic development	The Proposed Development will foster the wider economic development of low-carbon industries and of other high-growth industries.
Demographic change and housing	Subject to labour availability locally the operation of the Proposed Development may require the relocation of workers locally. This may put pressure on the housing market.

Table 22.19: Summary of socio-economic matters proposed to be scoped out of EIA

Potential Impact Pathway	Justification
Construction	
Temporary disruptions	Temporary disruptions are unlikely to result in significant adverse, given their localised and temporary nature. The implementation of the CEMP is would also contribute to mitigating any adverse impact. This impact is also expected to be assessed in detail in other Chapters of the ES
Provision of local services	Demand for local services would be temporary, reversed upon completion of the construction, and dispersed over a wider geographic area. This is therefore unlikely to be significant
Operation	
Tourism	Impact of the Proposed Development associated with tourism attractions and accommodations in

	proximity to the site are anticipated to be assessed in detail within other Chapters.
Provision of local services	Demand for local services would likely be dispersed over a wider geographic area. This is therefore unlikely to be significant

Population and Health

22.1.13 Population and health will be a topic included in the EIA. Table 22.20 provides those population and health matters proposed to be scoped in to the EIA. Table 22.21 provides those population and health matters proposed to be scoped out of the EIA.

Table 22.20: Summary of population and health matters proposed to be scoped in to EIA

Potential Impact Pathway
Construction
Physical activity
Open space, leisure and play
Transport modes, access and connections
Employment and income
Climate change mitigation and adaptation
Air quality
Noise and vibration
Operation
Physical activity
Open space, leisure and play
Climate change mitigation and adaptation
Air quality
Noise and vibration
Radiation

Table 22.21: Summary of population and health matters proposed to be scoped out of EIA

Potential Impact Pathway
Construction
Risk taking behaviour
Diet and nutrition
Housing
Relocation
Community safety

Community identity, culture, resilience and influence
Social participation, interaction and support
Education and training
Water quality or availability
Land quality
Radiation
Health and social care services
Built environment
Wider societal infrastructure and resources
Operation
Risk taking behaviour
Diet and nutrition
Housing
Relocation
Transport modes, access and connections
Community safety
Community identity, culture, resilience and influence
Social participation, interaction and support
Education and training
Employment and income
Water quality or availability
Land quality
Health and social care services
Built environment
Wider societal infrastructure and resources

Climate Change

22.1.14 Climate change will be a topic included in the EIA. Table 22.22 provides those climate change matters proposed to be scoped in to the EIA. Table 22.23 provides those climate change matters proposed to be scoped out of the EIA.

Table 22.22: Summary of climate change matters proposed to be scoped in to EIA

Potential Impact Pathway	Justification
Construction	

GHG emission impacts from the embodied carbon (supply chain) of materials and products used in the Proposed Development	May be material to the overall lifecycle impact of the development (to be confirmed via a screening assessment), and an area of further mitigation opportunity to be recommended for the detailed design stage
GHG emission impacts from the construction of off-site networks for fuel, CO_2 and electricity	An attributable proportion of off-site network construction emissions is considered to be an indirect but causal impact that may be material to the overall lifecycle impact of the development
Operation	
Residual (uncaptured) GHG emission impacts from fuel combustion	Likely to be the main direct GHG impact if natural gas fuel is used
GHG emission impacts from the upstream fuel and reagent supply chain and downstream CO_2 export solution (if applicable)	An attributable proportion of emissions from off-site network operation, fuel supply chain and CO_2 export (if applicable) is likely to be material to the overall lifecycle impact of the development
GHG emission impacts in the future baseline that would be avoided due to displacement of alternative energy generation by the Proposed Development	The purpose of the Proposed Development is to provide low-carbon flexible generation and energy storage to facilitate the UK's net zero carbon transition, including roll-out of renewable generation, and reduce reliance on high carbon intensity legacy gas-fired generators. This is therefore material to the net GHG emission impact.
Climate risks to the physical assets of the development, workforce, and operational resilience	Potential for climate risks to be significant under a high change scenario in the longer term of the Proposed Development's operating life

Table 22.23: Summary of climate change matters proposed to be scoped out of EIA

Potential Impact Pathway	Justification
Construction	
GHG emission impacts from on-site construction activities, energy and water use	Considered to be non-material to the assessment and mitigated through the CEMP.
Climate risks to the workforce or construction programme	Review of climate projections for the near-future construction period indicates limited change, likely to introduce new or significantly greater risks than those to which the construction industry is adapted. Good-practice workforce health and safety measures for outdoor working, based on HSE guidance, included in the CEMP.
Operation	
GHG emission impacts from operational workforce commuting and from potable water use, wastewater treatment and waste management	Very likely to be *de minimis* and non-material to the assessment and hence appropriate to scope out. To be confirmed through a screening calculation for PEIR.

Marine Environment and Biodiversity

22.1.15 Marine environment and biodiversity will be a topic included in the EIA. Table 22.24 provides those marine environment matters proposed to be scoped in to the EIA. Table 22.25 provides those marine environment matters proposed to be scoped out of the EIA.

Table 22.24: Summary of Marine Ecology and Biodiversity matters proposed to be scoped in to EIA

Potential Impact Pathway	Justification
Construction Benthic Ecology	
Temporary habitat loss/disturbance	Temporary habitat loss and/or disturbance to benthic subtidal communities will be limited by the Proposed Development's design including HDD installation for the outfall and intake. This method significantly reduces the footprint of seabed disturbance. Nonetheless, a small area of subtidal seabed will be temporarily disturbed during activities such as HDD breakout and installation of any pipeline protection.
Long term habitat loss/disturbance	The installation of permanent infrastructure associated with the seawater intake and brine outfall will result in long term loss of subtidal habitat, where seabed is replaced by artificial hard substrate. This infrastructure is likely to be in the form of mattress protection, with the amount/extent of seabed loss currently unknown. While the overall footprint is likely to be relatively small, these structures will alter the physical characteristics of the seabed and may lead to changes in the associated benthic communities.
Construction: Fish and Shellfish Ecology	
Effects associated with underwater noise emissions from construction of intake and outfall infrastructure on fish (including larvae)	Activities such as HDD involved in the construction of the intake and outfall have the potential to generate underwater noise, which may result in effects (including auditory injury and disturbance) on fish receptors within the fish and shellfish ecology study area.
Temporary habitat loss/disturbance	As for Benthic Ecology.
Long term habitat loss/disturbance	As for Benthic Ecology.
Construction: Marine Mammals	
Effects associated with underwater noise emissions from construction of intake and outfall infrastructure	Activities such as HDD involved in the construction of the intake and outfall have the potential to generate underwater noise, which may result in effects (including auditory injury and disturbance) on marine mammal receptors within the marine mammal study area. Mitigation measures will be applied to reduce these risks (e.g. the use of a MMO, pre-watch survey and exclusion zones).

Increased underwater noise from vessels	There will be limited vessel traffic associated with the Proposed Development during construction. Until details are known, this impact is scoped in on a precautionary basis.
Increased vessel activity which may result in collision risk	Potential increased vessel traffic during the construction phase has the potential to increase the risk of collisions with marine mammals. Although there is only expected to be only a minor uplift in vessel numbers associated with the Proposed Development, this impact is scoped in on a precautionary basis. Mitigation measures including a Vessel Management Plan will include a code of conduct for vessel operators which will manage vessel speed, and routes will reduce any risk of this impact to negligible. However, until details of specific vessels to be used are known, this impact is scoped in on a precautionary basis.
Changes to prey availability	Changes in prey abundance and distribution during construction phase may have an indirect impact on marine mammals. Therefore, this impact is scoped in on a precautionary basis.
Operation: Benthic Ecology	
Effects associated with the discharge of brine during operation of the outfall	Brine discharge is expected to cause localised increases in salinity. Increased salinity may affect osmoregulation in subtidal benthic fauna. Modelling will be performed to predict the extent of the impact, which will be used in the assessment.
Long term habitat loss/disturbance	The installation of permanent infrastructure associated with the seawater intake and brine outfall will result in long term loss of subtidal habitat, where seabed is replaced by artificial hard substrate. This infrastructure is likely to be in the form of mattress protection, with the amount/extent of seabed loss currently unknown. While the overall footprint is likely to be relatively small, these structures will alter the physical characteristics of the seabed and may lead to changes in the associated benthic communities.
Introduction and colonisation of hard structures	The installation of anthropogenic structures will represent a change from sedimentary to hard substrate, which is expected to be colonised by a range of hard substrate species. This is expected to result in a change of species composition and potentially a localised increase in biodiversity.
Operation: Fish and Shellfish Ecology	

Effects from entrainment and impingement associated with the operation of the intake structure	Fish and some shellfish are free-moving receptors that could be found within range of the intake structure, and therefore an impact–receptor pathway exists. Depending on the intake velocity and size of individuals, many may be able to avoid impingement and entrainment, however smaller individuals may be entrained into the intake pipe or impinged against the mesh screen.
Effects associated with the discharge of brine during operation of the outfall	As for Benthic Ecology
Long term habitat loss/disturbance	As for Benthic Ecology
Operation: Marine Mammals	
Changes to prey availability	Changes in prey abundance and distribution during operational phase may have an indirect impact on marine mammals. Therefore, this impact is scoped in on a precautionary basis.

Table 22.25: Summary of Marine Ecology and Biodiversity matters proposed to be scoped out of EIA

Potential Impact Pathway	Justification
Construction: Benthic Ecology	
All impacts to benthic intertidal ecology	Intertidal benthic habitats have been scoped out of further assessment due to the avoidance of impact through the Proposed Development design and outfall distance of approximately 0.66 km from MLWS. The use of HDD ensures that no construction activities will occur within the intertidal zone. As a result, no physical disturbance or habitat loss is anticipated in this area.
Effects associated with the discharge of brine during operation of the outfall	Salinity effects are scoped out for the construction phase as no brine is discharged during this period, only during the operational phase. Therefore, there is no pathway for salinity-related impacts on benthic subtidal receptors during construction.
Increased Suspended Sediment Concentrations (SSCs) and associated deposition	Activities such as HDD punchout are expected to generate sediment plumes, resulting in temporary and localised increases in SSCs and subsequent deposition. However, given the short-term and spatially limited nature of these effects during the construction phase, potential impacts to subtidal benthic receptors are considered negligible and have therefore been scoped out of further assessment.
Resuspension of contaminated sediments	This effect is closely linked to increases in SSCs. The level of sediment resuspension expected

	during construction is limited and temporary. Therefore, this effect has been scoped out of further assessment.
Increased risk of introduction and spread of Invasive Non-Native Species (INNS)	Vessel movements during the construction present a recognised vector for the introduction and spread of INNS. Transfer mechanisms include hull fouling, ballast water discharge, and equipment contamination. Additionally, the installation of artificial hard structures (e.g. intake and outfall infrastructures) introduce novel substrates that may facilitate colonisation and establishment of INNS. Adherence to the International Maritime Organization (IMO) biofouling guidelines, compliance with available guidelines on mitigating the introduction and spread of INNS, alongside adherence to standard protocols embedded within the Environmental Management Plan (EMP) will collectively minimise the risk of INNS introduction and spread. Therefore, this impact has been scoped out of further assessment.
Introduction and colonisation of hard structures	While anthropogenic hard structures (e.g. intake and outfall infrastructure) will be introduced during construction, colonisation by marine organisms will occur gradually over time. As such, this effect is only anticipated during the operational phase and is therefore scoped out for the construction phase.
Accidental pollution during construction	There is a risk of accidental pollution from vessels and equipment during construction. This risk will be minimised through the use of good industry practice for vessels and the application of relevant guidelines for the prevention of pollution at sea (such as those from the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention), International Maritime Organisation (IMO), and the International Convention for the Prevention of Pollution from Ships (MARPOL)). Thus, it is unlikely that accidental pollution will occur.
Effect of heat from brine discharge	This effect is scoped out for the construction phase, there is no expected thermal increase of discharged brine and no brine is discharge during this period. Therefore, there is no potential pathway for thermal effects on benthic receptors.
Effects from entrainment and impingement associated with the operation of the intake structure	The intake will not be operational during construction, therefore no impact-receptor pathway for further assessment.
Construction: Fish and Shellfish Ecology	

Effects on shellfish receptors associated with underwater noise emissions from construction of the intake and outfall infrastructure	No impact-receptor pathway and therefore scoped out from further assessment.
Effects from entrainment and impingement associated with the operation of the intake structure	The intake is not operational during the construction phase, therefore there is no impact-receptor pathway, and this impact is scoped out for the construction phase.
Effects associated with the discharge of brine during operation of the outfall	As for Benthic Ecology
Effect of heat from brine discharge	As for Benthic Ecology
Increases in SSCs and associated sediment deposition	As for Benthic Ecology
Resuspension of sediment-bound contaminants	As for Benthic Ecology
Increased risk of introduction and spread of INNS	As for Benthic Ecology
Introduction and colonisation of hard structures	The introduction of anthropogenic hard structures on the seabed will represent a change from sedimentary to hard substrate, which is expected to be colonised by hard substrate benthic species and therefore a change in species composition. However, the effect is considered negligible for fish and shellfish receptors due to the small scale of habitat change and the availability of extensive alternative habitat in the surrounding area. Therefore, this impact is scoped from further assessment.
Accidental pollution during construction	As for Benthic Ecology
Construction: Marine Mammals	
Effects on marine ecology receptors associated with the discharge of brine during operation of the outfall	As for Benthic Ecology
Effects on marine mammal receptors from entrainment and impingement associated with the operation of intake	The intake is not operational during the construction phase, therefore there is no impact-receptor pathway, and this impact is scoped out for the construction phase.
Disturbance to seal haul-out sites	The closest seal haul-out sites are found at Donna Nook. This is approximately 26 km north of the Proposed Development and therefore no potential for disturbance and this impact has been scoped out from further assessment.
Increases in SSCs and associated sediment deposition	As for Benthic Ecology
Accidental pollution during construction	As for Benthic Ecology
Operation: Benthic Ecology	

All impacts associated with benthic intertidal ecology	Intertidal benthic habitats have been scoped out of further assessment due to the avoidance of impact through the Proposed Development design and outfall distance of approximately 0.66 km from MLWS. The use of HDD ensure that no construction activities will occur within the intertidal zone. As a result, no physical disturbance or habitat loss is anticipated in this area.
Temporary habitat loss/disturbance	There will be no further temporary habitat loss and/or disturbance during the operation phase, therefore this effect is scoped out.
Increased SSCs and associated deposition	No activities during the operational phase are expected to cause significant increases in SSCs and this impact has therefore been scoped out of further assessment.
Resuspension of contaminated sediments	This effect is closely linked to increases in SSCs. During the operational phase, no activities are proposed that would cause significant sediment resuspension. As such, the potential for resuspension of sediment-bound contaminants is considered negligible. Therefore, this effect has been scoped out for the operation phase.
Increased risk of introduction and spreads of INNS	As for the construction phase.
Effect of heat from brine discharge Receptor: Benthic Subtidal Ecology	This effect is scoped out for the operation phase as the temperature of the returned brine will not be elevated beyond that of the surrounding seawater. Therefore, there is no potential pathway for thermal effects on benthic receptors.
Effects on benthic receptors from entrainment and impingement associated with the operation of intake	Sessile communities therefore no impact-receptor pathway for further assessment.
Operation: Fish and Shellfish Ecology	
Effects associated with underwater noise emissions from construction of intake and outfall infrastructure	There is no expected significant underwater noise generated during the operational phase of the Proposed Development. No impact-receptor pathway for shellfish. Therefore, this effect is scoped out for further assessment.
Temporary habitat loss/disturbance Receptor: Fish and Shellfish Ecology	As for Benthic Ecology
Increases in SSCs and associated sediment deposition	As for Benthic Ecology
Resuspension of sediment-bound contaminants	As for Benthic Ecology
Increased risk of introduction and spread of INNS	As for Benthic Ecology construction phase.
Introduction and colonisation of hard structures	As for construction phase.

Operation Marine Mammals	
Increased underwater noise from vessels	During the operational phase there will be occasional ongoing visits to and from the site (e.g. for site inspections). However, there will be only a very minor uplift in vessel numbers associated with the Proposed Development, resulting in a negligible risk of this impact.
Increased vessel activity which may result in collision risk	Potential increased vessel traffic during all phases of the Proposed Development has the potential to increase the risk of collisions with marine mammals. However, there is expected to only be a minor uplift in vessel numbers associated with the Proposed Development. Mitigation measures including a Vessel Management Plan will include a code of conduct for vessel operators which will manage vessel speed, and routes will reduce any risk of this impact to negligible.
Effects on marine ecology receptors associated with the discharge of brine during operation of the outfall	Modelling to confirm the dispersion of brine will be performed, but it is expected to be over a small area in comparison to the habitat available to marine mammals. Marine mammals are highly mobile and so can easily move away. It is unlikely this impact will pose any adverse impacts to marine mammal receptors. As such, this impact has been scoped out of further assessment.
Underwater noise emissions from construction and operation of intake and outfall	There is likely no significant underwater noise generated during the operational phase of the Proposed Development. Therefore, this effect is scoped out for further assessment.
Effects on marine mammal receptors from entrainment and impingement associated with the operation of intake	Marine mammals are large receptors and as such will not be susceptible to entrainment. Their size and swim speed reduces the likelihood of impingement, making it negligible. As such, this impact has been scoped out of further assessment.
Disturbance to seal haul-out sites	The closest seal haul-out sites are found at Donna Nook. This is approximately 26 km north of the Proposed Development and therefore there is no potential for disturbance and this impact has been scoped out from further assessment.
Increases in SSCs and associated sediment deposition	As for Benthic Ecology

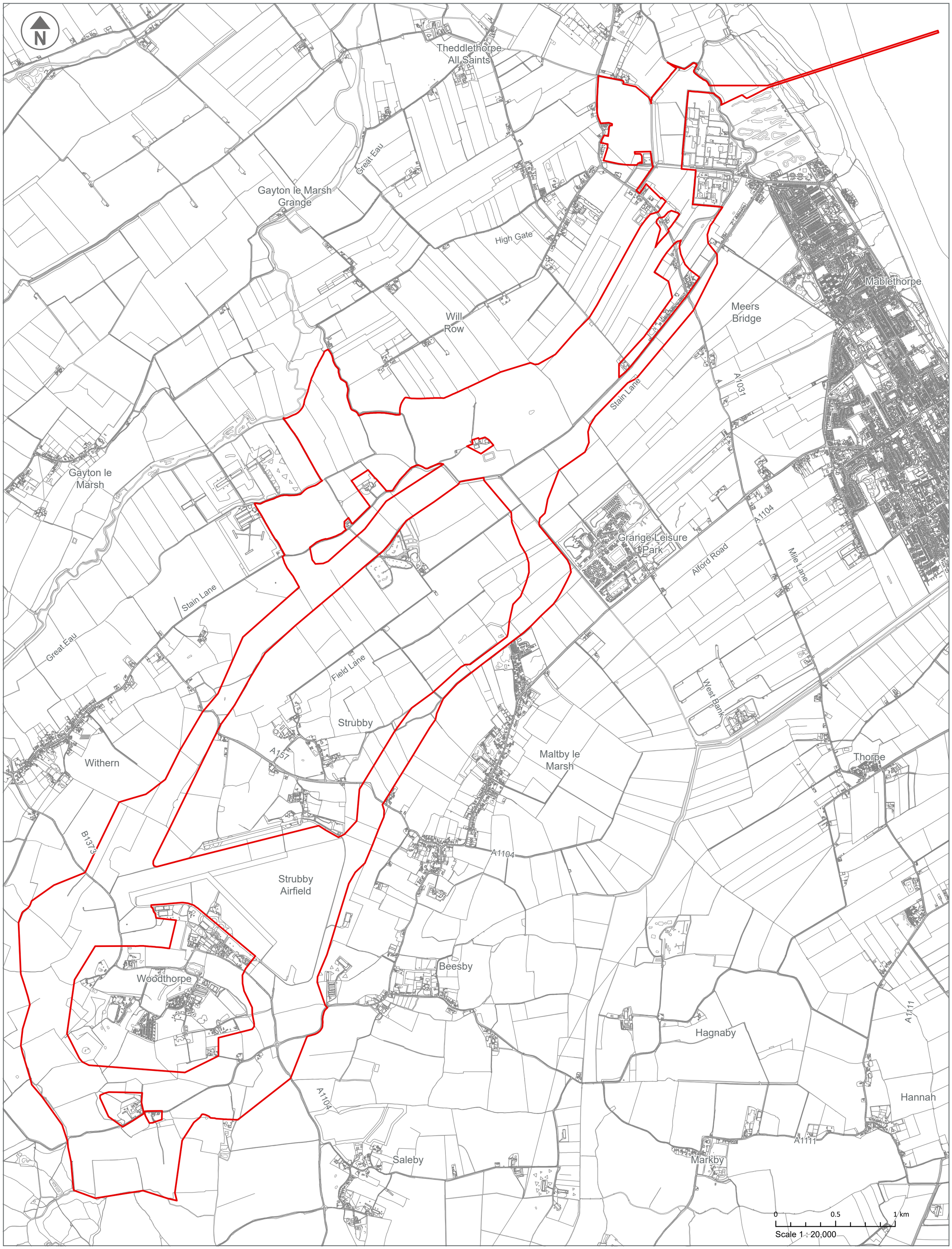
Glossary

Association of Noise Consultants (ANC).	Organisation for consultants engaged in acoustic, noise and vibration consultancy.
Battery Energy Storage System (BESS)	Technology that stores electrical energy in batteries for later use.
Best and Most Versatile (BMV) Agriculture	Defined as land in Grades 1, 2 and 3a of the Agricultural Land Classification. This land is considered the most productive and flexible for growing a range of crops, with high and consistent yields and limited input requirements
Biodiversity Action Plan (BAP)	Strategic document for conserving and enhancing biological diversity, developed in response to national or international commitments. Local Biodiversity Action Plans (LBAPS) may operate at local level.
Biodiversity Net Gain (BNG)	A gain provided in terms of biodiversity as a result of a development.
Carbon Capture and Storage (CCS)	Technology that aims to reduce CO2 emissions by capturing the gas, transporting it, and then storing it.
Centre for Environment, Fisheries and Aquaculture Science (Cefas)	Agency of the United Kingdom government Department for Environment, Food and Rural Affairs (Defra) covering fisheries, aquaculture and related sciences.
Chartered Institute for Ecology and Environmental Management (CIEEM)	Professional body which represents and supports ecologists and environmental managers.
Combined Cycle Power Plant (CCGT)	A combined cycle power plant utilises two different power generation cycles – a gas turbine cycle and a steam turbine cycle – to produce electricity.
Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR)	Legal instrument to protect the North-East Atlantic marine environment.
Department of Food and Rural Affairs (Defra)	Ministerial department for the UK government responsible for environmental protection, food production, agriculture, fisheries and rural communities.
Design Manual for Roads and Bridges (DMRB)	The Design Manual for Roads and Bridges (DMRB) contains information about current design standards relating to the design, assessment and operation of motorway and all-purpose trunk roads in the United Kingdom.
Development Consent Order (DCO)	The order by which a Nationally Significant Infrastructure Project is granted planning permission under the 2008 Planning Act.
Electric Magnetic Field (EMF)	Electric magnetic field that represents the electric and magnetic influences generated by and acting upon electric charges.
Environmental Impact Assessment (EIA)	Process which assesses potential environmental impacts of a proposed project or development.
Environmental Statement (ES)	A document (or suite of documents) which provides a written account of an Environmental Impact Assessment.
European Marine Observation and Data Network (EMODnet)	Network of European organisations providing marine data services.
European Nature Information System (EUNIS)	Provides access to the publicly available data in the EUNIS database for species, habitat types and protected sites across Europe.
Flood Risk Assessment (FRA)	A document (or suite of documents) prepared to assess the flood risk associated with a particular development.
Gigawatt (GW)	A unit of power equal to one billion watts.
Habitat Regulations Assessment (HRA)	Process to assess if a plan or project will harm protected wildlife sites, known as habitats sites.
High Water Mean (HMW)	Average high level that the tide reaches on a coastal area.
Horizontal Directional Drill (HDD)	Horizontal Directional Drilling (HDD), also known as directional boring, is a trenchless technology used to install underground utilities like pipes and cables without disrupting the surface.
Institute of Environmental Management and Assessment (IEMA)	Professional body for environmental practitioners.
Internal Drainage Board (IDB)	Internal Drainage Boards (IDBs) are independent public bodies responsible for managing local water levels and drainage. IDBs maintain and operate infrastructure such as pumping stations, watercourses, and sluices to ensure effective water management.
International Council for the Exploration of the Sea (ICES)	Scientific forum for exchange of information on aspects of marine science.

International Union for Conservation of Nature (IUCN)	Global environmental network to promote nature conservation and the sustainable use of natural resources
Invasive Non-Native Species (INNS)	Non-native invasive specifies (i.e. Japanese Knotweed)
Joint Cetacean Data Programme (JCDP)	Platform and set of resources to support the collection and utilisation of standardised cetacean survey data
Joint Nature Conservation Committee (JNCC)	Provides advice at national level for decision takers relating to matters of nature conservation.
Kilowatt (KW)	A measure of one thousand watts of electrical power.
Landscape and Visual Impact Assessment (LVIA)	A document (or suite of documents) prepared to assess the landscape and visual impacts associated with a particular development.
Landscape Character Area (LCA)	A geographically distinct area of land over which a particular landscape character is considered to exist.
Lead Local Flood Authority (LLFA)	Lead Local Flood Authorities (LLFAs) are unitary authorities or county councils in the UK tasked with managing local flood risks. Established under the Flood and Water Management Act 2010, LLFAs develop, maintain, and implement strategies for managing flood risks from surface water, groundwater, and ordinary watercourses.
Lincolnshire Connection Substation A (LCSA)	It is one of two proposed 400kV substations planned by National Grid as part of 'The Great Grid Upgrade' Grimsby to Walpole connection.
Local Planning Authority (LPA)	Public body responsible for administering planning and development in a specific area (normally the local Council).
Marine Mammal Observers (MMOs)	Professional spotting marine mammals, such as whales and dolphins, during offshore construction or industrial activities.
Marine Management Organisation (MMO)	Organisation responsible for regulating and managing activities within the marine environment.
Mean Low Water Spring (MLWS)	Average low level that the tide reaches on a coastal area.
Megawatt (MW)	A unit of power equal to one million watts, especially as a measure of the output of a power station.
Multi Agency Geographical Information for the Countryside (MAGIC)	UK Government website which provides geographic information, in map form.
National Biodiversity Network (NBN)	Network seeking to provide information on biodiversity at national level.
National Character Area (NCA)	A geographically distinct area of land set at a national level, over which a particular landscape character is considered to exist
National Nature Reserve (NNR)	Land declared under the National Parks and Access to the Countryside Act 1949 or Wildlife and Countryside Act (1981) for the protection of habitat and of geological formations.
National Planning Policy Framework (NPPF)	The national planning policy document for making planning decisions in England.
National Policy Statement (NPS)	Planning document that outlines government policy for nationally significant infrastructure projects (NSIPs).
Nationally Significant Infrastructure Project (NSIP)	Large scale infrastructure development projects in England or Wales which are of national significance.
Natural Environment Research Council (NERC)	Organisation that practices environmental sciences to advance understanding of Earth systems and impacts.
Office of Deputy Prime Minister (ODPM)	Former ministerial office within the UK government, now forms part of the Department for Communities and Local Government (DCLG)
Open Cycle Gas Turbines (OCGT)	Power generation system where air is drawn in, compressed, mixed with fuel, burned, and then expanded through a turbine, generating electricity. Exhaust gases are released directly into the atmosphere.
Outline Construction Environment Management Plan (OCEMP)	Plan which sets out working approach and activities, to control or prevent adverse impacts during construction.
Outline Construction Traffic Management Plan (OCTMP)	Management Plan to be prepared and submitted at point of DCO application providing a framework for the future management of construction traffic.
Outline Landscape and Ecology Management Plan (OLEMP)	Management Plan to be prepared and submitted at point of DCO application providing a framework for the future management of landscape and habitats during the course of development.
Planning Inspectorate (PINS)	Government agency with responsibility for managing the DCO process.
Preliminary Environmental Information Report (PEIR)	Report which provides early, non-technical information about a proposed project's likely environmental effects to the public and stakeholders during a consultation period.
Principal Areas of Disagreement Summary Statement (PADSS	Statement with stakeholders on principal areas of disagreement in advance of progressing Statements of Common Ground.

Rochdale Envelope	An approach established by UK planning case law which involves broadly defining the project (or elements of it) but limiting it by a number of clearly defined fixed parameters. Rochdale Envelopes are typically defined by a series of maximum extents of a project (or 'worst case scenarios') by which effects can be assessed.
Scoping Report	This document
Sea Mammal Research Unit (SMRU)	Research unit dedicated to the study of fundamental biology and ecology of marine mammals.
Secretary of State (SoS)	Member of Parliament who is in charge of a government department and has the authority to make the final decision on whether to grant development consent for the project, based on the recommendations from the Planning Inspectorate.
Sites of Special Scientific Interest (SSSI)	Designation given to areas in the UK that are of national importance for their flora, fauna, geology, or geomorphology.
Special Area of Conservation (SAC)	Site designated to protect habitats and species listed in the Habitats Directive.
Special Protection Area (SPA)	Designated area at national level which is protected under the Habitats Regulations.
Statement of Common Ground (SoCG)	A statement providing an account of matters which have been agreed (or disagreed) between parties.
Statement of Community Consultation (SoCC)	Document which provides the approach by which a developer intends to consult on a proposed development.
Suspended Sediment Concentrations (SSC)	Measurement of the amount of fine particulate matter—like silt, sand, and organic debris—that is suspended in a body of water.
Sustainable Urban Drainage Systems (SuDS)	Sustainable Urban Drainage Systems (SuDS) are a way of managing stormwater runoff that mimics natural processes, rather than relying on traditional drainage systems. They are designed to slow, store, and treat water near its source, reducing flooding risks and improving water quality while also offering environmental benefits.
The British Geological Survey (BGS)	Organisation which seeks to advance geoscientific knowledge of the United Kingdom landmass and its continental shelf by means of systematic surveying, monitoring and research.
The Institute of Acoustics (IOA)	Professional body for those working in acoustics, noise and vibration.
Theddlethorpe Thermal and Electrolysis Site (TES)	The main thermal generation and electrolysis site at Theddlethorpe.
UK Habitat Classification (UKHabs)	Coding system used for surveying and classifying habitats.
Water Framework Directive (WFD)	The Water Framework Directive aims to protect and enhance the quality of water resources across Europe. Adopted in 2000, it sets out a comprehensive framework for managing and safeguarding inland surface waters, transitional waters, coastal waters, and groundwater.
Wildlife and Countryside Act 1981 (WCA)	The Wildlife and Countryside Act 1981 is an act of Parliament in the United Kingdom
Zone of Influence (ZoI)	The area where an activity is anticipated to have a direct or indirect impact.
Zone of Theoretical Visibility (ZTV)	A "Zone of Theoretical Visibility" (ZTV) is a computer-generated tool used in landscape and visual impact assessments to determine the theoretical extent of visibility of a development.

Appendix A: Scoping Boundary



Key

Redline boundary

REV	DATE	COMMENT
A	30.07.25	Three minor changes along field boundaries and extended to include a corridor for a water pipe into the sea.

STATERA
BALANCING THE GRID

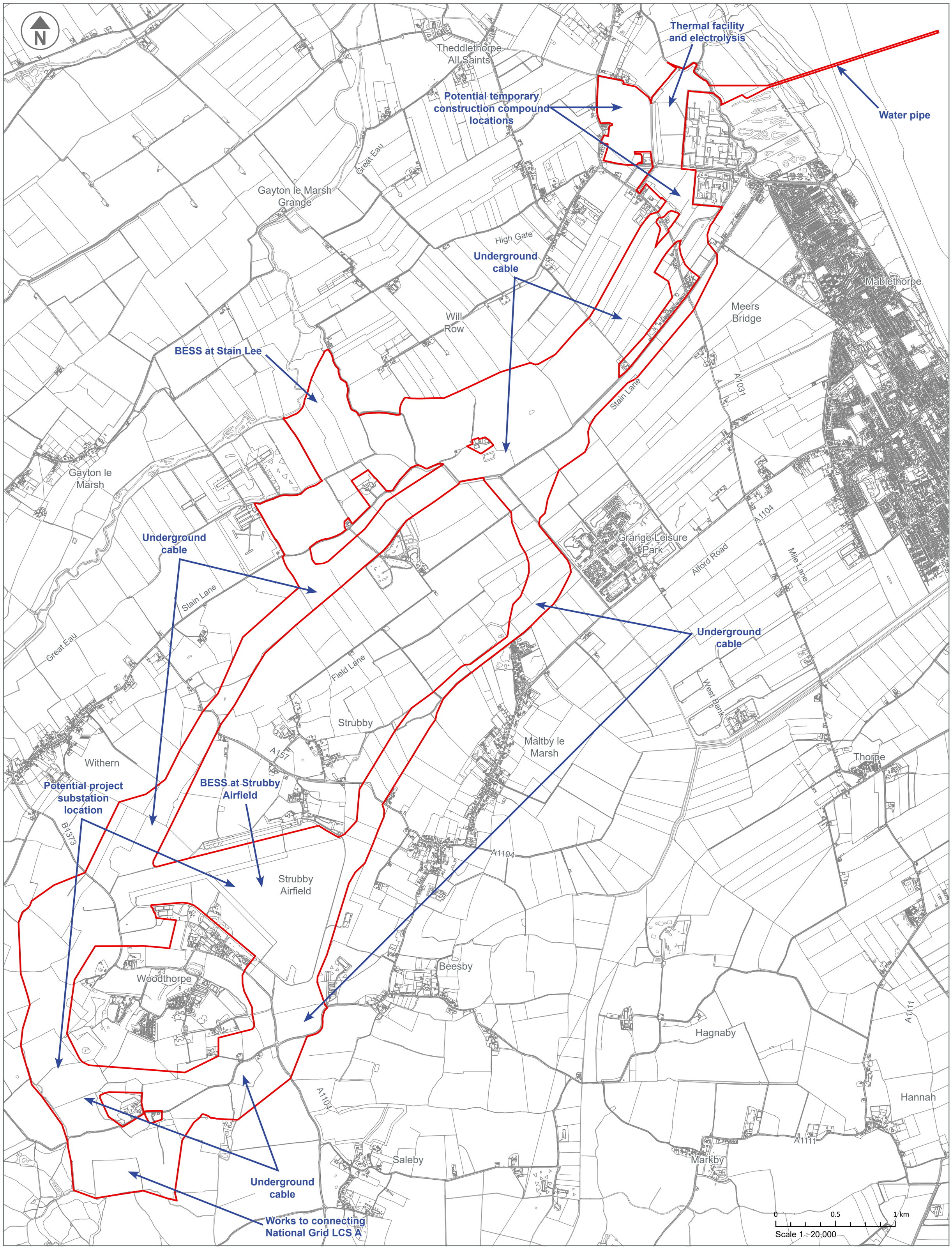
ON BEHALF
Statera

PROJECT
Theddlethorpe Flexible Generation

DATE 17th January 2025
SCALE 1: 20,000 @ A2
DWG NO. SL282_L_X_LP_1_Rev A
APPROVED CM

TITLE
Site Location Plan

Appendix B: Annotated Scoping Boundary



STATERA
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Redline boundary

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APPROVED CM

TITLE

Site Location Plan

Appendix C: Suggested Structure for ES

Volume	Chapter	Title
Volume 1	N/A	Non-Technical Summary
	N/A	Glossary of terms
Volume 2 pt 1	1	Introduction
	2	Project Description
	3	Consideration of Alternatives
	4	EIA Methodology
	5	Scoping and Consultation
Volume 2 pt 2	6	Landscape and Visual
	7	Ecology and Biodiversity
	8	Archaeology and Heritage
	9	Water environment
	10	Ground conditions and land contamination
	11	Agriculture and Soils
	12	Transport and access
	13	Air quality
	14	Noise and vibration
	15	Socio-economic
	16	Population and health
	17	Climate change
	18	Marine environment
	19	Summary of inter-related effects
	20	Summary of cumulative effects
	21	Summary of mitigation, monitoring and residual effects

Volume	Chapter	Title
	22	Conclusions
Volume 3	N/A	Technical Appendices
	N/A	Figures

Appendix D: Cumulative Developments, Long List

Site	Reference	Decision	Description of Development	
3km Radius (inc Minor apps)				
Woodthorpe Leisure Park	N/171/00120/22	Granted 19/12/22	Planning Permission - Change of use of land to form an extension to existing holiday park to provide up to 299 additional transportable holiday units, restaurant, ponds with embankments and provision of internal access routes and wooden play equipment to a maximum height of 1m	
Causeway Bridge Farm, 48 Church Lane, Manby, Louth, Ln11 8hl	N/113/00842/21	Granted 19/11/21	Planning Permission - Erection of 3no. poultry units and associated buildings/equipment including water tanks, 5no. gas tanks, a plant room, a gatehouse, 5no. feed silos. 10 no. existing poultry units to be demolished. Construction of an attenuation pond and bunding to the maximum height of 1.0metre.	
20km Radius from project boundary				
LAND AT HALTON ROAD AND, ASHBY ROAD, SPILSBY	S/165/00287/24	Under consideration	Reserved Matters application relating to the erection of 600 dwellings, 3no. pumping stations, 2no. electricity sub-stations, provision of open space, landscaping, infrastructure, attenuation ponds and construction of vehicular accesses, (outline planning permission ref no. S/165/2238/20 for the erection of up to 600 dwellings and a medical centre with provision of associated open space, landscaping and infrastructure, estate roads and cycle ways, granted 9th May, 2022).	
LAND WEST OFF, GRIMSBY ROAD, LOUTH	N/105/01921/23	Granted 24/01/24	Reserved Matters application relating to the erection of 90 dwellings with associated garages, access roads, drainage features and landscaping (outline planning permission ref no. N/105/01055/22 erection of up to 90no. dwellings with garages with means of access to be considered granted 30th August 2023).	
LAND SOUTH OF, CHESTNUT DRIVE, LOUTH	N/092/02375/23	Under consideration	Outline erection of up to 50no. dwellings and associated infrastructure (with means of access, landscaping and layout to be considered).	

LAND SOUTH OF, CHESTNUT DRIVE, LOUTH	N/092/01869/21	Granted 18/02/21	Reserved Matters application for approval of reserved matters in relation to appearance, scale, revised layout and landscaping for the erection of 141no. dwellings with associated garages pursuant to Outline Planning Permission N/092/01017/20 (erection of 141no. dwellings).	
WOODTHORPE LEISURE PARK, ALFORD ROAD, WOODTHORPE, ALFORD, LN13 0DD	N/171/00120/22	Granted 19/12/22	Planning Permission - Change of use of land to form an extension to existing holiday park to provide up to 299 additional transportable holiday units, restaurant, ponds with embankments and provision of internal access routes and wooden play equipment to a maximum height of 1m	
LAND WEST OFF, GRIMSBY ROAD, LOUTH	N/105/01055/22	Granted 30/08/23	Outline erection of up to 90no. dwellings with garages with means of access to be considered.	
LAND OFF, LEGBOURNE ROAD, LOUTH	N/105/02010/20	Granted 06/01/22	Reserved matters application for the erection of up to 89no. dwellings (Outline Planning Permission N/105/00431/17).	
LAND SOUTH OF TENNYSON FIELDS, LOUTH, LINCOLNSHIRE, LN11 7AX	N/092/01017/20	Granted 15/06/21	Outline erection of up to 141no. dwellings (with means of access, landscaping and layout to be considered).	
FORMER MONKS DYKE TENNYSON COLLEGE, SEAHOLME ROAD, MABLETHORPE, LN12 2DF	N/110/00286/24	Under consideration	Planning Permission - Erection of 68no. dwellings, construction of vehicular access and internal access roads, provision of a drainage basin and associated landscaping and demolition of existing hard-standing.	
LAND ADJACENT JOCKHEDGE, HALL LANE, BURGH LE MARSH	S/023/01718/22	Granted 28/04/23	Outline erection of 104no. dwellings and excavation of 2no. retention/conservation ponds with all matters reserved.	
LAND AT HALTON ROAD AND, ASHBY ROAD, SPILSBY	S/165/02238/20	Granted 09/05/22	Outline planning permission for erection of up to 600no. dwellings and a medical centre with provision of associated open space, landscaping, estate roads and cycleways.	

WEST END, HOGSTHORPE, SKEGNESS, PE24 5PA	N/084/01712/22	Under consideration	Reserved Matters application relating to the erection of 89no. dwellings, erection of a pumping station, construction of a vehicular access and construction of internal roads (outline planning permission ref no. N/084/0809/19, granted 13th September 2019).	
THE GOLFERS INN, SANDILANDS GOLF CLUB, ROMAN BANK, SANDILANDS, SUTTON ON SEA, LN12 2RJ	N/110/01144/23	Granted 07/12/23	Planning Permission - Creation of a wetland nature reserve including the change of use, conversion of and alterations to the former golf clubhouse to provide a visitor centre (Building A), the erection of a toilet block and canopy structure (Building B) and a compound comprising of a maintenance building and relocated portable cabin (Building C) along with construction of a vehicular access with associated parking and visitor infrastructure.	
NSIPs 20km radius				
EGL3/4	EN0210003	DCO submission 2026	Eastern Green Link 3 (EGL3) comprises a converter station in the Walpole area of Norfolk along with associated development. Eastern Green Link 4 (EGL4) comprises a converter station in the Walpole area of Norfolk alone or together with a switching station and a converter station in the East Lindsey area of Lincolnshire, along with associated development.	
Viking CCS	EN070008	Development Consent Granted - 09/04/25	The Viking CCS Pipeline project comprises a new 55 km (approx.) onshore underground pipeline from the point of receipt of dense phase CO2 at Immingham, through its transportation to facilities at TGT, and transportation from TGT through the existing LOGGS pipeline to Mean Low Water Spring (MLWS). Associated infrastructure and ancillary works are anticipated including but not exclusive to required valves, inspection, monitoring, venting and handling facilities and temporary construction compounds, storage areas and access roads will also form part of the project.	
Grimsby to Walpole	EN020036	DCO application Spring 2027	The project will be a new c140 km long 400 kv overhead line and 5 new substations stretching from a new substation to the west of Grimsby in the north to a new substation at Walpole near Wisbech in the south. Three further substations will be built, two to the south west of Mablethorpe and one to the north east of Spalding.	
Ossian Wind Farm	EN0210006	Anticipated submission July 2026	The project is the transmission infrastructure located at the boundary of the English/Scottish territorial waters, routing south to landfall on the Lincolnshire coast and then over land to two separate grid connection points within Lincolnshire.	

Outer Dowsing Offshore Wind (Generating Station)	EN010130	Decision not issued, examination started 10/10/24	The project is in the Southern North Sea, approximately 54km from the Lincolnshire coast. Makes landfall at Walla Bank c17km south of our site	

Appendix E: LVIA Scoping Figures (8-1, 8-2, 8-3, 8-4)