

The Great Grid Upgrade

Grimsby to Walpole

Preliminary Environmental Information Report

Volume 2 Part B Section Specific Assessments

Section 1 New Grimsby West Substation

Chapters 1 to 13

June 2025



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Grimsby to Walpole

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Preface

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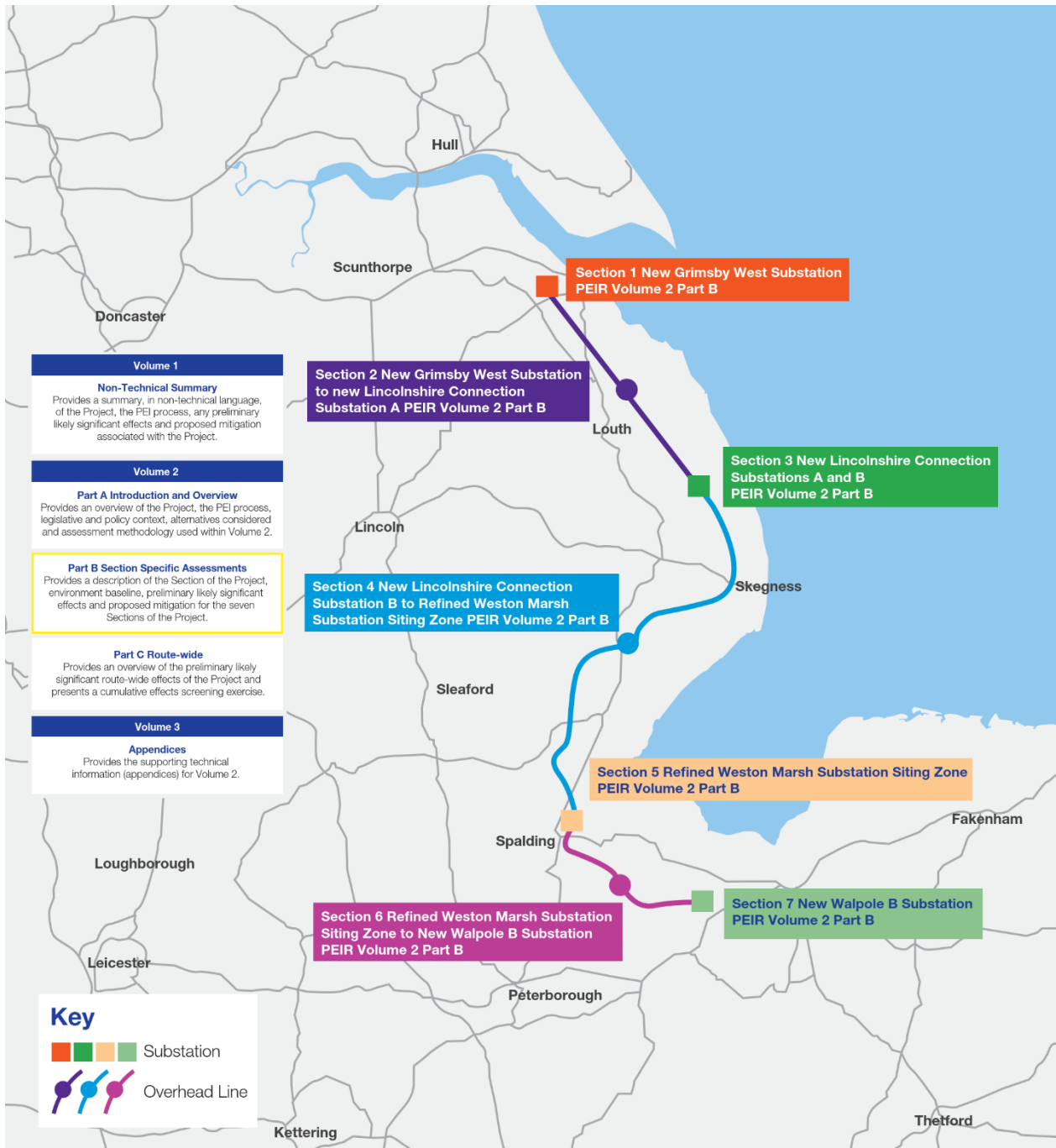
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1. Part B Preface

1.1 Structure and Context of the Preliminary Environmental Information Report

- 1.1.1 This **Preliminary Environmental Information (PEI) Report Volume 2 Part B** is part of the wider suite of documents that make up the PEI Report for the Grimsby to Walpole Project (the Project), prepared by Ove Arup and Partners Ltd and AECOM Ltd, on behalf of National Grid Electricity Transmission plc (National Grid). The purpose of this PEI Report is to give consultees an understanding of the potential likely significant environmental effects (positive or negative) of the Project to enable them to prepare well-informed responses to the statutory consultation. This PEI Report has been prepared in accordance with the Planning Inspectorate (PINS) Advice Note Seven: Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements (Ref 1).
- 1.1.2 The proposal by National Grid is to reinforce the transmission network with a new 400 kilovolt (kV) electricity transmission line over a distance of approximately 140 kilometres (km) starting from a new 400 kV substation west of the town of Grimsby in North East Lincolnshire and ending at a new 400 kV substation west of the village of Walpole St Andrew and north of the town of Wisbech, in King's Lynn and West Norfolk District. The Project also includes the construction of two new 400 kV Lincolnshire Connection Substations located south-west of Mablethorpe in East Lindsey, up to two new 400 kV substations in the vicinity of the Spalding Tee-Point in South Holland District and the decommissioning (in full or part) of the existing Grimsby West Substation.
- 1.1.3 The Project is a Nationally Significant Infrastructure Project (NSIP), as defined under Section 16 of the Planning Act 2008 (PA 2008) (Ref 2), because it comprises a new electricity line above ground with a length of more than 2 km, and with an operating voltage of above 132 kV. Regulation 12(2) of the EIA Regulations (Ref 3) defines preliminary environmental information as information that has been compiled by the applicant and is '*reasonably required for the consultation bodies to develop an informed view of the likely significant environmental effects of the development (and of any associated development)*'. This PEI Report consists of three volumes:
- i. **PEI Report Volume 1** contains the Non-technical Summary (NTS);
 - ii. **PEI Report Volume 2 Part A** contains an Introduction and Overview;
 - iii. **PEI Report Volume 2 Part B** contains the Section Specific Assessments;
 - iv. **PEI Report Volume 2 Part C** contains the Route-wide Assessments; and
 - v. **PEI Report Volume 3** contains the technical appendices supporting Volume 2.
- 1.1.4 Further detail on the structure and content of this PEI Report is provided in the following figure:



References

- Ref 1 References Planning Inspectorate (PINS) (2020) Advice Note Seven: Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements. [online]. Available at: <https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-advice-note-seven-environmental-impact-assessment-process-preliminary-environmental-information-an> [Accessed 21 February 2025]
- Ref 2 Planning Act 2008 [online]. Available at: <https://www.legislation.gov.uk/ukpga/2008/29/part/3> [Accessed 21 February 2025].
- Ref 3 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 [online]. Available at: <https://www.legislation.gov.uk/uksi/2017/572/contents/made> [Accessed 31 January 2025].

1. Overview of the Section and Description of the Project

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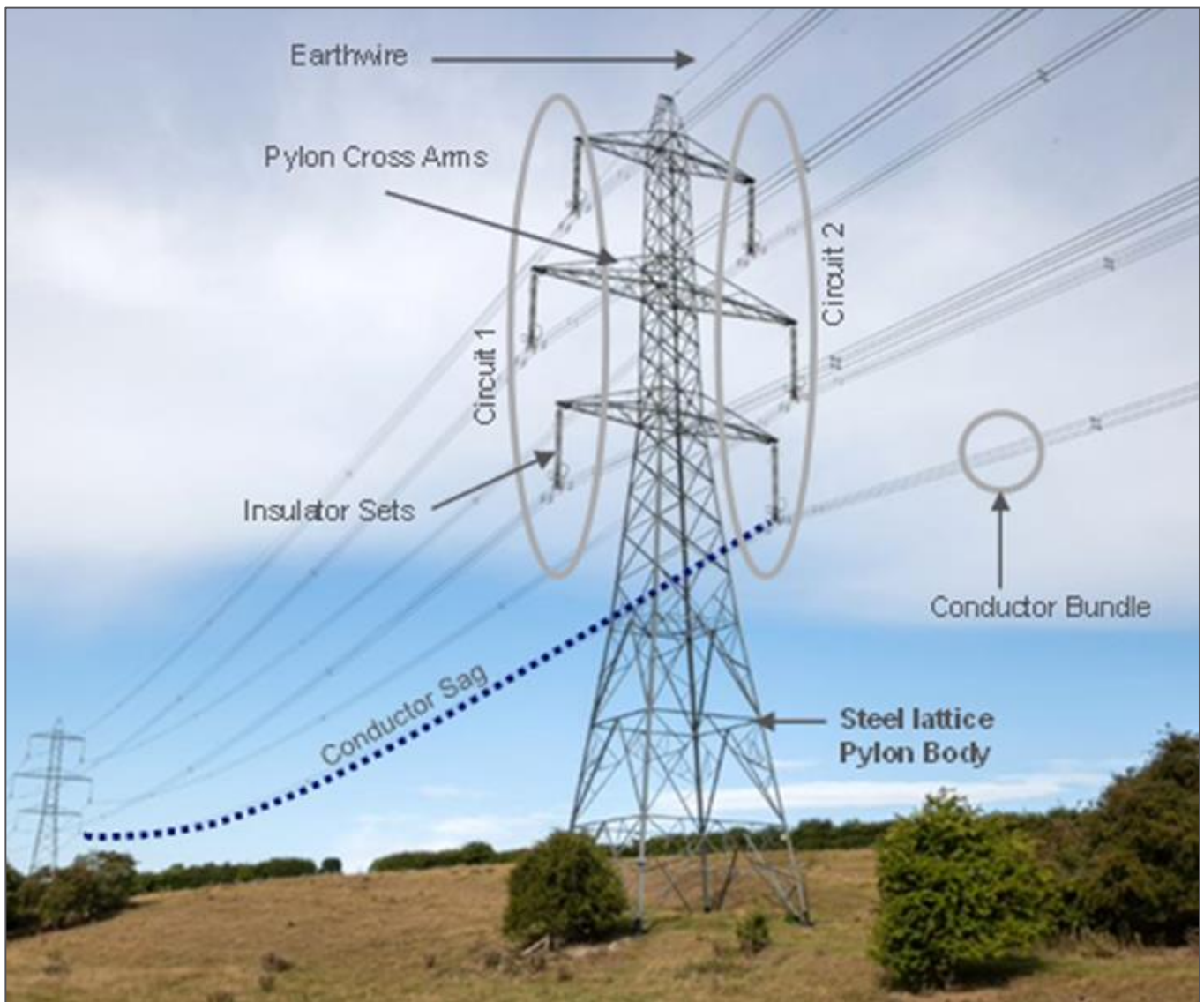
1. Overview of the Section and Description of the Project

1.1 Overview of the Section

- 1.1.1 This Chapter presents an overview of the Grimsby to Walpole Project (the Project) within Section 1 New Grimsby West Substation (Section 1) and has informed the preliminary environmental assessments reported in subsequent Chapters 2 to 13 within Preliminary Environmental Information (PEI) Report Volume 2 Part B Section 1.
- 1.1.2 Section 1 is located at the northern end of the Project and principally comprises the replacement of the existing Grimsby West 400 kV Substation with a new and expanded 400 kV substation (the proposed new Grimsby West Substation). Section 1 also includes a short section of the new 400 kilovolt (kV) overhead line which continues on to the new Lincolnshire Connection Substation A, as well as modifications to an existing 400 kV overhead line (known as the 4KG route) which is currently connected to the existing Grimsby West Substation.
- 1.1.3 The draft Order Limits are presented in **PEI Report Volume 2 Part B Section 1 Figure 1.1 Draft Order Limits**. They extend from east of Wells Road in an eastern direction toward Wybers Wood and south toward Pyewipe Farm. There are a number of water bodies in this Section and within the wider area there are several footpaths, bridleways and local access roads that provide links between rural dwellings and villages. The Section is located within the local authority area of North East Lincolnshire.
- 1.1.4 In summary, within Section 1, the Project includes the following components and activities:
- i. the proposed new Grimsby West Substation located west of Wybers Wood;
 - ii. an approximately 0.5 km long section of the new 400 kV overhead line from the proposed new Grimsby West Substation continuing south to the Route Section break between Section 1 and Section 2 New Grimsby West Substation to New Lincolnshire Connection Substation A (Section 2) at pylon no. GL4;
 - iii. modifications to approximately 2 km of the existing 4KG 400 kV overhead line between Wells Road and the existing Grimsby West Substation, in order to connect it to the proposed new Grimsby West Substation; and
 - iv. decommissioning (in full or part) of the existing Grimsby West Substation.
- 1.1.5 The decommissioning works at the existing Grimsby West Substation are yet to be defined, therefore the preliminary environmental assessments reported in subsequent chapters of this PEI Report do not assess the impact of these works. The decommissioning works will be assessed as part of the Environmental Statement (ES).

- 1.1.6 For the purposes of this PEI Report, it has been assumed that the pylon type is a typical steel lattice pylon. The main components of an overhead line and a typical steel lattice pylon are shown in **Image 1.1** below. Further detail on the selected pylon model will be included within the ES.
- 1.1.7 A more detailed description of the design of Section 1 is provided in section 1.2 below. For the purpose of reporting within this PEI Report, pylons located within Section 1 have been assigned a nominal code with the prefix 'GL', followed by a number. These can be seen on **PEI Report Volume 2 Part B Section 1 Figure 1.3 Permanent and Operational Features**.

Image 1.1 Components of a Typical Transmission Connection



1.2 Proposed Project

Proposed New Grimsby West Substation

Design and Overview

- 1.2.1 Substations play a key role in the electricity transmission system, helping to manage and control electricity flows as well as connecting generators and/or connecting to the electricity distribution network at grid supply points.
- 1.2.2 The proposed new Grimsby West Substation is located west of Wybers Wood and is the northern-most connection of the Project with the national electricity transmission system. The proposed new Grimsby West Substation is a necessary component of the network reinforcement provided by the Project, as it would enable a number of planned energy generation and storage developments to connect to the electricity transmission system. Customers currently contracted to connect into the proposed new Grimsby West Substation include:
- i. Eco Grimsby West – Energy Storage and Photo Voltaic (PV) Array;
 - ii. Stallingborough PV and BESS – Energy Storage/Solar;
 - iii. Carbon Free 2030 – Energy Storage/Solar;
 - iv. Stallingborough Carbon Capture – Combined Cycle Gas Turbine (CCGT);
 - v. Grimsby BESS – Energy Storage.
 - vi. Great Coates BESS – Energy Storage; and
 - vii. Bute Hydrogen Project 3 .
- 1.2.3 There would also be a need for transformers due to Distribution Network Operator (DNO) requirements in the area.
- 1.2.4 For the purposes of the preliminary environmental assessment and consistent with paragraph 2.5.6 of the Corridor Preliminary Routeing and Siting Study (CPRSS) (Ref 1), it has been assumed that the proposed new Grimsby West Substation would be an Air Insulated Switchgear (AIS) substation. AIS substations use air as the insulation medium for electrical equipment meaning that equipment is predominantly located outdoors. The proposed new Grimsby West Substation would be located within a secured fenced compound. The total footprint of the proposed new Grimsby West Substation would be approximately 10.2 ha, including a 5 m buffer around the fence line. The dimensions for the main compound itself would be approximately 522 m by 185 m (approximately 9.7 ha), plus a 106 m by 52 m (approximately 0.5 ha) extra area near the entrance for ancillary equipment and car parking. The existing Grimsby West Substation is approximately 3.3 ha. Within the proposed new Grimsby West Substation there would be a range of specialist electrical equipment, including transformers and reactors. The maximum height for High Voltage (HV) plant and buildings within the proposed new Grimsby West Substation is 12.5 m, and the maximum height for gantries, which connect the new and modified overhead lines to it, is assumed to be 15 m.
- 1.2.5 During operation, lighting would be required at the substation sites to allow for safe movement and the operation of equipment. Security lighting would also be required. All lighting would be designed in accordance with the appropriate design standards

and National Grid technical specifications. For the purpose of the PEI Report, it is assumed that the security lighting would be event activated (i.e. would not be continuous) and would be designed to be environmentally sensitive (e.g. directional and low light not exceeding 50 lux). Further information regarding substation lighting design will be provided within the project description within the Environmental Statement. An overview of the proposed substation design is provided in **PEI Report Volume 2 Part B Section 1 Figure 1.4 New Grimsby West Substation Layout**.

- 1.2.6 Further detail on the evolution of the design of the Project, and the design of Section 1, can be found in the **Grimsby to Walpole Design Development Report**.

Mitigation measures

- 1.2.7 As detailed within **PEI Report Volume 2 Part A Chapter 4 Approach to Preliminary Environmental Information** there are three types of mitigation measures that have been considered across the Project. In summary the three types are:
- i. Design mitigation measures which are those that are intrinsic to and built into the design;
 - ii. Control mitigation measures which comprise management activities, control measures and techniques, that would be implemented during construction or operation of the Project to limit impacts; and
 - iii. Additional mitigation measures which comprise measures over and above any design or control and management mitigation measures, for which the Environmental Impact Assessment (EIA) has identified a requirement to further reduce significant environmental effects.
- 1.2.8 Additional environmental mitigation measures which have been incorporated into the Project have been assigned a unique code to identify the location and nature of the measure. This code begins with the Route Section number (e.g. S1; S2) followed by either 'L+V' for Landscape and Visual measures, or 'ECO' for those regarding Ecology. Each measure is then numbered sequentially, starting with 01.
- 1.2.9 Additional environmental mitigation measures that have been incorporated into the design of Section 1 include the following:
- i. S1-ECO-01: a management regime for grassland to the north of the proposed new Grimsby West Substation to provide habitat for skylark;
 - ii. S1-ECO-02: ditch creation to the north of the proposed new Grimsby West Substation;
 - iii. S1-L+V-01: replacement woodland planting for the removal of part of the woodland at Maud Hole Covert, located to the north of the proposed new Grimsby West Substation;
 - iv. S1-L+V-02 to S1-L+V-04 and S1-L+V-06 to S1-L+V-09: areas of landscape planting to provide screening and filtering of views of the proposed new Grimsby West Substation, this includes areas of planting to the north, west and south of the proposed new Grimsby West Substation; and
 - v. S1-L+V-05: hedgerow replacement to the north of the proposed new Grimsby West Substation.

- 1.2.10 These mitigation areas can be seen on **PEI Report Volume 2 Part B Section 1 Figure 1.3 Permanent and Operational Features**.

Construction

- 1.2.11 Subject to gaining development consent in 2028, it is anticipated that construction of the Project would commence in 2029, starting with enabling works. It is expected that the main construction works (construction of substations and overhead line) would continue through to 2033 (four years).
- 1.2.12 Construction of the proposed new Grimsby West Substation includes the following key stages and activities:
- i. site establishment;
 - ii. site preparation and earthworks;
 - iii. civil works;
 - iv. construction of buildings;
 - v. installation of electrical equipment;
 - vi. site reinstatement and landscaping; and
 - vii. commissioning.
- 1.2.13 In regard to temporary construction requirements, there are three construction compounds located to the immediate south of the proposed new Grimsby West Substation. This includes the following:
- i. a construction compound located to the south of the proposed new Grimsby West Substation with an area of 3 ha;
 - ii. a construction compound located to the west of the above construction compound with an area of 2.1 ha; and
 - iii. a construction compound located to the south of the proposed access road with an area of 1 ha.
- 1.2.14 The land on which construction compounds are located would be reinstated upon completion of construction.
- 1.2.15 Construction and permanent access for the proposed new Grimsby West Substation connects to Aylesby Road. This partially makes use of the existing access point for the existing Grimsby West Substation.
- 1.2.16 **PEI Report Volume 2 Part B Section 1 Figure 1.2 Temporary and Construction Features** outlines the temporary features within Section 1 in place as part of construction and **PEI Report Volume 2 Part A Chapter 5 Project Description** provides further information on the what the construction of the proposed new Grimsby West Substation entails.

Operation

- 1.2.17 During operation the Project would reinforce the electricity transmission network in Lincolnshire, Cambridgeshire and Norfolk, and facilitate the connection of planned offshore wind generation, battery storage/solar, combined cycle gas turbines,

interconnectors with other countries, increased distribution network capacity and subsea links to Scotland.

- 1.2.18 The proposed new Grimsby West Substation within Section 1 forms part of this reinforcement by enabling a number of planned energy generation and storage developments to connect to the electricity transmission system, and providing a connection point for the new overhead line to link with the existing transmission network. Once operational, on-site activity at the proposed new Grimsby West Substation is generally limited to regular inspection and maintenance.
- 1.2.19 **PEI Report Volume 2 Part B Section 1 Figure 1.3 Permanent and Operational Features** outlines the permanent features within Section 1 in place as part of operation of the Project, including for the proposed new Grimsby West Substation and **PEI Report Volume 2 Part A Chapter 5 Project Description** provides further information on the what the operation of the proposed new Grimsby West Substation entails.

Proposed Overhead Line Route

Design and overview

- 1.2.20 A short section of the proposed new 400 kV overhead line route measuring approximately 0.5 km is included within Section 1, this extends southwards from the proposed new Grimsby West Substation to the Route Section break between Section 1 and Section 2 at pylon no. GL4.
- 1.2.21 Along the approximately 0.5 km long section of the new 400 kV overhead line in Section 1, there are three structures. This includes two gantries at a height of up to 15 m which are located within the proposed new Grimsby West Substation, and one pylon at a height of approximately 49 m. The span distances between pylon no. GL1 and GL3 and pylon no. GL2 and GL3 are approximately 70 m, with a longer span distance of approximately 300 m between pylon no. GL3 and pylon no. GL4 at the Route Section break between Section 1 and Section 2.
- 1.2.22 The pylons along the proposed new 400 kV overhead line route within Section 1 are assumed to comprise of steel lattice pylons, the foundations of which would either be a standard foundation (concrete pad and column) or non-standard foundation (either concrete pad and column of increased dimension or depth, or piled foundations). The selection of foundation type would depend upon the ground conditions encountered.
- 1.2.23 Within the design of the Project, there is a need for some flexibility, which has been accounted for in the assessments within this PEI Report. The horizontal Limits of Deviation (LoD) applied either side of the full length of the overhead line centreline is 50 m, for a total width of 100 m. Where the LoD is 100 m, the extent of movement of any pylon is limited by the span length and conductor swing. At a maximum span length, the centre of the pylon could move approximately 20 m either side of the centreline subject to topography and local conditions.
- 1.2.24 There is no fixed limit on the movement of a pylon along the centreline of the proposed route i.e. pylons can move up and down the centreline (longitudinal LoD). While there is no fixed limit, in practical terms the movement of pylons along the centreline is constrained by a combination of the span distance between adjacent pylons and maintaining the necessary ground clearances without exceeding the vertical LoD.

- 1.2.25 The vertical Limits of Deviation (LoD) applied along the length of the overhead line is 6 m to allow for the pylon height to be increased in order to increase ground clearances.

Construction

- 1.2.26 The construction of the 400 kV overhead line would generally follow the sequence outlined below:
- i. surveys including archaeological investigation;
 - ii. ground investigation;
 - iii. installation of bellmouths and creation of visibility splays;
 - iv. installation of stock proof fencing and gates or equivalent;
 - v. topsoil stripping, temporary drainage installation where required;
 - vi. installation of access tracks (including culverts and bridges) and demarcated pylon working areas;
 - vii. installation of pylon foundations (pad and column, mini pile, tube pile or bespoke);
 - viii. working area and layout of steelwork in preparation for erection;
 - ix. assembly (painting if required) and erection of steelwork;
 - x. installation of pylon signage including safety notice plate and anti-climbing devices;
 - xi. installation of crossing protection prior to stringing of conductors, including scaffolding;
 - xii. installation of insulator assemblies on suspension pylons;
 - xiii. establishment of machine sites for conductor stringing;
 - xiv. conductor and earthwire stringing;
 - xv. temporary earthing;
 - xvi. installation of tension insulator assemblies on tension and terminal pylons;
 - xvii. removal of construction equipment and reinstatement of ground and restoration of soils;
 - xviii. removal of access tracks and bellmouths; and
 - xix. removal of construction compounds and ground reinstatement.
- 1.2.27 Detail on the location of construction compounds in regard to Section 1 is provided above under construction of the proposed new Grimsby West Substation.
- 1.2.28 Construction access for the overhead line within Section 1 is via an access point that falls within Section 2, connected to Aylesby Road further to the south.
- 1.2.29 **PEI Report Volume 2 Part B Section 1 Figure 1.2 Temporary and Construction Features** outlines the temporary features within Section 1 in place as part of construction, including for the proposed 400 kV overhead line route and **PEI Report**

Volume 2 Part A Chapter 5 Project Description provides further information on the what the construction of the proposed 400 kV overhead line entails.

Operation

- 1.2.30 During operation the Project would reinforce the electricity transmission network in Lincolnshire, Cambridgeshire and Norfolk, and facilitate the connection of planned offshore wind generation, battery storage/solar, combined cycle gas turbines, interconnectors with other countries, increased distribution network capacity and subsea links to Scotland.
- 1.2.31 The overhead line within Section 1 forms part of this reinforcement by providing a high capacity power transmission route between the proposed new Grimsby West Substation and the Route Section break between Section 1 and Section 2. Overhead lines require minimal maintenance during operation and would be monitored and regularly inspected for signs of fatigue. Subject to planting within the vicinity of Section 1, it is assumed that there would be an ongoing vegetation management regime. Overall, once operational, the overhead line would not generate significant activity beyond ordinary inspection and maintenance.
- 1.2.32 **PEI Report Volume 2 Part B Section 1 Figure 1.3 Permanent and Operational Features** outlines the permanent features within Section 1 in place as part of operation, including for the proposed 400 kV overhead line route and **PEI Report Volume 2 Part A Chapter 5 Project Description** provides further information on the what the operation of the proposed 400 kV overhead line entails.

Proposed Modifications to the Existing Overhead Line Route

Design and overview

- 1.2.33 An existing 400 kV overhead line (known as the 4KG route) is routed in an eastern direction from the A1173 to the existing Grimsby West Substation. As part of the Project the 4KG route would be diverted and connected to the proposed new Grimsby West Substation. To facilitate this, temporary diversions would be constructed to allow replacement pylons to be constructed along the existing overhead line route, and a short new section of the 4KG route would be constructed to connect into the new substation. This would allow a short redundant section of the existing line to be dismantled.
- 1.2.34 As part of the modifications to the 4KG route, the following would be carried out:
- i. seven structures would be dismantled along approximately 1.4 km of the 4KG route, including:
 - dismantling of two pylons, with replacement in close proximity along the same alignment; and
 - dismantling of three further pylons and two gantries that currently connect into the existing Grimsby West Substation.
 - ii. five new structures would be constructed along approximately 0.6 km of the existing 4KG route, and approximately 0.4 km of the new 4KG route, including:
 - two gantries at a height of approximately 15 m; and
 - three pylons ranging from a height of approximately 45 m to 49 m.

Construction

- 1.2.35 During construction, temporary diversions of the 4KG route would take place. This would include construction of temporary pylons and temporary overhead line. Within Section 1, there are five temporary pylons, ranging from a height of approximately 45 m to 50 m along approximately 1.4 km of temporary overhead line. Detail around how construction of new overhead line would be carried out is provided above under construction of the proposed overhead line route.
- 1.2.36 The phasing of these construction works would consist of the following:
- temporary diversion of the 4KG route into the existing Grimsby West Substation;
 - construction of the new substation;
 - permanent works on the 4KG route in parallel to the construction of the new proposed overhead line;
 - connection of the 4KG route to the new substation; and
 - decommissioning (in full or part) of the existing Grimsby West substation¹.
- 1.2.37 Detail on the location of construction compounds in regard to Section 1 is also provided above under construction of the proposed new Grimsby West Substation.
- 1.2.38 **PEI Report Volume 2 Part B Section 1 Figure 1.2 Temporary and Construction Features** outlines the temporary features within Section 1 which would be in place as part of construction, including for the modifications to the 4KG route. **PEI Report Volume 2 Part A Chapter 5 Project Description** provides further information on the what the construction of the modifications to the 4KG route entails.

Operation

- 1.2.39 During operation the Project would reinforce the electricity transmission network in Lincolnshire, Cambridgeshire and Norfolk, and facilitate the connection of planned offshore wind generation, battery storage/solar, combined cycle gas turbines, interconnectors with other countries, increased distribution network capacity and subsea links to Scotland.
- 1.2.40 Overhead lines require minimal maintenance during operation and would be monitored and regularly inspected for signs of fatigue. Subject to planting within the vicinity of Section 1, there may also be an ongoing vegetation management regime. Overall, once operational, the overhead line would not generate significant activity beyond ordinary inspection and maintenance.
- 1.2.41 **PEI Report Volume 2 Part B Section 1 Figure 1.3 Permanent and Operational Features** outlines the permanent features within Section 1 which would be in place during operation and maintenance, including the modifications to the 4KG route. **PEI Report Volume 2 Part A Chapter 5 Project Description** provides further information on what the operation of the modifications to the 4KG route entails.

¹ As stated at paragraph 1.1.5 above, the preliminary environmental assessments reported in subsequent chapters of this PEI Report do not assess the impact of these works.

References

- Ref 1 Grimsby to Walpole Corridor Preliminary Routeing and Siting Study. January 2024 [online]. Available at: <https://www.nationalgrid.com/document/352621/download> [Accessed 3 March 2025].

2. Landscape

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2. Landscape

2.1 Introduction

- 2.1.1 This chapter presents the Preliminary Environmental Information (PEI) in relation to the Landscape assessment of the New Grimsby West Substation Section (Section 1) of the Grimsby to Walpole Project (the Project). Specifically, the chapter includes the following sections:
- i. An introduction to the topic (section 2.1);
 - ii. Identification of key local and regional policy relevant to the assessment (section 2.2). A full overview of the legislation and national, regional onshore and marine planning policy context that applies to the Project is presented within **PEI Report Volume 2 Part A Chapter 2 Legislative, Regulatory and Planning Policy Context and supporting appendices**;
 - iii. A summary of the assessment scoping process and subsequent scope of the Landscape assessment (section 2.3). Further detail is provided within **PEI Report Volume 3 Part A Appendix 4A Planning Inspectorate Scoping Opinion Responses**;
 - iv. A high-level summary of the methodology of the Landscape assessment within Section 1 (section 2.4). A detailed description of the assessment methods and scope, applicable to the whole Project, is contained in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**;
 - v. A description of the environmental baseline within the Section 1 Study Area relevant to the Landscape assessment (section 2.5);
 - vi. A description of mitigation measures included for the purposes of the Landscape assessment reported within the PEI Report (section 2.6). Further information regarding design development can be found in **PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered** and the **Grimsby to Walpole Design Development Report**;
 - vii. The likely significant and non-significant Landscape effects arising during construction and operation of the Project within Section 1 (section 2.7), based upon the assessment completed to date; and
 - viii. An outline of the proposed monitoring requirements in relation to Landscape (section 2.8).
- 2.1.2 Further supporting information is set out in **Table 2.1** below, including supporting figures and technical appendices.

Table 2.1 Supporting documentation

Supporting Information	Description
Topic Specific Supporting Documentation	
PEI Report Volume 2 Part B Section 1 Figures	<p>Figure 2.1 Landscape Designations and Features</p> <p>Figure 2.2 Landform and Drainage</p> <p>Figure 2.3 National Character Areas</p> <p>Figure 2.4 Regional and Local Landscape Character Areas</p> <p>Figure 3.2 Zone of Theoretical Visibility (ZTV)</p>
PEI Report Volume 3 Part B Appendix 2A Landscape Character Baseline	Description of the landscape character baseline across the route of the Project.
Project Supporting Documentation	
PEI Report Volume 2 Part B Section 1 Chapter 1 Overview of the Section and Description of the Project	A summary of the works within Section 7, including permanent infrastructure, temporary construction works, and operational activities.
PEI Report Volume 3 Part A Appendix 2A Key Legislation	A list of identified environmental legislation considered relevant to the Project, which will be updated and amended as required to inform the Environmental Statement (ES).
PEI Report Volume 3 Part A Appendix 2B National and Regional Planning Policy	A list of National and regional policies generally applicable to the assessment principles which underpin the PEI Report and ES.
PEI Report Volume 3 Part A Appendix 2Ci Local Plan Policy: Section Specific	An outline of the potentially relevant local planning policy allocations affecting each of the specific Sections of the Project.
PEI Report Volume 3 Part A Appendix 2Cii Local Plan Policy: Route-wide	Details of planning policies applicable route-wide within the relevant Local Authority areas.
PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered	A summary of the main alternatives considered in relation to the Project during the design development process, including the main reasons for selecting the chosen option.
PEI Report Volume 2 Part A Chapter 4 Approach to Preliminary Environmental Information	Sets out the Environmental Impact Assessment (EIA) approach and general methodology that has been used in developing the PEI Report for the Project.
PEI Report Volume 2 Part A Chapter 5 Project Description	An overarching description of the Project and its key components, including available construction information.

Supporting Information	Description
PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice	Sets out control and management measures that will be undertaken during construction of the Project if granted consent. The final Code of Construction Practice (CoCP) will be submitted in support of the Development Consent Order (DCO) application.

- 2.1.3 There are also interrelationships between the potential effects on Landscape and other environmental topics. Therefore, please also refer to the following chapters within **PEI Report Volume 2 Part B** and **Part C**:
- i. **PEI Report Volume 2 Part B Section 1 Chapter 3 Visual** should be consulted in relation to the viewpoint assessment. This helps to inform the baseline description and supports the assessment of effects on the landscape.
 - ii. **PEI Report Volume 2 Part B Section 1 Chapter 4 Ecology and Biodiversity** should be consulted in relation to impacts on trees and woodland. An Arboricultural Impact Assessment will be presented as an appendix to the ES and will be cross referenced in relation to impacts on trees and woodland. Both documents will be used to help inform the baseline landscape and support the assessment of effects on the landscape.
 - iii. **PEI Report Volume 2 Part B Section 1 Chapter 5 Historic Environment** should be consulted in relation to historic assets including historic landscapes and Registered Parks and Gardens, which may contribute to the value of the landscape. This helps to inform the baseline description and supports the assessment of effects on the landscape.
 - iv. **PEI Report Volume 2 Part B Section 1 Chapter 9 Traffic and Movement** should be consulted in relation to increased traffic flows, which may influence the character of the landscape through noise and visual disturbance. This helps to inform the baseline description and supports the assessment of effects on the landscape.
 - v. **PEI Report Volume 2 Part B Section 1 Chapter 10 Noise and Vibration** should be consulted in relation to noise intrusion, which may affect the perceptual qualities of the landscape. This helps to inform the baseline description and supports the assessment of effects on the landscape.
 - vi. **PEI Report Volume 2 Part B Section 1 Chapter 11 Socio-economics, Recreation and Tourism** should be consulted in relation to areas of recreational importance which may contribute to the value of the landscape. The outputs of the landscape assessment will inform the assessment of effects on recreation and tourism.
 - vii. **PEI Report Volume 2 Part B Section 1 Chapter 13 Summary** which provides a concise, consolidated summary of the likely significant effects reported for all topics, based upon the preliminary assessment.
 - viii. **PEI Report Volume 2 Part C Route-wide Chapter 2 Landscape** should be consulted in relation to the assessment of effects on the natural beauty and special qualities of the Lincolnshire Wolds National Landscape (Area of

Outstanding Natural Beauty (AONB)). This helps to inform the baseline description and supports the assessment of effects on the landscape.

- ix. **PEI Report Volume 2 Part C Route-wide Chapter 10 Cumulative Effects** reports those intra-project effects which could potentially act in combination to result in cumulative environmental effects. It also identifies a shortlist of other Committed Developments with which there may be potential for cumulative effects, and the relevant environmental topics for such effects (inter-project). The full cumulative effects assessment will be reported within the ES.

2.2 Legislation and Policy Framework

Legislation and National Policy

- 2.2.1 Legislation and national policy relevant to the Project and this chapter is described in **PEI Report Volume 2 Part A Chapter 2 Legislative, Regulatory and Planning Policy Context** and supporting appendices, detail of which is set out in **Table 2.1**.

Regional and Local Policy

- 2.2.2 Regional and local plans or policies relevant to this assessment are as follows.
 - i. North East Lincolnshire Local Plan 2013 to 2032 (Adopted 2018) (Ref 1)
 - Policy 31 Renewable and low carbon infrastructure requires that developments will be assessed on their impact on landscapes and townscapes, particularly in regard to the Landscape Character Assessment and impact on the setting and scenic beauty of the Areas of Outstanding Natural Beauty (AONB); and
 - Policy 42 Landscape requires consideration of landscape character in proposals, adherence to the Landscape Character Assessment and supports prioritising the protection and enhancement of the Lincolnshire Wolds National Landscape (AONB).
 - ii. North East Lincolnshire Local Plan Review (Ref 2)
 - Draft Strategic Policy 2: Development boundaries supports the need for assessment of impacts for visual intrusion and landscape and that development will be supported if it harmonizes with the local setting and respects the area's distinctive character and landscape quality; and
 - Draft Strategic Policy 10: Landscape states that developers must consider landscape character in their proposals, prioritise the protection of the Lincolnshire Wolds National Landscape (AONB), conducting a site-specific landscape appraisal and submitting a suitable landscaping scheme.
 - iii. Central Lincolnshire Local Plan (Adopted April 2023) (Ref 3)
 - Policy S14: Renewable Energy details the support for renewable energy schemes, including ancillary development, only where the direct, indirect, individual and cumulative impacts are, or will be made, acceptable;
 - Policy S16: Wider Energy Infrastructure details the support for proposals that seek to aid the transition to Net Zero and that any such proposals will take reasonable measures to mitigate harm; and

- Policy S62: Areas of Outstanding Natural Beauty and Areas of Great Landscape Value requires that all development proposals within, or affecting the setting of, the AONB shall protect and enhance important views into, out of and within the AONB.

2.3 Scope of Assessment

- 2.3.1 The scope of the assessment has been informed by the Scoping Opinion (Ref 4) provided by the Planning Inspectorate in September 2024 on behalf of the Secretary of State, following the submission of the EIA Scoping Report (Ref 5). The scope has also been informed through consultation and engagement with relevant consultees. A summary of the Scoping Opinion together with a response against each point of relevance to the Landscape chapter is provided in **PEI Report Volume 3 Part A Appendix 4A Planning Inspectorate Scoping Opinion Responses**. A summary of the stakeholder engagement undertaken to date is provided in **PEI Report Volume 3 Part A Appendix 4D Summary of Stakeholder Engagement**.
- 2.3.2 Non statutory consultation feedback is summarised within the **Grimsby to Walpole Stage 1 Consultation Feedback Report**.
- 2.3.3 The scope of the construction and operation assessment covers the following receptor types:
- i. Locally designated landscapes;
 - ii. Landscape Character Types (LCT);
 - iii. Regional Landscape Character Types (RLCT); and
 - iv. Landscape Character Areas (LCA).
- 2.3.4 A preliminary assessment of the effects of the Project on the natural beauty and special qualities of the Lincolnshire Wolds National Landscape (AONB) has been produced as a separate route-wide assessment and is presented in **PEI Report Volume 2 Part C Route-wide Chapter 2 Landscape**. This is because multiple Sections of the Project potentially impact the receptor, so it was considered appropriate to assess it at a route-wide level.
- 2.3.5 For completeness and to provide further context to the assessment, the relevant National Character Areas (NCA) as defined by Natural England (Ref 7) are listed under baseline conditions in section 2.5. This is to ensure that the potential for significant effects at a wider level than district level is understood, given the length of the route and geographical coverage of the Project. An assessment of the effects of the Project on the NCAs will be provided in the project-wide assessment of landscape effects presented in the ES once the assessments of the more detailed regional and local landscape types have been completed.
- 2.3.6 North East Lincolnshire LCT 1: Industrial Landscape is located within the Study Area but has been scoped out due to distance and lack of potential for significant effects.
- 2.3.7 Where a receptor is impacted by multiple Sections of the Project, section 2.7 describes the impact upon the receptor within this Section first. It then provides an aggregated assessment of all impacts across all Sections upon the receptor to assess how the cumulative effect of the Project as a whole impacts the receptor from a landscape perspective.

2.4 Assessment Methodology

- 2.4.1 The assessment methodology, relevant guidance, key assumptions and limitations for the Landscape assessment are set out in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**. This includes a description of how receptor sensitivity, magnitude of impact and significance of effects are all defined and assigned to the assessment. A summary of the key components is outlined below.

Approach

- 2.4.2 As explained in paragraph 5.1 of GLVIA3 (Ref 6) “*An assessment of landscape effects deals with the effects of change and development on landscape as a resource*”. Changes may affect the elements that make up the landscape, its aesthetic and perceptual aspects, and its distinctive character.
- 2.4.3 Landscape receptors are the elements or aspects of the landscape that may be affected by a proposed development or change. These can include physical, visual, and experiential components of the landscape.
- 2.4.4 The Landscape assessment is based on published landscape character assessments across the Study Area. The preliminary baseline for the assessment is presented in the **PEI Report Volume 3 Part B Appendix 2A Landscape Character Baseline**.
- 2.4.5 In accordance with GLVIA3 (Ref 6), the assessment of landscape effects involves evaluating both the nature of the landscape receptors (their sensitivity) and the nature of the effects on those receptors (the magnitude of effect). These factors are then considered together to form an overall judgment regarding the significance of landscape effects.
- 2.4.6 The Landscape section of **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope** describes the methodology used to evaluate sensitivity and magnitude and how the judgements on sensitivity and magnitude of effect are combined to make an informed professional assessment of the significance of each landscape effect. A summary of the approach is set out below.

Establishing Landscape Sensitivity

- 2.4.7 In accordance with paragraph 5.39 of GLVIA3 (Ref 6) evaluations of the sensitivity of a landscape receptor to change are based on consideration of the judgements on the value attached to the landscape (which is established and reported as part of the baseline) and the susceptibility of the landscape to change arising from the Project. These judgements are guided by the indicative criteria set out in the Landscape section of **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**. Judgements on value and susceptibility are recorded as either very high, high, medium or low.

Predicting the Magnitude of Change

- 2.4.8 In accordance with paragraph 5.48 of GLVIA3 (Ref 6), evaluations of the magnitude of landscape change are based on consideration of the judgements on size/scale, geographical extent, duration and reversibility of the predicted change. They are

guided by the indicative criteria set out in the Landscape section of **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**. Judgements on the magnitude of predicted landscape change are recorded as large, medium, small and very small.

Judging Levels of Landscape Effect and Significance

- 2.4.9 The final step in the assessment requires the judgements on the sensitivity of the landscape receptors and the predicted magnitude of landscape change to be combined to make an informed professional assessment of the significance of each landscape effect. In accordance with paragraph 5.55 of GLVIA3 (Ref 6) the evaluations of the individual aspects set out above (susceptibility, value, size and scale, geographical extent, duration and reversibility) are considered together to provide an overall profile of each identified landscape effect guided by the indicative criteria set out in the Landscape section of **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
- 2.4.10 Professional judgement and experience are applied to balance the many different variables that need to be considered and given different weight according to site-specific and location-specific considerations.
- 2.4.11 Levels of landscape effect are identified as major, moderate, minor, or negligible and the direction of change as beneficial or adverse. Effects judged to be moderate or major are considered significant in the context of the EIA Regulations (Ref 8). The general approach taken to determining the significance of effect in this preliminary assessment is only to state whether effects are likely or unlikely to be significant, rather than assigning significance levels, which will be presented in the ES.

Assessment Assumptions and Limitations

- 2.4.12 All general assumptions and limitations for the topic are listed within **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
- 2.4.13 The decommissioning works at the existing Grimsby West Substation are yet to be defined, therefore a limitation of this preliminary assessment of landscape effects is that it does not assess these works. The decommissioning works will be assessed as part of the ES.
- 2.4.14 The key parameters and assumptions which inform the assessment will be reviewed based on the design presented in the DCO application and, where required, updated, or refined, for the ES. The ES will present the final key limitations and assumptions applicable to the full assessment, particularly drawing attention to any areas that may have changed from that presented in this preliminary assessment.

2.5 Baseline Conditions

Study Area

- 2.5.1 The Study Area for the preliminary Landscape assessment is shown on **PEI Report Volume 2 Part B Section 1 Figure 2.1 Landscape Designations and Features**. The extent of the Study Area for the preliminary Landscape assessment (based on the same approach which will be adopted when defining the EIA Study Area),

extends 5 km from the Limits of Deviation (LoD) for the new 400 kV overhead line^[1]. This distance was informed by the ZTV, the scale and appearance of the pylons (as detailed in **PEI Report Volume 2 Part A Chapter 5 Project Description**), field survey and professional judgment, and is considered sufficient to capture the likely significant landscape effects of the Project. Although the ZTV indicates potential visibility beyond 5 km in certain directions, based on previous experience of similar schemes, significant impacts on the character and perception of the landscape are highly unlikely to arise beyond this distance.

- 2.5.2 The preliminary cumulative Landscape assessment Study Area extends 10 km from the LoD for the new 400 kV overhead line. This radius was established to evaluate potential cumulative landscape impacts in conjunction with other committed developments.
- 2.5.3 The ZTV map, which incorporates screening elements such as buildings and woodland, is presented in **PEI Report Volume 2 Part B Section 1 Figure 3.2 Zone of Theoretical Visibility (ZTV)**. Based on pylon locations provided by design engineers, the ZTV identifies areas from where the proposed 400 kV overhead line may theoretically be visible. It also helped determine the extent of the Study Area for the Landscape assessment. The theoretical visibility of individual pylons is limited to a maximum distance of 10 km, as beyond this distance, the pylons would be almost imperceptible. This also covers the full extent of the Study Area for the cumulative assessment.
- 2.5.4 Further information on Study Area definition and ZTV production is presented in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
- 2.5.5 To ensure that all likely significant effects are captured in the assessment, the Study Area will continue to be reviewed in the light of feedback received during statutory consultation, ongoing site surveys, and following the production of updated ZTVs as the Project develops.

Data Collection

- 2.5.6 The following data has been used to inform the baseline conditions:
 - i. Ordnance Survey (OS) 1:10,000, 1:25,000, 1:50,000 and 1:250,000 base mapping;
 - ii. OS Terrain® 50 mid-resolution and LIDAR Composite 2017 – 50 cm Digital Terrain Model (DTM);
 - iii. Google Earth Pro aerial photography, and Google Maps Street View;
 - iv. Base mapping from ArcGIS Map Service;
 - v. Open source Geographic Information System (GIS) data;
 - vi. North East Lincolnshire Local Plan 2013 to 2032 (Adopted 2018) (Ref 1)

¹ The Study Area for the preliminary assessment is measured from the LoD for the new 400 kV overhead line as significant effects are most likely to result from construction and operation of the new substations and 400 kV overhead line rather than the temporary access tracks, which in some instances could extend several kilometres from the draft Order Limits but are unlikely to result in significant effects.

- vii. Central Lincolnshire Local Plan (Adopted April 2023) (Ref 3);
- viii. Natural England National Character Area Profiles (Ref 7);
- ix. North East Lincolnshire Landscape Character Assessment, Sensitivity and Capacity Study (Ref 9);
- x. Lincolnshire Historic Landscape Characterisation Project (Ref 10); and
- xi. East Midlands Regional Landscape Character Assessment (Ref 11).

2.5.7 Site surveys were carried out during several visits under differing weather conditions between spring 2023 and summer 2024.

Existing Baseline

2.5.8 The following section outlines the Landscape baseline and should be read in conjunction with **PEI Report Volume 3 Part B Appendix 2A Landscape Character Baseline**. The appendix provides a description of the landscape, including its elements, features, and overall character, with reference to the landscapes and landscape character areas listed below. It also includes judgements on the landscape's relative value and its susceptibility to change resulting from the Project.

2.5.9 The baseline section should also be read in conjunction with the following supporting Figures, as found within **PEI Report Volume 2**:

- i. **PEI Report Volume 2 Part B Section 1 Figure 2.1 Landscape Designations and Features;**
- ii. **PEI Report Volume 2 Part B Section 1 Figure 2.2 Landform and Drainage;**
- iii. **PEI Report Volume 2 Part B Section 1 Figure 2.3 National Character Areas;**
- iv. **PEI Report Volume 2 Part B Section 1 Figure 2.4 Regional and Local Landscape Character Areas;** and
- v. **PEI Report Volume 3 Appendix 2A Landscape Character Baseline.**

2.5.10 **PEI Report Volume 2 Part B Section 1 Figure 2.1 Landscape Designations and Features** shows the distribution of woodland across the Study Area.

Designated Landscapes

2.5.11 The Lincolnshire Wolds National Landscape (AONB) overlaps the western side of much of the Study Area for Section 1. The construction and operational effects of the Project as whole on the natural beauty and statutory purpose of the Lincolnshire Wolds National Landscape (AONB) is presented in **PEI Report Volume 2 Part C Route-wide Chapter 2 Landscape**.

Landscape Character

2.5.12 The following landscape character areas cover the Study Area for Section 1:

- i. Natural England - National Character Area Profiles (NCA)
 - NCA 41 Humber Estuary;
 - NCA 42 Lincolnshire Coast and Marshes; and

- NCA 43 Lincolnshire Wolds.
- ii. North East Lincolnshire Landscape Character Types (LCT)
 - LCT 2 Open Farmland (Lincolnshire Coast and Marshes LCA) which is considered to be of medium value and medium susceptibility to the Project.
 - LCT 3 Wooded Open Farmland (Lincolnshire Coast and Marshes LCA) which is considered to be of high value and high susceptibility to the Project.
- iii. East Midlands Regional Landscape Character Types (RLCT)
 - RLCT 7A Chalk Wolds which is considered to be of very high value and very high susceptibility to the Project.

Future Baseline

- 2.5.13 The future baseline relates to known or foreseeable changes to the current baseline in the future, against which the effects of the Project during construction and operation are assessed. Specifically, it accounts for anticipated changes including those caused by changing climatic conditions, policy, legislation, advances in technology and by other confirmed development projects which will be complete prior to construction of the Project.
- 2.5.14 At this preliminary stage, a full assessment of the implications of any committed development projects with regard to future baseline conditions has not been undertaken. A list of the currently known developments which are anticipated to be included within the future baseline scenario is provided within **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope Annex A Developments for Consideration within the Future Baseline**. This will be reviewed and updated as appropriate during development of the ES, as with other information which informs assessment of the future baseline.
- 2.5.15 The ES chapter will establish the relevant baseline inclusive of both the current and future baseline against which the Project's environmental effects will be assessed, incorporating an updated list of developments due to complete prior construction commencing.
- 2.5.16 Ash trees (*Fraxinus excelsior*) within the Study Area for Section 1 may be affected by ash dieback, a frequently fatal disease caused by the fungus *Hymenoscyphus fraxineus*. Therefore, the future baseline assumes long-term ash tree loss, with other species filling gaps in the short-term, keeping overall vegetation levels similar. An Arboricultural Impact Assessment will record incidents of ash dieback, which in turn will inform the detailed Landscape assessment presented in the ES

2.6 Design, Control and Additional Mitigation Measures

Design Mitigation Measures

- 2.6.1 The Project and draft Order Limits have been designed to avoid sensitive receptors as far as practicable. This is in accordance with the 'Holford Rules' (Ref 12) which apply to the routing of new overhead lines, and the 'Horlock Rules' (Ref 13), which apply to design and siting of substations. These approaches are explained in further detail within the Corridor Preliminary Routeing and Siting Study (CPRSS) (Ref 14) and **PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered**.

Principles include, but are not limited to, seeking to avoid areas of highest amenity, cultural or scientific value, taking advantage of natural screening provided by existing landform and features (e.g. woodland) and keeping visual, noise and other environmental effects to a minimum.

- 2.6.2 Following the selection of the preferred route corridor, environmental specialists have been integral to the ongoing design refinement of works within Section 1. This has further contributed to the avoidance or reduction of the potential environmental impacts of the Project. Specific examples relevant to the assessment include amendments to locations of access tracks and bellmouths and overhead line proposed alignments to minimise loss of mature vegetation, which in turn would help to retain existing landscape character.
- 2.6.3 The Project has also committed to producing an Outline Landscape Environmental Management Plan (LEMP) (commitment GG06), which will set out the measures to protect existing vegetation and details regarding the reinstatement and additional planting. This will also account for biodiversity net gain targets (see **PEI Report Volume 2 Part B Sections 1-7 Chapter 4 Ecology and Biodiversity**) and will accompany the ES and DCO application.
- 2.6.4 A detailed mitigation plan for Section 1 will be presented in the ES. This will include proposals for planting, including indicative species mixes and will be presented as part of the Outline LEMP.

Control Mitigation Measures

Construction

- 2.6.5 A Preliminary CoCP is provided in **PEI Report Volume 3 Appendix 5A Preliminary Code of Construction Practice**. Measures contained in the Preliminary CoCP that are relevant to the control and management of potential landscape impacts are:
- i. LV01: The contractor(s) will retain vegetation where practicable. Where vegetation is lost and trees cannot be replaced in situ due to the restrictions associated with land rights required for operational safety, native shrub planting approved by National Grid Electricity Transmission plc (National Grid) will be used as a replacement, in accordance with the outline vegetation reinstatement plans included within the LEMP. Replacement vegetation will be planted as close by as practicable and will complement landscape character and be sympathetic to the local habitat type in order to provide a high biodiversity value;
 - ii. LV02: The contractor(s) will apply the relevant protective principles set out in British Standard (BS) 5837:2012: Trees in relation to Design, Demolition and Construction Recommendations (Ref 15 This will be applied to trees within the Order Limits which will be preserved through the construction phase, and to trees outside of the Order Limits where such measures do not hinder or prevent the use of the relevant working width for construction. An Arboricultural Clerk of Works will ensure the suitability of tree protection before and during the construction phase. All works to high grade trees, including trees under Tree Preservation Orders and veteran trees, will be undertaken, or supervised by a suitably qualified arboriculturist;
 - iii. LV03: A five-year aftercare period will be established for all reinstatement and mitigation planting, details of which will be set out in the LEMP;

- iv. LV04: Construction lighting will be of the lowest luminosity necessary to safely perform tasks. Lighting will be directional and minimised where possible;
- v. B08: Where the works require the crossing or removal of hedgerows, the gap will be reduced to a width required for safe working. Where hedge removals are necessary, 'dead hedging' should be used, where practicable, in the interim periods to retain connectivity during construction. Dead hedging can comprise vegetation arisings or artificial provision, such as willow screening panels or Heras fencing covered in camouflage netting. New hedgerow planting will contain native, woody species of local provenance; and
- vi. NV01: Construction working will be undertaken within the agreed working hours set out within the DCO unless the works are under an exception to the set working hours in which case they will be carried out in a manner that minimises noise and vibration at all times. Best practicable means to reduce construction noise will be set out within the Construction Environmental Management Plan (CEMP).

Additional Mitigation Measures

- 2.6.6 Additional mitigation measures are those required to reduce likely significant adverse environmental effects which may still occur despite the inclusion of the embedded design and control measures described above.
- 2.6.7 Potential additional mitigation measures which may be required to reduce the effects of the Project upon Landscape are in the early stages of development, based upon an iterative process informed by ongoing survey and assessment. These typically include additional measures which specifically serve a mitigation function, to reduce the scale of potential impacts.
- 2.6.8 As set out within **PEI Report Volume 2 Part B Section 1 Chapter 1 Overview of the Section and Description of the Project** and illustrated on **PEI Report Volume 2 Part B Section 1 Figure 1.3 Permanent and Operational Features** the preliminary additional mitigation measures embedded into the design of Section 1 for Landscape include:
 - i. Areas of woodland planting to replace those affected by the Project would also help would help with landscape integration for Section 1; and
 - ii. Introduction of tree planting on field boundaries and roadsides to filter views of the Project for people as they move around their communities would also help strengthen the pattern of the landscape as defined by field boundaries.
- 2.6.9 Any measures to be included within the Project will be informed by further design development and consultation with the relevant stakeholders, including engagement with the statutory consultees.
- 2.6.10 Finalised additional mitigation measures will be detailed within the ES.

2.7 Preliminary Assessment of Effects

- 2.7.1 The following section presents the findings of the preliminary assessment of effects upon the receptors identified within the Study Area as a result of construction and/or operational activities within Section 1.

- 2.7.2 The preliminary assessment of effects reported below takes into account the Design Mitigation Measures, Control Mitigation Measures and Additional Mitigation Measures (where they have already been included in the design), as previously described.
- 2.7.3 For a summary of the likely significant effects please refer to **PEI Report Volume 2 Part B Section 1 Chapter 13 Summary**. A supplementary summary of all non-significant effects is also included within this Section in **Table 2.2**, based upon the assessment scope detailed in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
- 2.7.4 As explained in section 2.3 of this PEI Report, the Natural England NCAs which are included in the baseline above are not assessed at this preliminary stage. An assessment of the effects of the Project on the NCAs will be provided in the project-wide assessment of landscape effects presented in the ES once the more detailed assessments have been completed
- 2.7.5 Where an effect is reported in this PEI Report, it is an adverse effect unless stated otherwise.
- 2.7.6 Reference is made in the assessment to ‘direct’ and ‘indirect effects’. Direct effects occur within the draft Order Limits and involve physical changes to components of the landscape, such as vegetation removal or the presence of new structures, while indirect effects arise from the interaction between the Project and its surrounding context for example, effects on the character and perception of the landscape.
- 2.7.7 It is noted that this is an ongoing assessment and is subject to change due to the ongoing design development of the Project, statutory consultation feedback and further stakeholder engagement. A full assessment will be included within the ES submitted with the DCO application.

Likely Significant Effects

Construction

- 2.7.8 Changes in the character and perception of the landscape could occur during construction due to the physical effects on landscape character. Effects could arise from activities such as vegetation removal and presence of construction compounds, storage areas, access tracks, plant (including mobile cranes), vehicles and personnel. However, these effects would be temporary and reversible once the works are complete, and the land is reinstated.²

Designated Landscapes

- 2.7.9 The Lincolnshire Wolds National Landscape (AONB) overlaps the western side of the Study Area for Section 1.
- 2.7.10 A preliminary assessment of the effects of the Project on the natural beauty and special qualities of the Lincolnshire Wolds National Landscape (AONB) has been produced as a separate route-wide assessment and is presented in **PEI Report Volume 2 Part C Route-wide Chapter 2 Landscape**. This is because the receptor

² To prevent double counting, the effects resulting from vegetation loss are assessed as part of the operational phase rather than the construction phase. This approach ensures that the long-term impacts of vegetation removal on the landscape are considered in the context of the final, post-construction condition.

is potentially impacted by multiple Sections of the Project, so assessing it at a route-wide level was considered appropriate.

North East Lincolnshire Landscape Character Types

LCT 3 Wooded Open Farmland

- 2.7.11 LCT 3 Wooded Open Farmland, which is located within the Study Area for Section 1, is also located in Section 2 New Grimsby West Substation to New Lincolnshire Connection Substation A.
- 2.7.12 The preliminary assessment of the effects on LCT 3 Wooded Open Farmland presented below considers the part of the LCT that is located within the Study Area for Section 1.
- 2.7.13 LCT 3 Wooded Open Farmland would be directly impacted by construction of the new Grimsby West Substation, pylons GL3 and GL4 and the presence of two construction compounds, a haul road and access tracks. The works would extend across the part of the LCT near Wybers Wood. Construction of new line entries to the substation would also affect the landscape. The size/scale of change resulting from construction of the Project would further diminish the rural character of part of this LCT, which is already affected by existing high voltage electricity infrastructure. The overall magnitude of predicted change is medium. Combined with the landscape's high value and susceptibility, this could result in a likely significant effect on the part of the LCT in Section 1.
- 2.7.14 When considering the operational phase of the Project, in its entirety across all Sections, the overall magnitude of predicted change increases but remains in the medium category. When combined with the high value and high susceptibility of LCT 3: Wooded Open Farmland, the Project would result in a likely significant effect.

Operation

- 2.7.15 The potential effects that could result from the operation phase of the Project are changes to the composition, character and perception of the landscape due to long-term loss of elements and features in the landscape, changes to the landform, introduction of new infrastructure and introduction of landscape elements such as trees and hedgerows. The effects would be long-term and considered permanent.

North East Lincolnshire Landscape Character Types

LCT 3 Wooded Open Farmland

- 2.7.16 LCT 3 Wooded Open Farmland, which is located within the Study Area for Section 1, is also located in Section 2 New Grimsby West Substation to New Lincolnshire Connection Substation A.
- 2.7.17 The preliminary assessment of the effects on LCT 3 Wooded Open Farmland presented below considers the part of the LCT that is located within the Study Area for Section 1.
- 2.7.18 LCT 3 Wooded Open Farmland would be directly impacted by the presence of the new Grimsby West Substation and pylons GL3 and GL4, which would be located near Wybers Wood. This part of the LCT is already affected by the presence of the existing substation, pylons and wind turbines, however the rest of the LCT in Section

1 has few detractors. The size/scale of change resulting from the Project would further diminish the rural character of the farmland. The overall magnitude of predicted change is medium. Combined with the landscape's high value and susceptibility, this could result in a likely significant effect on the part of the LCT in Section 1.

- 2.7.19 When considering the operational phase of the Project, in its entirety across all Sections, the overall magnitude of predicted change increases but remains in the medium category. When combined with the high value and susceptibility of LCT Wooded Open Farmland, the Project would give rise to a likely significant effect.

Likely Non-Significant Effects

- 2.7.20 For completeness, **Table 2.2** summarises the findings of the preliminary assessment with respect to those impacts that are not predicted to result in significant Landscape effects.
- 2.7.21 The preliminary assessment of effects below considers receptors that are not significantly affected in Section 1 but, when evaluated as a whole across all the Sections in which they occur, would experience a likely significant effect.

Construction

- 2.7.22 Changes in the character and perception of the landscape could occur during construction due to physical impacts arising from activities such as vegetation removal and presence of construction compounds, storage areas, access tracks, plant (including mobile cranes), vehicles and personnel. The effects would, however, be short-term and reversible.

North East Lincolnshire Landscape Character Types

RLCT 7A Chalk Wolds

- 2.7.23 RLCT 7A Chalk Wolds, which is located within the Study Area for Section 1, is also located in:
- Section 2 New Grimsby West Substation to New Lincolnshire Connection Substation A;
 - Section 3 New Lincolnshire Connection Substations A and B; and
 - Section 4 New Lincolnshire Connection Substation B to Refined Weston Marsh Substation Siting Zone.
- 2.7.24 The preliminary assessment of the effects on RLCT 7A Chalk Wolds presented below considers the part of the RLCT that is located within the Study Area for Section 1.
- 2.7.25 There would be no direct impacts on RLCT 7A Chalk Wolds. While construction of the new substation and pylons GL3 and GL4 may be present in views from a small part of the RLCT, the works would be partially obscured by the intervening woodland and would be seen in the context of settlement and infrastructure, including the existing substation, pylons and wind turbines. The overall magnitude of predicted change is small. Even given the landscape's very high value and susceptibility, significant effects on the part of the RLCT in Section 1 are unlikely.

- 2.7.26 When considering the construction phase of the Project in its entirety across all Sections, the overall magnitude of predicted change increases to medium. Combined with the very high value and susceptibility of RLCT 7A Chalk Wolds, the Project would result in a likely significant effect.

Operation

North East Lincolnshire Landscape Character Types

RCTL 7A Chalk Wolds

- 2.7.27 LCT 7 Chalk Wolds, which is located within the Study Area for Section 1, is also located in:
- i. Section 2 New Grimsby West Substation to New Lincolnshire Connection Substation A;
 - ii. Section 3 New Lincolnshire Connection Substations A and B; and
 - iii. Section 4 New Lincolnshire Connection Substation B to Weston Marsh Substation Siting Zone.
- 2.7.28 The preliminary assessment of the effects on LCT 7 Chalk Wolds considers the part of the LCT that is located within the Study Area for Section 1.
- 2.7.29 There would be no direct impacts on RLCT 7A Chalk Wolds. The most noticeable part of the Project would be the new pylons (GL3 and GL4). These would be visible on the skyline but would be seen alongside other pylons and wind turbines. The overall magnitude of predicted change is small. Even given the landscape's very high value and susceptibility, significant effects on the part of the RLCT in Section 1 are unlikely.
- 2.7.30 When considering the operational phase of the Project in its entirety across all Sections, the overall magnitude of predicted change is medium. Combined with the very high value and susceptibility of RLCT 7A Chalk Wolds, the Project would give rise to a likely significant effect.

Table 2.2 Preliminary summary of non-significant Landscape effects – Section 1

Receptor	Value and susceptibility of the landscape	Impact	Magnitude of Change	Significance	Rationale
North East Lincolnshire Landscape Character Types (LCT)					
LCT 2 Open Farmland	Value – Medium	Indirectly affected by construction of the new Grimsby West Substation and pylons GL3-4 in Section 1	Construction – small	Construction – not significant	The new Grimsby West Substation would be adjacent to the southern edge of this LCT, and it would be directly affected by construction of the Project, but only a very localised part of the LCT would be affected. The works would also be seen in the context of settlement and other infrastructure. The overall magnitude of predicted change is small. Combined with the landscape's medium value and susceptibility, significant effects on the part of the LCT in Section 1 are unlikely.
	Susceptibility – Medium	Indirectly affected by the presence of the new Grimsby West Substation and pylons GL3-4 in Section 1	Operation – small	Operation – not significant	The presence of the new Grimsby West Substation and pylons GL3-4 would add to the effects of the existing substation and overhead lines but would not fundamentally change the character of the landscape within the LCT as substation infrastructure and overhead lines are already a feature. The overall magnitude of predicted change is small. Combined with the landscape's medium value and

susceptibility, significant effects on the part of the LCT in Section 1 are unlikely.

East Midlands Regional Landscape Character Types (RLCT)

RLCT 7A Chalk Wolds	Value – Very High Susceptibility – Very High	Indirectly affected by construction of the new Grimsby West Substation and pylons GL3-4 in Section 1	Construction – small	Construction – not significant	There would be no direct impacts on RLCT 7A Chalk Wolds. While construction of the new substation and pylons GL3-4 may be present in views from a small part of the RLCT, the works would be partially obscured by the intervening woodland and would be seen in the context of settlement and infrastructure, including the existing substation, pylons and wind turbines. The overall magnitude of predicted change is small. Even given the landscape's very high value and susceptibility, significant effects on the part of the RLCT in Section 1 are unlikely.
		Indirectly affected by the presence of the new Grimsby West Substation and pylons GL3-4 in Section 1	Operation – small	Operation – not significant	There would be no direct impacts on RLCT 7A Chalk Wolds. The most noticeable part of the Project would be the new pylons (GL3-4). These would be visible on the skyline but would be seen alongside other pylons and wind turbines. The overall magnitude of predicted change is small. Even given the landscape's very high value and susceptibility, significant effects on the part of the RLCT in Section 1 are unlikely.

2.8 Monitoring

- 2.8.1 No landscape monitoring is currently proposed for Section 1, as it is only necessary to ensure the establishment of mitigation planting. A five-year aftercare period for mitigation planting is secured through the Preliminary CoCP, eliminating the need for additional monitoring measures.

References

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- Ref 3 Central Lincolnshire Joint Strategic Planning Committee (2023). Central Lincolnshire Local Plan (Adopted April 2023) [online]. Available at: <https://www.n-kesteven.gov.uk/sites/default/files/2023-04/Local%20Plan%20for%20adoption%20Approved%20by%20Committee.pdf> [Accessed 20 September 2024].
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- Ref 5 National Grid Electricity Transmission (2024). Grimsby to Walpole Environmental Impact Assessment Scoping Report [online]. Available at: <https://nsip-documents.planninginspectorate.gov.uk/published-documents/EN020036-000004-EN020036%20-%20Scoping%20Report%20Volume%201%20Main%20Report.pdf> [Accessed 18 October 2024].
- Ref 6 Landscape Institute and Institute for Environmental Management and Assessment (IEMA) (2013) Guidelines for Landscape and Visual Impact Assessment – 3rd Edition (GLVIA3).
- Ref 7 Natural England (2024) National Character Area Profiles [online]. Available at: <https://nationalcharacterareas.co.uk/> [Accessed 20 September 2024].
- Ref 8 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 [online]. Available at: <https://www.legislation.gov.uk/ukxi/2017/572/contents/made> [Accessed 06 September 2024].
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- Ref 10 Lincolnshire County Council (2017). Lincolnshire Historic Landscape Characterisation Project. [online] Available at: <https://www.lincolnshire.gov.uk/historic-environment/historic-landscape-characterisation> [Accessed 20 September 2024].
- Ref 11 Natural England (2010). East Midlands Regional Landscape Character Assessment [online]. Available at: <https://publications.naturalengland.org.uk/publication/5635681403535360#:~:text=Th>

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- Ref 13 National Grid. NGC Substations and the Environment: Guidelines on Siting and Design. [online] Available at: <https://www.nationalgrid.com/sites/default/files/documents/13796-The%20Horlock%20Rules.pdf> [Accessed 20 September 2024].
- Ref 14 National Grid Electricity Transmission (2024). Grimsby to Walpole Corridor Preliminary Routeing and Siting Study [online]. Available at: <https://www.nationalgrid.com/document/352621/download> [Accessed 12 April 2024].
- Ref 15 British Standard (BS) 5837:2012: Trees in relation to Design, Demolition and Construction – Recommendations.

3. Visual

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3. Visual

3.1 Introduction

- 3.1.1 This chapter presents the Preliminary Environmental Information (PEI) in relation to the Visual assessment of the New Grimsby West Substation Section (Section 1) of the Grimsby to Walpole Project (the Project). Specifically, the chapter includes the following sections:
- i. An introduction to the topic (section 3.1);
 - ii. Identification of key local and regional policy relevant to the assessment (section 3.2). A full overview of the legislation and national, regional onshore and marine planning policy context that applies to the Project is presented within **PEI Report Volume 2 Part A Chapter 2 Legislative, Regulatory and Planning Policy Context** and supporting appendices;
 - iii. A summary of the assessment scoping process and the subsequent scope of the Visual assessment (section 3.3). Further detail is provided within **PEI Report Volume 3 Part A Appendix 4A Planning Inspectorate Scoping Opinion Responses**;
 - iv. A high-level summary of the methodology of the Visual assessment within Section 1 (section 3.4). A detailed description of the assessment methods and scope, applicable to the whole Project, is contained in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**;
 - v. A description of the environmental baseline within the Section 1 Study Area relevant to the Visual assessment (section 3.5);
 - vi. A description of mitigation measures included for the purposes of the visual assessment reported within the PEI Report (section 3.6). Further information regarding design development can be found in **PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered** and the **Grimsby to Walpole Design Development Report**;
 - vii. The likely significant and non-significant Visual effects arising during construction and operation of the Project within Section 1, based upon the assessment completed to date (section 3.7); and
 - viii. An outline of the proposed monitoring requirements in relation to visual (section 3.8).
- 3.1.2 Further supporting information is set out in **Table 3.1** below, including supporting figures and technical appendices.

Table 3.1 Supporting documentation

Supporting Information	Description
Topic Specific Supporting Documentation	
PEI Report Volume 2 Part B Section 1 Figures	Figure 3.1 Visual Receptors and Viewpoints Figure 3.2 Zone of Theoretical Visibility (ZTV)
PEI Report Volume 3 Part B Section 1 Appendix 3A Proposed Viewpoints	This appendix provides background baseline information of the representative viewpoints selected within the Study Area.
PEI Report Volume 3 Part B Section 1 Appendix 3B Visual Baseline	This appendix provides an overview of the visual baseline, explanation of proposed viewpoint selection and initial baseline information for the community areas within the Study Area.
Project Supporting Documentation	
PEI Report Volume 2 Part B Section 1 Chapter 1 Overview of the Section and Description of the Project	A summary of the works within Section 1, including permanent infrastructure, temporary construction works, and operational activities.
PEI Report Volume 3 Part A Appendix 2A Key Legislation	A list of identified environmental legislation considered relevant to the Project, which will be updated and amended as required to inform the Environmental Statement (ES).
PEI Report Volume 3 Part A Appendix 2B National and Regional Planning Policy	A list of national and regional policies generally applicable to the assessment principles which underpin the PEI Report and ES.
PEI Report Volume 3 Part A Appendix 2Ci Local Plan Policy: Section Specific	An outline of the potentially relevant local planning policy allocations affecting each of the specific Sections of the Project.
PEI Report Volume 3 Part A Appendix 2Cii Local Plan Policy: Route-wide	Details of planning policies applicable route-wide within the relevant Local Authority areas.
PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered	Provides a summary of the main alternatives considered in relation to the Project during the design development process, including the main reasons for selecting the chosen option.
PEI Report Volume 2 Part A Chapter 4 Approach to Preliminary Environmental Information	Sets out the Environmental Impact Assessment (EIA) approach and general methodology that has been used in developing the PEI Report for the Project.
PEI Report Volume 2 Part A Chapter 5 Project Description	An overarching description of the Project and its key components, including available construction information.

Supporting Information	Description
PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice	Sets out control and management measures that will be undertaken during construction of the Project if granted consent. The Code of Construction Practice (CoCP) will be submitted in support of the Development Consent Order (DCO) application.

3.1.3 There are interrelationships between the potential effects on Visual and other environmental topics. Therefore, please also refer to the following chapters within **PEI Report Volume 2 Part B** and **Part C**:

- i. **PEI Report Volume 2 Part B Section 1 Chapter 2 Landscape** should be consulted in relation to the landscape assessment. This helps to inform judgements on the value of the views and supports the Visual assessment.
- ii. **PEI Report Volume 2 Part B Section 1 Chapter 4 Ecology and Biodiversity** should be consulted in relation to impacts on trees and woodland. An Arboricultural Impact Assessment will be presented as an appendix to the ES and will be cross referenced in relation to impacts on trees and woodland. Both documents will be used to help inform the baseline landscape and support the assessment of visual effects reported in the ES.
- iii. **PEI Report Volume 2 Part B Section 1 Chapter 5 Historic Environment** should be consulted in relation to historic assets including historic landscapes and Registered Parks and Gardens, which may contribute to the value of the view. This helps to inform the baseline description and supports the Visual assessment.
- iv. **PEI Report Volume 2 Part B Section 1 Chapter 9 Traffic and Movement** should be consulted in relation to increased traffic flows which may influence the character of the views through noise and visual disturbance. This helps to inform the baseline description and supports the Visual assessment.
- v. **PEI Report Volume 2 Part B Section 1 Chapter 10 Noise and Vibration** should be consulted in relation to noise intrusion which may affect the perception and value of a view. This helps to inform the baseline description and supports the Visual assessment.
- vi. **PEI Report Volume 2 Part B Section 1 Chapter 11 Socio-economics, Recreation and Tourism** should be consulted in relation to areas of recreational importance which may contribute to the value of the view. The outputs of the visual assessment will inform the assessment of effects on recreation and tourism.
- vii. **PEI Report Volume 2 Part B Section 1 Chapter 13 Summary** which provides a concise, consolidated summary of the likely significant effects reported for all topics, based upon the preliminary assessment.
- viii. **PEI Report Volume 2 Part C Route-wide Chapter 2 Landscape** should be consulted in relation to the assessment of effects on the natural beauty and special qualities of the Lincolnshire Wolds National Landscape (Area of Outstanding Natural Beauty (AONB)). This includes commentary on views in relation to the Special Qualities of the AONB.

- ix. **PEI Report Volume 2 Part C Route-wide Chapter 10 Cumulative Effects** presents a preliminary assessment of cumulative effects upon common receptors across environmental topics identified within PEI Report Volume 2 Part B (intra-project). It identifies a shortlist of other Committed Developments with which there may be potential for cumulative effects and the relevant environmental topics for such effects (inter-project). The full cumulative effects assessment will be reported within the ES

3.2 Legislation and Policy Framework

Legislation and National Policy

- 3.2.1 Legislation and national policy relevant to the Project and this chapter is described in **PEI Report Volume 2 Part A Chapter 2 Legislative, Regulatory and Planning Policy Context** and supporting appendices, detail of which is set out in **Table 3.1**.

Regional and Local Policy

- 3.2.2 Regional and local plans or policies relevant to this assessment are as follows:
- i. North East Lincolnshire Local Plan 2013 to 2032 (Adopted 2018) (Ref 1)
 - Policy 31 Renewable and low carbon infrastructure requires that developments will be assessed on their impact on landscapes and townscapes, particularly in regard to the Landscape Character Assessment and impact on the setting and scenic beauty of the Areas of Outstanding Natural Beauty (AONB); and
 - Policy 42 Landscape requires consideration of landscape character in proposals, adherence to the Landscape Character Assessment and supports prioritizing the protection and enhancement of the Lincolnshire Wolds National Landscape (AONB).
 - ii. North East Lincolnshire Local Plan Review (Ref 2)
 - Draft Strategic Policy 2: Development boundaries supports the need for assessment of impacts for visual intrusion and landscape and that development will be supported if it harmonizes with the local setting and respects the area's distinctive character and landscape quality; and
 - Draft Strategic Policy 10: Landscape states that developers must consider landscape character in their proposals, prioritise the protection of the Lincolnshire Wolds National Landscape (AONB), conducting a site-specific landscape appraisal and submitting a suitable landscaping scheme
 - iii. Central Lincolnshire Local Plan (Adopted April 2023) (Ref 3)
 - Policy S14: Renewable Energy details the support for renewable energy schemes, including ancillary development, only where the direct, indirect, individual and cumulative impacts are, or will be made, acceptable;
 - Policy S16: Wider Energy Infrastructure details the support for proposals that seek to aid the transition to Net Zero and that any such proposals will take reasonable measures to mitigate harm; and

- Policy S62: Areas of Outstanding Natural Beauty and Areas of Great Landscape Value requires that all development proposals within, or affecting the setting of, the AONB shall protect and enhance important views into, out of and within the AONB.

3.3 Scope of Assessment

- 3.3.1 The scope of the assessment has been informed by the Scoping Opinion (Ref 4) provided by the Planning Inspectorate in September 2024 on behalf of the Secretary of State, following the submission of the EIA Scoping Report (Ref 5). The scope has also been informed through consultation and engagement with relevant consultees. A summary of the Scoping Opinion together with a response against each point of relevance to the Visual chapter is provided in **PEI Report Volume 3 Part A Appendix 4A Planning Inspectorate Scoping Opinion Responses**. A summary of the stakeholder engagement undertaken to date is provided in **PEI Report Volume 3 Part A Appendix 4D Summary of Stakeholder Engagement**.
- 3.3.2 Non statutory consultation feedback has been addressed within the **Grimsby to Walpole Stage 1 Consultation Feedback Report**.
- 3.3.3 The scope of the construction and operation assessment covers the following receptor types:
- Communities - People in communities for whom the surrounding environment is essential to their quality of life and work, including those engaging in recreational activities such as using Public Rights of Way (PROW) and waterways; and
 - Recreational Routes and Receptors - People using National Trails and regionally promoted routes, long distance cycle routes, and people at protected viewpoints, panoramas and viewing corridors and people visiting tourist attractions where views are important to the experience.
- 3.3.4 A preliminary assessment of the effects of the Project on the natural beauty and special qualities of the Lincolnshire Wolds National Landscape (AONB) has been produced as a separate route-wide assessment and is presented in **PEI Report Volume 2 Part C Chapter 2 Landscape**. This is because multiple Sections of the Project potentially impact the AONB, so it is appropriate to assess it at a route-wide level.

3.4 Assessment Methodology

- 3.4.1 The assessment scope, methodology, relevant guidance, key assumptions and limitations for the Visual assessment are set out in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**. This includes a description of how receptor sensitivity, magnitude of impact and significance of effects are all described and assigned to the assessment. A summary of the key components is outlined below.

Approach

- 3.4.2 As explained in paragraph 6.1 of GLVIA3 (Ref 6) “*An assessment of visual effects deals with the effects of change and development on views available to people and their visual amenity*”. Changes in views can be experienced by individuals at various locations within the Study Area, including from static positions (typically assessed

using representative viewpoints) and while moving through the landscape (commonly referred to as sequential views, such as those experienced from roads and footpaths).

- 3.4.3 Visual receptors are individuals or groups of people who may be affected by changes in views and visual amenity. As noted in paragraphs 6.31 - 6.32 of GLVIA3 (Ref 6), they are usually grouped by their occupation or activity (e.g. residents, motorists, recreational users, tourists visiting a specific location or area) and the extent to which their attention is focused on the view.
- 3.4.4 The visual assessment is based on communities within the jurisdiction boundaries of parishes (also referred to in this assessment as community areas) and the preliminary baseline for the community areas is presented in **PEI Report Volume 3 Part B Appendix 3B Visual Baseline**.
- 3.4.5 The visual assessment also includes consideration of the effects on sequential views, for example from nationally designated and regionally promoted long distance footpaths and cycleways.
- 3.4.6 The visual assessment is informed by a series of publicly accessible viewpoint locations. These have been carefully chosen to provide a representative overview of the Project's potential visibility. Each viewpoint has been visited, with photography captured in line with TGN 06/19 (Ref 8) to document the existing visual characteristics of Section 1. The baseline for the representative viewpoints is presented in the Visual section of **PEI Report Volume 3 Part B Appendix 3A Proposed Viewpoints**.
- 3.4.7 In accordance with GLVIA 3 (Ref 6), the assessment of visual effects involves evaluating both the nature of the visual receptors (their sensitivity) and the nature of the effects on those receptors (the magnitude of effect). These factors are then considered together to form an overall judgment regarding the significance of visual effects.
- 3.4.8 The Visual section of **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope** describes the methodology used to evaluate sensitivity and magnitude and how the judgements on sensitivity and magnitude of effect are combined to make an informed professional assessment on the significance of each visual effect. A summary of the approach is set out below.

Establishing Visual Sensitivity

- 3.4.9 In accordance with paragraph 6.31 of GLVIA3 (Ref 6), evaluations of the sensitivity of a visual receptor to change are based on consideration of the judgements on the value attached to the existing view (which is established and reported as part of the baseline) and the susceptibility of the receptor to changes in the view arising from the Project. These judgements are guided by the indicative criteria set out in the Visual section of **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**. Judgements on value and susceptibility are recorded as either very high, high, medium or low.

Predicting the Magnitude of Change

- 3.4.10 In accordance with paragraph 6.38 of GLVIA3 (Ref 6), judgements on the magnitude of visual change are informed by balanced consideration of the judgements on size/scale, geographical extent, duration and reversibility of the predicted change.

They are guided by the indicative criteria set out in the Visual section of **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**. Judgements on the magnitude of visual change are recorded as large, medium, small and very small.

Judging Levels of Visual Effect and Significance

- 3.4.11 The final step in the assessment requires the judgements on the sensitivity of the visual receptors and the predicted magnitude of visual change to be combined to make an informed professional assessment on the significance of each visual effect.
- 3.4.12 In accordance with paragraph 6.43 of GLVIA3 (Ref 6), the evaluations of the individual aspects set out above (susceptibility, value, size and scale, geographical extent, duration and reversibility) are considered together to provide an overall profile of each identified visual effect, guided by the indicative criteria set out in the Visual section of **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
- 3.4.13 Professional judgement and experience are applied to take on board the many different variables which need to be considered, and given different weight according to site-specific and location-specific considerations.
- 3.4.14 Levels of visual effect are identified as major, moderate, minor, or negligible and the direction of change as beneficial or adverse. Effects judged to be moderate or major are considered significant in the context of the EIA Regulations (Ref 7). The general approach taken to determining the significance of effect in this preliminary assessment is only to state whether effects are likely or unlikely to be significant, rather than assigning significance levels, which will be presented in the ES.

Assessment Assumptions and Limitations

- 3.4.15 All general assumptions and limitations for the topic are listed within **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
- 3.4.16 The decommissioning works at the existing Grimsby West Substation are yet to be defined, therefore a limitation of this preliminary assessment of visual effects is that it does not assess these works. The decommissioning works will be assessed as part of the ES.
- 3.4.17 The key parameters and assumptions which inform the assessment will be reviewed based on the design presented in the DCO application and, where required, updated, or refined, for the ES. The ES will present the final key limitations and assumptions applicable to the full assessment, particularly drawing attention to any areas that may have changed from that presented in this preliminary assessment.

3.5 Baseline Conditions

Study Area

- 3.5.1 The Study Area for the preliminary assessment is shown on **PEI Report Volume 2 Part B Section 1 Figure 3.1 Visual Receptors and Viewpoints**. The extent of the Study Area for the preliminary Visual assessment (based on the same approach which will be adopted when defining the EIA study area), extends 5 km from the

Limits of Deviation (LoD) for the new 400 kV overhead line¹. This distance was informed by the ZTV, the scale and appearance of the pylons (as detailed in **PEI Report Volume 2 Part A Chapter 5 Project Description**, field survey and professional judgment, and is considered sufficient to capture the likely significant visual effects of the Project. Although the ZTV indicates potential visibility beyond 5 km in certain directions, based on experience of similar schemes, significant visual impacts are highly unlikely to arise beyond this distance.

- 3.5.2 The Study Area for the preliminary cumulative Visual assessment extends 10 km from the LoD for the new 400 kV overhead line. This radius was established to evaluate potential cumulative Visual impacts in conjunction with other existing, consented, and/or proposed developments.
- 3.5.3 The ZTV map, which incorporates screening elements such as buildings and woodland, is presented in **PEI Report Volume 2 Part B Section 1 Figure 3.2 Zone of Theoretical Visibility (ZTV)**. Based on pylon locations provided by design engineers, the ZTV identifies areas where the proposed 400 kV overhead line may theoretically be visible. It also helps determine the extent of the Study Area for the Visual assessment. The theoretical visibility of individual pylons is limited to a maximum distance of 10 km, as beyond this distance the pylons would be almost imperceptible. This also covers the full extent of the Study Area for the cumulative assessment.
- 3.5.4 Further information on Study Area definition and ZTV production is presented in the Visual section of **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
- 3.5.5 To ensure that all likely significant effects are captured in the assessment, the extent of the Study Area will continue to be reviewed in the light of feedback received during statutory consultation, ongoing site surveys, and following the production of updated ZTVs as the Project develops.

Data Collection

- 3.5.6 The following data has been used to inform the baseline conditions:
- Ordnance Survey (OS) 1:10,000, 1:25,000, 1:50,000 and 1:250,000 base mapping;
 - OS Terrain® 50 mid-resolution and LIDAR Composite 2017 – 50 cm Digital Terrain Model (DTM);
 - Google Earth Pro aerial photography, and Google Maps Street View;
 - Base mapping from ArcGIS Map Service;
 - Open source Geographic Information System (GIS) data;
 - North East Lincolnshire Local Plan 2013 to 2032 (Adopted 2018) (Ref 1);
 - North East Lincolnshire Local Plan Review (Ref 2); and

¹ The Study Area for the preliminary assessment is measured from the LoD as significant effects are most likely to result from construction and operation of the new substations and 400 kV overhead line rather than the temporary access tracks, which in some instances could extend several kilometres from the draft Order Limits but are unlikely to result in significant effects.

- viii. Central Lincolnshire Local Plan (Adopted April 2023) (Ref 3);
- ix. Site surveys were carried out during several visits under differing weather conditions between spring 2023 and summer 2024.

Existing Baseline

- 3.5.7 The following section outlines the Visual baseline. The baseline section should be read in conjunction with the following supporting Figures and Appendices as found within **PEI Report Volume 2** and **Volume 3** respectively:
- i. **PEI Report Volume 2 Part B Section 1 Figure 3.1 Visual Receptors and Viewpoints;**
 - ii. **PEI Report Volume 3 Part B Appendix 3A Proposed Viewpoints;** and
 - iii. **PEI Report Volume 3 Part B Appendix 3B Visual Baseline.**
- 3.5.8 **PEI Report Volume 2 Part B Figure 2.1 Landscape Designations and Features** shows the distribution of woodland across the Study Area.

Communities

- 3.5.9 The following communities, which are based on the jurisdictional boundaries of parishes across the Study Area, are included in Section 1. The viewpoint numbers refer to the representative viewpoints used to inform the assessment.
- 3.5.10 The people within these communities are all considered to be highly susceptible to visual change resulting from the Project, while the characteristics of the landscape indicate that the value of the views is assessed as medium.
- i. Aylesby (VP05, VP06, VP202 and VP204);
 - ii. Great Coates (VP205);
 - iii. Healing (VP03 and VP205);
 - iv. Keelby (VP01)
 - v. Riby (VP04); and
 - vi. Stallingborough (VP02).
- 3.5.11 For people living within the Grimsby suburbs of Little Coates and Scartho (VP198, VP201, VP203 and VP204), the susceptibility to visual change is medium due to the built up nature of those communities, while the characteristics of the landscape indicate that the value of the views is assessed as medium.
- 3.5.12 Descriptions of the baseline visual amenity of these community areas are provided in **PEI Report Volume 3 Part B Appendix 3B Visual Baseline**. This includes a description of the community area and its key visual receptors and susceptibility as well as a judgement on the value of the views currently experienced.

Recreational Routes and Receptors

- 3.5.13 One recreational route has been identified in the Study Area for Section 1.
- 3.5.14 The Nev Cole Way is a 90 km route between Burton upon Stather and Nettleton, following the edge of the Humber Estuary before passing through the northern end of

the Lincolnshire Wolds National Landscape (AONB). It crosses the Study Area in Sections 1 and 2. In Section 1, between Healing and Great Coates, the footpath passes through a more suburban area. As views contribute to the landscape setting enjoyed by people using the path, their susceptibility to the Project is high and views are considered to have medium value.

Future Baseline

- 3.5.15 The future baseline relates to known or foreseeable changes to the current baseline in the future, against which the effects of the Project during construction and operation are assessed. Specifically, it accounts for anticipated changes including those caused by changing climatic conditions, policy, legislation, advances in technology and by other confirmed development projects which will be complete prior to construction of the Project.
- 3.5.16 At this preliminary stage, a full assessment of the implications of any committed development projects with regard to future baseline conditions has not been undertaken. A list of the currently known developments which are anticipated to be included within the future baseline scenario is provided within **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope Annex A Developments for Consideration within the Future Baseline**. This will be reviewed and updated as appropriate during development of the ES, as with other information which informs assessment of the future baseline.
- 3.5.17 The ES chapter will establish the relevant baseline inclusive of both the current and future baseline against which the Project's environmental effects will be assessed, incorporating an updated list of developments due to complete prior construction commencing.
- 3.5.18 Ash trees (*Fraxinus excelsior*) within the Study Area for Section 1 may be affected by ash dieback, a frequently fatal disease caused by the fungus *Hymenoscyphus fraxineus*. Therefore, the future baseline assumes long-term ash tree loss, with other species filling gaps in the short-term, keeping overall vegetation levels similar. An Arboricultural Impact Assessment will record incidents of ash dieback, which in turn will inform the detailed Visual assessment in the ES.

3.6 Design, Control and Additional Mitigation Measures

Design Mitigation Measures

- 3.6.1 The Project and draft Order Limits have been designed to avoid sensitive receptors as far as practicable. This is in accordance with the 'Holford Rules' (Ref 9) applicable to routing of new overhead lines and the 'Horlock Rules' (Ref 10), which apply to design and siting of substations. These approaches are explained in further detail within the Corridor Preliminary Routeing and Siting Study (CPRSS) (Ref 11) and **PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered**. Principles include, but are not limited to, seeking to avoid areas of highest amenity, cultural or scientific value, taking advantage of natural screening provided by existing landform and features (e.g. woodland) and keeping visual, noise and other environmental effects to a minimum. .
- 3.6.2 Following selection of the preferred route corridor, environmental specialists have been integral to ongoing design refinement of works within Section 1. This has further

contributed to the avoidance or reduction of the potential environmental impacts of the Project. Specific examples relevant to the assessment include amendments to locations of access tracks and bellmouths and overhead line proposed alignment to minimise loss of mature vegetation, which in turn would help to screen and filter views of the Project.

3.6.3 The Project has also committed to producing an Outline Landscape and Environmental Mitigation Plan (LEMP) (commitment GG06), which will set out the measures to protect existing vegetation and details regarding the reinstatement and additional planting. This will also account for biodiversity net gain targets (see **Volume 2 Part B Sections 1-7 Chapter 4: Ecology and Biodiversity**) and will accompany the ES and DCO application.

3.6.4 A detailed mitigation plan will be produced at the ES stage. This will include proposals for planting including indicative species mixes and will be presented as part of the LEMP.

Control Mitigation Measures

3.6.5 A Preliminary CoCP is provided in **PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice**. Measures contained in the Preliminary CoCP that are relevant to the control and management of potential visual impacts are:

- i. LV01: The contractor(s) will retain vegetation where practicable. Where vegetation is lost and trees cannot be replaced in situ due to the restrictions associated with land rights required for operational safety, native shrub planting approved by National Grid Electricity Transmission plc (National Grid) will be used as a replacement, in accordance with the outline vegetation reinstatement plans included within the Outline Landscape and Ecological Management Plan (LEMP). Replacement vegetation will be planted as close by as practicable and will complement landscape character and be sympathetic to the local habitat type in order to provide a high biodiversity value;
- ii. LV02: The contractor(s) will apply the relevant protective principles set out in British Standard (BS) 5837:2012: Trees in relation to Design, Demolition and Construction Recommendations (Ref 12). This will be applied to trees within the Order Limits which will be preserved through the construction phase, and to trees outside of the Order Limits where such measures do not hinder or prevent the use of the relevant working width for construction. An Arboricultural Clerk of Works (ACoW) will ensure the suitability of tree protection before and during the construction phase. All works to high grade trees, including trees under Tree Preservation Orders and veteran trees, will be undertaken, or supervised by a suitably qualified arboriculturist;
- iii. LV03: A five-year aftercare period will be established for all reinstatement and mitigation planting, details of which will be set out in the LEMP;
- iv. LV04: Construction lighting will be of the lowest luminosity necessary to safely perform tasks. Lighting will be directional and minimised where possible; and
- v. B08: Where the works require the crossing or removal of hedgerows, the gap will be reduced to a width required for safe working. Where hedge removals are necessary, 'dead hedging' should be used, where practicable, in the interim periods to retain connectivity during construction. Dead hedging can comprise

vegetation arisings or artificial provision, such as willow screening panels or Heras fencing covered in camouflage netting. New hedgerow planting will contain native, woody species of local provenance. .

Additional Mitigation Measures

- 3.6.6 Additional mitigation measures are those required to reduce likely significant adverse environmental effects which may still occur despite the inclusion of the embedded design and control measures described above.
- 3.6.7 Potential additional mitigation measures which may be required to reduce the effects of the Project upon Visual are in the early stages of development, based upon an iterative process informed by ongoing survey and assessment. These typically include additional measures which specifically serve a mitigation function, to reduce the scale of potential impacts.
- 3.6.8 As set out within **PEI Report Volume 2 Part B Section 1 Chapter 1 Overview of the Section and Description of the Project** and illustrated on **PEI Report Volume 2 Part B Section 1 Figure 1.3 Permanent and Operational Features** the preliminary additional mitigation measures embedded into the design of Section 1 for Visual includes areas of woodland planting around the new Grimsby West Substation to provide visual screening and reduce the effects for visual receptors, integrating the substations into the surrounding landscape.
- 3.6.9 Any measures to be included within the Project will be informed by further design development and consultation with the relevant stakeholders, including engagement with the statutory consultees.
- 3.6.10 Finalised additional mitigation measures will be detailed within the ES.

3.7 Preliminary Assessment of Effects

- 3.7.1 The following section presents the findings of the preliminary assessment of effects upon the receptors, identified within the Study Area, as a result of construction and/or operational activities within Section 1.
- 3.7.2 The preliminary assessment of effects reported below takes into account the Design Mitigation Measures, Control Mitigation Measures and Additional Mitigation Measures (where they have already been included in the design), as previously described.
- 3.7.3 For a summary of the likely significant effects please refer to **PEI Report Volume 2 Part B Section 1 Chapter 13 Summary**. A supplementary summary of all non-significant effects is also included within this Section in **Table 3.2**, based upon the assessment scope detailed in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
- 3.7.4 The visual effects of maintenance activities during operation are scoped out of the assessment as agreed in the Scoping Opinion adopted by the Secretary of State on 10 September 2024 (Ref 4). As agreed in the Scoping Opinion adopted by the Secretary of State on 10 September 2024 (Ref 4), effects on people using the road or rail network or those working within the Study Area, are scoped out of the assessment as an appreciation of the wider landscape and views is generally not integral to their activities. These receptors are typically considered to have lower susceptibility to changes in the view and will often share views of the Project with

receptors who have a greater susceptibility and are therefore included in the assessment in any event.

- 3.7.5 It should be noted that where an effect is reported in this PEI Report it is an adverse effect unless stated otherwise.
- 3.7.6 Reference is made in the assessment to 'direct' and 'indirect effects'. Direct effects occur within the draft Order Limits and involve physical changes to components of the landscape such as vegetation removal or presence of new structures, while indirect effects arise from the interaction between the Project and its surrounding context for example, effects on views and how they are perceived.
- 3.7.7 It is noted that this is an ongoing assessment and is subject to change due to the ongoing design development of the Project, statutory consultation feedback and further stakeholder engagement. A full assessment will be included within the ES submitted with the DCO application.

Likely Significant Effects

Construction

- 3.7.8 Changes in the character and perception of a view would occur during construction due to the physical effects on landscape character. Effects would arise from activities such as vegetation removal and presence of construction compounds, storage areas, access tracks, plant (including mobile cranes), vehicles and personnel. However, these effects would be temporary and reversible once the works are complete, and the site is reinstated².

Communities

- 3.7.9 One community has been identified as experiencing likely significant effects during construction of the Project in Section 1. All other communities would experience effects which have been judged to be not significant and are included in **Table 3.2**. There may be individual properties within community areas that would experience a greater effect from the Project. These will be identified and reported at the ES stage as part of the Residential Visual Amenity Assessment (RVAA).

Aylesby

- 3.7.10 Aylesby Parish is located within Section 1, however a large part of the community is also located within Section 2 New Grimsby West Substation to New Lincolnshire Connection Substation A. The preliminary assessment of the effects on people living and moving around Aylesby Parish presented below considers the part of the community that is located within the Study Area for Section 1.
- 3.7.11 The community of Aylesby Parish is considered highly susceptible to visual change resulting from the Project, while the characteristics of the landscape indicate that the value of the views across the parish is judged to be medium. Views across the eastern side of the parish would be affected by construction of the new Grimsby West Substation, pylons GL3 and GL4 and by the works to modify the existing 4KG 400 kV

² To prevent double counting, the effects resulting from vegetation loss are assessed as part of the operational phase rather than the construction phase. This approach ensures that the long-term impacts of vegetation removal on visual amenity are considered in the context of the final, post-construction condition.

overhead line. Views to the south of the parish would also be affected by construction activities associated with the proposed 400 kV overhead line located in Section 2. Overall, this would result in a large magnitude of change and likely significant effects.

- 3.7.12 When considering the construction phase of the Project in its entirety across all Sections, the overall magnitude of predicted change remains large, primarily due to the construction activities associated with the new Grimsby West Substation. When combined with the medium value and high susceptibility, the Project would give rise to a likely significant effect.

Recreational Routes and Receptors

- 3.7.13 No significant effects for recreational routes or receptors have been identified in Section 1 during construction. Effects which have been judged to be not significant are included in **Table 3.2**.

Operation

- 3.7.14 The potential effects that could result from the operation of the Project are the effects on views due to long-term loss of elements and features in the landscape, changes to the landform, introduction of new high-voltage electricity infrastructure and introduction of landscape elements such as trees and hedgerows. The effects would be long-term and are considered permanent.

Communities

- 3.7.15 One community has been identified as being significantly affected during operation of the Project in Section 1. All other communities would experience effects which have been judged to be not significant and are included in **Table 3.2**. There may be individual properties within community areas that would experience a greater effect from the Project. These will be identified and reported at the ES stage as part of the RVAA.

Aylesby

- 3.7.16 Aylesby Parish is located within Section 1, however a large part of the community is also located within Section 2. The preliminary assessment of the effects on people living and moving around Aylesby Parish presented below considers the part of the community that is located within the Study Area for Section 1.
- 3.7.17 The community of Aylesby Parish is considered highly susceptible to visual change resulting from the Project, while the characteristics of the landscape indicate that the value of the views across the parish is judged to be medium. Views across the eastern side of the community area would be affected by the presence of the new Grimsby West Substation. Views to the south would also be affected by the section of new 400 kV overhead line located in Section 2. Existing planting would help to screen the substation and proposed environmental mitigation, which includes screening planting, would help to reduce the effects of the substation in the long-term, but the effects of the new overhead line would remain. Overall, this would result in a medium magnitude of change and likely significant effects.
- 3.7.18 When considering the operation phase of the Project in its entirety across all Sections, the overall magnitude of predicted change remains medium. Although the new Grimsby West Substation is located within the parish and mitigation planting would help to screen views from visual receptors within the community, the presence

of a new substation and 400 kV overhead line will spread the effects of infrastructure further across the parish. When combined with the medium value and high susceptibility, the Project would give rise to a likely significant effect.

Recreational Receptors

- 3.7.19 No significant effects for recreational routes or receptors have been identified in Section 1 during operation. Effects which have been judged to be not significant are included in **Table 3.2**.

Likely Non-Significant Effects

- 3.7.20 For completeness, **Table 3.2** summarises the findings of the preliminary assessment with respect to those impacts that are not predicted to result in significant visual effects.
- 3.7.21 There are some visual receptors where the effects are likely to be not significant when considering only impacts within Section 1, however when considering the Project in its entirety would result in a likely significant effect. For those receptors, additional information is presented below to describe the effects in Section 1 and which other Sections of the Project would result in a greater effect.

Construction

Nev Cole Way

- 3.7.22 The Nev Cole Way is located within Section 1 and is also located within Section 2. The preliminary assessment of the effects on people using the Nev Cole Way presented below considers the part of the footpath that is located within the Study Area for Section 1.
- 3.7.23 People using the footpath are considered highly susceptible to visual change resulting from the Project, whilst the characteristics of the landscape indicate the value of the views currently experienced is considered to be medium.
- 3.7.24 Users of the Nev Cole Way would have distant views of taller equipment as the footpath passes between Healing and Great Coates where there are views south. This is only for a short section of the footpath. Other views in Section 1 are screened by buildings and vegetation as the footpath passes through more suburban areas. This would result in a very small magnitude of change and is unlikely to result significant effects.
- 3.7.25 When considering the construction phase of the Project in its entirety across all Sections, the overall magnitude of predicted change would increase to medium due to the proximity to the construction activities in Section 2. When combined with the medium to high value views, with the value of views being higher in Section 2, and high susceptibility of people using the Nev Cole Way, the Project would give rise to a likely significant effect.

Operation

Nev Cole Way

- 3.7.26 The Nev Cole Way is located within Section 1 and is also located within Section 2. The preliminary assessment of the effects on people using the Nev Cole Way presented below considers the part of the footpath that is located within the Study Area for Section 1.
- 3.7.27 People using the footpath are considered highly susceptible to visual change resulting from the Project, whilst the characteristics of the landscape indicate the value of the views currently experienced is considered to be medium in Section 1.
- 3.7.28 Users of the Nev Cole Way would have very filtered views towards the Project in Section 1, with the footpath passing through the built up areas of Healing and Great Coates and views influenced by the industrial areas to the north of the A180. This would result in a very small magnitude of change and is unlikely to result significant effects.
- 3.7.29 When considering the operation phase of the Project, in its entirety across all Sections, the predicted magnitude of change increases to medium. Approximately 5 km of the route would have views of new 400 kV overhead line from the edge of the Wolds to the new Grimsby West Substation. When combined with the medium to high value views, with the value of views being higher in Section 2, and high susceptibility of people using the Nev Cole Way, the Project would give rise to a likely significant effect.

Table 3.2 Preliminary summary of Non-Significant Visual effects – Section 1

Receptor	Value of Views and Susceptibility of Receptor	Impact	Magnitude of Change	Significance	Rationale
Communities					
Great Coates (VP205)	Value of Views – Medium Susceptibility – High	Indirect effects from construction activities associated with the new Grimsby West Substation in Section 1 and construction of pylons in Sections 1 and 2.	Construction – very small	Construction – not significant	Construction will be barely perceptible from the majority of the community area. There may be glimpses of taller equipment associated with the works to the existing overhead line and substation but this would be temporary in nature and existing vegetation heavily filters views from visual receptors. The magnitude of change is considered to be very small and effects on this community area would likely be not significant during construction.
		Indirect effects on views from the presence of the New Grimsby West Substation in Section 1 and pylons in Section 1 and the northern parts of Section 2 during operation.	Operation - very small	Operation - not significant	The new 400 kV overhead line would be barely perceptible in views within this suburban community area. Where there are views to the south west, these are already affected by the existing 4KG overhead line and therefore the Project would not fundamentally alter the composition or character of the views from this community area. The new Grimsby West Substation would be screened by existing vegetation at Wybers

Receptor	Value of Views and Susceptibility of Receptor	Impact	Magnitude of Change	Significance	Rationale
					<p>Wood and on intervening field boundaries.</p> <p>Due to the limited nature of views, the magnitude of change is considered to be very small and effects on this community area during operation would likely be not significant.</p>
Grimsby suburbs of Little Coates and Scartho	Value of Views – Medium Susceptibility – Medium	Indirectly affected by views of construction activities for the New Grimsby West Substation in Section 1 and the overhead line in Sections 1 and 2.	Construction – small	Construction – not significant	<p>There would be views towards construction activities to the east of the community area, however existing vegetation including woodland blocks and along field boundaries would filter views of construction. Taller equipment may be visible, however, these effects would be very temporary in nature.</p> <p>The magnitude of change is considered to be small and effects on this community area during construction would likely be not significant.</p>
		Indirectly affected by the presence of the New Grimsby West Substation in Section 1 and pylons in Sections 1 and 2 during operation.	Operation – small	Operation – not significant	<p>The new 400 kV overhead line would be noticeable in views east. Views are already affected by the existing 132 kV overhead line, and therefore the Project would not fundamentally alter the composition or character of the views currently experienced. The existing overhead line would remain</p>

Receptor	Value of Views and Susceptibility of Receptor	Impact	Magnitude of Change	Significance	Rationale
					<p>the more prominent feature from Little Coates. Views would be limited to those properties on the very edge of the suburbs and would be filtered by vegetation. The new Grimsby West Substation would be screened by existing and proposed vegetation.</p> <p>The magnitude of change is considered to be small and effects on this community area during operation would likely be not significant.</p>
Healing (VP03, VP205)	Value of Views – Medium Susceptibility – High	Directly impacted by the construction of the new Grimsby West Substation and works to the existing 400 kV overhead line in Section 1.	Construction – small	Construction – not significant	<p>Views of access roads and working areas associated with the works to the existing 400 kV overhead line would be filtered by vegetation for visual receptors within this community area. Taller equipment may be visible above vegetation but would be temporary in nature.</p> <p>The magnitude of change is considered to be small and effects on this community area likely be not significant during construction.</p>
		Indirect effects on views from the presence of the New Grimsby West Substation in Section 1 and pylons in the northern parts of	Operation - small	Operation - not significant	<p>The new 400 kV overhead line would be noticeable in views south from this community area, however views are already affected by the existing 4KG overhead line and therefore the Project would not fundamentally alter</p>

Receptor	Value of Views and Susceptibility of Receptor	Impact	Magnitude of Change	Significance	Rationale
		Section 2 during operation.			<p>the composition or character of the views currently experienced. The new Grimsby West Substation would have mitigation planting to screen views from properties.</p> <p>The magnitude of change is considered to be small and effects on this community area during operation would likely be not significant.</p>
Keelby (VP01)	Value of Views – Medium Susceptibility – High	Indirect effects on views from the presence of construction activities associated with the New Grimsby West Substation in Section 1 and pylons in the northern parts of Section 2.	Construction – very small	Construction – not significant	<p>The tops of taller construction equipment may be perceptible but would be temporary in nature and at distance.</p> <p>The magnitude of change is considered to be very small and effects on this community area during construction would likely be not significant.</p>
		Indirect effects on views from the presence of the New Grimsby West Substation in Section 1 and pylons in the northern parts of Section 2 during operation.	Operation - very small	Operation - not significant	<p>At 4.4 km, the taller components of the Project may be perceptible but the effect on visual amenity would not be significant and would be seen in the context of the existing 4KG 400 kV overhead lines which is in views to the west of this community area. The new Grimsby West Substation would not be visible due to intervening vegetation.</p>

Receptor	Value of Views and Susceptibility of Receptor	Impact	Magnitude of Change	Significance	Rationale
					Due to the limited nature of views, the magnitude of change is considered to be very small and effects on this community area during operation would likely be not significant.
Riby	Value of Views – Medium Susceptibility – High	Indirect effects on views from the presence of construction activities associated with the New Grimsby West Substation in Section 1 and pylons in the northern parts of Section 2.	Construction – very small	Construction – not significant	<p>The tops of taller construction equipment may be perceptible but would be temporary in nature and at distance.</p> <p>The magnitude of change is considered to be very small and effects on this community area during construction would likely be not significant.</p>
		Indirect effects on views from the presence of the New Grimsby West Substation in Section 1 and pylons in the northern parts of Section 2 during operation.	Operation - small	Operation - not significant	<p>At 2 km, the taller components of the Project may be perceptible but the effect on visual amenity would not be significant and would be seen in the context of the existing 4KG 400 kV overhead lines which is in views to the west of this community area. The new Grimsby West Substation would be filtered by intervening vegetation.</p> <p>Due to the limited nature of views, the magnitude of change is considered to be small and effects on this community area during</p>

Receptor	Value of Views and Susceptibility of Receptor	Impact	Magnitude of Change	Significance	Rationale
					operation would likely be not significant.
Stallingborough (VP02)	Value of Views – Medium Susceptibility – High	Indirect effects on views from the presence of construction activities associated with the New Grimsby West Substation in Section 1 and pylons in the northern parts of Section 2.	Construction – very small	Construction – not significant	<p>The tops of taller construction equipment may be perceptible but would be temporary in nature and at distance.</p> <p>The magnitude of change is considered to be very small and effects on this community area during construction would likely be not significant.</p>
		Indirect effects on views from the presence of the New Grimsby West Substation in Section 1 and pylons in the northern parts of Section 2 during operation.	Operation - very small	Operation - not significant	<p>At 2.2 km, the new overhead line may be perceptible but would be seen in the context of the existing 4KG and 2AH 400 kV overhead lines which pass through this community area. The new Grimsby West Substation would not be visible due to intervening vegetation.</p> <p>The magnitude of change is considered to be very small and effects on this community area during operation would likely be not significant.</p>

Receptor	Value of Views and Susceptibility of Receptor	Impact	Magnitude of Change	Significance	Rationale
Recreational Route and Receptors					
Nev Cole Way	Value of Views – Medium Susceptibility – High	Indirect effects on views from the presence of construction activities associated with the New Grimsby West Substation in Section 1 and pylons in the northern parts of Section 2.	Construction – very small	Construction – not significant	<p>The tops of taller construction equipment may be perceptible but would be temporary in nature and at distance.</p> <p>The magnitude of change is considered to be very small and effects on this community area during construction would likely be not significant.</p>
		Indirect effects on views from the presence of the New Grimsby West Substation in Section 1 and pylons in the northern parts of Section 2 during operation.	Operation - very small	Operation - not significant	<p>Users of the Nev Cole Way would have very filtered views towards the Project in Section 1, the footpath passing through the built up areas of Healing and Great Coates, views influenced by the industrial areas to the north of the A180. In addition to the existing vegetation along the River Freshney which filters views, the new Grimsby West Substation would have mitigation planting to further screen views.</p> <p>This would result in a very small magnitude of change during operation would likely be not significant.</p>

3.8 Monitoring

- 3.8.1 No monitoring is currently proposed as part of the Visual assessment for Section 1, although a five-year aftercare period for mitigation planting is secured through the Preliminary CoCP.

References

- Ref 1 North East Lincolnshire Council (2018), North East Lincolnshire Local Plan 2013 to 2032 (Adopted 2018). [online] Available at: <https://www.nelincs.gov.uk/assets/uploads/2018/05/20180518-AdoptedLocalPlan2018-WEB.pdf> (Accessed 20 September 2024)
- Ref 2 North East Lincolnshire Council (2022). North East Lincolnshire Local Plan Review. [online] Available at: <https://www.nelincs.gov.uk/assets/uploads/2022/09/20220916-ScopingAndIssuesPaper.pdf> [Accessed 20 September 2024]
- Ref 3 Central Lincolnshire Joint Strategic Planning Committee (2023). Central Lincolnshire Local Plan (Adopted April 2023) [online]. Available at: <https://www.n-kesteven.gov.uk/sites/default/files/2023-04/Local%20Plan%20for%20adoption%20Approved%20by%20Committee.pdf> [Accessed 20 September 2024].
- Ref 4 The Planning Inspectorate (2024). Scoping Opinion: Proposed Grimsby to Walpole Project [online]. Available at: <https://nsip-documents.planninginspectorate.gov.uk/published-documents/EN020036-000109-Scoping%20Opinion%202017%20EIA%20Regs.pdf> [Accessed 18 October 2024].
- Ref 5 National Grid Electricity Transmission (2024). Grimsby to Walpole Environmental Impact Assessment Scoping Report [online]. Available at: <https://nsip-documents.planninginspectorate.gov.uk/published-documents/EN020036-000004-EN020036%20-%20Scoping%20Report%20Volume%201%20Main%20Report.pdf> [Accessed 18 October 2024].
- Ref 6 Landscape Institute and Institute for Environmental Management and Assessment (IEMA) (2013) Guidelines for Landscape and Visual Impact Assessment – 3rd Edition (GLVIA3).
- Ref 7 His Majesty's Stationary Office (HMSO) (2017), Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (EIA Regulations) [online] Available at: <https://www.legislation.gov.uk/ukxi/2017/572/contents> [Accessed 20 September 2024].
- Ref 8 Landscape Institute (2019). Technical Guidance Note (TGN) 06/19 Visual Representation of Development Proposals [online]. Available at: https://www.landscapeinstitute.org/wp-content/uploads/2019/09/LI_TGN-06-19_Visual_Representation-1.pdf [Accessed 20 September 2024].
- Ref 9 National Grid. The Holford Rules: Guidelines on Overhead Line Routeing. [online] Available at: <https://www.nationalgrid.com/sites/default/files/documents/13795-The%20Holford%20Rules.pdf> [Accessed 20 September 2024].
- Ref 10 National Grid. NGC Substations and the Environment: Guidelines on Siting and Design. [online] Available at: <https://www.nationalgrid.com/sites/default/files/documents/13796-The%20Horlock%20Rules.pdf> [Accessed 20 September 2024].

- Ref 11 National Grid Electricity Transmission (2024). Grimsby to Walpole Corridor Preliminary Routeing and Siting Study [online]. Available at: <https://www.nationalgrid.com/document/352621/download> [Accessed 12 April 2024].
- Ref 12 British Standard (BS) 5837:2012: Trees in relation to Design, Demolition and Construction – Recommendations.

4. Ecology and Biodiversity

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4. Ecology and Biodiversity

4.1 Introduction

- 4.1.1 This chapter presents the Preliminary Environmental Information (PEI) in relation to the Ecology and Biodiversity assessment of the New Grimsby West Substation Section (Section 1) of the Grimsby to Walpole Project (the Project). Specifically, the chapter includes the following sections:
- i. An introduction to the topic (section 4.1);
 - ii. Identification of key local and regional policy relevant to the assessment (section 4.2). A full overview of the legislation and national, regional onshore and marine planning policy context that applies to the Project is presented within **PEI Report Volume 2 Part A Chapter 2 Legislative Regulatory and Planning Policy Context** and supporting appendices;
 - iii. A summary of the assessment scoping process and the subsequent scope of the Ecology and Biodiversity assessment (section 4.3). Further detail is provided within **PEI Report Volume 3 Part A Appendix 4A Planning Inspectorate Scoping Opinion Responses**;
 - iv. A high-level summary of the methodology of the Ecology and Biodiversity assessment within Section 1 (section 4.4). A detailed description of the assessment methods and scope, applicable to the whole Project, is contained in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**;
 - v. A description of the environmental baseline within the Section 1 Study Area relevant to the Ecology and Biodiversity assessment (section 4.5);
 - vi. A description of mitigation measures included for the purposes of the Ecology and Biodiversity assessment reported within the PEI Report (section 4.6). Further information regarding design development can be found in **PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered** and the **Grimsby to Walpole Design Development Report**;
 - vii. The likely significant and non-significant Ecology and Biodiversity effects arising during construction and operation/maintenance of the Project within Section 1, based upon the assessment completed to date (section 4.7); and
 - viii. An outline of the proposed monitoring requirements in relation to Ecology and Biodiversity (section 4.8).
- 4.1.2 Further supporting information is set out in **Table 4.1** below, including supporting figures and technical appendices.

Table 4.1 Supporting documentation

Supporting Information	Description
Topic Specific Supporting Documentation	
PEI Report Volume 2 Part B Section 1 Figures	<p>Figure 4.1 Sites Statutorily Designated for their International Biodiversity Importance</p> <p>Figure 4.2 Sites Statutorily Designated for their National and County Biodiversity Importance</p> <p>Figure 4.3 Sites Non-Statutorily Designated for their County Biodiversity Importance</p>
Project Supporting Documentation	
PEI Report Volume 2 Part B Section 1 Chapter 1 Overview of the Section and Description of the Project	A summary of the works within Section 1, including permanent infrastructure, temporary construction works, and operational activities.
PEI Report Volume 3 Part A Appendix 2A Key Legislation	A list of identified environmental legislation considered relevant to the Project, which will be updated and amended as required to inform of the Environmental Statement (ES).
PEI Report Volume 3 Part A Appendix 2B National and Regional Planning Policy	A list of National and regional policies generally applicable to the assessment principles which underpin the PEI Report and ES.
PEI Report Volume 3 Part A Appendix 2Ci Local Plan Policy: Section Specific	An outline of the potentially relevant local planning policy allocations affecting each of the specific sections of the Project.
PEI Report Volume 3 Part A Appendix 2Cii Local Plan Policy: Route-wide	Details of planning policies applicable route-wide within the relevant Local Authority areas.
PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered	A summary of the main alternatives considered in relation to the Project during the design development process, including the main reasons for selecting the chosen option.
PEI Report Volume 2 Part A Chapter 4 Approach to Preliminary Environmental Information	Sets out the Environmental Impact Assessment (EIA) approach and general methodology that has been used in developing the PEI Report for the Project.
PEI Report Volume 2 Part A Chapter 5 Project Description	An overarching description of the Project and its key components, including available construction information.
PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice	Sets out control and management measures that will be undertaken during construction of the Project if granted consent. The final Code of Construction Practice (CoCP) will be

Supporting Information	Description
	submitted in support of the Development Consent Order (DCO) application.

- 4.1.3 There are also interrelationships between the potential effects on Ecology and Biodiversity and other environmental topics. Therefore, please also refer to the following chapters within **PEI Report Volume 2 Part B** and **Part C**:
- i. **PEI Report Volume 2 Part B Section 1 Chapter 6 Water Environment and Flood Risk** includes details of the location of sensitive features, including Water Framework Directive (WFD) waterbodies, and the associated mitigation that would also be required to address potential impacts upon important ecological features, such as wetland Habitats of Principal Importance (HPI) and aquatic fauna;
 - ii. **PEI Report Volume 2 Part B Section 1 Chapter 7 Geology and Hydrogeology** includes effects identified by the geology and hydrogeology assessment that may affect ecological receptors.
 - iii. **PEI Report Volume 2 Part B Section 1 Chapter 8 Agriculture and Soils** includes details of Agri-environment and Woodland and Forestry schemes, as well as relevant factors related to soil ecosystem services.
 - iv. **PEI Report Volume 2 Part B Section 1 Chapter 10 Noise and Vibration** includes details of the potential noise and vibration effects within Section 1, which are used to inform assessment of effects upon sensitive ecological features.
 - v. **PEI Report Volume 2 Part B Section 1 Chapter 12 Air Quality** includes supporting detail on the potential impacts of any changes in air quality upon sensitive ecological features, such as designated sites and ancient woodland.
 - vi. **PEI Report Volume 2 Part B Section 1 Chapter 13 Summary** provides a concise, consolidated summary of the likely significant effects reported for all topics, based upon the preliminary assessment.
 - vii. **PEI Report Volume 2 Part C Route-wide Chapter Ecology and Biodiversity** presents a summary of the route-wide preliminary impacts and likely significant effects of the Project upon the ecology and biodiversity.
 - viii. **PEI Report Volume 2 Part C Route-wide Chapter 10 Cumulative Effects** reports those intra-project effects which could potentially act in combination to result in cumulative environmental effects. It also identifies a shortlist of other Committed Developments with which there may be potential for cumulative effects, and the relevant environmental topics for such effects (inter-project). The full cumulative effects assessment will be reported within the ES.

4.2 Legislation and National Policy

- 4.2.1 Legislation and national policy relevant to the Project and this chapter is described in **PEI Report Volume 2 Part A Chapter 2 Legislative, Regulatory and Planning Policy Context** and supporting appendices, the details of which are set out in **Table 4.1**.

Regional and Local Policy

- 4.2.2 Regional and local plans or policies relevant to this assessment are as follows:

- i. North East Lincolnshire Local Plan 2013 to 2032 (Adopted 2018) (Ref 1):
 - Policy 9 Habitat Mitigation – South Humber Bank: which requires proposals within the Mitigation Zone, which will adversely affect the Humber Estuary Special Protection Area (SPA)/Ramsar site due to loss of functionally linked land, to provide their own mitigation to comply with the requirements of the Habitats Regulations.
 - Policy 40 Green Infrastructure: development will be expected to maintain and improve the network of green infrastructure. Recognition should be made to the role such green infrastructure plays in mitigating the effects of recreational pressure on the Humber Estuary Special Area of Conservation (SAC)/SPA/Ramsar.
 - Policy 41 Biodiversity and Geodiversity: which sets out a strategic approach, which positively plans for the creation, protection, enhancement and management of sites of biodiversity and geodiversity value.
 - Policy 31 Renewable and Low Carbon Infrastructure: Proposals for renewable and low carbon energy generating systems will be supported where any significant adverse impacts are satisfactorily minimised and the residual harm is outweighed by the public benefits of the proposal. Developments and their associated infrastructure will be assessed on their merits and subject to impact considerations including biodiversity, geodiversity and nature conservation, with regard given to the findings of the site and project specific Habitat Regulations Assessment (HRA) and potential impacts on SPA birds, where appropriate.
- ii. Central Lincolnshire Local Plan (Adopted April 2023) (Ref 2):
 - Policy S59 - Green and Blue Infrastructure Network: states that green and blue infrastructure in Central Lincolnshire will be protected and that development proposals should ensure that new green and blue infrastructure is considered and integrated into scheme design from the outset. Designs should take opportunities to, amongst other considerations, deliver biodiversity net gain and support ecosystem services.
 - Policy S60 - Protecting Biodiversity and Geodiversity: all development should protect, manage, enhance and extend the ecological network of habitats, species and sites of international, national and local importance; minimise impacts on biodiversity and features of geodiversity value; deliver measurable and proportionate net gains in biodiversity; and protect and enhance the aquatic environment within or adjoining the site, including water quality and habitat.

- Policy S61 - Biodiversity Opportunity and Delivering Measurable Net Gains: in summary requires developments to apply the mitigation hierarchy and ensure opportunities are taken to retain, protect and enhance biodiversity. Development proposals should create new habitats, and links between habitats, to maintain and enhance a network of wildlife sites and corridors, minimise habitat fragmentation and provide opportunities for species to respond and adapt to climate change. Proposals for major and large scale development should seek to deliver wider environmental net gains where feasible.
- Policy S66 - Trees, Woodland and Hedgerows: Development proposals should be prepared based on the overriding principle that the existing tree and woodland cover is maintained, improved and expanded; and opportunities for expanding woodland are actively considered, and implemented where practical and appropriate to do so.

Biodiversity Net Gain

- 4.2.3 National Grid Electricity Transmission plc (National Grid) has committed to 10 per cent net gain in environmental value, including as a minimum a 10 per cent Biodiversity Net Gain (BNG) across all its construction projects, in line with the Environment Act 2021 (although the statutory requirement is not yet in force for Nationally Significant Infrastructure Projects (NSIPs)).

4.3 Scope of Assessment

- 4.3.1 The scope of the assessment for Ecology and Biodiversity has been informed by the Scoping Opinion (Ref 3) provided by the Planning Inspectorate in September 2024 on behalf of the Secretary of State, following the submission of the EIA Scoping Report (Ref 4). The scope has also been informed through consultation and engagement with relevant consultees. A summary of the Scoping Opinion together with a response against each point of relevance to the Ecology and Biodiversity chapter is provided in **PEI Report Volume 3 Part A Appendix 4A Planning Inspectorate Scoping Opinion Responses**. A summary of the stakeholder engagement undertaken to date is provided in **PEI Report Volume 3 Part A Appendix 4D Summary of Stakeholder Engagement**.
- 4.3.2 Non statutory consultation feedback is summarised within the **Grimsby to Walpole Stage 1 Consultation Feedback Report**.
- 4.3.3 The scope of the Ecology and Biodiversity assessment for Section 1 includes the consideration of the effects of construction and operation/maintenance of the Project. A summary of the sensitive receptors and potential impacts considered is provided below:
- Sites statutorily designated for their biodiversity value – habitat loss, habitat modification/degradation, fragmentation, and direct and indirect changes in surface water quality and quantity, and effects on qualifying features/notified species;
 - Sites non-statutorily designated for their biodiversity value – habitat loss, habitat modification/degradation, fragmentation and direct and indirect changes in surface water quality and quantity, and effects on qualifying features/notified species;

- iii. Ancient Woodland - habitat loss, habitat modification and fragmentation and change in surface water and air quality;
- iv. Aquatic and terrestrial habitats present within the Ecology and Biodiversity Study Area, including HPI - habitat loss, habitat modification, fragmentation and change to surface water quality or flows;
- v. Protected and notable species (e.g. Species of Principal Importance (SPIs)) which are either confirmed present or potentially present within the Section 1 Survey Area which could be impacted through habitat loss or degradation, disturbance (e.g. due to noise or light pollution) or killing/injury. Species considered are:
 - terrestrial invertebrates;
 - great crested newt;
 - reptiles;
 - wintering birds;
 - breeding birds;
 - badger;
 - bats;
 - otter;
 - water vole
 - fish;
 - aquatic macroinvertebrates and macrophytes; and
 - other notable species.
- vi. invasive non-native species (INNS) – risk of spread due to construction and operational/maintenance activities and influence of presence upon habitat condition.

4.4 Assessment Methodology

- 4.4.1 The assessment scope, methodology, relevant guidance, key assumptions and limitations for the Ecology and Biodiversity assessment are set out in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**. This includes a description of how receptor sensitivity, magnitude of impact and significance of effects are all defined and assigned to the assessment. A summary of the key components of the assessments, assumptions and limitations is outlined below.
- 4.4.2 The Ecology and Biodiversity assessment is being undertaken principally with reference to the Chartered Institute of Ecology and Environmental Management's (CIEEM's) Guidelines for Ecological Impact Assessment in the UK and Ireland Terrestrial, Freshwater, Coastal and Marine (Ref 5).
- 4.4.3 Where possible, nationally recognised standard survey methods have and will continue to be used to inform biodiversity evaluation and impact assessment. The explanation of the methods and status of surveys are summarised in **PEI Report**

Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope.

- 4.4.4 The current assessment presented in this PEI Report is preliminary and is likely to be subject to change as more detailed baseline data becomes available, such as completed ecological survey results. Additionally, the design will also be subject to further refinement prior to submission of the ES. On this basis, a precautionary approach has been taken to the preliminary assessment.

Assessment Assumptions and Limitations

- 4.4.5 All general assumptions and limitations for Ecology and Biodiversity are listed within **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope.**
- 4.4.6 The decommissioning works at the existing Grimsby West Substation are yet to be defined, therefore a limitation of this preliminary assessment of Ecology and Biodiversity effects is that it does not assess these works. The decommissioning works will be assessed as part of the ES.
- 4.4.7 The key parameters and assumptions which inform the assessment will be reviewed based on the design presented in the DCO application and, where required, updated, or refined, for the ES. The ES will present the final key limitations and assumptions applicable to the full assessment, particularly drawing attention to any areas that may have changed from that presented in this preliminary assessment.

4.5 Baseline Conditions

Study Area and Survey Areas

- 4.5.1 The desk Study Areas for the Ecology and Biodiversity assessment of Section 1 have been informed by published guidance and professional judgement. They include the area within the draft Order Limits and a wider zone of potential influence. This zone represents the areas within which effects could reasonably occur as a result of the Project and associated activities. It should be noted that in relation to each assessed receptor, the Project's zone of influence can vary, for example depending on the importance or sensitivity of the identified designated ecological sites. This could for example relate to where the features that define a given site are mobile or there could be connectivity between the proposed Project and a given site. The Study Areas will be reviewed and, as appropriate, refined for the assessment presented in the ES.
- 4.5.2 The desk Study Areas for different ecological features (hereafter referred to as 'the Study Areas') relevant to this assessment are set out in **Table 4.2** below.
- 4.5.3 The field Survey Areas for the Ecology and Biodiversity assessment of Section 1 have also been informed by published guidance and professional judgement. As with the desk Study Area, the Survey Areas are defined on a case-by-case basis and differ for each of the ecological features surveyed. The Survey Areas typically include land within the draft Order Limits (i.e. within the 'Site' boundary) plus wider areas within the Zone of Influence, where the Project could result in impacts upon habitats or species.

4.5.4 The field Survey Areas for key ecological features (hereafter referred to as ‘the Survey Areas’) relevant to this assessment, including associated methods and status of surveys, are set out in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.

Table 4.2 Study Areas for key ecological features for Section 1

Study Area (distance from Section 1 draft Order Limits)	Feature
30 km	Special Areas of Conservation (SAC), Special Protection Areas (SPAs) and Ramsar sites where respectively bats or bird species with large foraging ranges are noted as, or one of, the qualifying features.
10 km	Sites designated statutorily for their international nature conservation importance e.g. SAC, SPA and Ramsar sites (as well as proposed or potential sites).
5 km	Statutory designated sites of up to national conservation importance e.g. Sites of Special Scientific Interest (SSSI) (also referencing Natural England Impact Risk Zones for SSSIs on the ‘Multi-Agency Geographic Information for the Countryside’ (MAGIC) website (Ref 5), National Nature Reserves (NNR) and Local Nature Reserves (LNRs)).
5 km	Specific ornithological records and data for wetland birds from the British Trust for Ornithology (BTO) Wetland Birds Survey (WeBS).
2 km	Non-statutory designated sites of nature conservation value e.g. Local Wildlife Sites (LWS), Roadside Nature Reserves (RNR), ancient woodland and other notable habitats (e.g. HPIs Ref 6)).
2 km	Records of protected and notable species received from Local Environmental Records Centres (LERC), including general ornithological records and INNS.

Data Collection

4.5.5 Desk study data sources have comprised LERCs, including requests to Greater Lincolnshire Nature Partnership (GLNP) (initially contacted in March 2024) for information on pre-existing ecological data (i.e. locations of non-statutory sites designated for nature conservation, existing records of protected, notable and INNS).

- 4.5.6 Online data resources have comprised:
- i. the Natural England website (Ref 8) for information on statutory designated sites of nature conservation interest;
 - ii. the MAGIC website (Ref 6) to identify the location (and details) of statutorily designated sites, ancient woodland, HPI (including Priority River Habitat) and for any granted European Protected Species Licence applications;

- iii. the Joint Nature Conservation Committee (JNCC) website (Ref 9) for site information and designation details of SACs, SPAs and Ramsar sites;
- iv. aerial imagery (Google Maps);
- v. Environment Agency (EA) Ecology and Fish Data for species records of fish, macroinvertebrate and macrophytes species (Ref 10); and
- vi. EA Catchment Data Explorer for data on WFD water bodies and water catchments (Ref 11).

4.5.7 In addition to these desk-based data, field survey data are in the process of being collected, and this work is ongoing. Apart from pre-construction surveys and those specifically required to collect data to inform any applications for protected species licences, these surveys are anticipated to be complete by the end of 2025. Once planned surveys to support the DCO application are complete, results will be collated with the survey data already collected to date, for inclusion within the ES to be submitted with the DCO application (see **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope** for a summary of surveys undertaken and those planned for 2025).

4.5.8 Features of ecological importance are in the process of being assessed. The data available at the time of writing this PEI Report were varied for any given ecological feature, dependent on the extent of surveys undertaken. This is due to specific survey requirements (such as optimal timing of surveys) and/or where only partial access to land has been secured in advance of the PEI Report being developed. The survey data being collected is as follows:

- i. Habitat survey, using the UK Habitat (UKHab) Classification for terrestrial habitats (Ref 11) and BNG condition assessments for applicable habitats;
- ii. Aquatic habitat surveys results including an appraisal for suitability for fish, aquatic plants, aquatic macroinvertebrates; and
- iii. Results from protected species surveys:
 - great crested newt;
 - reptiles;
 - wintering birds;
 - breeding birds;
 - badger;
 - bats;
 - otter;
 - water vole; and
- iv. INNS surveys.

4.5.9 Incidental records of other notable species, such as brown hare and hedgehog have also been recorded.

4.5.10 In addition to the above, arboricultural surveys are being undertaken in 2025. The results of which will be integrated into the ecological data collected for habitats (i.e. hedges, trees and woodland) and included within the ES.

Existing Baseline

- 4.5.11 The following section outlines the ecology and biodiversity baseline to date. The baseline section should be read in conjunction with the following supporting Figures and Appendices as found within **PEI Report Volume 2** and **Volume 3** respectively:
- i. **PEI Report Volume 2 Part B Section 1 Figure 4.1 Sites Statutorily designated for their International Biodiversity Importance;**
 - ii. **PEI Report Volume 2 Part B Section 1 Figure 4.2 Sites Statutorily designated for their National and County Biodiversity Importance;**
 - iii. **PEI Report Volume 2 Part B Section 1 Figure 4.3 Sites Statutorily designated for their County Biodiversity Importance.**

Section Overview

- 4.5.12 A description of the works within Section 1 is provided within **PEI Report Volume 2 Part B Section 1 Chapter 1 Overview of the Section and Description of the Project**. In summary, Section 1 is located at the northern end of the Project and principally comprises the replacement of the existing Grimsby West 400kV Substation with a new and expanded 400kV substation (the proposed New Grimsby West Substation). Section 1 also includes a short section of the new 400 kilovolt (kV) overhead line, which continues within Section 2, as well as modifications to an existing 400kV overhead line (known as the 4KG route) which is currently connected to the existing Grimsby West Substation.
- 4.5.13 The habitats within the Section 1 Study Area are dominated by arable fields with boundary hedgerows and ditches. Parcels of broadleaved woodland are present to the north and east of the proposed substation. No major watercourses have been identified within this Section.

Designated Sites

- 4.5.14 No site (nor part of any site) statutorily designated for its biodiversity value is present within the Section 1 draft Order Limits. There are however a number of statutory designated sites present within the defined Study Areas described in **Table 4.2**. A brief description of each of the designated sites within the Section 1 Study Area is provided in **Table 4.3**, which includes a summary of the main qualifying features and their relative distances from the Section 1 draft Order Limits at the closest point.
- 4.5.15 The Humber Estuary, an SPA, SAC and Ramsar site falls within 10 km of the Section 1 draft Order Limits. In addition, Greater Wash SPA, where bird species with large foraging ranges are noted as, or one of, the qualifying features, falls within 30 km of the Section 1 draft Order Limits.
- 4.5.16 There is one SSSI (Humber Estuary SSSI), and two LNR's (Bradley and Dixon Woods LNR and Freshney Parkway LNR) within the Section 1 Study area (i.e. within 5 km of the Section 1 draft Order Limits and/or where the SSSI Impact Risk Zones (IRZ's) overlap). The Impact Risk Zone for Humber Estuary SSSI overlaps with the Section 1 draft Order Limits.
- 4.5.17 There are five sites non-statutorily designated for their biodiversity value as Local Wildlife Sites (LWSs) within the 2 km Study Area, none of which is located within the Section 1 draft Order Limits.

Table 4.3 Sites designated for their biodiversity value, their qualifying features and distance from Section 1 draft Order Limits

Site	Status	Area (ha)	Brief description of site	Distance and direction from draft Order Limits
Internationally Designated (Statutory)				
Humber Estuary	SPA	37, 630	Qualifying features of the SPA: <ul style="list-style-type: none"> • Avocet (<i>Recurvirostra avosetta</i>) – breeding • Avocet (<i>Recurvirostra avosetta</i>) – non-breeding • Bar-tailed godwit (<i>Limosa lapponica</i>) – non-breeding • Bittern (<i>Botaurus stellaris</i>) – breeding • Bittern (<i>Botaurus stellaris</i>) – non-breeding • Black-tailed godwit (<i>Limosa limosa islandica</i>) – non-breeding • Dunlin (<i>Calidris alpina alpina</i>) – non-breeding • Golden plover (<i>Pluvialis apricaria</i>) – non-breeding • Hen harrier (<i>Circus cyaneus</i>) – non-breeding • Knot (<i>Calidris canutus</i>) – non-breeding • Little tern (<i>Sternula albifrons</i>) – breeding • Marsh harrier (<i>Circus aeruginosus</i>) – breeding • Redshank (<i>Tringa totanus</i>) – non-breeding • Ruff (<i>Calidris pugnax</i>) – non-breeding • Shelduck (<i>Tadorna tadorna</i>) – non-breeding • Waterbird assemblage 	3.1 km north-east
Humber Estuary	SAC	37, 630	Designated for Annex I habitats: <ul style="list-style-type: none"> • H1110 Sandbanks which are slightly covered by sea water all the time • H1130 Estuaries 	3.1 km north-east

Site	Status	Area (ha)	Brief description of site	Distance and direction from draft Order Limits
			<ul style="list-style-type: none"> • H1140 Mudflats and sandflats not covered by seawater at low tide • H1150 Coastal lagoons • H1310 Salicornia and other annuals colonising mud and sand • H1330 Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) • H2110 Embryonic shifting dunes • H2120 Shifting dunes along the shoreline with <i>Ammophila arenaria</i> ('White dunes') • H2130 Fixed dunes with herbaceous vegetation ('Grey dunes') • H2160 Dunes with <i>Hippophae rhamnoides</i> <p>Designated for Annex II species:</p> <ul style="list-style-type: none"> • S1095 Sea lamprey (<i>Petromyzon marinus</i>) • S1099 River lamprey (<i>Lampetra fluviatilis</i>) • S1364 Grey seal (<i>Halichoerus grypus</i>) 	
Humber Estuary	Ramsar site	37, 630	<p>Designated under:</p> <p>Ramsar Criterion 1: Near-natural estuary with the following component habitats: dune systems and humid dune slacks, estuarine waters, intertidal mud and sand flats, saltmarshes, and coastal brackish/saline lagoons.</p> <p>Ramsar Criterion 3:</p> <ul style="list-style-type: none"> • Grey seal (<i>Halichoerus grypus</i>) – breeding • Natterjack toad (<i>Epidalea calamita</i>) <p>Ramsar Criterion 5: Assemblages of international importance: 153,934 waterfowl, non-breeding season (5 year peak mean 1996/97-2000/2001)</p> <p>Ramsar Criterion 6: Species/populations occurring at levels of international importance</p>	3.1 km north-east

Site	Status	Area (ha)	Brief description of site	Distance and direction from draft Order Limits
			<p>Species with peak counts in spring/autumn:</p> <ul style="list-style-type: none"> • Black-tailed godwit (<i>Limosa limosa</i>) - Passage • Dunlin (<i>Calidris alpina</i>) • Golden plover (<i>Pluvialis apricaria</i>) • Knot (<i>Calidris canutus</i>) – Wintering • Redshank (<i>Tringa totanus</i>) • Species with peak counts in winter: • Golden plover (<i>Pluvialis apricaria</i>) • Redshank (<i>Tringa totanus</i>) • Knot (<i>Calidris canutus</i>) – Wintering • Shelduck (<i>Tadorna tadorna</i>) • Dunlin (<i>Calidris alpina</i>) • Black-tailed godwit (<i>Limosa limosa</i>) • Bar-tailed godwit (<i>Limosa lapponica</i>) <p>Ramsar Criterion 8: river lamprey (<i>Lampetra fluviatilis</i>) and sea lamprey (<i>Petromyzon marinus</i>)</p>	
Greater Wash	SPA	344,267	<p>Qualifying features of the SPA:</p> <ul style="list-style-type: none"> • Red-throated diver (<i>Gavia stellata</i>) – non-breeding • Common scoter (<i>Melanitta nigra</i>) – non-breeding • Little gull (<i>Hydrocoloeus minutus</i>) – non-breeding • Sandwich tern (<i>Sternula sandvicensis</i>) – breeding • Common tern (<i>Sterna hirundo</i>) – breeding • Little tern (<i>Sternula albifrons</i>) – breeding 	18.1 km east

Site	Status	Area (ha)	Brief description of site	Distance and direction from draft Order Limits
Nationally Designated (Statutory)				
Humber Estuary	SSSI	37,001	The Humber Estuary is a nationally important site with a series of nationally important habitats. These are the estuary itself (with its component habitats of intertidal mudflats and sandflats and coastal saltmarsh) and the associated saline lagoons, sand dunes and standing waters. The estuary supports nationally important numbers of 22 wintering waterfowl and nine passage waders, and a nationally important assemblage of breeding birds of lowland open waters and their margins. It is also nationally important for a breeding colony of grey seals (<i>Halichoerus grypus</i>), river lamprey (<i>Lampetra fluviatilis</i>) and sea lamprey (<i>Petromyzon marinus</i>), a vascular plant assemblage and an invertebrate assemblage.	3.1 km north-east
Bradley and Dixon Woods	LNR	41.8	An ancient woodland. Meadow areas present along with ponds.	2.9 km south-east
Freshney Parkway	LNR	10.1	Small greenspace developed by the local council in the 1980s from an old landfill. Area now deemed valuable to wildlife with water vole present within the LNR along the River Freshney. Area is predominantly meadow with wildflowers and areas of tree plantations. Connected to larger Freshney Parkway LWS. Freshney River LWS forms part of this LNR.	1.0 km east
County Designated (Non-statutory)				
Freshney Parkway	LWS	34.8	Council developed woodland and meadow area that runs adjacent to the River Freshney. Lowland mixed deciduous woodland and wet woodland present on-site. Important for wildlife within the local area.	0.8km east
Freshney Parkway North	LWS	3.0	A stretch of the River Freshney immediately downstream of Freshney Parkway Local Nature Reserve, plus adjacent drains and a little marsh, grassland and woody vegetation.	1.3 km east

Site	Status	Area (ha)	Brief description of site	Distance and direction from draft Order Limits
Laceby Beck North	LWS	6.2	Connected to the Freshney Parkway LWS and continues to run adjacent to the River Freshney. Lowland mixed deciduous woodland and wet woodland present on-site.	0.9 km south
Laceby Carr Plantation and Pond	LWS	3.9	Lowland mixed deciduous woodland and wet woodland with several small ponds that is located next to the river Freshney.	0.9 km south
Sweedale Croft Drain	LWS	1.0	Drain area that runs adjacent to arable land.	1.5 km north-east

Habitats

Habitats of Principal Importance

4.5.18 The following HPI have been identified within the Section 1 Study Area:

- i. Coastal and Floodplain Grazing Marsh;
- ii. Woodland (potentially priority habitat if it meets HPI criteria);
- iii. Hedgerows (potentially priority habitat if it meets HPI criteria); and
- iv. Priority River Habitat.

Ancient Woodland

4.5.19 There are no areas of designated ancient woodland within the Section 1 Study Area.

Terrestrial Habitats

4.5.20 Where the UKHab surveys have been completed within the Section 1 Survey Area, the main habitat type identified was cropland, which is of negligible ecological importance.

4.5.21 The surrounding hedgerows and arable field margins provide important connectivity through the landscape and are therefore considered to be of at least Local importance.

4.5.22 Two areas of HPI deciduous woodland were present within Section 1 draft Order Limits: Maud Hole Covert woodland located in the north; and Wybers Wood in the east. These HPI are assessed as being of County importance.

4.5.23 To the south of the Section 1 Survey Area a field of silage crop has been classified as modified grassland which is of negligible importance. An area of mixed scrub of Local importance is present to the north of this field, alongside the existing access road to the current Grimsby West substation.

4.5.24 Survey work will continue through 2025 to characterise the terrestrial habitat types which are present within the Section 4 Survey Area, and their constituent flora and fauna, and to confirm the condition of relevant habitats. Survey findings will inform the design of appropriate mitigation and the assessment of impacts and effects to be reported within the ES.

Aquatic Habitats

4.5.25 No Main Rivers are crossed by the draft Order Limits within Section 1. A network of smaller ditches/drains are however present across the Section 1 Study area and are traversed by the proposed overhead line route. The permanent access road to the New Grimsby West Substation also crosses one such watercourse. These small ditches/drains are assessed to be of Local importance.

4.5.26 There are no streams, rivers or ponds present within Section 1 draft Order Limits, noting that the nearest river is the River Freshney/Lacey Beck which lies approximately 1.0 km to the south.

4.5.27 No ponds were identified within the Section 1 draft Order Limits but nine were identified within the Survey Area.

- 4.5.28 Survey work will continue through 2025 to characterise the aquatic habitat types which are present within the Section 1 Survey Area, their constituent flora and fauna, and to confirm the condition of relevant habitats. Survey findings will inform the design of appropriate mitigation and the assessment of impacts and effects reported within the ES.

Water Framework Directive (WFD) Waterbodies

- 4.5.29 No WFD waterbodies are crossed by the Section 1 Study Area. Further details of the water environment baseline are provided within **PEI Report Volume 2 Chapter 6 Water Environment and Flood Risk**.

Protected and Notable Species

- 4.5.30 Surveys are being undertaken following the methodology included within the **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**. The extent of planned surveys is based upon the area within the Section 1 draft Order Limits and a wider zone of influence which is also described within this supporting Appendix. As previously stated, survey work for protected and notable species is currently incomplete and will continue through 2025.

Terrestrial Invertebrates

- 4.5.31 The habitats within the Section 1 Survey Area largely comprise agricultural land which is of limited value to terrestrial invertebrates. However, mixed scrub, woodland and hedgerows also recorded within the Section 1 Survey Area and provide potential for a more diverse assemblage of terrestrial invertebrates.
- 4.5.32 Any areas within the Section 1 Survey Area that are identified during the 2024/25 habitat surveys as potentially suitable to support species of conservation concern will be subject to a scoping survey in 2025, to assess their potential importance to invertebrates. Following on from this, targeted surveys would be undertaken if required, to inform the final assessments reported in the ES, and any specific mitigation requirements.

Great Crested Newt

- 4.5.33 The desk study records indicate a population of great crested newts is present at ponds beyond the draft Order Limits, approximately 1.8 km south at Aylesby.
- 4.5.34 Great crested newt surveys to date have included various waterbodies across several locations within the Section 1 Survey Area. Surveys have specifically included Habitat Suitability Index (HSI) assessments and analysing water samples from ponds for great crested newt eDNA.¹
- 4.5.35 A total of 9 ponds are present within the Section 1 Survey Area, of which one has been surveyed to date. This pond returned a negative eDNA result.
- 4.5.36 Seasonal survey work will continue in 2025 to confirm the status of great crested newt and the survey results will be used to inform the assessment of impacts and effects and the details of appropriate mitigation to be presented within the ES.

¹ eDNA refers to tiny traces of genetic material shed by organisms in their environment. For great crested newts, this could be skin cells left in the water. By collecting water samples and analysing them for newt DNA, their presence or absence from a particular waterbody may be determined.

Reptiles

- 4.5.37 Desk study research has indicated that there are no records for reptile species within the Section 1 Study Area.
- 4.5.38 The mixed scrub, hedgerow and woodland habitats in the Section 1 Study Area have potential for common reptiles, however, the general habitats within the remaining Section 1 Study Area that are suitable for reptiles appear to be limited in extent, being confined to field boundaries and the margins of ditches. Therefore, as any use of the habitats by reptiles is likely to be localised, Section 1 is considered to be of no more than Local importance for common reptile species.
- 4.5.39 Survey work will continue in 2025 to inform the full assessment of impacts and effects and the details of appropriate mitigation to be presented in the ES.

Wintering Birds

- 4.5.40 Surveys for wintering birds were carried out between November 2022 and March 2023. The surveys involved driven transects (once in January 2023 and in March 2023). Data are presented from the Section 1 draft Order Limits and an adjacent zone of 500 m, to account for the mobility of birds and the limited coverage of survey extents.
- 4.5.41 Within the ornithological surveys of Section 1, the species found to be present in winter are presented in **Table 4.4**. The survey results for Section 1 recorded one species only, black-headed gull (*Chroicocephalus ridibundus*) (Amber-listed) (Ref 13), as collected by the whole route driven transect only. As summarised in **Table 4.5**, black-headed gull is considered to be of Local importance.
- 4.5.42 Further avian work was undertaken during winter 2024/25 and will be analysed (along with all of the avian survey data) to inform the full assessment of impacts and effects and the details of any appropriate mitigation to be presented in the ES.

Table 4.4 Winter bird species and abundance recorded from Section 1 Survey Area

Common name	Scientific name	Abundance	Distribution	BoCC5 status	Section 41	Annex I	European Site Qualifying Feature
Black-headed gull	<i>Chroicocephalus ridibundus</i>	4	Present in a field to the south-west of Section 1	Amber	No	No	Not considered a main component species of Humber Estuary SPA.

Table 4.5 Importance of wintering species observed from the Section 1 Survey Area

Common name	Scientific name	Winter abundance	County Status	Importance
Black-headed gull	<i>Chroicocephalus ridibundus</i>	4	Very common passage migrant and winter visitor.	Local

Breeding Birds

- 4.5.43 Surveys for breeding birds were carried out between March 2024 and July 2024. A single transect overlapped with the Section 1 Survey Area.
- 4.5.44 For breeding bird data, a number of territories are derived from a standardised approach of assessing breeding status given proximity of observations (including acoustic records) and the distribution of suitable habitat. Data presented represent only those species of conservation concern as defined by Red or Amber listed species (3), Section 41 species (Ref 7), and Schedule 1 species of the Wildlife and Countryside Act 1981.
- 4.5.45 Breeding season data showing the species and the numbers of territories recorded are presented in **Table 4.6**. A range of bird species were recorded on-site, typical of an arable landscape. Species included farmland specialists such as yellowhammer (*Emberiza citrinella*) and skylark (*Alauda arvensis*). Four Red-listed and four Amber-listed species (3) were recorded in the Section 1 Study Area. The transect only has partial coverage of the area and thus the number of territories does not represent the total number of birds breeding or those using this area in the breeding season.
- 4.5.46 All of the recorded species are considered to be of Local importance based upon a combination of survey records, local distribution and Birds of Conservation Concern (BoCC) status (see **Table 4.7**).

Table 4.6 Breeding season species and numbers of territories recorded from Section 1 Survey Area

Common name	Scientific name	Numbers of territories	Distribution	BoCC status	Section 41	Annex I	European Site Qualifying Feature
Skylark	<i>Alauda arvensis</i>	4	Present away from field boundary	Red	No	No	No
Song thrush	<i>Turdus philomelos</i>	1	Woodland to north of substation	Amber	Yes	No	No
Whitethroat	<i>Curruca communis</i>	1	Field boundary	Amber	No	No	No
Reed bunting	<i>Emberiza schoeniclus</i>	1	Located near field margin	Amber	Yes	No	No

Common name	Scientific name	Numbers of territories	Distribution	BoCC status	Section 41	Annex I	European Site Qualifying Feature
Shelduck	<i>Tadorna tadorna</i>	1	Located near field margin	Amber	Yes	No	No
Linnet	<i>Linaria cannabina</i>	1	Field boundary	Red	Yes	No	No
Yellowhammer	<i>Emberiza citrinella</i>	1	Located near field margin	Red	No	No	No
Yellow wagtail	<i>Motacilla flava</i>	1	Located near field margin	Red	Yes	No	No

Table 4.7 Importance of breeding species observed from the Section 1 Survey Area

Common name	Scientific name	Numbers of territories	County Status	Importance
Skylark	<i>Alauda arvensis</i>	4	Very widespread	Local breeding species.
Song thrush	<i>Turdus philomelos</i>	1	Very widespread	Local breeding species.
Whitethroat	<i>Curruca communis</i>	1	Very widespread	Local breeding species.
Reed bunting	<i>Emberiza schoeniclus</i>	1	Very widespread	Local breeding species.
Shelduck	<i>Tadorna tadorna</i>	1	Fairly widespread	Local breeding species.
Linnet	<i>Linaria cannabina</i>	1	Very widespread	Local breeding species.
Yellowhammer	<i>Emberiza citrinella</i>	1	Very widespread	Local breeding species.
Yellow wagtail	<i>Motacilla flava</i>	1	Very widespread	Local breeding species.

- 4.5.47 Upon assessment of the Year 1 breeding bird survey results, further survey work will be required in 2025. Therefore, the results presented above are incomplete. Once available, the full survey results will be assessed and presented within the ES.
- 4.5.48 It is important to note that this section considers the importance of a species in the context of the geographical extent of Section 1 only. An initial route-wide assessment is included in **PEI Report Volume 2 Part C Route-wide Assessment Chapter 3 Ecology and Biodiversity**.

Badger

- 4.5.49 Desk study records identified over 20 records of badger within the Section 1 Study Area. These included recorded setts and signs of badger activity and badger casualties on roads throughout the area.
- 4.5.50 Surveys for badger were conducted between November 2024 and March 2025 and incidental records of badger field signs were recorded during other species and habitat surveys.
- 4.5.51 A potential main badger sett was recorded within the Section 1 Survey Area. The results of the badger surveys (including the locations of the setts) will be presented in a Confidential Appendix to the ES.
- 4.5.52 Given its common status and widespread distribution within the county, Badger is assessed as being of Local importance.
- 4.5.53 Surveys are ongoing in 2025 to inform the full assessment of impacts and effects and the details of appropriate mitigation to be presented in the ES.

Bats

- 4.5.54 Local Records Centre data for the Section 1 Study Area did not include any records of bat roosts.
- 4.5.55 There were no European Protected Species Mitigations Licences (EPSML) for bats within the Section 1 Study Area.
- 4.5.56 Initial surveys for bats were carried out between May and October 2024.
- 4.5.57 The field surveys completed to date have confirmed that the bat species present within the Section 1 Survey Area include common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*), Myotis sp., brown long-eared (*Plecotus auritus*), noctule (*Nyctalus noctula*), nathusius pipistrelle (*Pipistrellus nathusi*), Lesiler's (*Nyctalus leisleri*), barbastelle (*Barbastella barbastellus*) and daubenton's (*Myotis daubentonii*). The activity surveys indicated that hedgerows and woodland edges are being utilised by foraging and commuting bats around the proposed New Grimsby West substation.
- 4.5.58 Survey work was also conducted in winter 2024/2025 and will continue in spring/summer 2025 to confirm assemblage of foraging and commuting bats, bat roosts and the status of bats. When planned surveys are complete, results will inform the design of appropriate mitigation and the assessment of impacts and effects to be presented within the ES. It should be noted that at the time of writing this PEI Report, results from the winter 2024/2025 surveys were not available.
- 4.5.59 At this stage no buildings or structures, with the exception of the existing Grimsby West Substation, are known to be within the Section 1 draft Order Limits. If any

buildings or structures are identified within the Section 1 draft Order Limits with the potential to support to bats, these will be surveyed accordingly.

Otter

- 4.5.60 Desk study survey identified 12 records of otter within the Section 1 Study Area. These included signs of otter activity and otter casualties on roads throughout the area.
- 4.5.61 Initial surveys for otter were carried out between March 2024 and October 2024.
- 4.5.62 Within the Section 1 Survey Area, no field signs of otter were identified, and no breeding or resting sites were recorded.
- 4.5.63 Where suitable otter habitat exists, surveys will be completed to confirm presence/absence.
- 4.5.64 Given its recovering status and importance within the county, where otter is present, the species is assessed as being of County importance.
- 4.5.65 Survey work will continue in 2025 to inform the full assessment of impacts and effects and the details of appropriate mitigation measures to be presented in the ES.

Fish

- 4.5.66 Desk study research has identified Environment Agency records of the notable fish species brown/sea trout (*Salmo trutta*) and European eel (*Anguilla anguilla*; **Table 4.8**) within the Section 1 Study Area.

Table 4.8 Notable Fish species identified within the Section 1 Study Area

Common name	Scientific name	Designation/Status	Importance
European eel	<i>Anguilla anguilla</i>	Global Red List Post 2001 – Critically Endangered, Annex II of the Habitats Directive, Appendix II of the Bonn Convention, UK Biodiversity Action Plan (BAP) 2007, Section 41 NERC Act 2006, Eels (England and Wales) Regulations 2009, Salmon and Freshwater Fishes Act (SAFFA) 1975, OSPAR, European Union and Trade in Wild Fauna and Flora-AB	County, due to the relative scarcity of this species and small population size likely to be affected.
Brown/Sea trout	<i>Salmo trutta</i>	UKBAP 2007, Section 41 NERC Act 2006	County, due to the relative scarcity of this species, migratory nature and small population size likely to be affected.

- 4.5.1 Survey work will be undertaken in 2025 to confirm the status of fish within the Section 1 Study Area and to inform the assessment of impacts and effects and the design of any appropriate mitigation, which will be presented with the survey results in the ES.

Aquatic Macroinvertebrates

- 4.5.2 No notable aquatic macroinvertebrate species have been identified as present within the Section 1 Study Area based upon the completed desk study.
- 4.5.3 Survey work will be undertaken in 2025 to confirm the status of aquatic macroinvertebrates. Survey findings will inform the full assessment of impacts and effects and the details of any appropriate mitigation measures to be presented within the ES, along with the completed survey results.

Aquatic Macrophytes

- 4.5.4 Based upon desk study research (data search), no notable aquatic macrophyte species were identified within the Section 1 Study Area.
- 4.5.5 Survey work will be undertaken in 2025 to confirm the status of aquatic macrophytes, to inform the full assessment of impacts and effects and the details of any appropriate mitigation measures to be presented within the ES.

Water Vole

- 4.5.6 Desk study records included over 50 records of water vole within the Section 1 Study Area. These included sightings of individuals and signs of water vole activity, including dropping, burrows and feeding signs throughout the area.
- 4.5.7 Initial surveys for water vole were carried out between March 2024 and October 2024.
- 4.5.8 Within the Section 1 Survey Area, no evidence of water voles was recorded and the majority of ditches surveyed being recorded as unsuitable for water voles due to being dry at the time of survey.
- 4.5.9 Where suitable water vole habitat exists, surveys will be completed to confirm presence/absence.
- 4.5.10 Given its declining status and importance within the county, where water vole is present, the species is assessed as being of County importance.
- 4.5.11 Survey work will continue in 2025 to confirm the status of water vole and to inform the full assessment of impacts and effects and the details of appropriate mitigation measures to be presented within the ES, along with the completed survey results.

Other Protected and Notable Species

- 4.5.12 The desk study returned records for hedgehog (*Erinaceus europaeus*) within the Section 1 Study Area.
- 4.5.13 Habitats within the Section 1 Survey Area are suitable for SPI including brown hare, common toad and hedgehog, which are of Local importance.
- 4.5.14 Survey work will continue in 2025 to inform the full assessment of impacts and effects and the details of any appropriate mitigation measures to be presented within the ES.

Invasive Non-Native Species

- 4.5.15 Desk study research has identified the presence of a total of four INNS within the Section 1 Study Area. These comprise the invasive non-native plant species listed under Schedule 9 of the Wildlife Countryside Act 1981: Canadian waterweed (*Elodea canadensis*), Japanese knotweed (*Reynoutria japonica*) and Himalayan balsam (*Impatiens glandulifera*); and one additional INNS listed in the Invasive Alien Species (Enforcement and Permitting) Order 2019 (Ref 13) Nuttall's waterweed (*Elodea nuttallii*).
- 4.5.16 No specific INNS survey has been undertaken to date; however, field observations have been made during other ecological surveys undertaken within the Survey Area. A *Cotoneaster* species was identified within the woodland to the south-west of the draft Order Limits near Pyewipe Farm.
- 4.5.17 Further planned habitat and species surveys, such as those for aquatic habitats and invertebrates, will include the recording of invasive non-native species. The results of these surveys will be presented in the ES.

Future Baseline

- 4.5.18 The future baseline relates to known or foreseeable changes to the current baseline in the future which will be assessed as part of the Project in the ES. Specifically, it accounts for anticipated changes including those caused by changing climatic conditions, policy, legislation, advances in technology and by other confirmed development projects which will be complete prior to construction of the Project.
- 4.5.19 At this preliminary stage, a full assessment of the implications of any committed development projects with regard to future baseline conditions has not been undertaken. A list of the currently known developments which are anticipated to be included within the future baseline scenario is provided within **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope Annex A Developments for Consideration Within the Future Baseline**. This will be reviewed and updated as appropriate during development of the ES, as with other information which informs assessment of the future baseline.
- 4.5.20 Habitats within the Section 1 Study Area and Study Area comprise mainly arable farmland currently under cultivation.
- 4.5.21 In addition to the main habitat coverage, field boundaries are in places defined by hedgerows, ditches and farm tracks.
- 4.5.22 Existing ecological features are unlikely to materially change in the future e.g. cropland, field boundaries and ditches. Those areas of known change will be assessed, where necessary, as part of the surveys in 2025.
- 4.5.23 Relative to the current baseline, the importance of ecological features present within the Section 1 Study Area are not expected to change significantly by the end of the construction period. Management of the habitats is unlikely to change over this period, and consequently no significant degradation or improvement of habitat condition is expected.
- 4.5.24 Due to development pressure year on year within the wider landscape, protected and notable species and habitats are likely to remain priorities for conservation within future baseline scenarios.

4.6 Design, Control and Additional Mitigation Measures

- 4.6.1 As set out in **PEI Report Volume 2 Part A Chapter 4 Approach to Preliminary Environmental Information**, mitigation measures fall into one of three categories: embedded design measures; control and management measures; and additional mitigation measures. Those measures relevant to the assessment of effects on important ecological features are set out below.

Design Mitigation Measures

- 4.6.2 The Project and draft Order Limits have been designed to avoid sensitive receptors as far as practicable. This is in accordance with the 'Holford Rules' (Ref 15) applicable to routing of new overhead lines and the 'Horlock Rules' (Ref 16) which apply to the design and siting of substations. These approaches are explained in further detail within the Corridor Preliminary Routeing and Siting Study (CPRSS) (Ref 17) and **PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered**. Principles include, but are not limited to, seeking to avoid areas of highest amenity, cultural or scientific value, taking advantage of natural screening provided by existing landform and features (e.g. woodland) and keeping visual, noise and other environmental effects to a minimum.
- 4.6.3 The Section 1 draft Order Limits on which this assessment is based have been located to avoid designated sites, HPIs and important receptors as far as practicable. This is in accordance with the Planning Inspectorate's Advice on Habitats Regulations Assessment relevant to nationally significant infrastructure projects (September 2024) (Ref 16), the Habitats Regulations 2017 (Ref 17).
- 4.6.4 Following selection of the preferred route corridor, as outlined in the CPRSS, ecological specialists have been integral to ongoing design refinement of works within Section 1. This has further contributed to the avoidance or reduction of the potential ecological impacts of the Project. Examples of such measures include the refined positioning individual pylons and access routes to avoid or reduce direct and indirect impacts on notable species and habitats, including woodland and trees.
- 4.6.5 At sensitive crossing locations (e.g. rivers), existing access routes would be used as far as practicable and the width of any required working area minimised. If access upgrades are required, large or sensitive watercourses, for example those designated as Main River, and those with WFD status, would be crossed using clear span bridges. Where culverts are implemented, these will either be arch culverts, leaving the natural bed undisturbed, or as far as reasonably practicable, they would be installed with the invert set below the natural bed level for a semi-natural bed to establish within the culvert.
- 4.6.6 Wherever practicable, areas of temporary habitat loss will be reinstated back to the type of baseline habitat affected or improved/enhanced. The ES will also include proposals for enhancing existing habitats. Areas of permanent habitat loss will be considered during the siting and design of measures required to achieve a net gain in biodiversity value.

Control and Management Measures

Construction

4.6.7

A Preliminary CoCP is provided in **PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice**. General control measures included within the Preliminary CoCP relevant to the Ecology and Biodiversity assessment include:

- i. GG01: The Project will be run in compliant with all relevant legislation, consents and permits. (*i.e. The Conservation of Habitats and Species Regulations 2017 and The Wildlife and Countryside Act 1981. See **PEI Report Volume 2 Part A Chapter 2 Legislative, Regulatory and Planning Policy** for more detail on relevant legislation), consents and permits.*)
- ii. GG03: Suitably experienced Environmental Advisers will be appointed for the duration of the construction phase. In addition, qualified and experienced Environmental Clerk of Works (EnvCoW) will be available during the construction phase to advise, supervise and report on the delivery of the mitigation methods and controls outlined in the Management Plans. The EnvCoW(s) will monitor that the works proceed in accordance with relevant environmental DCO requirements and adhere to the required good practice and mitigation measures. The EnvCoW(s) will be supported as necessary by appropriate specialists, including ecologists and arboriculturists, soils and land drainage experts.
- iii. GG04: Construction workers will undergo training to increase their awareness of environmental issues as applicable to their role on the Project. Topics will include where appropriate:
 - pollution prevention and pollution incident response;
 - dust management and control measures;
 - location and protection of sensitive environmental sites and features;
 - adherence to protected environmental areas around sensitive features;
 - working hours and noise and vibration reduction measures;
 - working with potentially contaminated materials;
 - waste management and storage;
 - flood risk response actions;
 - agreed traffic routes, access points, etc.;
 - soil management; and
 - drainage management.
- iv. GG05: A record of condition will be carried out (photographic and descriptive) of the working areas that may be affected by the construction activities, prior to works commencing. This record will be available for comparison following reinstatement after the works have been completed to ensure that the standard of reinstatement at least meets that recorded in the pre-condition survey.
- v. GG06: A Construction Environmental Management Plan (CEMP), a Landscape and Ecological Management Plan (LEMP), a Materials and Waste Management

Plan (MWMP) and a Construction Traffic Management Plan (CTMP), Emergency Action Plan, Public Rights of Way Management Plan (PRoWMP), Overarching Written Scheme of Investigation (OWSI), Biodiversity Management Plan, Noise and Vibration Management Plan, Pollution Prevention Plan, Foundation Works Risk Assessment, Carbon efficiency Plan, Dust Management Plan (DMP), Drainage Management Plan (DrMP) along with a Soil Management Plan (SMP) will be produced prior to construction. These are collectively referred to as ‘the environmental control Plans’.

- vi. GG07: The CEMP will set out site specific measures and construction methodologies to avoid or reduce potential effects of the Project on the environment during construction. The contractor(s) shall undertake regular site inspections to check conformance to the Management Plans.
- vii. GG08: Land used temporarily will be reinstated where practicable to its pre-construction condition (including Agricultural Land Classification ((ALC)) grade) and use. Hedgerows, fences and walls (including associated earthworks and boundary features) will be reinstated to a similar style and quality to those that were removed, in consultation with the landowner.
- viii. GG09: Where sensitive features such as ancient woodland and protected habitats are to be retained within or immediately adjacent to the draft Order Limits, an appropriate protective area will be established using appropriate fencing and signage and will be inspected, repaired and replaced as necessary. The protective areas will be shown on the Retention and Reinstatement Plans contained within the LEMP.
- ix. GG11: Any activity carried out or equipment located within a construction compound that may produce a noticeable nuisance, including but not limited to dust, noise, vibration and lighting, will be located away from sensitive receptors such as residential properties or ecological sites where practicable.
- x. GG15: Fuels, oils and chemicals will be stored responsibly, away from sensitive water receptors. Where practicable, they will be stored >15 m from watercourses, ponds and groundwater dependent terrestrial ecosystems. Where it is not practicable to maintain a >15 m distance, additional measures will be identified. All refuelling, oiling and greasing of construction plant and equipment will take place above drip trays and also away from drains as far as is reasonably practicable. Vehicles and plant will not be left unattended during refuelling. Appropriate spill kits will be made easily accessible for these activities. Potentially hazardous materials used during construction will be safely and securely stored including use of secondary containment where appropriate. Stored flammable liquids such as diesel will be protected either by double walled tanks or stored in a bunded area with a capacity of 110% of the maximum stored volume. Spill kits will be located nearby.
- xi. GG16: Runoff across the site will be controlled through a variety of methods including header drains, buffer zones around watercourses, on-site ditches, silt traps and bunding. There will be no intentional discharge of site runoff to ditches, watercourses, drains or sewers without appropriate treatment and agreement of the appropriate authority (except in the case of an emergency).
- xii. GG17: Wash down of vehicles and equipment will take place in designated areas within construction compounds. Wash water will be prevented from passing

untreated into watercourses and groundwater. Appropriate measures will include use of sediment traps, daily checks and ongoing monitoring.

xiii. GG19: Earthworks and stockpiled soil will be managed as per the SMP.

4.6.8 The topic specific control and management measures included within the Preliminary CoCP which are relevant to the assessment of effects upon Ecology and Biodiversity receptors are:

- i. B01: The contractor(s) will comply with relevant protected species legislation. Appropriate licences will be obtained where necessary from Natural England for all works affecting protected species as identified by the ES and through pre-construction surveys. All applicable works will be undertaken in accordance with the relevant requirements and conditions set out in those licences.
- ii. B02: In the event that vegetation or any other feature with the potential to support breeding birds is required to be removed during the main breeding bird season (01 March to 31 August) or, in the case of Schedule 1 birds (e.g. barn owl), is likely to be disturbed, then works will be undertaken in the presence of an Ecological Clerk of Works (ECoW). Appropriate protection measures will be put in place should active nests be found. These will include exclusion zones around active nests until chicks fledge or nests become inactive as determined by monitoring by the ECoW(s). Active nests of wild birds are protected at all times and therefore the same measures will be put in place if an active nest is identified at any time of year.
- iii. B03: Where there will be a risk of animal entrapment, a means of escape will be installed into all excavations left open overnight.
- iv. B04: To control the spread of invasive weeds in accordance with the Wildlife and Countryside Act 1981, any plant or machinery that has been used in areas contaminated with invasive species (both terrestrial and aquatic), such as Japanese knotweed and Himalayan balsam, will be thoroughly cleaned. Water used to clean vehicles, when necessary, will be discharged or emptied into the contaminated area to prevent the spread of the plant (through plant propagules, e.g. seeds, rhizomes, fragments, etc.). The area will be cordoned off to prevent any inadvertent spreading. Any plant material or soil contaminated with plant propagules if removed from a site is classified as controlled waste and should be disposed of in a suitably licensed landfill site, accompanied by appropriate Waste Transfer documentation, and must comply with Section 34 of the Environmental Protection Act 1990. Further detail will be set out in a Biosecurity Management Plan.
- v. B05: Subject to the location and scale of impact, suitable habitat for common reptiles will be subject to two-stage habitat manipulation that will take place between mid-March and mid-October. Firstly, vegetation will be cut to approximately 150 mm (with the arisings removed) under the supervision of an ECoW and the site left for a minimum of two days to allow reptiles to naturally disperse from the area. Secondly, vegetation will be cleared down to ground level under the supervision of an ECoW. Vegetation will be cleared using appropriate equipment based on the type of vegetation to be removed, the area affected, and the risk of mortality or injuring reptiles. Construction works could commence immediately after completion of the second stage. Reptile hibernacula will be retained and protected during construction where practicable. If unavoidable, the removal of vegetation and groundworks at hibernacula will be

timed to avoid the hibernation season (late October to early March). Replacement hibernacula and refugia will be provided prior to clearance of any suitable habitat.

- vi. B06: Alternative roost structures (bat boxes) will be installed, prior to removal of nesting sites (with landowner consent) on retained trees within the draft Order Limits or areas outside of the Order Limits agreed with landowners. Unless specified otherwise by the provisions of any protected species licence for bats, two boxes will be provided for each tree to be felled where Potential Roost Features (PRF) on that tree are classified as PRF-I bat roost potential. Five boxes will be provided for each tree with PRF-M bat roost potential to be felled.
- vii. B07: Alternative barn owl breeding sites (barn owl boxes) will be installed, prior to removal of nesting sites, (with landowner consent) on retained trees or poles within the draft Order Limits or areas outside of the Order Limits agreed with landowners.
- viii. B08: Where the works require the crossing or removal of hedgerows, the gap will be reduced to a width required for safe working. Where hedge removals are necessary, 'dead hedging' should be used, where practicable, in the interim periods to retain connectivity during construction. Dead hedging can comprise vegetation arisings or artificial provision, such as willow screening panels or Heras fencing covered in camouflage netting. New hedgerow planting will contain native, woody species of local provenance.
- ix. B09: Habitat translocation or any species translocation (if required) that is not covered by protected species licences will be undertaken in accordance with a strict method statement. The method statement will be specific to the habitat type or species affected and will detail the appropriate construction methods, timing, management, receptor site preparation and post-construction habitat management and monitoring. The receptor site will be clearly identified and prepared in advance of translocation.
- x. B10: Where any in channel watercourse works are required, works will be completed outside of fish spawning season (March 16th-June 16th inclusive) and fish migratory seasons (species specific, dependant on the waterbody) subject to likely fish presence confirmed through pre-construction fish surveys.
- xi. B11: Where works require dewatering of waterbodies known to contain fish, fish removal and relocation will be required (which will require appropriate permits such as an FR2 licence from the Environment Agency).
- xii. B12: A method statement to ensure works within watercourse crossings include suitable measures to allow the passage of otters, water vole and fish throughout construction (i.e., during fluctuating water levels).
- xiii. B13: In the first instance reasonable avoidance measures will be incorporated to avoid impacting known otter holts/couches, badger setts and/or trees identified as having bat roosting potential and suitable buffer zones implemented.
- xiv. LV01: The contractor(s) will retain vegetation where practicable. Where vegetation is lost and trees cannot be replaced in situ due to the restrictions associated with land rights required for operational safety, native shrub planting approved by National Grid will be used as a replacement, in accordance with the outline vegetation reinstatement plans included within the LEMP. Replacement vegetation will be planted as close by as practicable and will complement

landscape character and be sympathetic to the local habitat type in order to provide a high biodiversity value.

- xv. LV02: The contractor(s) will apply the relevant protective principles set out in British Standard (BS) 5837:2012: Trees in relation to design, demolition, and construction. This will be applied to trees within the draft Order Limits which will be preserved through the construction phase, and to trees outside of the draft Order Limits where such measures do not hinder or prevent the use of the relevant working width for construction. An Arboricultural Clerk of Works will ensure the suitability of tree protection before and during the construction phase. All works to high grade trees, including trees under Tree Preservation Orders and veteran trees, will be undertaken, or supervised by a suitably qualified arboriculturist.
- xvi. LV03: A five-year aftercare period will be established for all reinstatement and mitigation planting, details of which will be set out in the LEMP.
- xvii. LV04: Construction lighting will be of the lowest luminosity necessary to safely perform tasks. Lighting will be directional and minimised where possible.
- xviii. W01: All works affecting watercourses or within the relevant permitting stand-off distance from the top of bank or landward toe of a flood defence on main rivers and IDB-maintained watercourses will be in accordance with a method approved under consents issued under the Environmental Permitting Regulations 2016, Land Drainage Act 1991, IDB Byelaws (where relevant) or the protective provisions of the DCO for the benefit of the Environment Agency, LLFAs and IDBs . Where possible, a stand-off distance from the top of bank of all watercourses/waterbodies will be established (with the exception of crossings and where existing field access roads are already located adjacent to watercourses are to be utilised). To align with Environment Agency and IDB consenting requirements, it is proposed that this will be: 16 m for tidal main rivers; 8 m for non-tidal main rivers; and 9m for IDB-maintained watercourses. No statutory stand-off distances are specified for ordinary watercourses, but any works liable to cause an obstruction to flow would be subject to consent under the Land Drainage Act 1991. Appropriate stand-off distances should also be implemented where Project construction activities coincide with water supply and sewerage infrastructure. These are to be agreed on a case-by-case basis. For any instances where the stand-off distances stated above cannot be achieved between construction works and watercourses, these works would be subject to the appropriate consent by the relevant drainage authority (FRAP for main rivers, OWC for ordinary watercourses).
- xix. W02: For open cut watercourse crossings and installation of vehicle crossing points, good practice measures will include but not be limited to, where practicable:
 - reducing the working width for open cut crossings of a main or ordinary watercourse whilst still providing safe working;
 - installation of a pollution boom downstream of open cut works;
 - the use and maintenance of temporary lagoons, tanks, bunds, silt fences or silt screens as required;
 - have spill kits and straw bales readily available at all crossing points for downstream emergency use in the event of a pollution incident;

- the use of all static plant such as pumps in appropriately sized spill trays;
 - prevent refuelling of any plant or vehicle within 15 m of a watercourse;
 - prevent storing of soil stockpiles within 15 m of a main river;
 - inspect all plant prior to work adjacent to watercourses for leaks of fuel or hydraulic fluids; and
 - reinstating the riparian vegetation and natural bed of the watercourse, using the material removed when appropriate, on completion of the works and compacting as necessary. If additional material is required, appropriately sized material of similar composition will be used.
- xx. W03: Riverbank and in-channel vegetation will be retained where not directly affected by installation works. Natural substrate will be provided through temporary watercourse crossings culverts.
- xxi. W04: Where watercourses are to be crossed by construction traffic, measures to be applied include the use of temporary culverts or temporary spanned bridges. Once the temporary culvert is installed, the area above the temporary culvert will be backfilled and construction mats placed over the backfilled area to permit the passage of plant, equipment, materials, and people. Temporary culverts will be sized to reflect the span width and the estimated flow characteristics of the watercourse under peak flow conditions and kept free from debris. Where used, temporary bridges will be designed specifically to consider the span length and the weight and size of plant and equipment that will cross the bridge. Specific detailed designs for each watercourse crossing, consistent with these design principles, will be prepared by the construction contractor. These will be subject to the appropriate consent by the relevant drainage authority (Flood Risk Activities Permit from the EA for main rivers, Ordinary Watercourse Consent from the Lead Local Flood Authority or Internal Drainage Board for ordinary watercourses).
- xxii. W05: The contractor(s) will comply with all relevant consent conditions or DCO provisions regarding de-watering and other discharge activities. This will particularly be with regard not only to volumes and discharge rates, but also to water quality (particularly suspended solids, pH and hydrocarbons) and will include discharges to land, water bodies or third-party drains/sewers.
- xxiii. W10: Severance of existing land drainage routes, including agricultural field drainage systems would be managed during construction through provision of temporary alternative drainage routes, and these drainage systems would be permanently reinstated to ensure their existing function is maintained.
- xxiv. W11: Appropriate control of runoff from working areas will be achieved through implementation of a DrMP for the construction phase. The DrMP will use sustainable urban drainage systems (SuDS) principles, promoting infiltration of runoff wherever possible and specifying appropriate treatment and attenuation storage to ensure any discharges to watercourses are uncontaminated and limited to greenfield rates. The DrMP will cover all aspects of construction works and temporary infrastructure. Drainage measures will be phased to be completed before the commencement of earthwork operations, in a specific area, and will be retained until the drainage system of the completed Project is fully operational, or site restoration works are completed. This will include the temporary diversion of existing agricultural drainage around working areas, if

required, followed by reinstatement on completion of works. At this stage of the design process, preliminary work has already been done to identify runoff treatment and attenuation requirements for temporary access tracks and working areas associated with overhead line construction, including defining potential locations of water treatment areas and discharge outfalls. Further work is required to develop drainage strategies for substations, considering arrangements for both construction and operational phases of the Project, which will be reported as part of the ES chapter and FWRA in submission with the DCO application.

- 4.6.9 The CEMP will include other standard measures relating to ecology such as pre-construction surveys to validate and, where necessary, update the baseline survey findings. The purpose of these pre-construction surveys would be to ensure mitigation during the construction phase is based on the latest protected species information. This would also be required for any protected species licensing.

Operation and Maintenance

- 4.6.10 During the operation and maintenance of the Project, National Grid operatives will be required to adhere with National Grid best practice requirements during the completion of routine maintenance activities, such as the management of vegetation within and adjacent to assets (e.g. substations, pylons, access routes).
- 4.6.11 Key measures relevant to the control of potential impacts upon ecology and biodiversity during operation and maintenance include:
- i. Minimising pollution risks as far as practicable through the control of hazardous substances, including refuelling of plant and equipment away from drains or watercourses within dedicated areas and the use of secondary containment systems, such as bunds, drip trays and plant nappies;
 - ii. Consultation with the relevant regulatory body where works are required in, around, or that may impact watercourses, or there is a potential impact on local flora and fauna of works near controlled waters;
 - iii. Identifying and notifying the presence of invasive species within the operational areas of the site;
 - iv. Proactively seeking to avoid disturbance to birds during the breeding season, including the use of deterrent measures, acting as early as possible;
 - v. Reviewing the need for licenses, ensuring existing licenses adequately cover the operations and activities planned on sites and ensuring the correct use of and compliance with licenses; and
 - vi. Ensuring that tenancy and land use agreements include requirements to protect, preserve and enhance habitats, biodiversity and ecosystem services.
- 4.6.12 During the operation and maintenance of the Project, National Grid or their appointed Contractor will be required to appoint an ecologist during any maintenance or refurbishment works to ensure that ecological constraints present at the time will be identified and mitigated accordingly.
- 4.6.13 Additionally, habitats created or enhanced by the Project and embedded within the design, will be managed in accordance with the LEMP.

Additional Mitigation Measures

- 4.6.14 Additional mitigation measures are those required to reduce likely significant adverse environmental effects which may still occur despite the inclusion of the embedded design and control measures described above.
- 4.6.15 Potential additional mitigation measures which may be required to reduce the effects of the Project upon Ecology and Biodiversity are in the early stages of development, based upon an iterative process informed by ongoing survey and assessment.
- 4.6.16 As set out within **PEI Report Volume 2 Part B Section 1 Chapter 1 Overview of the Section and Description of the Project**, initial measures within Section 1 include:
- i. Replacement and/or reinstatement of woodland, ditch and hedgerow habitats; and
 - ii. Skylark mitigation areas.
- 4.6.17 Any mitigation or compensation measures to be included within the Project will be informed by further design development and consultation with the relevant stakeholders, including engagement with the statutory consultees.
- 4.6.18 Finalised additional mitigation or compensation measures will be detailed within the ES.

4.7 Preliminary Assessment of Effects

- 4.7.1 The following section presents the findings of the preliminary assessment of effects upon the receptors, identified within the Study Area, as a result of construction, operational and/or maintenance activities within Section 1.
- 4.7.2 As discussed in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**, only features of local importance and above, where there is the potential for the project to impact them directly or indirectly, have been taken forward to impact assessment. In addition, consideration is given to INNS where in the absence of mitigation there is potential for a legal offence.
- 4.7.3 The conclusions of the preliminary assessment are based upon surveys completed to date and professional judgement of the ecological receptors likely to be present within the Study Area and influenced by the construction, maintenance and/or operation of the Project. The precautionary principle has been applied, such that where information about a particular receptor is incomplete or uncertain, then significant effects have not been excluded. Therefore, at this stage, most of the ecological receptors identified in the baseline of this PEI Report have been retained in the assessment. The significance of effects reported may be greater than that reported at the ES stage, once all survey data has been collated, the status of these receptors confirmed and all mitigation measures identified. An updated assessment will be included within the ES submitted with the DCO application.
- 4.7.4 The preliminary assessment of effects reported below takes into account the Design and Control mitigation measures previously described. This assessment does not take into account the Additional Mitigation Measures at this stage as these are subject to further design refinement and will be informed by stakeholder engagement and the baseline survey findings.

- 4.7.5 For a summary of the likely significant effects please refer to **PEI Report Volume 2 Part B Section 1 Chapter 13 Summary**. A supplementary summary of all non-significant effects is also included within this Section in **Table 4.9**, based upon the assessment scope detailed in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
- 4.7.6 It is noted that this is an ongoing assessment and is subject to change due to the ongoing design development of the Project, surveys, statutory consultation feedback and further stakeholder engagement. A full assessment will be included within the ES submitted with the DCO application.

Likely Significant Effects

Construction

Designated Sites

- 4.7.7 The nearest international site is the Humber Estuary SPA, SAC and Ramsar site which is located 3.1 km north-east of Section 1 draft Order Limits at its closest point. Greater Wash SPA is located 18.1 km east of the Section 1 draft Order Limits at its closest point.
- 4.7.8 According to Natural England guidance (Ref 20), only those main component species of internationally designated sites which have an overlapping IRZ with the Section 1 draft Order Limits, are considered to be functionally linked. 'Functionally linked land' (FLL) is a term often used to describe areas of land or sea occurring outside a designated site which is considered to be critical to, or necessary for, the ecological or behavioural functions in a relevant season of a qualifying feature for which a Special Areas of Conservation (SAC)/Special Protection Area (SPA)/Ramsar site has been designated. Given the distances of the draft Order Limits from the identified sites, no direct habitat loss within the designated areas is considered likely. However, impacts through habitat loss, degradation and displacement may occur within FLL, as a result of construction of the Project.
- 4.7.9 The Humber Estuary SPA and Ramsar site include birds as qualifying features. Potential pathways of effect between the Project and these designated sites include habitat loss within FLL, noise and visual disturbance within FLL, changes in water quality and flow, and atmospheric pollution. The potential for Likely Significant Effects (LSE) upon these sites will be assessed within the Report to inform HRA (to be submitted with the ES), and significant effects cannot be excluded at this stage in the assessment.
- 4.7.10 The Humber Estuary SAC and Ramsar site lists river lamprey and sea lamprey as qualifying features which undertake upstream migrations to reach suitable spawning habitats. Works within or adjacent to watercourses which are hydrologically linked to the Humber Estuary could therefore impact lamprey species. The watercourses impacted within the Section 1 are limited to field drainage ditches, many of which are unlikely to support lamprey. Notwithstanding this, given that surveys of these watercourses are ongoing, at this stage of the assessment, significant effects cannot be excluded.
- 4.7.11 Qualifying bird species of the Greater Wash SPA are considered to be coastally dependent and located too far from the Section 1 draft Order Limits to give rise to any significant effect from disturbance or habitat loss to species associated with FLL.

Further assessment is however required, once surveys are completed and data assessed. Therefore, on a precautionary basis, significant effects due to potential disturbance and/or loss of functionally linked habitat cannot be excluded at this stage of the assessment. The potential for LSE upon this site will be assessed within the Report to inform HRA (to be submitted with the ES), and significant effects cannot be excluded at this stage in the assessment.

- 4.7.12 The Impact Risk Zone (IRZ) for the nationally designated Humber Estuary SSSI (designated for habitats such as estuary, intertidal mudflats, sandflats and coastal marsh, saline lagoons and sand dunes as well its populations of waterfowl, waders, grey seals, lamprey, plant and invertebrate assemblages) partially overlaps with the Section 1 draft Order Limits.
- 4.7.13 The Humber Estuary SSSI is located 3.1 km north-east of the Project. There are potential hydrological links between the Project and this SSSI, however given the separation distances and the pollution prevention measures secured by the CoCP, no effects upon habitats are predicted. The bird assemblage of the SSSI may use habitats within the wider area for foraging and there is potential for some of the land within the Section 1 draft Order Limits to be functionally linked. In addition, river lamprey and sea lamprey may be present within hydrologically linked watercourses. Potential impacts upon the bird assemblage and lamprey species will be assessed once all baseline surveys are complete and will be reported within the ES. Therefore, on a precautionary basis, significant effects cannot be excluded at this stage of the assessment.
- 4.7.14 Taking into account the pollution prevention measures contained within the Preliminary CoCP (such as GG15, GG16, GG17) impacts upon the remaining nationally designated sites within 5 km of the Section 1 draft Order Limits (or where the IRZ overlaps) (i.e. Bradley and Dixon Woods LNR and Freshney Parkway LNR) are unlikely to result in significant effects and assessment of these sites is included within **Table 4.9**.
- 4.7.15 No significant effects are anticipated for the five LWS within 2 km of the Section 1 draft Order Limits and these are included within **Table 4.9** below.

Habitats

Terrestrial Habitats

- 4.7.16 Initial habitat survey results indicate that the majority of Section 1 Survey Area is cultivated cropland with negligible biodiversity importance. Areas of this habitat would be lost during construction of the substation; access; proposed pylons; stringing areas; and to create the temporary haul roads and compound for construction.
- 4.7.17 Areas of HPI woodland, Maud Hole Covert, would be lost to facilitate construction of the overhead line. Wyber's Wood, another HPI woodland, would also be directly affected with permanent loss of part of this habitat for an access track. There is also potential for indirect effects on these receptors, for example due to release of pollutants during construction. However standard pollution control measures would be implemented as included within the draft Preliminary CoCP (e.g. GG15, GG16). Further assessment of the potential indirect impacts of changes in air quality will be undertaken to assess any potential effects on these receptors and will be reported within the ES.

- 4.7.18 Hedgerows, scrub and small woodland parcels would be crossed by the proposed overhead line. Temporary severance of hedgerows would occur during construction, where the haul road route and permanent access routes are proposed. Existing tracks and roads would be utilised where practicable, however these may require widening in certain instances resulting in localised impacts upon habitats. Wherever practicable, those habitats which would be directly impacted by the establishment of haul roads and/or stringing works would be reinstated upon completion of construction (Preliminary CoCP measure LV01).
- 4.7.19 Survey work will continue through to 2025 to characterise the terrestrial habitat types, and their constituent flora and fauna, within the Section 1 Survey Area. These surveys will confirm the condition of relevant habitats, in order to inform the design of appropriate mitigation or compensation and the assessment effects, which will be developed fully in the ES.
- 4.7.20 In the absence of supplementary survey findings and confirmed additional mitigation measures, significant effects due to impacts upon terrestrial habitats within the Section 1 Study Area cannot be excluded at this preliminary stage of assessment.

Aquatic Habitats

- 4.7.21 There are no streams, rivers or ponds present within the Section 1 draft Order Limits, noting that the nearest river is the River Freshney which lies approximately 1.0 km to the south. However, there are eight ditches within the Section 1 draft Order Limits which would be directly impacted by the proposed works, including temporary drainage outfalls.
- 4.7.22 Direct impacts upon aquatic habitats within the Section 1 Study Area would include those associated with overhead line watercourse crossings. However, these have been minimised through the setting back of pylons from the channel and marginal habitats. The stringing of the overhead line could potentially result in temporary loss or damage to watercourses and ditches within the draft Order Limits, however the stringing methodology would seek to minimise any potential impacts to watercourses during construction and any effects are likely to be temporary.
- 4.7.23 Within Section 1, the construction of the assumed five temporary access crossings and one permanent access crossing would result in direct impacts upon watercourses. The design of these elements will seek to minimise impacts through reducing the footprint of these works as far as practicable. Based upon the implementation of best practice construction methods and reinstatement of habitats impacted by temporary crossings post-construction (see Preliminary CoCP measures W01 to W11), effects are likely to be temporary.
- 4.7.24 Drainage installations for any Sustainable Drainage Systems (SuDS) features have the potential to adversely affect watercourses, both directly and indirectly, if not designed appropriately. However, the design of drainage features within Section 1 includes at least three attenuation ponds to allow settlement before discharge into any river system. Further assessment of potential indirect impacts due to construction activities, including changes in water quality, will be undertaken and reported within the ES.
- 4.7.25 As noted above, survey work will continue through to 2025 to characterise the aquatic habitat types, and their constituent flora and fauna, within the Section 1 Survey Area. Survey findings will also confirm the condition of relevant habitats and

inform the design of appropriate mitigation or compensation measures and the assessment of impacts and effects, which will be reported in the ES.

- 4.7.26 In the absence of supplementary survey findings and confirmed additional mitigation measures, significant effects on aquatic habitats within the Section 1 Study Area cannot be excluded at this stage of the assessment.

Protected or Notable Species

Terrestrial Invertebrates

- 4.7.27 Survey results to date indicate that the majority habitats (i.e. cropland) within the Section 1 Survey Area have limited value to terrestrial invertebrates. However, woodland, hedgerow and scrub habitats also recorded within the Section 1 Survey Area provide potential habitat for terrestrial invertebrates.
- 4.7.28 Potential impacts upon terrestrial invertebrates include habitat loss, habitat fragmentation and death/injury through the loss of woodland habitats and severance of hedgerows.
- 4.7.29 Relevant measures within the Preliminary CoCP which would reduce potential impacts include implementation of Management Plans (GG06), reinstatement of hedgerows (GG08), establishment of protective areas (GG09) and maintenance of hedgerow connectivity (B08).
- 4.7.30 A scoping survey will be undertaken in 2025 to assess those habitats recorded in 2024/25 as potentially suitable for terrestrial invertebrates, to assess their potential importance. Following on from this, targeted surveys would be undertaken if required, to inform the assessment of impacts and effects and design of appropriate mitigation, which will be reported within the ES.
- 4.7.31 On a precautionary basis, significant effects on terrestrial invertebrates cannot be excluded at this stage of the assessment.

Great Crested Newt

- 4.7.32 Whilst desk study records indicate a population of great crested newts is present at ponds south at Aylesby, no evidence of great crested newt has been found within the Section 1 Survey Area to date. Results for ponds within the Survey Area located close to the northern extent of the Section 1 draft Order Limits indicate that great crested newt is likely absent from these ponds.
- 4.7.33 No ponds would be lost during construction, however potentially suitable terrestrial habitat for great crested newts up to 500 m away from ponds including hedgerows and grassland would be directly impacted through temporary habitat loss/severance during construction, including loss of habitat loss where the substation accesses are located. Additionally, there is a risk of machinery and traffic killing or injuring great crested newts if they are present within the draft Order Limits during construction activities.
- 4.7.34 Where impacts upon great crested newt cannot be avoided, a licence from Natural England would be required to permit derogation (as outlined in Preliminary CoCP management measure B01). Indicative locations for mitigation are provided on **PEI Report Volume 2 Part B Section 2 Figure 1.3 Permanent and Operation Features**.

- 4.7.35 Additional relevant measures within the Preliminary CoCP which would reduce potential impacts include pollution control measures (GG15, GG16, GG17 and W01 to W11), implementation of Management Plans (GG06), reinstatement of hedgerows (GG08), establishment of protective areas (GG09), maintenance of hedgerow connectivity (B08) and directional and minimised lighting (LV04).
- 4.7.36 Survey work will continue in 2025 to inform the assessment of impacts and effects and the details of appropriate mitigation to be presented in the ES. Further survey findings will also be used to confirm any licencing and enhancement requirements.
- 4.7.37 On a precautionary basis, significant effects on great crested newt cannot be excluded at this stage of the assessment.

Reptiles

- 4.7.38 The majority of habitats within the Section 1 draft Order Limits that are suitable for reptiles are limited in extent, being confined to field boundaries and the margins of ditches. However, hedgerow and woodland habitats in this area have potential for common reptiles.
- 4.7.39 There are potential impacts through habitat loss and risk of killing and/or injury of reptiles during construction.
- 4.7.40 Where impacts upon reptiles cannot be avoided, measures would be implemented to prevent a breach of legislation. These measures are outlined in the Preliminary CoCP and include two-stage habitat manipulation of suitable habitats, with an ECoW appointed to oversee these works (B05). Any species translocation (if required) would be undertaken in accordance with a strict method statement (B09).
- 4.7.41 Additional relevant measures within the Preliminary CoCP which would reduce potential impacts include implementation of Management Plans (GG06), reinstatement of hedgerows (GG08), establishment of protective areas (GG09) and maintenance of hedgerow connectivity (B08).
- 4.7.42 Seasonal survey work will continue in 2025 to confirm the status of reptiles. The survey results will be used to inform the assessment of impacts and effects and the details of any appropriate mitigation and enhancement to be presented in the ES.
- 4.7.43 On a precautionary basis, significant effects on reptiles cannot be excluded at this stage of the assessment.

Birds: Breeding and Wintering

- 4.7.44 Surveys for wintering birds carried out between November 2022 and March 2023 indicate that apart from black-headed gull, there is little use by wintering birds of land within the Section 1 Survey Area (see **Table 4.4**). However, the survey extent is limited in this area and conclusions are therefore limited.
- 4.7.45 In addition, the surveys for breeding birds, carried out between March 2024 and July 2024, indicated an expected assemblage of farmland specialists and generalists across the Section 1 Survey Area (see **Table 4.6**).
- 4.7.46 Although measure B02 in the Preliminary CoCP would ensure the impacts of construction works upon active nests would be mitigated, the construction works within Section 1 are likely to result in a loss of breeding and wintering habitat and disturbance to birds through noise, construction traffic movements and increased human presence on-site.

- 4.7.47 Additional relevant measures within the Preliminary CoCP which would reduce potential impacts include the implementation of Management Plans (GG06), reinstatement of hedgerows (GG08), establishment of protective areas (GG09), maintenance of hedgerow connectivity (B08) and lighting restrictions (LV04).
- 4.7.48 It should be noted that bird surveys are incomplete, and survey work has continued over the winter of 2024/2025 and will be undertaken in spring/summer of 2025 to confirm the status of wintering and breeding birds respectively, and to inform the assessment of impacts and effects and the design of appropriate mitigation and enhancement, which will be further developed and presented within the ES.
- 4.7.49 On a precautionary basis, significant effects on wintering and breeding birds e.g. through habitat loss and disturbance, cannot be excluded at this stage of the assessment.
- Badger
- 4.7.50 One potential main badger sett was recorded within the Section 1 Survey Area and there is therefore potential for direct impacts through the loss of this sett. Specifically, hedgerow and areas of woodland habitats would require clearance during construction to establish the on-site haul roads construction compounds and within the footprint of proposed pylons and substation.
- 4.7.51 There is also potential for general disturbance impacts during construction from noise and vibration, temporary site lighting, human presence and potentially an increased risk of vehicle-animal collisions. In addition, there are legal restrictions regarding certain construction works (e.g. piling) which could take place close to active setts.
- 4.7.52 As outlined in Preliminary CoCP measure B13, in the first instance, reasonable avoidance measures would be incorporated to avoid impacting known badger setts. If however direct impacts on badger setts cannot be avoided, a licence from Natural England would be sought to permit derogation (as outlined in Preliminary CoCP measure B01). Mitigation measures may include the provision of artificial setts within the Order Limits where main setts would be closed.
- 4.7.53 Additional relevant measures within the Preliminary CoCP which would reduce potential impacts include the implementation of Management Plans (GG06), reinstatement of hedgerows (GG08), establishment of protective areas (GG09), maintenance of hedgerow connectivity (B08), lighting restrictions (LV04) and closing of excavations overnight to avoid entrapment (B03).
- 4.7.54 Survey work continued during winter 2024/2025 and spring 2025 to confirm the status of badger and will be used to inform the assessment of impacts and effects, and any appropriate mitigation and enhancement measures, which will be developed fully and presented within the ES.
- 4.7.55 On a precautionary basis, significant effects on badger cannot be excluded at this stage of the assessment.
- Bats
- 4.7.56 Surveys in 2024 confirmed that bats were foraging and commuting within the Section 1 Survey Area and indicated that bats were associated with hedgerows and woodland edges within the substation study area.

- 4.7.57 There is potential for both permanent and temporary loss of roosting, foraging and commuting habitat for bats and severance of commuting routes, and would likely be impacts from disturbance such as noise, vibration and lighting during construction. Specifically, hedgerow and areas of woodland habitats would require clearance during construction during the establishment of on-site accesses and within the footprint of the proposed pylons and substation.
- 4.7.58 As outlined in Preliminary CoCP measure B13, in the first instance, reasonable avoidance measures would be incorporated to avoid impacting known bat roosts. Where impacts upon bat roosts cannot be avoided, a licence from Natural England would be required to permit derogation (as outlined in Preliminary CoCP measure B01).
- 4.7.59 Additional relevant measures within the Preliminary CoCP which would reduce potential impacts include the implementation of Management Plans (GG06), reinstatement of hedgerows (GG08), establishment of protective areas (GG09), maintenance of hedgerow connectivity (B08) and lighting restrictions to (LV04).
- 4.7.60 The survey work in 2024 and 2025 will be used to confirm presence of foraging and commuting bats and bat roosts, particularly the presence of any bat roosts within or close to the Section 1 draft Order Limits. The outputs of these surveys will be used to confirm the status of bats and the assessment reported within the ES.
- 4.7.61 On a precautionary basis, significant effects on bats cannot be excluded at this stage of the assessment.

Otter

- 4.7.62 No field signs of otter have been identified within the Section 1 Survey Area during the initial surveys carried out in 2024 and no breeding or resting sites were recorded.
- 4.7.63 Where suitable habitat for otter is present, there is the potential for disturbance of otters through noise, vibration and increased human presence and site and lighting. Habitat degradation could potentially occur through pollution of habitats. There would also be a risk of machinery and traffic killing or injuring otters if they are present during construction activities.
- 4.7.64 As outlined by Preliminary CoCP measure B13, in the first instance, works would be located to avoid the loss of any otter holts or resting places. If it is not possible to avoid impacts on otter holts, a licence from Natural England would be sought to permit derogation from legislation (as outlined in Preliminary CoCP measure B01).
- 4.7.65 Additional relevant measures within the Preliminary CoCP which would reduce potential impacts include pollution control measures (GG15, GG16, GG17 and W01 to W11), implementation of Management Plans (GG06), establishment of protective areas (GG09), lighting restrictions (LV04) and closing of excavations overnight to avoid entrapment (B03). Preliminary CoCP measure B12 requires a method statement to be in place to ensure works within watercourse crossings include suitable measures to allow the passage of otters.
- 4.7.66 Survey work will continue in 2025 to confirm the status of otter and will be used to inform the assessment of impacts and effects, and the details of any appropriate mitigation and enhancement, which will be developed fully and presented within the ES.

- 4.7.67 On a precautionary basis, significant effects on otter cannot be excluded at this stage of the assessment.

Water Vole

- 4.7.68 Initial survey work indicates that water vole are absent from watercourses surveyed within the Section 1 Survey Area.
- 4.7.69 Where suitable habitat for water vole exists, there is a risk of construction works impacting watercourses and associated riparian habitat causing incidental mortality of protected species. Furthermore, there may be suitable habitats within and/or adjacent to the draft Order Limits that could be impacted by proposed works (e.g. through habitat loss, disturbance and fragmentation).
- 4.7.70 If impacts to water vole burrows cannot be avoided, a licence from Natural England would be sought to permit derogation (as outlined in Preliminary CoCP measure B01).
- 4.7.71 Additional relevant measures within the Preliminary CoCP which would reduce potential impacts include pollution control measures (GG15, GG16, GG17 and W01 to W11), implementation of Management Plans (GG06), establishment of protective areas (GG09) and lighting restrictions (LV04). In addition, as outlined in B12 a method statement would be required to ensure works within watercourse crossings include suitable measures to allow the passage of water vole.
- 4.7.72 Survey work will continue in 2025 to confirm the status of water vole and will be used to inform the assessment of impacts and effects, and details any appropriate mitigation and enhancement, which will be developed fully and presented within the ES.
- 4.7.73 On a precautionary basis, significant effects on water vole cannot be excluded at this stage of the assessment.

Operation and maintenance

Designated Sites

- 4.7.74 The Humber Estuary SPA, Ramsar site and SSSI are designated (or partially designated) for their bird interest. There is potential for collision mortality to occur during the operational phase of the Project. This will be assessed once baseline surveys are complete and the results presented within the ES and the report to inform HRA.
- 4.7.75 Therefore, on a precautionary basis, significant effects upon these designated sites, associated with collision risk and subsequent killing/injury of bird species which are qualifying features, cannot be excluded at this stage.
- 4.7.76 European designated sites within the Zol of the Project are sensitive to changes in flow regimes, including the volume of water supplied, water depth and water flow rates. In SACs, the potential impact of altered flow regimes can directly affect the qualifying habitats, and hydrological changes may impact SAC/SPA species indirectly. Given that watercourses within Section 1 are limited to a network of smaller ditches/drains, significant effects are considered unlikely. However the potential for LSE upon these sites will be assessed within the Report to inform HRA, and significant effects cannot be excluded at this stage in the assessment.

- 4.7.77 As species of Greater Wash SPA are considered to be coastally dependent and located too far from the Section 1 draft Order Limits to give rise to any significant effect from collision risk, significant effects are considered unlikely. However the potential for LSE upon these sites will be assessed within the Report to inform HRA, and significant effects cannot be excluded at this stage in the assessment.

Protected and Notable Species

Birds: Breeding and Wintering

- 4.7.78 As noted above in relation to designated sites, the collision risk with the overhead line within the Section 1 area will need to be fully assessed once further winter and breeding bird data have been collected.
- 4.7.79 Therefore, on a precautionary basis, significant effects upon breeding and wintering birds associated with collision risk cannot be excluded at this stage of the assessment.

Likely Non-Significant Effects

- 4.7.80 For completeness, **Table 4.9** summarises the findings of the preliminary assessment with respect to those impacts that are not predicted to result in significant Ecology and Biodiversity effects.

Table 4.9 Preliminary summary of non-significant Ecology and Biodiversity effects – Section 1

Receptor	Impact	Receptor Importance	Duration	Embedded Mitigation/ Rationale	Likely Significance of Effect
Construction					
Bradley and Dixon Woods LNR, Freshney Parkway LNR	Habitat loss	National	Permanent or Temporary	Due to the distance of these sites from the Section 1 draft Order Limits there would be no habitat loss within these nationally designated sites.	Not Significant
	Habitat degradation as a result of contamination during construction, changes in air quality, dust and/or changes in water quality	National	Temporary	The likelihood of contamination is considered to be minimal assuming appropriate management (such as Preliminary CoCP pollution prevention measures GG15, GG16, GG17).	Not Significant
Freshney Parkway LWS, Freshney Parkway North LWS, Laceby Beck North LWS, Laceby Carr Plantation and Pond LWS, Sweedale LWS	No impact	County	Permanent or Temporary	Due to the distances between these receptors and the Section 1 draft Order Limits, and also the lack of ecological or hydrological connectivity, there is not considered to be a pathway to effects. Therefore no mitigation would be required.	Not Significant
Fish	Habitat loss, incidental harm or mortality, disturbance	TBC following baseline surveys	Permanent or Temporary	Due to lack of Main Rivers and generally dry and uniform habitats within the Section 1 Study Area the species present are unlikely to be notable. The following control measures detailed within the	Not Significant

				Preliminary CoCP would prevent harm to fish during construction: GG06, GG09, B10, B12 and LV04.	
	Habitat degradation as a result of contamination during construction and changes in water quality	TBC following baseline surveys	Temporary	The likelihood of contamination is considered to be minimal assuming appropriate management (such as Preliminary CoCP pollution prevention measures GG15, GG16, GG17).	Not Significant
Aquatic macroinvertebrates	Habitat loss, incidental harm or mortality, disturbance	TBC following baseline surveys		Due to lack of Main Rivers and generally dry and uniform habitats within the Section 1 Study Area the population of species present is unlikely to be significant. The following control measures detailed within the Preliminary CoCP would prevent harm to aquatic macroinvertebrates during construction: GG06, GG09 and LV04.	Not Significant
	Habitat degradation as a result of contamination during construction and changes in water quality	TBC following baseline surveys		The likelihood of contamination is considered to be minimal assuming appropriate management (such as Preliminary CoCP pollution prevention measures GG15, GG16, GG17).	Not Significant
Aquatic macrophytes	Habitat loss, incidental mortality	TBC following baseline surveys		Due to lack of Main Rivers and generally dry and uniform habitats within the Section 1 Study Area the population of species present is unlikely to be significant. The following control measures detailed within the Preliminary	Not Significant

				CoCP would prevent harm to aquatic macrophytes during construction: GG06 and GG09.	
	Habitat degradation as a result of contamination during construction, changes in water quality	TBC following baseline surveys		The likelihood of contamination is considered to be minimal assuming appropriate management (such as Preliminary CoCP pollution prevention measures GG15, GG16, GG17).	Not Significant
Hedgehog, brown hare, common toad	Habitat loss, incidental harm or mortality	Local	Temporary or Permanent	The following control measures detailed within the Preliminary CoCP would prevent harm to hedgehog and brown hare during construction: GG06, B01, B03. Habitats would be reinstated post construction (GG08).	Not Significant
Invasive Non-Native Species (INNS)	Spread of INNS during construction activities	N/A	Permanent	Preliminary CoCP measure B04 would ensure that the construction works do not result in the spreading or mishandling of any invasive non-native species.	Not Significant
Operation/Maintenance					
Bradley and Dixon Woods LNR, Freshney Parkway LNR	No impact	National	Temporary	Due to the distance between these receptors and the Section 1 draft Order Limits and also the lack of ecological or hydrological connectivity, there is not considered to be a pathways to effect. Therefore no mitigation is required.	Not Significant
Freshney Parkway LWS, Freshney	No impact	County	Temporary or Permanent	Due to the distance between these receptors and the Section 1 draft	Not Significant

Parkway North LWS, Laceby Beck North LWS, Laceby Carr Plantation and Pond LWS, Sweedale LWS				Order Limits and also the lack of ecological or hydrological connectivity, there is not considered to be a pathways to effect. Therefore no mitigation is required.	
Habitats: Broadleaved Woodland HPI	Contamination during maintenance works	County	Temporary	The likelihood of contamination is considered to be minimal assuming appropriate management. During the operation and maintenance of the Project, National Grid operatives would be required to adhere with National Grid best practice requirements during the completion of routine maintenance activities, such as the management of vegetation within and adjacent to assets (e.g. substations, pylons, access routes).	Not Significant
Habitats: arable field margins, hedgerows mixed scrub, ditches/drains	Contamination during maintenance works	Local	Temporary	The likelihood of contamination is considered to be minimal assuming appropriate management. During the operation and maintenance of the Project, National Grid operatives would be required to adhere with National Grid best practice requirements during the completion of routine maintenance activities, such as the management of vegetation within and adjacent to assets (e.g. substations, pylons, access routes).	Not Significant

Terrestrial Invertebrates	Habitat loss or fragmentation	TBC following surveys (if necessary)	Permanent	National Grid or their appointed Contractor would be required to appoint an ecologist during any maintenance or refurbishment works to ensure that ecological constraints present at the time would be identified and mitigated accordingly.	Not Significant
	Contamination of habitats during maintenance works	TBC following surveys (if necessary)	Temporary	The likelihood of contamination is considered to be minimal assuming appropriate management. During the operation and maintenance of the Project, National Grid operatives would be required to adhere with National Grid best practice requirements during the completion of routine maintenance activities, such as the management of vegetation within and adjacent to assets (e.g. substations, pylons, access routes).	Not Significant
Great crested newt	Habitat loss, killing or injury	County	Permanent	National Grid or their appointed Contractor would be required to appoint an ecologist during any maintenance or refurbishment works to ensure that ecological constraints present at the time would be identified and mitigated accordingly.	Not Significant
	Contamination of habitats during maintenance works	County	Temporary	The likelihood of contamination is considered to be minimal assuming appropriate management. During the operation	Not Significant

				and maintenance of the Project, National Grid operatives would be required to adhere with National Grid best practice requirements during the completion of routine maintenance activities, such as the management of vegetation within and adjacent to assets (e.g. substations, pylons, access routes).	
Reptiles	Killing or injury during maintenance	Local	Permanent	National Grid or their appointed Contractor would be required to appoint an ecologist during any maintenance or refurbishment works to ensure that ecological constraints present at the time would be identified and mitigated accordingly.	Not Significant
Wintering birds	Disturbance (e.g. noise, vibration) during maintenance activities	TBC following baseline surveys – species recorded to date - Local	Temporary	The nature of maintenance works are anticipated to be small in scale and of an intermittent nature and therefore broadly comparable to current agricultural operations or less.	Not Significant
Breeding birds	Loss of nests	TBC following baseline surveys – species recorded to date - Local	Permanent	National Grid or their appointed Contractor would be required to appoint an ecologist during any maintenance or refurbishment works to ensure that ecological constraints present at the time would be identified and mitigated accordingly.	Not Significant

	Disturbance (e.g. noise, vibration) during maintenance activities	TBC following baseline surveys – species recorded to date - Local	Temporary	The nature of maintenance works are anticipated to be small in scale and of an intermittent nature and therefore broadly comparable to current agricultural operations or less.	Not Significant
Badger	Loss/damage of setts, killing or injury	County	Permanent	National Grid or their appointed Contractor would be required to appoint an ecologist during any maintenance or refurbishment works to ensure that ecological constraints present at the time would be identified and mitigated accordingly.	Not Significant
	Disturbance (e.g. noise, vibration) during maintenance works	County	Temporary	The nature of maintenance works are anticipated to be small in scale and of an intermittent nature and therefore broadly comparable to current agricultural operations or less.	Not Significant
Bats	Habitat loss (including loss of roosts if tree felling is required)	TBC following baseline surveys	Permanent	National Grid or their appointed Contractor would be required to appoint an ecologist during any maintenance or refurbishment works to ensure that ecological constraints present at the time would be identified and mitigated accordingly.	Not Significant
	Disturbance of roosts (e.g. noise, vibration) during maintenance works	TBC following baseline surveys	Temporary	The nature of maintenance works are anticipated to be small in scale and of an intermittent nature and therefore broadly comparable to	Not Significant

				current agricultural operations or less.	
Otter	Loss/damage of holts, killing or injury	County	Permanent	National Grid or their appointed Contractor would be required to appoint an ecologist during any maintenance or refurbishment works to ensure that ecological constraints present at the time would be identified and mitigated accordingly.	Not Significant
	Disturbance (e.g. noise, vibration) during maintenance works	County	Temporary	The nature of maintenance works are anticipated to be small in scale and of an intermittent nature and therefore broadly comparable to current agricultural operations or less.	Not Significant
	Contamination of habitats during maintenance works	County	Temporary	The likelihood of contamination is considered to be minimal assuming appropriate management. During the operation and maintenance of the Project, National Grid operatives would be required to adhere with National Grid best practice requirements during the completion of routine maintenance activities, such as the management of vegetation within and adjacent to assets (e.g. substations, pylons, access routes).	Not Significant
Fish	Disturbance (e.g. noise, vibration) during maintenance works	TBC following baseline surveys	Temporary	The nature of maintenance works are anticipated to be small in scale and of an intermittent nature and	Not Significant

				therefore broadly comparable to current agricultural operations or less.	
	Contamination of habitats during maintenance works	TBC following baseline surveys	Temporary	The likelihood of contamination is considered to be minimal assuming appropriate management. During the operation and maintenance of the Project, National Grid operatives would be required to adhere with National Grid best practice requirements during the completion of routine maintenance activities, such as the management of vegetation within and adjacent to assets (e.g. substations, pylons, access routes).	Not Significant
Aquatic macroinvertebrates	Disturbance (e.g. noise, vibration) during maintenance works	TBC following baseline surveys	Temporary	The nature of maintenance works are anticipated to be small in scale and of an intermittent nature and therefore broadly comparable to current agricultural operations or less.	Not Significant
	Contamination of habitats during maintenance works	TBC following baseline surveys	Temporary	The likelihood of contamination is considered to be minimal assuming appropriate management. During the operation and maintenance of the Project, National Grid operatives would be required to adhere with National Grid best practice requirements during the completion of routine maintenance activities, such as the management of vegetation	Not Significant

				within and adjacent to assets (e.g. substations, pylons, access routes).	
Aquatic macrophytes	Contamination of habitats during maintenance works	TBC following baseline surveys	Temporary	The likelihood of contamination is considered to be minimal assuming appropriate management. During the operation and maintenance of the Project, National Grid operatives would be required to adhere with National Grid best practice requirements during the completion of routine maintenance activities, such as the management of vegetation within and adjacent to assets (e.g. substations, pylons, access routes).	Not Significant
Water vole	Habitat Loss, <u>killing or injury</u>	County	Permanent <u>or</u> <u>temporary</u>	National Grid or their appointed Contractor would be required to appoint an ecologist during any maintenance or refurbishment works to ensure that ecological constraints present at the time would be identified and potential impacts mitigated accordingly.	Not Significant
	Disturbance (e.g. noise, vibration) during maintenance works	County	Temporary	The nature of maintenance works are anticipated to be small in scale and of an intermittent nature and therefore broadly comparable to current agricultural operations or less.	Not Significant

	Contamination of habitats during maintenance works	County	Temporary	The likelihood of contamination is considered to be minimal assuming appropriate management. During the operation and maintenance of the Project, National Grid operatives would be required to adhere with National Grid best practice requirements during the completion of routine maintenance activities, such as the management of vegetation within and adjacent to assets (e.g. substations, pylons, access routes).	Not Significant
Brown hare, hedgehog, common toad	Disturbance (e.g. noise, vibration) during maintenance works	Local	Temporary	The nature of maintenance works are anticipated to be small in scale and of an intermittent nature and therefore broadly comparable to current agricultural operations or less.	Not Significant
Invasive Non-Native Species (INNS)	Spread of INNS during maintenance activities	N/A	Permanent	National Grid would identify and notify the presence of invasive species within the operational areas of the site. National Grid or their appointed Contractor would be required to appoint an ecologist during any maintenance or refurbishment works to ensure that ecological constraints present at the time would be identified and mitigated accordingly.	Not Significant

4.8 Monitoring

- 4.8.1 Monitoring requirements, that may be required for the Project following the implementation of mitigation to ensure mitigation is successful and meets the requirements or permits/licences, will be presented in the ES once the on-going surveys are complete (and a detailed data set obtained), and mitigation and enhancement measures have been developed.

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- Ref 12 UKHab (2018.2022). The UK Habitat Classification System [online]. Available at: <https://ukhab.org/> [Accessed 01 March 2024].
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5. Historic Environment

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5. Historic Environment

5.1 Introduction

- 5.1.1 This chapter presents the Preliminary Environmental Information (PEI) in relation to the Historic Environment assessment of the New Grimsby West Substation (Section 1) of the Grimsby to Walpole Project (the Project). Specifically, the chapter includes the following sections:
- i. An introduction to the topic (section 5.1);
 - ii. Identification of key local and regional policy relevant to the assessment (section 5.2). A full overview of the legislation and national, regional onshore and marine planning policy context that applies to the Project is presented within **PEI Report Volume 2 Part A Chapter 2 Legislative, Regulatory and Planning Policy Context** and supporting appendices;
 - iii. A summary of the assessment scoping process and the subsequent scope of the Historic Environment assessment (section 5.3). Further detail is provided within **PEI Report Volume 3 Part A Appendix 4A Planning Inspectorate Scoping Opinion Responses**.
 - iv. A high-level summary of the methodology of the historic environment assessment within Section 1 (section 5.4). A detailed description of the assessment methods and scope, applicable to the whole Project, is contained in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
 - v. A description of the environmental baseline within the Section 1 Study Areas relevant to the Historic Environment assessment (section 5.5).
 - vi. A description of mitigation measures included for the purposes of the Historic Environment assessment reported within the PEI Report (section 5.6). Further information regarding design development can be found in **PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered** and the **Grimsby to Walpole Design Development Report**;
 - vii. The likely significant and non-significant Historic Environment effects arising during construction and operation of the Project within Section 1, based upon the assessment completed to date (section 5.7); and
 - viii. An outline of the proposed monitoring requirements in relation to the Historic Environment (section 5.8).
- 5.1.2 Further supporting information is set out in **Table 5.1** below, including figures and technical appendices.

Table 5.1 Supporting documentation

Supporting Information	Description
Topic Specific Supporting Documentation	
PEI Report Volume 2 Part B Section 1 Figures	Figure 5.1 Designated Heritage Assets Figure 5.2 Non-designated Heritage Assets
PEI Report Volume 3 Part B Section 1 Appendix 5A Known Heritage Assets	A list of all identified heritage assets within the assessment Study Areas. This will be updated and amended as required to inform the Environmental Statement (ES).
PEI Report Volume 3 Part B Section 1 Appendix 5B Preliminary Summary of Likely Non-Significant effects	A table summarising the preliminary assessment of likely non-significant effects on heritage assets within the assessment Study Areas. The assessment of likely non-significant effects will be updated and amended as required for the ES.
PEI Report Volume 3 Part B Section 1 Appendix 5C Detailed Gradiometer Survey Report	A technical report detailing the results of geophysical survey (detailed magnetometry) completed for the proposed Grimsby West Substation site.
Project Supporting Documentation	
PEI Report Volume 2 Part B Section 1 Chapter 1 Overview of the Section and Description of the Project	A summary of the works within Section 1, including permanent infrastructure, temporary construction works, and operational activities.
PEI Report Volume 3 Part A Appendix 2A Key Legislation	A list of identified environmental legislation considered relevant to the Project, which will be updated and amended as required to inform the ES.
PEI Report Volume 3 Part A Appendix 2B National and Regional Planning Policy	A list of national and regional policies generally applicable to the assessment principles which underpin the PEI Report and ES.
PEI Report Volume 3 Part A Appendix 2Ci Local Policy: Section Specific	An outline of the potentially relevant local planning policy allocations affecting each of the specific sections of the Project.
PEI Report Volume 3 Part A Appendix 2Cii Local Policy: Route-wide	Details of planning policies applicable route-wide within the relevant Local Authority areas.
PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered	Provides a summary of the main alternatives considered in relation to the Project during the design development process, including the main reasons for selecting the chosen option.
PEI Report Volume 2 Part A Chapter 4 Approach to Preliminary Environmental Information	Sets out the Environmental Impact Assessment (EIA) approach and general methodology that has been used in developing the PEI Report for the Project.

PEI Report Volume 2 Part A Chapter 5 Project Description	An overarching description of the Project and its key components, including available construction information.
PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice	Sets out control and management measures that will be undertaken during construction of the Project if granted consent. The final Code of Construction Practice (CoCP) will be submitted in support of the Development Consent Order (DCO) application.

- 5.1.3 There are also interrelationships between the potential effects on the Historic Environment and other environmental topics. Therefore, please also refer to the following chapters within **PEI Report Volume 2 Part B** and **Part C**:
- i. **PEI Report Volume 2 Part B Section 1 Chapter 2 Landscape** to assist in the identification and assessment of the impact of the Project within the historic landscape and potential impacts to individual historic landscape features and assets such as Registered Parks and Gardens;
 - ii. **PEI Report Volume 2 Part B Section 1 Chapter 3 Visual** to inform the understanding of the extent to which the Project is visible in the landscape which may result in visual changes to the settings of heritage assets and their values;
 - iii. **PEI Report Volume 2 Part B Section 1 Chapter 10 Noise and Vibration** to inform the understanding of the extent to which noise and vibration impacts arising from the Project may extend, which could result in changes to the settings of heritage assets and their values.
 - iv. **PEI Report Volume 2 Part B Section 1 Chapter 13 Summary** which provides a concise, consolidated summary of the likely significant effects reported for all topics, based upon the preliminary assessment; and
 - v. **PEI Report Volume 2 Part C Route-wide Chapter 10 Cumulative Effects** presents a preliminary assessment of cumulative effects upon common receptors across environmental topics identified within PEI Report Volume 2 Part B (intra-project) and identifies a shortlist of other Committed Developments with which there may be potential for cumulative effects and the relevant environmental topics for such effects (inter-project). The full cumulative effects assessment will be reported within the ES.

5.2 Legislation and Policy Framework

Legislation and National Policy

- 5.2.1 Legislation and national policy relevant to the Project and this chapter is described in **PEI Report Volume 2 Part A Chapter 2 Legislative, Regulatory and Planning Policy Context** and supporting appendices, detailed in **Table 5.1**.

Regional and Local Policy

- 5.2.2 Regional and local plans or policies relevant to this assessment are summarised as follows:
- i. North East Lincolnshire Local Plan 2013 to 2032 (Adopted in 2018) (Ref 1):
 - Policy 39: Conserving and enhancing the historic environment - Proposals for development will be permitted where they would sustain the cultural distinctiveness and significance of North East Lincolnshire's historic urban, rural and coastal environment by protecting, preserving and, where appropriate, enhancing the character, appearance, significance and historic value of designated and non-designated heritage assets and their settings.

5.3 Scope of Assessment

- 5.3.1 The scope of the assessment has been informed by the Scoping Opinion (Ref 2) provided by the Planning Inspectorate in September 2024 on behalf of the Secretary of State, following the submission of the EIA Scoping Report (Ref 3). The scope has also been informed through consultation and engagement with relevant consultees. A summary of the Scoping Opinion together with a response against each point of relevance to the Historic Environment chapter is provided in **PEI Report Volume 3 Part A Appendix 4A Planning Inspectorate Scoping Opinion Responses**. A summary of the stakeholder engagement undertaken to date is provided in **PEI Report Volume 3 Part A Appendix 4D Summary of Stakeholder Engagement**.
- 5.3.2 Non statutory consultation feedback is summarised within the **Grimsby to Walpole Stage 1 Consultation Feedback Report**.
- 5.3.3 The scope of the construction assessment covers the following heritage assets:
- i. Designated heritage assets (scheduled monuments, listed buildings, conservation areas and registered parks and gardens, noting that no World Heritage Sites or registered battlefields are located within the Section 1 Study Areas); and
 - ii. Non-designated heritage assets (e.g. buried archaeological remains, earthwork remains, non-designated historic buildings and structures, non-designated historic parks and gardens, tracks/routeways and artefact scatters).
- 5.3.4 The scope of the operation assessment covers the following heritage assets:
- i. Designated heritage assets (scheduled monuments, listed buildings, conservation areas and registered parks and gardens, noting that no World Heritage Sites or registered battlefields are located within the Section 1 Study Area); and
 - ii. Non-designated heritage assets (e.g. earthwork remains, non-designated historic buildings and structures, non-designated historic parks and gardens and tracks/routeways).

5.4 Assessment Methodology

- 5.4.1 The assessment scope, methodology, relevant guidance, key assumptions and limitations for the Historic Environment assessment are set out in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**. It includes a description of how heritage value, magnitude of impact and significance of effects are all defined and assigned to the assessment. A summary of the key components are outlined below.
- 5.4.2 Designated and non-designated heritage assets identified from the baseline data as having the potential to be impacted by the Project have been selected for inclusion in the preliminary assessment. The preliminary assessment follows four key stages:
- i. The assessment of an asset's value (heritage significance) using the criteria set out in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope** and taking into account the asset's designated status, heritage interest (e.g. archaeological, architectural, artistic) as defined by paragraph 5.9.3 of EN-1 (Ref 5) with reference to the National Planning Policy Framework (NPPF) Annex 2 Glossary (Ref 4), consultation, regional variation and individual qualities.
 - ii. Identification of the magnitude of impacts arising from the construction of the new Grimsby West Substation and operation of the Project. Impacts can affect the physical fabric of a heritage asset or affect its setting and can be temporary or permanent. The degree of impact is expressed in terms of a four-point scale set out in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope** and takes into account any Project design mitigation (embedded mitigation).
 - iii. The classification of the significance of the effects arising from the Project on each heritage asset. The significance of effect is determined using the matrix provided in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**. Effects can be neutral, adverse, or beneficial.
 - iv. Finally, the application of additional mitigation measures identified at this preliminary stage, to reduce likely significant adverse effects on heritage assets is used to determine the residual effects arising from the Project.
- 5.4.3 The preliminary assessment reports on the significance of effect in accordance with EIA methodology. Major and moderate effects are considered to be significant, whilst minor and negligible effects are considered to be not significant. Professional judgement will be applied in reaching conclusions as to the significance of effects.

Assessment Assumptions and Limitations

- 5.4.4 All general assumptions and limitations for the topic are listed within **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
- 5.4.5 The decommissioning works at the existing Grimsby West Substation are yet to be defined, therefore a limitation of this preliminary assessment of effects upon the Historic Environment is that it does not assess these works. The decommissioning works will be assessed as part of the ES.

- 5.4.6 The key parameters and assumptions which inform the assessment will be reviewed based on the design presented in the DCO application and, where required, updated, or refined, for the ES. The ES will present the final key limitations and assumptions used within that assessment, particularly drawing attention to any areas that may have changed from that presented in this preliminary assessment.

5.5 Baseline Conditions

Study Area

- 5.5.1 The preliminary assessment for the Historic Environment utilises the following Study Areas, comprising the area directly affected by the Project and a buffer around the draft Order Limits, as detailed further in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**:
- i. 1 km from the draft Order Limits for non-designated heritage assets;
 - ii. 3 km from the draft Order Limits for all designated heritage assets; and
 - iii. 3-5 km from the draft Order Limits for designated heritage assets of high value (World Heritage Sites, scheduled monuments, grade I and II* listed buildings and grade I and II* registered parks and gardens) where setting is a key factor in their value and where this setting extends over a large area.
- 5.5.2 In addition, designated high value heritage assets located beyond the 5 km Study Area have been assessed where their setting has the potential to be impacted by the Project. The selection of designated heritage assets beyond the 5 km Study Area has been undertaken using professional judgement and in consideration of heritage assets highlighted by stakeholders.

Data Collection

- 5.5.3 The following data has been used to inform the baseline conditions presented in this preliminary assessment chapter:
- i. the National Heritage List for England (NHLE), held by Historic England, for designated assets;
 - ii. North East Lincolnshire Historic Environment Records (HER) for non-designated heritage assets;
 - iii. Historic Landscape Characterisation (HLC) mapping undertaken for the Lincolnshire Historic Landscape Characterisation Project;
 - iv. geological mapping held by the British Geological Survey (BGS);
 - v. The detailed magnetometer survey report for the new Grimsby West Substation site provided at **PEI Report Volume 3 Part B Section 1 Appendix 5C Detailed Gradiometer Survey Report**; and
 - vi. various online sources including:
 - Historic Ordnance Survey maps held by the National Library of Scotland;
 - Historic England's Aerial Archaeology Mapping Explorer; and

- local authority conservation area appraisal and management documents and their mapping.

Existing Baseline

- 5.5.4 The following section outlines the Historic Environment baseline. The baseline section should be read in conjunction with the following supporting Figures and Appendices as found within **PEI Report Volume 2** and **Volume 3** respectively:
- PEI Report Volume 2 Part B Section 1 Figure 5.1 Designated Heritage Assets;**
 - PEI Report Volume 2 Part B Section 1 Figure 5.2 Non-designated Heritage Assets;**
 - PEI Report Volume 3 Part B Section 1 Appendix 5A Known Heritage Assets;** and
 - PEI Report Volume 3 Part B Section 1 Appendix 5C Detailed Gradiometer Survey Report.**
- 5.5.5 Designated heritage assets are referenced with their National Heritage List for England (NHLE) reference number (e.g. NHLE 1010947).
- 5.5.6 Non-designated assets are referenced using the North East Lincolnshire HER unique identifier number (e.g. MNL240).
- 5.5.7 Non-designated heritage assets identified by the preliminary assessment that are not yet recorded on the county HERs (e.g. possible archaeological remains identified by geophysical survey), have been assigned a unique identifier using an AEC prefix (e.g. AEC100).

Geology and Topography

- 5.5.8 Section 1 is located in National Character Area 42 Lincolnshire Coast and Marshes and the North East Lincolnshire Landscape Character Assessment Landscape Type 3: Wooded Open Farmland comprising a wide, flat, coastal plain extending from the foot of the Lincolnshire Wolds eastwards to the North Sea coast. The Study Area lies on the higher ground of the Middle Marsh with a pattern of mixed arable farmland and nucleated villages (Ref 15). The topography of the Study Area is essentially flat lying between approximately 10m and 20m AOD with localised areas of higher ground around Aylesby and rising westwards towards the foot of the Lincolnshire Wolds (Ref 16).
- 5.5.9 The British Geological Survey (Ref 17) records that the bedrock of Section 1 comprises Cretaceous chalk bedrock of the Burnham Chalk Formation which formed between 93.9 and 83.6 million years ago, overlain by superficial deposits comprising Glacial Till with pockets of sand and gravel glaciofluvial deposits formed during the Devensian glaciation between 116 and 11.8 thousand years ago.

Designated Heritage Assets

- 5.5.10 There are no World Heritage Sites or Registered Battlefields within the 3 km or 5 km Section 1 Study Areas.

- 5.5.11 Located within the 3 km Section 1 Study Area, there are 32 designated heritage assets as summarised in **Table 5.2**, with none located within the draft Order Limits. The majority of the grade II listed assets are located within Great Coates Conservation Area and Wellow Conservation Area.

Table 5.2 Designated heritage assets within the 3 km Section 1 Study Area

Designation	Number of assets within Study Area	Number of assets within the draft Order Limits
Scheduled monument	3	0
Conservation area	2	0
Grade I listed building	2	0
Grade II* listed building	1	0
Grade II listed building	24	0
Grade I registered park and garden	0	0
Grade II* registered park and garden	0	0
Grade II registered park and garden	0	0

- 5.5.12 Nine additional designated heritage assets of high value have been identified located within the 3-5 km Section 1 Study Area and their designations are listed in **Table 5.3**.

Table 5.3 Designated heritage assets of high value within the 3-5 km Section 1 study area

Designation	Number of assets within Study Area
Scheduled monument	2
Grade I listed building	3
Grade II* listed building	3
Grade I registered park and garden	0
Grade II* registered park and garden	1

- 5.5.13 One additional designated heritage asset of high value is located beyond the 5 km Section 1 Study Area that has the potential to be impacted by the Project. This is listed in **Table 5.4**.

Table 5.4 Designated heritage assets of high value beyond the 5 km Section 1 Study Area

Designation	Number of assets within Study Area
Scheduled monument	0
Grade I listed building	1

Grade II* listed building	0
Grade I registered park and garden	0
Grade II* registered park and garden	0

Non-designated Heritage Assets

- 5.5.14 A total of ten non-designated heritage assets and two findspots have been identified within the 1 km Section 1 Study Area. Ten are recorded by the North East Lincolnshire HER record, plus a further two non-designated heritage assets have been identified by geophysical survey undertaken by the Project. Nine of the non-designated assets and a single findspot are located within the draft Order Limits. A summary of the types of non-designated heritage assets identified is provided in **Table 5.5** and discussed where appropriate in the archaeological and historical background below.

Table 5.5 Non-designated heritage assets within the 1 km Study Area

Asset Type	Number of assets within Study Area	Number of assets within the draft Order Limits
Cropmarks	0	1
Earthworks (including roddons and sea defences)	0	0
Saltern Site	0	0
Settlement site	0	0
Deserted medieval village	0	0
Moated Site	0	0
Ridge and Furrow	1	2
Parkland	0	0
Farmstead or building	0	0
Military Remains	0	0
Roads/trackways	0	2
Woodland/Covert	0	2
Find spot	1	1
Geophysical Anomalies – possible archaeology	0	2

- 5.5.15 It should be noted that find spots are locations where artefacts have generally been removed from their primary archaeological context and often represent residual material found in archaeological deposits of a chronologically later date. As such, their presence can be indicative of an area's past uses and can contribute to an

understanding of the area's archaeological potential. They are not heritage assets as defined by the NPPF and, as the archaeological finds have been removed from their location, they would not be impacted by the Project resulting in no effect to their value.

Archaeological and Historic Background

- 5.5.16 Evidence of Palaeolithic (500,000 to 10,000 BCE) activity is rare nationally, with in situ remains particularly rare. Evidence for human occupation during this period is most commonly evidenced by infrequent find spots of stone tools. During this period, glaciers of the Anglian Ice Age extended across Lincolnshire scouring the landscape and depositing the superficial glacial till deposits across Section 1.
- 5.5.17 There is no recorded evidence for Palaeolithic or Mesolithic (c. 10,000 to 4,000 BCE) activity within Section 1. Evidence for later prehistoric settlement is limited to two recorded find spots of worked flint; within the draft Order Limits worked flint scrapers and fragments of quern (MNL818) dating to the Neolithic period (c. 4,000 to 2,200 BCE) have been recorded west of the proposed new Grimsby West substation, while undiagnostic worked flint generally dated as 'prehistoric' (MNL4760) were recovered during an archaeological evaluation in Aylesby approximately 440 m west of the draft Order Limits.
- 5.5.18 During the Roman period (AD 43 to 410) the pattern of settlement is likely to have been focussed on areas of high ground or along tidal creeks and watercourses, with salt making an important industry. The importance of salt continued into the early medieval (c. AD 410 to 1066) period with many of the modern-day villages along the edge of the Lincolnshire marsh established during the Middle or Late Saxon period. No evidence for Roman or early medieval activity has been recorded within the 1 km Study Area.
- 5.5.19 Medieval (1066 to 1540) settlement and associated agricultural landscapes are represented within the draft Order Limits and surrounding area, with nucleated villages occupying areas of higher ground surrounded by open field systems of ridge and furrow cultivation. Medieval nucleated settlements in the area include Great Coates to the northeast of the draft Order Limits and Healing to the north. The villages are both recorded in the Domesday Book of 1086 which included reference to a church and a mill within the settlement of Great Coates and a mill in Healing. The extant church in Great Coates is the grade I listed Church of St Nicholas (NHLE 1379843) and was built in c.1200. Numerous fields are recorded as having evidence for ridge and furrow, either as extant earthworks or from aerial photographs, associated with the villages of Great Coates (MNL2232), Aylesby (MNL2225) and Healing (MNL2233). Located approximately 740 m north of the draft Order Limits, the two moated sites at Healing Hall scheduled monument (NHLE 1010947) represent a manorial complex closely associated with the village of Healing and its medieval parish church (NHLE 1103466) and forms part of remnant medieval landscape with ridge and furrow cultivation recorded in the surrounding fields (MNL2233), several of which extend within the draft Order Limits.
- 5.5.20 The development of the rural landscape during the post-medieval period (1540 – 1900) is evidenced on historic mapping by a pattern of nucleated villages, enclosed fields, isolated farmsteads and small blocks of woodland, of which Wybers Wood (MNL1562) and Maud Hole Covert (MNL1563) are recorded extending into the draft Order Limits. The post-medieval Aylesby Lane (MNL3481) is also recorded on 19th century maps extending north to south through the draft Order Limits to the west of

the proposed new Grimsby West Substation, with the post-medieval to modern Aylesby Road (MNL3482) located approximately 100 m south of the draft Order Limits. Evidence of post-medieval activity also includes extant buildings. Within the settlement of Great Coates, are several 18th and 19th century grade II listed houses and outbuildings. The closest to the draft Order Limits is The Grange (NHLE 1379355), a grade II listed building located approximately 920 m northeast of the Section 1 draft Order Limits.

- 5.5.21 Changes to the agricultural landscape following enclosure of the medieval open fields during the post-medieval period can also be evidenced by extant post-medieval farm buildings. This includes one grade II listed building, the farm range on north side of Healing Wells Farm (NHLE 1346977), located approximately 810 m northwest of the Section 1 draft Order Limits. The building is a multifunctional farm building including a stable, granary, dovecote and store and was built in the late 18th or early 19th century,
- 5.5.22 The increasing urbanization of the landscape to the east of the draft Order Limits continued through the 20th century with the urban areas of Grimsby extending further west to its current extent at Great Coates. No non-designated heritage assets of modern date (1901 to the present) are recorded within the 1 km Study Area, however, there are three grade II listed war memorials located within the 3 km Study Area at Great Coates (NHLE 1453562), Healing (NHLE 1455332) and Bargate (NHLE 1379370). The military importance of Lincolnshire, its coast and airfields, during the Second World War is evidenced by the grade II* listed former Heavy Anti-Aircraft Gun site (NHLE 1403222) located approximately 3.3 km to the northwest of the Section 1 draft Order Limits.
- 5.5.23 Undated cropmarks (MNL240) representing evidence for rural past settlement activity and land management are recorded within the draft Order Limits south of Maud Hole Covert. To the east of the recorded location of the undated cropmarks geophysical survey of the proposed Grimsby West substation have identified anomalies interpreted as possible archaeological remains, which may be related to the undated cropmarks. A group of anomalies representing the buried remains of ditches and a rectilinear ditched enclosure of unknown date (AEC100), have been recorded within the draft Order Limits in the fields immediately northeast of, and extending into, the footprint of the proposed Grimsby West substation. A second group of anomalies identified to the south of the proposed Grimsby West Substation are also indicative of ditches (AEC101). These may be archaeological in origin and may represent former field boundaries or drains of unknown date. The most distinct former field boundary corresponds with a boundary depicted in the First Edition Ordnance Survey 25-inch map of 1888. The cropmarks and geophysical survey anomalies provide evidence for the presence of buried archaeological deposits, the date and character of which have not yet been determined by archaeological investigation.

Historic Landscape Character

- 5.5.24 Section 1 is located within a single broad historic landscape Regional Character Area, 3 The Northern Marshes, and a single historic landscape character zone (HLCZ) NOM3 The Grimsby Commuter Belt within The Northern Marshes, defined by the Lincolnshire Historic Landscape Characterisation project (Ref 18 and Ref 19).
- 5.5.25 The NOM3 The Grimsby Commuter Belt within The Northern Marshes HLCZ extends to the south and east of Grimsby and is broadly characterised by a pattern of medieval villages expanded by modern housing development, bounded by a rural

landscape of predominantly large modern fields, formed by the amalgamation and boundary loss of regular 18th and 19th century planned enclosure with straight boundaries. Small areas of irregular fields do survive close to some of the villages and have been interpreted as early enclosure of medieval open fields, evidence for which survives in some fields as the earthwork remains of ridge and furrow cultivation (Ref 19).

Future Baseline

- 5.5.26 The future baseline relates to known or foreseeable changes to the current baseline in the future, against which the effects of the Project during construction and operation are assessed. Specifically, it accounts for anticipated changes including those caused by changing climatic conditions, policy, legislation, advances in technology and by other confirmed development projects which will be complete prior to construction of the Project.
- 5.5.27 At this preliminary stage, a full assessment of the implications of any committed development projects with regard to future baseline conditions has not been undertaken. A list of the currently known developments which are anticipated to be included within the future baseline scenario is provided within **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope Annex A Developments for Consideration within the Future Baseline**. This will be reviewed and updated as appropriate during development of the ES, as with other information which informs assessment of the future baseline.
- 5.5.28 The baseline details as presented above (including changes to settings of the assets) are not anticipated to change in the absence of the Project. Any change to archaeological remains, historic buildings and structures and historic landscape features would be limited to the existing and ongoing degradation of their fabric over time through processes such as erosion, desiccation, corrosion or decay.

5.6 Design, Control and Additional Mitigation Measures

Design Mitigation Measures

- 5.6.1 The Project and draft Order Limits have been designed to avoid sensitive receptors as far as practicable. This is in accordance with the 'Holford Rules' (Ref 20) applicable to routing of new overhead lines and the 'Horlock Rules' (Ref 21) which apply to design and siting of substations. These approaches are explained in further detail within the Corridor Preliminary Routeing and Siting Study (CPRSS) (Ref 22) and **PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered**. Principles include, but are not limited to, seeking to avoid areas of highest amenity, cultural or scientific value, taking advantage of natural screening provided by existing landform and features (e.g. woodland) and keeping visual, noise and other environmental effects to a minimum.
- 5.6.2 Following selection of the preferred route corridor, environmental specialists have been integral to ongoing design refinement of works within Section 1. This has further contributed to the avoidance or reduction of the potential environmental impacts of the Project. Specific examples relevant to the assessment include the design of the Project has been developed to avoid physical impacts to designated assets. The Section 1 design has been developed to avoid physical impacts to the Two moated sites at Healing Hall scheduled monument, by locating the proposed substation

approximately 330 m to the south of the monument. The proposed substation has also been located away from grade I and grade II listed buildings located at Aylesby, Laceby and Healing, thereby reducing or avoiding significant effects to these designated heritage assets from changes to their setting.

Control Mitigation Measures

Construction

- 5.6.3 A Preliminary CoCP is provided in **PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice**. The control measures included within the Preliminary CoCP relevant to the Historic Environment assessment of Section 1 include:
- i. GG03: Suitably experienced Environmental Advisers will be appointed for the duration of the construction phase. In addition, qualified and experienced Environmental Clerk of Works (ENvCoW) will be available during the construction phase to advise, supervise and report on the delivery of the mitigation methods and controls outlined in the Management Plans. The ENvCoWs will monitor that the works proceed in accordance with relevant environmental DCO requirements and adhere to the required good practice and mitigation measures. The ENvCoWs will be supported as necessary by appropriate specialists, including ecologists and arboriculturists, soils and land drainage experts.
 - ii. GG06: A Construction Environmental Management Plan (CEMP), a Landscape and Ecological Management Plan (LEMP), a Materials and Waste Management Plan (MWMP) and a Construction Traffic Management Plan (CTMP), Emergency Action Plan, Public Rights of Way Management Plan (PRoWMP), Overarching Written Scheme of Investigation (OWSI), Biodiversity Management Plan, Noise and Vibration Management Plan, Pollution Prevention Plan, Foundation Works Risk Assessment, Carbon efficiency Plan, Dust Management Plan (DMP), Drainage Management Plan (DrMP) along with a Soil Management Plan (SMP) will be produced prior to construction. These are collectively referred to as 'the environmental control Plans'.
 - iii. GG09: Where sensitive features such as ancient woodland and protected habitats are to be retained within or immediately adjacent to the draft Order Limits, an appropriate protective area will be established using appropriate fencing and signage and will be inspected, repaired, and replaced as necessary. The protective areas will be shown on the Retention and Reinstatement Plans contained within the LEMP.
- 5.6.4 In addition, measures that relate to the historic environment either directly or through measures applied for landscape and visual, and noise and vibration include:
- i. H01: Known heritage assets and locations known archaeological interest will have been identified by a programme of desk-based assessment and field evaluation prior to construction. Wherever possible identified heritage assets and archaeological remains will be avoided by the Project design. Where avoidance has not been possible, archaeological mitigation measures comprising the preservation of archaeological remains, or a programme of archaeological investigation will be implemented. Areas of archaeological preservation, or where archaeological work is planned, will be demarcated using appropriate fencing

and signage to prevent unintentional damage. The fencing and condition of the areas will be inspected, repaired, and replaced as necessary. The areas of archaeological preservation or investigation will be identified on plans within the OWSI and CEMP.

- ii. H02: Where a previously unknown heritage asset is discovered, or a known heritage asset proves to be more significant than foreseen at the time of application, the Project will inform the relevant authorities and will agree a solution that protects the significance of the new discovery, so far as is practicable, within the Project parameters.
- iii. H03: An outline process for dealing with the unexpected discovery of archaeological remains including human remains and Treasure during construction will be set out in the OWSI and detailed CEMP.
- iv. H04: Where practicable, the Project will maintain elements within the historic landscape such as vegetation and hedgerows (including re-instating hedgerows and fences).
- v. LV01: The contractor(s) will retain vegetation where practicable. Where vegetation is lost and trees cannot be replaced in situ due to the restrictions associated with land rights required for operational safety, native shrub planting approved by National Grid Electricity Transmission plc (National Grid) will be used as a replacement, in accordance with the outline vegetation reinstatement plans included within the LEMP. Replacement vegetation will be planted as close by as practicable and will complement landscape character and be sympathetic to the local habitat type in order to provide a high biodiversity value.
- vi. LV04: Construction lighting will be of the lowest luminosity necessary to safely perform tasks. Lighting will be directional and minimised where possible.
- vii. NV01: Construction working will be undertaken within the agreed working hours set out within the DCO unless the works are under an exception to the set working hours in which case they will be carried out in a manner that minimises noise and vibration at all times. Best practicable means to reduce construction noise will be set out within the CEMP.

5.6.5 The requirements for, and scope of, archaeological control measures and additional mitigation will be set out in the OWSI and the CEMP submitted as part of the DCO application setting out how the requirements for archaeological control measures at each stage of construction will be implemented.

5.6.6 The archaeological and historic environment control measures required for the Project will be informed by the results of the forthcoming desk-based assessment, aerial photographic and LiDAR assessment, geoarchaeological desk study and the programme of pre-application archaeological evaluation comprising geophysical survey and archaeological trial trenching and geoarchaeological borehole survey. The results of the programme of archaeological evaluation will identify the presence/absence of buried archaeological assets within the draft Order Limits and characterise their extent, depth, date, state of preservation and significance. As such, specific control measures for individual heritage assets will be included in the ES and OWSI submitted as part of the DCO application.

5.6.7 The strategy and approach for appropriate archaeological and historic environment control measures to reduce or offset the identified impacts from construction and operation of the Project upon heritage assets, will be determined (where possible) in

consultation with the heritage stakeholders from the respective local planning authorities and, where required, Historic England.

Additional Mitigation Measures

- 5.6.8 Additional mitigation measures are those required to reduce likely significant adverse environmental effects which may still occur despite the inclusion of the embedded design and control measures described above.
- 5.6.9 Potential additional mitigation measures which may be required to reduce the effects of the Project upon the Historic Environment are in the early stages of development, based upon an iterative process informed by ongoing survey and assessment. These typically include additional measures which specifically serve a mitigation function, to reduce the scale of potential impacts.
- 5.6.10 As set out within **PEI Report Volume 2 Part B Section 1 Chapter 1 Overview of the Section and Description of the Project** and illustrated on **PEI Report Volume 2 Part B Section 1 Figure 1.3 Permanent and Operational Features** the preliminary additional mitigation measures embedded into the design of Section 1 for Historic Environment includes landscape screening vegetation embedded within the design to reduce the visual impact of the proposed substation within the landscape.
- 5.6.11 Where it is not possible to implement embedded mitigation, or to avoid impacts to earthwork remains or buried archaeological deposits, measures to reduce or offset those impacts would be required to manage the historic environment resource and may include (but not be limited to):
- i. An appropriate programme of archaeological investigation and recording with the objective of advancing the understanding of the significance of archaeological remains within the draft Order Limits that may be disturbed or either wholly or partially lost, in accordance with the guidance provided by the Overarching NPS for Energy (EN-1) (Ref 5, section 5.9.17).
 - ii. Appropriate archaeological and geoarchaeological investigation and recording will be undertaken prior to the commencement of construction works wherever possible but may also include archaeological monitoring and recording (watching brief) works during construction.
 - iii. Establishing an outline process for dealing with the unexpected discovery of archaeological remains including human remains and Treasure during construction within the OWSI and detailed CEMP.
- 5.6.12 Opportunities for further additional mitigation or enhancement will be reviewed as the Project develops and the results of the site walkover surveys and archaeological surveys become available and will be included in the assessment presented in the ES and OWSI submitted with the DCO application.
- 5.6.13 Any measures to be included within the Project will be informed by further design development and consultation with the relevant stakeholders, including engagement with the statutory consultees.
- 5.6.14 Finalised additional mitigation measures will be detailed within the ES.

5.7 Preliminary Assessment of Effects

- 5.7.1 The following section presents the findings of the preliminary assessment of effects upon the heritage assets, identified within the Study Area, as a result of construction and/or operational activities within Section 1.
- 5.7.2 The preliminary assessment of effects reported below takes into account the Design and Control measures, as previously described.
- 5.7.3 For a summary of the likely significant effects please refer to **PEI Report Volume 2 Part B Section 1 Chapter 13 Summary**. A supplementary summary of all non-significant effects is also included within this section in **Table 5.6** based upon the assessment scope detailed in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
- 5.7.4 A full table summarising the preliminary assessment of likely non-significant effects on individual heritage assets is provided within **PEI Report Volume 3 Part B Section 1 Appendix 5B Preliminary Summary of Likely Non-Significant effects**.
- 5.7.5 Unless stated otherwise all likely significant and non-significant effects reported below are adverse in nature.
- 5.7.6 It should be noted that the assessment which has informed the conclusions presented remains ongoing and is subject to change, due to the ongoing survey activities and further design development of the Project. A full assessment will be included within the ES submitted with the DCO application.

Likely Significant Effects

Construction

- 5.7.7 The preliminary assessment of the effects arising from construction of Section 1 of the Project is described in this section. The preliminary assessment considers the design, control and additional mitigation measures described in section 5.6.
- 5.7.8 Potential impacts identified during the construction phase include direct physical impacts on heritage assets within the draft Order Limits of Section 1 resulting from construction works e.g. topsoil stripping and groundworks for the construction access haul roads, pylon working areas, construction compounds and drainage.
- 5.7.9 Setting impacts arising from the construction phase on heritage assets may arise due to:
- i. Temporary short-term impacts from construction activities which can be incremental until construction is completed caused by the movement of mechanical plant, light, noise pollution and dust; and
 - ii. Permanent long-term impacts as a result of the introduction of the physical form and appearance of the built infrastructure into the landscape during the construction stage and continuing for the operational duration of the Project.
- 5.7.10 The existing Grimsby West substation will be decommissioned (in full or part), with the extent of the works to be confirmed and fully assessed in the ES.

Designated Heritage Assets

- 5.7.11 The preliminary assessment has identified one designated heritage asset within the Section 1 Study Areas that has the potential to experience temporary and/or permanent significant effects. This is a scheduled monument within the 3 km Study Area. The asset may experience significant effects from construction activities and non-significant effects from the permanency of the infrastructure in the landscape. The assessment for both effects is set out together for the asset in the Likely Significant Effects section, below, with the significant effects summarised in **PEI Report Volume 2 Part B Section 1 Chapter 13 Summary** and the non-significant effects summarised in **PEI Report Volume 3 Part B Section 1 Appendix 5B Preliminary Summary of Likely Non-Significant effects**.
- 5.7.12 Located approximately 330 m north of the draft Order Limits, Healing Hall scheduled monument (NHLE 1010947) is a medieval manorial site comprising earthwork remains of two moats, moat islands, associated banks and buried archaeological remains. As a focus of the medieval settlement of Healing the setting of the monument includes its historic interrelationships with the grade II listed medieval parish church of St Peter and St Paul, the historic village core and the wider agrarian landscape evidenced by former medieval ridge and furrow cultivation, which extends to the northern side of the proposed new Grimsby West Substation site. The monument is screened by existing woodland and mature tree planting to the south and west and by intervening vegetation and housing to the north of the draft Order Limits. The wider setting of the monument includes the existing overhead lines which connect to the existing Grimsby West substation. The construction of the Project may temporarily alter the setting of the monument due to activities such as construction traffic, noise and the introduction of additional temporary pylons to the skyline south of the monument. On a designated heritage asset of high value, these temporary impacts would have a small magnitude of impact, slightly changing the setting of the asset and resulting in a moderate adverse effect, which would be significant. Permanent changes to the setting of the monument would arise from limited filtered, seasonal views of new pylons and overhead line infrastructure against the skyline for both the existing 4KG line as it diverts into the new Grimsby West Substation and the new overhead line south of the new Grimsby West Substation. Views towards the Project would be partially screened by both existing mature vegetation and proposed substation screening vegetation. The permanency of the Project in the wider setting of the asset, from the time of construction and throughout its operational duration, is assessed as a negligible magnitude of impact resulting in a minor adverse effect, which would not be significant.

Non-designated Heritage Assets

- 5.7.13 The preliminary assessment has not identified any non-designated heritage assets within the draft Order Limits or 1 km Study Area with potential to experience significant effects.

Operation

- 5.7.14 Impacts during the operation of the Project that may affect heritage assets include those experienced from:
- i. security lighting with motion detectors;
 - ii. operational noise; and

iii. restrictions on accessibility to heritage assets.

- 5.7.15 In accordance with the PINS Scoping Response (Ref 2; Section 3.4, ID. 3.4.2), the assessment of physical impacts to, or changes to the settings of heritage assets, as a result of maintenance activities and traffic, have been scoped out of the preliminary assessment as they are unlikely to result in significant effects.
- 5.7.16 Although no additional significant effects are considered likely through operation over and above those already identified relating to the long-term presence of the Project in the landscape under the construction phase, further assessment of these operational elements will be undertaken in the ES.

Likely Non-Significant Effects

Construction

Designated Heritage Assets

- 5.7.17 A number of designated heritage assets, which may experience non-significant effects, have been identified as warranting further explanation of their assessment due to particular sensitivities, such as their high value, designed views, historic setting or their proximity to works proposed within the draft Order Limits, as set out below.
- 5.7.18 **Table 5.6** then summarises the findings of the preliminary assessment with respect to all impacts that are not predicted to result in significant effects with further detail on specific assets provided within **PEI Report Volume 3 Part B Section 1 Appendix 5B Preliminary Summary of Likely Non-Significant effects**.

Scheduled Monuments within the 3 km Study Area

- 5.7.19 Stallingborough medieval settlement, post-medieval manor house and formal gardens scheduled monument (NHLE 1020423) is located 2.4 km north of the draft Order Limits. The monument comprises the earthwork and associated buried remains of part of the medieval settlement of Stallingborough, together with the earthworks of a post-medieval manor house and associated formal gardens. The setting of the monument comprises the extent of the former medieval settlement, its association with the grade II* listed medieval parish Church of St Peter and St Paul (NHLE 1346978), the settlement of Stallingborough and surrounding agricultural landscape that formed the medieval open fields that would have supported the settlement. The draft Order Limits and Project do not form part of that setting and construction of the proposed new Grimsby West Substation and associated infrastructure would not result in changes to the setting or value of this high value heritage asset, or the way in which it is experienced or understood. Consequently, there would be no significant effect to the scheduled monument.

Conservation Areas within the 3 km Study Area

- 5.7.20 The southern extent of the Great Coates Conservation Area is adjacent to the draft Order Limits with Aylesby Road and approximately 250 m to the northeast of the draft Order Limits where the existing Grimsby West substation is located. A number of grade II listed assets are situated within the conservation area as well as the grade I listed Church of St Nicolas (NHLE 1379843). Open fields and mature vegetation to

the southwest may screen the conservation area from the Project but this would be season dependent, with the wider agricultural area forming part of the setting of the conservation area contributing to its character. However, most of the conservation area extends away from the Project such that any impacts would be limited to its south, with little alteration or change to its overall character or affecting the value of the listed assets within it. There is a potential for temporary impacts to the conservation area from construction works, such as traffic and noise along Aylesby Road, and permanent impacts to the setting of Great Coates Conservation Area due to the introduction of new infrastructure in the landscape. These changes would have a small impact upon this asset of medium value, resulting in minor adverse effects, which would not be significant. Temporary and permanent impacts on the grade II listed assets within the conservation area would not affect their setting, resulting in no change and neutral effects which are not significant. In respect of the grade I Church of St Nicolas (NHLE 1379843), there may be impacts upon its setting from temporary construction works which could alter how the asset is experienced and understood. The construction activities would have a negligible magnitude of impact resulting in a temporary minor adverse effect on this asset of high value, which would not be significant. The church would not experience impacts from the permanency of the Project in the landscape, as it does not form part of the wider setting of the church. This would result in a neutral effect which would not be significant.

Listed Buildings or Structures within the 3 km Study Area

- 5.7.21 The grade II listed Farm Range on the North Side of Healing Wells Farm (NHLE 1346977) is located approximately 850 m to the northwest of the Section 1 draft Order Limits, and dates to the late 18th century with later 19th century modifications. Comprising two end pylons, it operated as a multipurpose farm building including a stable, granary, dovecote and store. The immediate setting of the building appears to have been eroded by the presence of large modern sheds immediately to its southwest, although these may not completely obscure the pylons from views to and from the wider agricultural setting. Changes to the building's setting may occur from temporary and permanent impacts from the construction of the Project, but would have little affect on its value or how it is appreciated or understood. Both the construction activities and the permanency of the infrastructure in the landscape would have negligible impacts, resulting in negligible adverse effects on an asset of medium value, that would not be significant.
- 5.7.22 The grade II listed Mill (NHLE 1103468) is located approximately 2.2 km to the northwest of the Section 1 draft Order Limits. This was a former windmill tower of six storeys, constructed in 1875, which ceased operation in 1954 before later conversion as a residential property in the 1970s. There is intervening vegetation between the asset and the Project which would assist with screening, although impacts from the construction works may temporarily alter its setting. The magnitude of impact would be small, slightly altering its setting. This would result in a temporary minor adverse effect upon this asset of medium value, which would not be significant. Permanent impacts on the wider setting and associated views from the asset may result in a permanent minor adverse effect, which would not be significant.

High Value Designated Heritage Assets within the 3-5 km Study Area

- 5.7.23 The Former Heavy Anti-Aircraft Gun Site (NHLE 1403222) grade II* listed asset is one of only six surviving heavy anti-aircraft gun sites known nationally. It is located approximately 3.3 km to the northwest of the Section 1 draft Order Limits. It is likely

that temporary works would have a negligible impact upon the wider setting or how the asset is understood or appreciated. This would result in a temporary minor adverse effect on an asset of high value, which would not be significant. The permanency of the infrastructure in Section 1 introduced in the landscape would have a negligible magnitude of impact, with little effect on the wider setting of the asset or how it is appreciated or understood. This would result in a permanent minor adverse effect upon this asset of high value, which would not be significant.

- 5.7.24 The medieval nunnery of Nun Cotham scheduled monument (NHLE 1008686) is located approximately 5 km northwest of the draft Order Limits. The monument comprises the well surviving earthworks and buried archaeological remains of the nunnery founded in the mid-12th century by the Cistercian Order and dissolved in 1539. The monument also includes the remains of a 16th to 17th century house and formal gardens that were constructed on the site of the convent buildings, and which remain visible as low grass covered walls representing the post-dissolution house. These overlie the buried remains of the principal nunnery buildings and church laid out around a central cloister beyond which lie the remains of the post-dissolution gardens, a series of ditched and banked enclosures, the remains ancillary buildings and farmyard earthworks, a windmill mound and a pair of fishponds. The setting of the monument comprises the surviving extent of the earthwork and buried remains that represent the medieval nunnery and subsequent post-medieval house and gardens, which lie within a large enclosure defined on nearly all sides by a bank and the surrounding agricultural landscape. Areas within the draft Order Limits do not form part of that setting, meaning that the value of the asset and way in which the monument is understood and appreciated would remain unchanged. Consequently, there would be no significant effect upon this designated heritage asset.

High Value Designated Heritage Assets Beyond the 5 km Study Area

- 5.7.25 The grade I listed The Dock Tower, Royal Dock (NHLE 1379870) is located approximately 5.3 km to the northeast of the Section 1 draft Order Limits. The structure is about 94 m tall, described in the Historic England NHLE entry as the largest and architecturally most distinguished hydraulic tower in the UK. Constructed in the mid-19th century, it is styled on the Palazzo Pubblico in Siena comprising six tiers with an ashlar cap and iron lantern. The tower is an early application of hydraulic power, central to the new dock's hydraulic system, creating the water pressure from its height to power the lock gates and the cranes on the quay. A unique structure of its type, it is both a landmark and seamark in Grimsby's skyline and is symbolic of the town's importance as a port, with far reaching views across the landscape from the tower. The land within the draft Order Limits forms part of the wider setting of the tower which is visible in views from the asset. The construction activities would have a negligible impact on how the asset is appreciated or understood. This would result in a temporary minor adverse effect upon this asset of high value, which would not be significant. The permanency of the infrastructure in landscape in Section 1 may permanently alter the wider setting of the asset and views from and towards it. This would have a negligible impact on how the Tower is appreciated and understood and its wider setting, resulting in a permanent minor adverse effect upon this asset of high value, which would not be significant.

Non-designated Heritage Assets

- 5.7.26 The preliminary assessment has identified non-designated heritage assets within the draft Order Limits and the 1 km Study Area that have the potential to experience

temporary or permanent non-significant effects. A number of these heritage assets are described below with further explanation of their assessment due to particular sensitivities, such as their historic setting or their proximity to works proposed within the draft Order Limits. For transparency the preliminary assessment for all non-designated heritage assets identified as experiencing likely non-significant effects is provided in **PEI Report Volume 3 Part B Section 1 Appendix 5B Preliminary Summary of Likely Non-Significant effects**.

- 5.7.27 Undated cropmarks south of Maud Hole Covert (MNL240) comprise a non-designated heritage asset for which further archaeological investigation is required to confirm the full extent, character, date and value of the remains. Although not fully characterised or dated for the purpose of the preliminary assessment, this asset has been assessed as being of medium value and is considered to have potential to contribute to regional research objectives relating to rural settlement remains or agricultural practices. Construction of the proposed new Grimsby West Substation, associated construction access haul road, drainage and proposed screening vegetation will partially remove the asset. This is assessed as being a medium magnitude of impact, resulting in a permanent moderate adverse effect, which would be significant. Additional mitigation measures comprising a programme of archaeological investigation and recording, would reduce this to a permanent minor adverse residual effect, which would not be significant.
- 5.7.28 Geophysical anomalies of possible archaeological origin and representing the buried remains of undated ditches and a rectilinear ditched enclosure of unknown date (AEC100) may represent either rural settlement remains or agricultural enclosures. The anomalies require further archaeological investigation to confirm their full extent, character, date and value, however, for this preliminary assessment this asset has been assessed as being of medium value, based on their form and potential to contribute to regional research objectives. Construction of the proposed new Grimsby West Substation and associated construction access haul road, pylon working area and drainage works will partially remove the asset. This would comprise a medium magnitude of impact, resulting in a permanent moderate adverse effect, which would be significant. Additional mitigation measures comprising a programme of archaeological investigation and recording, would reduce this to a permanent minor adverse residual effect, which would not be significant.
- 5.7.29 Geophysical anomalies identified within the draft Order Limits to the south of the proposed new Grimsby West Substation indicative of ditches and former field boundaries (AEC101), comprise a non-designated heritage asset of low value. A small section of this heritage asset would be partially removed by topsoil stripping and groundworks for the construction access haul road. This would constitute a small magnitude of impact resulting in a permanent negligible adverse effect, which would not be significant.
- 5.7.30 Several fields containing evidence for former ridge and furrow cultivation in Healing (MNL2233) extend into the draft Order Limits to the immediate north of the proposed new Grimsby West Substation. This non-designated heritage asset is of low value, a small section of which would be partially removed by topsoil stripping and groundworks for the construction access haul road and working area for pylon 4KG154-N, and landscape mitigation planting. This would constitute a small magnitude of impact resulting in a permanent negligible adverse effect, which would not be significant.

- 5.7.31 Aylesby Lane (MNL3481) is a non-designated heritage asset of low value. Groundworks for the construction access haul road and working area of pylon 4KG152 would partially remove a small section of the asset resulting in a small magnitude of impact and a permanent negligible adverse effect, which would not be significant.

Operation

- 5.7.32 Although no additional non-significant effects are considered likely through operation, over and above those already identified relating to the long-term presence of the Project in the landscape assessed under the construction phase, further assessment of these operational elements will be undertaken in the ES.

Table 5.6 Preliminary summary of non-significant Historic Environment effects – Section 1

Heritage Asset	Value of the Asset	Potential Impact	Range of Impact Magnitude	Significance of Effect			Rationale
				Minor Adverse (Not significant)	Negligible Adverse (Not significant)	Neutral (Not Significant)	
Designated Assets within the 3 km Study Area							
Scheduled Monuments	High	Potential temporary change to setting or value of the assets arising from construction of the Project.	No Change	0	0	2	Temporary changes to the setting of scheduled monuments arising from construction of the Project have no potential to result in change to the value of these assets or how they are appreciated, resulting in neutral effects to these assets of high value. These effects would not be significant.
	High	Potential permanent change to setting or value of the assets arising from construction of the Project and throughout its operational duration.	Negligible or No Change	1	0	2	The permanency of the infrastructure in the landscape within the wider setting of the scheduled monuments would result in either little, or no change to the value of these assets or how they are appreciated, resulting in minor adverse or neutral effects to these assets of high value. These minor adverse or neutral effects would not be significant.
Grade I listed buildings	High	Potential temporary change to setting or value of the assets arising from	Negligible or No Change	1	0	1	Temporary changes to the setting of grade I listed buildings arising from construction of the project would result in either little, or no change to the setting of these assets or how they are appreciated, resulting in minor adverse

Heritage Asset	Value of the Asset	Potential Impact	Range of Impact Magnitude	Significance of Effect			Rationale
				Minor Adverse (Not significant)	Negligible Adverse (Not significant)	Neutral (Not Significant)	
		construction of the Project.					effects or neutral effects to these assets of high value. These effects would not be significant.
	High	Potential permanent change to setting or value of the assets arising from construction of the Project and throughout its operational duration.	No Change	0	0	2	The permanency of the infrastructure in the landscape within the wider setting of the grade I listed buildings would result in no change to the value of these assets or how they are appreciated, resulting in neutral effects to these assets of high value. These effects would not be significant.
Grade II* listed building	High	Potential temporary change to setting or value of the asset arising from construction of the Project.	No Change	0	0	1	Temporary changes to the setting of grade II* listed building arising from construction of the project would result in no change to the value of the asset or how it is appreciated, resulting in neutral effects to this asset of high value, which would not be significant.
	High	Potential permanent change to setting or value of the asset arising from construction of the Project and	No Change	0	0	1	The permanency of the infrastructure in the landscape within the wider setting of the grade II* listed building would result in no change to the value of the asset or how it is appreciated, resulting in neutral effects to this asset

Heritage Asset	Value of the Asset	Potential Impact	Range of Impact Magnitude	Significance of Effect			Rationale
				Minor Adverse (Not significant)	Negligible Adverse (Not significant)	Neutral (Not Significant)	
		throughout its operational duration.					of high value which would not be significant.
Conservation Areas	Medium	Potential temporary change to setting or value of the assets arising from construction of the Project.	Small or No Change	1	0	1	Temporary changes to the setting of the conservation areas arising from construction of the project would result in slight changes, or no change, to the value of these assets or how they are appreciated. The resulting minor adverse or neutral effects to these assets of medium value would not be significant.
	Medium	Potential permanent change to setting or value of the assets arising from construction of the Project and throughout its operational duration.	Small or No Change	1	0	1	The permanency of the infrastructure in the landscape within the wider setting of the conservation areas would result in slight changes, or no change, to the value of these assets or how they are appreciated. The resulting minor adverse or neutral effects to these assets of medium value would not be significant.
Grade II listed buildings	Medium	Potential temporary change to setting or value of the assets arising from	Small, Negligible or No Change	2	1	21	Temporary changes to the setting of grade II listed buildings arising from construction of the project would result in either slight changes to the setting of the assets, or no change to their setting. This would result in minor

Heritage Asset	Value of the Asset	Potential Impact	Range of Impact Magnitude	Significance of Effect			Rationale
				Minor Adverse (Not significant)	Negligible Adverse (Not significant)	Neutral (Not Significant)	
		construction of the Project.					adverse, negligible adverse or neutral effects to these assets of medium value. These effects would not be significant.
	Medium	Potential permanent change to setting or value of the assets arising from construction of the Project and throughout its operational duration.	Small, Negligible or No Change	1	2	21	The permanency of the infrastructure in the landscape within the wider setting of these grade II listed buildings would result in either slight changes to the setting of the assets, or no change to their setting. This would result in minor adverse, negligible adverse and neutral effects to these assets of medium value. These effects would not be significant.
High Value Designated Assets within the 3-5 km Study Area							
Scheduled Monuments	High	Potential temporary change to setting or value of the assets arising from construction of the Project.	No Change	0	0	2	Temporary effects arising from construction of the Project will not alter the value of these scheduled monuments or the way in which they are appreciated or understood. This would result in a neutral effect that would not be significant.
	High	Potential permanent change to setting or value of the assets arising from	No Change	0	0	2	The permanency of the infrastructure in the landscape within the wider setting of the scheduled monuments would result in no change to the value of these assets or how they are

Heritage Asset	Value of the Asset	Potential Impact	Range of Impact Magnitude	Significance of Effect			Rationale
				Minor Adverse (Not significant)	Negligible Adverse (Not significant)	Neutral (Not Significant)	
		construction of the Project and throughout its operational duration.					appreciated, resulting in neutral effects to these assets of high value. The neutral effects would not be significant.
Grade I listed buildings	High	Potential temporary change to setting or value of the assets arising from construction of the Project.	No Change	0	0	3	The Project does not form part of the setting of these grade I listed buildings and will not alter their value or the way in which they are appreciated or understood. This would result in a neutral effect that would not be significant.
	High	Potential permanent change to setting or value of the assets arising from construction of the Project and throughout its operational duration.	No Change	0	0	3	The Project does not form part of the setting of these grade I listed buildings and will not alter their value or the way in which they are appreciated or understood. This would result in a neutral effect that would not be significant.
Grade II* listed buildings	High	Potential temporary change to setting or value of the assets arising from	Negligible or No Change	1	0	1	Temporary changes to the setting of these high value grade II* listed buildings arising from construction of the project would result in either slight changes to their setting, or no change to their setting. This would result in

Heritage Asset	Value of the Asset	Potential Impact	Range of Impact Magnitude	Significance of Effect			Rationale
				Minor Adverse (Not significant)	Negligible Adverse (Not significant)	Neutral (Not Significant)	
		construction of the Project.					either minor adverse or neutral effects to these assets of high value. These effects would not be significant.
	High	Potential permanent change to setting or value of the assets arising from construction of the Project and throughout its operational duration.	Negligible or No Change	1	0	1	The permanency of the infrastructure in the landscape within the wider setting of the grade II* listed buildings would result in either slight changes to their setting, or no change to the value of these assets or how they are appreciated, resulting in minor adverse or neutral effects to these assets of high value which would not be significant.
Grade II* registered park and garden	High	Potential temporary change to setting or value of the asset arising from construction of the Project.	No Change	0	0	1	The Project does not form part of the setting of this grade II* registered park and garden and will not alter its value or the way in which it is appreciated or understood. This would result in a neutral effect that would not be significant.
	High	Potential permanent change to setting or value of the asset arising from construction of the Project and throughout its	No Change	0	0	1	The Project does not form part of the setting of this grade II* registered park and garden and will not alter its value or the way in which it is appreciated or understood. This would result in a neutral effect that would not be significant.

Heritage Asset	Value of the Asset	Potential Impact	Range of Impact Magnitude	Significance of Effect			Rationale
				Minor Adverse (Not significant)	Negligible Adverse (Not significant)	Neutral (Not Significant)	

operational duration.

High Value Designated Assets beyond the 5 km Study Area

Grade I listed building	High	Potential temporary change to setting or value of the asset arising from construction of the Project.	Negligible	1	0	0	Temporary changes to the setting of the high value grade I listed building arising from construction of the Project would have negligible impacts upon the value of this asset and how it is appreciated. This would result in a minor adverse effect which would not be significant.
	High	Potential permanent change to setting or value of the asset arising from construction of the Project and throughout its operational duration.	Negligible	1	0	0	The permanency of the infrastructure in the landscape within the wider setting of the grade I listed building would have negligible impacts upon the value of this asset and how it is appreciated, resulting in a minor adverse effect which is not significant.

Non-designated heritage assets within the draft Order Limits

	Medium or Low	Permanent physical construction impacts resulting	Negligible, Small; or Medium	2	7	0	The partial loss or disturbance of non-designated heritage assets of medium or low value, resulting in minor adverse, negligible adverse or neutral
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Heritage Asset	Value of the Asset	Potential Impact	Range of Impact Magnitude	Significance of Effect			Rationale
				Minor Adverse (Not significant)	Negligible Adverse (Not significant)	Neutral (Not Significant)	
		in the partial loss or disturbance of the asset.					effects that are not significant. Archaeological mitigation measures i.e. appropriate archaeological investigation and recording would further off-set or reduce the significance of the effects to not significant.

5.8 Monitoring

- 5.8.1 The control measures set out in section 5.6 of this chapter include provision for monitoring of the programme of additional archaeological mitigation measures by the Environmental Manager or Archaeological Clerk of Works (ACoW), in consultation with the Local Planning Authority. As such, no further requirement for monitoring the Historic Environment is anticipated at this time.

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6. Water Environment and Flood Risk

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6. Water Environment and Flood Risk

6.1 Introduction

- 6.1.1 This chapter presents the Preliminary Environmental Information (PEI) in relation to the Water Environment and Flood Risk assessment of the New Grimsby West Substation section (Section 1) of the Grimsby to Walpole Project (the Project). Specifically, the chapter includes the following sections:
- i. An introduction to the topic (section 6.1);
 - ii. Identification of key local and regional policy relevant to the assessment (section 6.2). A full overview of the legislation and national, regional onshore and marine planning policy context that applies to the Project is presented within **PEI Report Volume 2 Part A Chapter 2 Legislative, Regulatory and Planning Policy Context** and supporting appendices;
 - iii. A summary of the assessment scoping process and the subsequent scope of the Water Environment and Flood Risk assessment (section 6.3). Further detail is provided within **PEI Report Volume 3 Part A Appendix 4A Planning Inspectorate Scoping Opinion Responses**;
 - iv. A high-level summary of the methodology of the Water Environment and Flood Risk assessment within Section 1 (section 6.4). A detailed description of the assessment methods and scope, applicable to the whole Project, is contained in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**;
 - v. A description of the environmental baseline within the Section 1 Study Area relevant to the Water Environment and Flood Risk assessment (section 6.5);
 - vi. A description of mitigation measures included for the purposes of the Water Environment and Flood Risk assessment reported within the PEI Report (section 6.6). Further information regarding design development can be found in **PEI Report Volume 2 Part A Chapter 3 Main Alternatives** and the **Grimsby to Walpole Design Development Report**;
 - vii. The likely significant and non-significant Water Environment and Flood Risk effects arising during construction and operation of the Project within the Section 1 Study Area, based upon the assessment completed to date (section 6.7); and
 - viii. An outline of the proposed monitoring requirements in relation to the Water Environment and Flood Risk (section 6.8).
- 6.1.2 Further supporting information is set out in **Table 6.1** below, including supporting figures and technical appendices.

Table 6.1 Supporting documentation

Supporting Information	Description
Topic Specific Supporting Documentation	
PEI Report Volume 2 Part B Section 1 Figures	<p>Figure 6.1 Water Environment Receptors and Study Area</p> <p>Figure 6.2 Principal Local Water Environment Regulators</p> <p>Figure 6.3 Surface Water Flood Risk</p> <p>Figure 6.4 Water Framework Directive Surface Water Body Status</p>
PEI Report Volume 3 Part C Route-wide Appendix 5A Preliminary Flood Risk Assessment	Preliminary assessment of the potential flood risk in relation to the Project, which sets out further assessment to be completed in support of the Environmental Statement (ES) and Development Consent Order (DCO) application. The emerging outcomes of ongoing pre-application consultation with key flood risk stakeholders are referenced as appropriate.
PEI Report Volume 3 Part C Route-wide Appendix 5B Preliminary Water Framework Directive Screening Assessment	Preliminary assessment of the potential implications of the Project with respect to compliance with the Water Framework Directive (WFD). Provides further details on the WFD water body status and ecological and chemical characteristics for those waterbodies relevant to the Section 1 assessment.
Project Supporting Documentation	
PEI Report Volume 2 Part B Section 1 Chapter 1 Overview of the Section and Description of the Project	A summary of the works within Section 1, including permanent infrastructure, temporary construction works, and operational activities.
PEI Report Volume 3 Part A Appendix 2A Key Legislation	A list of identified environmental legislation considered relevant to the Project, which will be updated and amended as required to inform the ES.
PEI Report Volume 3 Part A Appendix 2B National and Regional Planning Policy	A list of national and regional policies generally applicable to the assessment principles which underpin the PEI Report and ES.
PEI Report Volume 3 Part A Appendix 2Ci Local Plan Policy: Section Specific	An outline of the potentially relevant local planning policy allocations affecting each of the specific sections of the Project.
PEI Report Volume 3 Part A Appendix 2Cii Local Plan Policy: Route-wide	Details of planning policies applicable route-wide within the relevant Local Authority areas.

PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered	Provides a summary of the main alternatives considered in relation to the Project during the design development process, including the main reasons for selecting the chosen option.
PEI Report Volume 2 Part A Chapter 4 Approach to Preliminary Environmental Information	Sets out the Environmental Impact Assessment (EIA) approach and general methodology that has been used in developing the PEI Report for the Project.
PEI Report Volume 2 Part A Chapter 5 Project Description	An overarching description of the Project and its key components, including available construction information.
PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice	Sets out control and management measures that will be undertaken during construction of the Project if granted consent. The CoCP will be submitted in support of the DCO application.

6.1.3 There are also interrelationships between the potential effects on Water Environment and Flood Risk and other environmental topics. Therefore, please also refer to the following chapters within **PEI Report Volume 2 Part B** and **Part C**:

- i. **PEI Report Volume 2 Part B Section 1 Chapter 4 Ecology and Biodiversity** considers the effects identified by the surface water environment assessment that may affect ecological receptors, including aquatic flora and fauna.
- ii. **PEI Report Volume 2 Part B Section 1 Chapter 7 Geology and Hydrogeology** considers the effects identified by the surface water environment assessment that may affect hydrogeological receptors.
- iii. **PEI Report Volume 2 Part B Section 1 Chapter 13 Summary** provides a concise, consolidated summary of the likely significant effects reported for all topics, based upon the preliminary assessment.
- iv. **PEI Report Volume 2 Part C Route-wide Chapter 5 Water Environment** presents a summary of the route-wide preliminary impacts and likely significant effects of the Project upon the water environment.
- v. **PEI Report Volume 2 Part C Route-wide Chapter 10 Cumulative Effects** reports those intra-project effects which could potentially act in combination to result in cumulative environmental effects. It also identifies a shortlist of other Committed Developments with which there may be potential for cumulative effects, and the relevant environmental topics for such effects (inter-project). The full cumulative effects assessment will be reported within the ES.

6.2 Legislation and Policy Framework

Legislation and National Policy

- 6.2.1 Legislation and national policy relevant to the Project and this chapter is described in **PEI Report Volume 2 Part A Chapter 2 Legislative, Regulatory and Planning Policy Context** and supporting appendices, the details of which are set out in **Table 6.1**.

Regional and Local Policy

- 6.2.2 Regional and local plans or policies relevant to this assessment are as follows:

- i. Lincolnshire Minerals and Waste Local Plan (2016) (Ref 1);
- ii. Joint Lincolnshire Flood Risk and Water Management Strategy 2019-2050 (2019) (Ref 2);
- iii. Central Lincolnshire Local Plan (Adopted April 2023) (Ref 3)
 - Policy S21 Flood Risk and Water Resources: requires development proposals to manage flood risks by using the best available information, ensuring safety and resilience, and incorporating Sustainable Drainage Systems (SuDS). It also mandates protecting water resources by meeting water efficiency standards, ensuring adequate water treatment, and safeguarding the future maintenance of water bodies.
- iv. North East Lincolnshire Council Local Plan 2013-2032 (Adopted 2018) (Ref 4):
 - Policy 33 Flood Risk: states that development proposals should adhere to the requirements of the flood risk sequential test and, if necessary, the exception test. The regeneration benefits of development in areas of high flood risk should also be considered.
 - Policy 34 Water Management: states that development proposals that have potential to impact on surface and ground water should consider the objectives and programme of measures set out in the *Humber River Basin Management Plan*. Where development is proposed within a Source Protection Zone, the potential for any risk to groundwater resources and groundwater quality must be assessed.
- v. North East Lindsey Internal Drainage Board Byelaws (2021) (Ref 5):
 - This document sets out local byelaws governing watercourse maintenance and water level management within the Internal Drainage Board (IDB) district.

6.3 Scope of Assessment

- 6.3.1 The scope of the assessment has been informed by the Scoping Opinion (Ref 6) provided by the Planning Inspectorate in September 2024 on behalf of the Secretary of State, following the submission of the EIA Scoping Report (Ref 7). The scope has also been informed through consultation and engagement with relevant consultees. A summary of the Scoping Opinion together with a response against each point of relevance to the Water Environment and Flood Risk assessment chapter is provided in **PEI Report Volume 3 Part A Appendix 4A Planning Inspectorate Scoping**

Opinion Responses. A summary of the stakeholder engagement undertaken to date is provided in **PEI Report Volume 3 Part A Appendix 4D Summary of Stakeholder Engagement**.

- 6.3.2 Non-statutory consultation feedback has been addressed within the **Grimsby to Walpole Stage 1 Consultation Feedback Report**.
- 6.3.3 Aspects of the Water Environment and Flood Risk which are included within the scope of the assessment are summarised in **Table 6.2**.
- 6.3.4 It should be noted that operational phase impacts on aquatic environment and water resources receptors arising from overhead line aspects of the project were scoped out of the assessment at scoping stage therefore, not considered further in this chapter in accordance with the Scoping Opinion.

Table 6.2 Water Environment and Flood Risk effects scoped in for further assessment

Receptor	Relevant Assessment Criteria	Potential Effects Considered
Construction Phase		
Aquatic environment receptors , comprising: <ul style="list-style-type: none"> - Main rivers - WFD river and transitional water bodies - IDB-maintained watercourses - Ordinary watercourses 	WFD and WFD (Standards and Classification) Directions (England and Wales) 2015 (Ref 8).	<ul style="list-style-type: none"> • Deterioration in the water quality of aquatic environment receptors via generation of sediment laden run-off as a result of construction activities, e.g. watercourse crossings and excavations. • Potential effects on the hydromorphology and flow conveyance as a result of increased sediment inputs or direct watercourse disturbance (including from new watercourse crossings). • Deterioration in the water quality of aquatic environment receptors affected by mobilisation of contaminants from contaminated soil, or accidental spillage of pollutants (e.g. fuel or oil). • Deterioration in the water quality of aquatic environment receptors affected by mobilisation of contaminants in groundwater and subsequently surface water. • Impact from any dewatering for construction from temporary works impacting groundwater – surface water interactions. • The potential effects noted above for surface water aquatic environment receptors could also have implications for surface water resource availability.
Water resource receptors , comprising: <ul style="list-style-type: none"> - Licensed surface water abstractions - Unlicensed surface water abstractions for private water supply - Discharges to surface waters 		

Flood risk receptors (property and infrastructure at risk of flooding)	National Planning Policy Framework (NPPF) (Ref 9)	<ul style="list-style-type: none"> • Changes to watercourse flow conveyance arising from the presence of new or modified temporary watercourse crossings. This has the potential not only to affect the morphology of aquatic environment receptors, but to increase the risk of flooding to flood risk receptors. • Changes to surface water flood risk due to changes in runoff rates resulting from ground disturbance and creation of impermeable surfaces, and to changes in surface water runoff pathways due to changes in ground surface levels. • Changes to fluvial flood risk associated with loss of floodplain storage and/or change in floodplain flow conveyance. • Changes to fluvial flood risk associated with compartmentalisation of the floodplain. • Impacts on the integrity of flood defence and land drainage infrastructure as a result of physical impingement of Project infrastructure.
Operational Phase		
Aquatic environment receptors , comprising: <ul style="list-style-type: none"> - Main rivers - WFD river and transitional water bodies - IDB-maintained watercourses - Ordinary watercourses 	WFD and WFD (Standards and Classification) Directions (England and Wales) 2015 (Ref 8).	<ul style="list-style-type: none"> • Deterioration in the water quality of aquatic environment receptors due to a spill or leakage of fuels/chemicals during periodic maintenance and refurb activities. These activities are unlikely to require heavy plant, or excavations or the need to construct new temporary access roads. • The potential effects noted above for surface water aquatic environment receptors could also have implications for surface water resource availability.
Water resource receptors , comprising: <ul style="list-style-type: none"> - Licensed surface water abstractions - Unlicensed surface water abstractions for private water supply - Discharges to surface waters 		
Flood risk receptors (property and	NPPF (Ref 9)	<ul style="list-style-type: none"> • Changes to surface water flood risk due to changes in runoff rates resulting creation of impermeable surfaces, and

infrastructure at risk of flooding)	<p>to changes in surface water runoff pathways due to changes in ground surface levels.</p> <ul style="list-style-type: none">• Changes to fluvial flood risk associated with loss of floodplain storage and/or change in floodplain flow conveyance.
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6.3.5 The receptor types identified in **Table 6.2** are briefly introduced below. Features in these three classes are only identified as receptors where they intersect with the Section 1 Study Area for Water Environment and Flood Risk, as defined in section 6.5.

Aquatic Environment Receptors

6.3.6 The basic unit for identification of aquatic environment receptors is WFD surface water bodies, as defined in the Environment Agency Cycle 3 River Basin Management Plans (RBMPs) (Ref 10) or water-dependent designated nature conservation sites. This is to allow alignment of the EIA with the WFD assessment for the Project. However, other classes of watercourse (main river, IDB-maintained watercourse, ordinary watercourse) are also identified as receptors where appropriate.

Water Resource Receptors

6.3.7 Water resource receptors are defined within this assessment as surface water abstractions including their associated upstream catchment. The potential for impacts on water quality and water balance/flow regime in the catchments upstream of abstraction locations have been assessed in order to determine potential effects on the abstractions themselves. The assessment of abstractions in the Water Environment and Flood Risk topic is restricted to those from surface water sources. The potential for effects on groundwater abstractions is considered in **PEI Report Volume 2 Part B Section 1 Chapter 7 Geology and Hydrogeology**.

6.3.8 Discharges to surface water from other parties are also considered as receptors, although there is little scope for effects of the Project on discharges, apart from direct physical impingement, which would be avoided through imposition of suitable stand-off distances between working areas and discharge infrastructure.

Flood Risk Receptors

6.3.9 Flood risk receptors are defined within this assessment as property and infrastructure that could be at risk of flooding. Their value is defined in terms of the flood risk vulnerability classification set out in Table 2 of the Planning Practice Guidance (PPG) on Flood Risk and Coastal Change (Ref 11) that supports the NPPF (Ref 9). It is recognised that the primary purpose of the NPPF flood vulnerability classification is to guide Flood Risk Assessment (FRA) requirements for new development, but it is also considered to be a useful tool for assessing the relative value of external receptors for flood risk effects from new development.

6.3.10 The preliminary assessment for flood risk reported in this chapter only considers the impacts of the Project on flood risk to external receptors. An appraisal of the risks of

flooding to proposed project infrastructure and activities and proposed mitigation of these risks is provided in the **PEI Report Volume 2 Part C Route-wide Appendix 5A Preliminary Flood Risk Assessment**.

6.4 Assessment Methodology

- 6.4.1 The assessment scope, methodology, relevant guidance, key assumptions and limitations for the Water Environment and Flood Risk assessment are set out in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**. This includes a description of how receptor value, magnitude of impact and significance of effects are all defined and assigned to the assessment. A summary of the key components is outlined below.
- 6.4.2 The text in this section presents a summary of the approach to the assessment of impacts arising from the Project on the surface water environment and flood risk in this PEI Report. The methodology has been applied to the construction and operation phases of the Project to provide a preliminary assessment of impacts and effects. The final approach to the assessment reported in the ES which accompanies the DCO application will be kept under review, subject to further consultation with relevant statutory bodies.
- 6.4.3 The assessment methodology is generally consistent with guidance set out in LA113 from the Design Manual for Roads and Bridges (DMRB) (Ref 12). Whilst primarily intended for use in assessing the impacts of highways projects on the water environment, the methodology is widely accepted for assessing the impacts and effects of other types of linear infrastructure. The assessment methodology, particularly in respect to the value assigned to receptors, also draws on experience from previous electricity transmission projects, as well as having regard for the specific characteristics of the water environment in the Project Study Area.
- 6.4.4 A supporting FRA is being developed in accordance with the requirements of the Energy National Policy Statement EN-1 and EN-5, the NPPF, relevant local planning policy and local flood risk management guidelines published by the Lead Local Flood Authorities (LLFAs) and IDBs. The final FRA will be included with the ES. A preliminary FRA (PFRA) is included within the PEI Report as an appendix to the Water Environment and Flood Risk chapter of the Route Wide Assessment in **PEI Report Volume 3 Part C Route-wide Appendix 5A Preliminary Flood Risk Assessment**.
- 6.4.5 An assessment of compliance with the WFD will be produced in line with Nationally Significant Infrastructure Projects: Advice on the Water Framework Directive (Ref 13) and included in the ES. A summary of the assessment approach and Stage 1 Screening assessment is included within the PEIR as an appendix to the Water Environment and Flood Risk chapter of the Route Wide Assessment in **PEI Report Volume 3 Part C Route-wide Appendix 5B Preliminary Water Framework Directive Screening Assessment**.
- 6.4.6 Relevant technical guidance and standards that have informed the methodology are listed in full in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.

Assessment Assumptions and Limitations

- 6.4.7 All general assumptions and limitations for the topic are listed within **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
- 6.4.8 The decommissioning works at the existing Grimsby West Substation are yet to be defined, therefore a limitation of this preliminary assessment of effects upon the Water Environment and Flood Risk receptors is that it does not assess these works. The decommissioning works will be assessed as part of the ES.
- 6.4.9 The key parameters and assumptions which inform the assessment will be reviewed based on the design presented in the DCO application and, where required, updated, or refined, for the ES. The ES will present the final key limitations and assumptions applicable to the full assessment, particularly drawing attention to any areas that may have changed from that presented in this preliminary assessment.

6.5 Baseline Conditions

Study Area

- 6.5.1 The Study Area for the Water Environment and Flood Risk assessment includes the area within the Section 1 draft Order Limits and extends to a 500 m buffer around the draft Order Limits. This is in accordance with the Scoping Report (Ref 7) and is considered an appropriate Study Area based on the nature of the Project construction and operation (and maintenance) activities, technical knowledge of similar schemes, and an understanding of source-pathway-receptor linkages for Water Environment and Flood Risk. Beyond the 500 m buffer, effects resulting from the Project are unlikely and have therefore been scoped out. This was accepted by the Planning Inspectorate (PINS) in their Scoping Opinion (Ref 6). The Section 1 Study Area is presented in **PEI Report Volume 2 Part B Section 1 Figure 6.1 Water Environment Receptors and Study Area**.
- 6.5.2 The following sections provide a description of the baseline environment relevant to the Section 1 Study Area.

Data Collection

- 6.5.3 At this stage, the Water Environment and Flood Risk baseline has been developed on the basis of a desk-based assessment of existing data, as summarised in **Table 6.1**. A site walkover will be undertaken in 2025 to supplement the data described below and inform the assessment reported in the ES. The understanding obtained from the baseline data will be supplemented by subsequent consultation with relevant water and flood risk stakeholders. The baseline characterisation will therefore be refined where appropriate as data becomes available and as the details of the design are developed.
- 6.5.4 Environment Agency flood model outputs (including flood extent and flood depth data) for the floodplains that are proposed to be crossed by the Project infrastructure for Section 1 include:
- Main East Coast Breach Model and Report (Ref 14); and

- ii. Northern Area Tidal Modelling (NTM) East Coast Overtopping Model and Report (Ref 15).

- 6.5.5 The known or predicted current and future baseline environment described in this section has been informed by the following data sources listed in **Table 6.3**.
- 6.5.6 The Flood Map for Planning was updated in March 2025 to represent the latest available data arising from the Environment Agency's updated National Flood Risk Assessment (NaFRA2) (Ref 16). This is not reflected within this PEI Report and the screening exercise presented in the Preliminary Flood Risk Assessment (PFRA) (**PEI Report Volume 3 Part C Appendix 5A Preliminary Flood Risk Assessment**), but will inform the updated assessment reported in the ES, including the FRA submitted in support of the DCO application for the Project.

Table 6.3 Data sources used to inform baseline conditions

Data topic	Sources of information
Climate	Met Office UK Climate averages at Cleethorpes (Ref 17)
Topography	Ordnance Survey Mapping (Ref 18)
Geology	British Geological Survey (BGS) Geology of Britain Viewer (Ref 19)
Soils and land use	Department for Environment, Food and Rural Affairs (DEFRA) Multi-Agency Geographic Information for the Countryside (Magic Map) online GIS portal (Ref 20); National Soil Research Institute Soilscales map viewer (Ref 21)
Hydrology	Environment Agency Statutory Main River Map for England (Ref 22) Flood Estimation Handbook Web Service (Ref 23)
Flood risk	Environment Agency Flood Map for Planning (Ref 24) Environment Agency Risk of Flooding from Surface Water (RoFSW) (Ref 25) National Flood Risk Assessment (NAFRA) Dataset (Ref 16) Environment Agency Risk of Flooding from Reservoirs (Ref 26) Environment Agency Flood Defence Asset database (Ref 27) National River Flow Archive (NRFA) (Ref 28)
Water quality and Water Framework Directive status	Catchment Data Explorer database (Ref 29) of Cycle 2 and 3 WFD information
Water abstractions and discharge consents	Environment Agency abstraction and discharge consent data including active discharge locations, abstraction licence strategies and local authority private water supply datasets (Ref 30) (Ref 31)

Survey Work

- 6.5.7 While a Water Environment and Flood Risk walkover survey was not undertaken to inform the PEI Report, this will be undertaken in 2025 with a view to informing the ES. The objective of this walkover survey will be to conduct visual inspections to

characterise watercourses in terms of morphology, depth of water, depth of movement and water quality.

6.5.8 The following data was not available at the time of writing this PEI Report but will be available to inform the ES:

- i. Field notes and photographs collected during watercourse surveys; and
- ii. Aquatic ecology surveys, including:
 - General characteristics of watercourses to be crossed, including physical features such as length, depth, width, flow, water level, bed and bank substrate and bankside and in-channel vegetation cover;
 - Aquatic habitat appraisal surveys and assessments; and
 - Appraisal of potential presence of protected and notable species typically associated with watercourse habitats.

Further Data Requests

6.5.9 To inform the full Water Environment and Flood Risk assessment to be reported in the ES, further data requests will be made with the LLFAs and IDBs to provide information on the following:

- i. Baseline flood risk data, including available modelled flood data and local flood risk data from commissioned studies;
- ii. Further information on the location and characteristics of IDB-maintained watercourses and operation of water level management assets; and
- iii. Information on local flood risk from LLFAs (e.g. specific watercourse characteristics, local flood history, Section 19 reports, asset information and maintenance regimes).

Existing Baseline

6.5.10 The following section outlines the Water Environment and Flood Risk baseline. The baseline section should be read in conjunction with the following supporting Figures and Appendices as found within **PEI Report Volume 2** and **Volume 3** respectively:

- i. **PEI Report Volume 2 Part B Section 1 Figure 6.1 Water Environment Receptors and Study Area;**
- ii. **PEI Report Volume 2 Part B Section 1 Figure 6.2 Principal Local Water Environment Regulators;**
- iii. **PEI Report Volume 2 Part B Section 1 Figure 6.3 Surface Water Flood Risk;**
- iv. **PEI Report Volume 2 Part B Section 1 Figure 6.4 Water Framework Directive Surface Water Body Status;**
- v. **PEI Report Volume 3 Part C Route-wide Appendix 5A Preliminary Flood Risk Assessment;** and
- vi. **PEI Report Volume 3 Part C Route-wide Appendix 5B Preliminary Water Framework Directive Screening Assessment.**

- 6.5.11 Section 1 comprises the new Grimsby West Substation, an approximately 0.5km long section of new 400 kV overhead line (which continues in Section 2), modifications to approximately 2 km of existing 4KG 400kV overhead line and decommissioning (in full or part) of the existing Grimsby West Substation. Infrastructure included within the Section 1 Study Area is further discussed in **Chapter 1 Overview of the Section and Description of the Project**.
- 6.5.12 The Section 1 draft Order Limits are located within the North East Lincolnshire Council area, although the Study Area crosses into the West Lindsey District Council/Lincolnshire County Council area in the west. The 500 m buffer also intersects the district of North East Lindsey IDB in the northeast of the Study Area, as illustrated in **PEI Report Volume 2 Part B Section 1 Figure 6.2 Principal Local Water Environment Regulators**.
- 6.5.1 At this stage, baseline conditions have been assessed based upon desk-based information and will be reviewed and updated as required within the ES, based upon further field survey and data collection.

Climate

- 6.5.2 Average annual rainfall estimates for the period 1991-2020 were taken from the Met Office website (Ref 17). This demonstrates the average annual total rainfall in the locality of Section 1 was approximately 601 mm, based on the Cleethorpes station record (NGR TA307085) located approximately 7 km from the Study Area for Section 1. This is lower than the Eastern and Northeastern England regional average (1991-2020) of 793 mm.
- 6.5.3 The distribution of rainfall throughout the year varied based on the Cleethorpes 1991-2020 record. The highest monthly average precipitation was recorded during October (58 mm) followed by August (56 mm). The driest months were March (35 mm) and April (39 mm).
- 6.5.4 Average monthly maximum and minimum temperature estimates for the period of 1991-2020 demonstrate that the summer months (June - August) featured the highest monthly maximum temperatures, and the winter months (December - February) featured the lowest monthly minimum temperatures. The temperature profile is consistent with the range to be expected for the East of England.
- 6.5.5 Across the Eastern and Northeastern England districts there has been minimal increase in annual rainfall between 1991-2020. The average annual maximum temperatures and average annual minimum temperatures both exhibit an increasing trend for the same period.

Topography and Land Use

- 6.5.6 A review of Ordnance Survey (OS) mapping shows the Section 1 Study Area to be generally flat-lying, with topography gently sloping down towards the east.
- 6.5.7 The land within the Section 1 Study Area is primarily used for agricultural purposes, with some areas of woodland within the centre and east. The new Grimsby West Substation is located to the west of the Grimsby urban area, near the village of Great Coates, and to the south of the village of Healing.
- 6.5.8 Existing electricity infrastructure is present within this Section, with overhead electricity lines oriented west to east through the Section and the existing Grimsby West Substation in the east.

Hydrology and Surface Water Features

- 6.5.9 Surface water features identified within the Section 1 Study Area are shown in **PEI Report Volume 2 Part B Section 1 Figure 6.1 Water Environment Receptors and Study Area**. These comprise a network of ditches and small watercourses, all of which are designated as ordinary watercourses, some of which fall within the district of the North East Lindsey IDB. IDB districts are shown in **PEI Report Volume 2 Part B Section 1 Figure 6.2 Principal Local Water Environment Regulators**. The Section 1 Study Area is located within the Humber River Basin District (RBD).
- 6.5.10 There are no Environment Agency main rivers or canals/navigable rivers within the Section 1 Study Area. The watercourses within the Study Area generally flow in an easterly or north-easterly direction. Their catchments can be categorised as generally rural in their land use, with relatively flat topography.
- 6.5.11 North East Lindsey IDB manages 10 gravity outfalls and six pumping stations to maintain water levels along a total of 130 km of watercourse. The northeast of the Section 1 Study Area, downstream of the draft Order Limits, intersects Mawnbridge Drain Branch 3 which flows in a northeasterly direction to the Mawnbridge Pumping Station (NGR TA246124) north of Pyewipe, where it discharges to the Mouth of the River Humber.
- 6.5.12 **Table 6.4** summarises the surface water receptors considered within the preliminary assessment. The value of each receptor has been determined in accordance with **PEI Report Volume 2 Part A Chapter 4 Approach to Preliminary Environmental Information** and **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.

Table 6.4 Identified surface water receptors and associated value

Receptor	Value	Rationale
Mawnbridge Drain (GB104029067540)	High	<ul style="list-style-type: none"> A WFD designated 'blue line' river water body supporting moderate status in the Cycle 3 classifications. The WFD catchment intersects the Section 1 Study Area although the 'blue line' watercourse is located outside of the Study Area. Therefore, any effects on the 'blue line' watercourse are considered negligible. Supports RAMSAR and Humber Estuary SSSI 4 km downstream. No licensed abstractions.
Laceby Beck (GB10402906753)	High	<ul style="list-style-type: none"> A WFD designated surface water body, supporting poor status in the Cycle 2 classifications. The WFD catchment intersects the Section 1 Study Area although the 'blue line' watercourse is located outside of the Study Area. Therefore, any effects on the 'blue line' watercourse are considered negligible.

Receptor	Value	Rationale
IDB-maintained watercourses	Medium	<ul style="list-style-type: none"> One IDB-maintained watercourse (Mawnbridge Drain Branch 3, Drain Number 4C) present in the Section 1 Study Area northeast and downstream of the draft Order Limits, as shown on PEI Report Volume 2 Part B Section 1 Figure 6.1 Water Environment Receptors and Study Area. The watercourse drains in a northeasterly direction towards Mawbridge Pumping Station (NGR TA246124) before discharging to the Mouth of the River Humber.
Field drains/ordinary watercourses	Low	<ul style="list-style-type: none"> Network of heavily modified or artificial drainage channels mainly in the form of field drains along arable field boundaries under the control and management of the North East Lincolnshire LLFA. The network largely discharges into the overall catchment of the Mawnbridge Drain water body as shown on PEI Report Volume 2 Part B Section 1 Figure 6.4 Water Framework Directive Surface Water Body Status. Potential for watercourse diversions on these field drains. No licensed abstractions for Section 1.

6.5.13 There are no Environment Agency gauging stations on any of the watercourses traversing Section 1. Given that parts of the Section 1 Study Area are located in an IDB-managed pumped catchment, data from nearby flow gauging stations on other watercourses are unlikely to serve as a useful proxy for the hydrological behaviour of the catchment. Further engagement with North East Lindsey IDB will be carried out prior to finalisation of the ES to ensure that watercourse connectivity and the level management regime in this catchment is fully understood.

Water Quality and Water Framework Directive Status

6.5.14 The Section 1 Study Area is located within the catchment of Mawnbridge Drain surface water body and Laceby Beck surface water body, which are, in turn, located within the Becks Northern Operational Catchment, the Louth Grimsby and Ancholme Management Catchment and the Humber River Basin District (RBD). This is shown in **PEI Report Volume 2 Part B Section 1 Figure 6.4 Water Framework Directive Surface Water Body Status**.

6.5.15 The WFD classifications for the water bodies are informed by monitoring a range of parameters that are indicators of water quality from the Environment Agency monitoring sites.

6.5.16 Table 6.5 indicates that the water bodies in Section 1 currently achieve moderate or poor status and have a heavily modified hydromorphological designation. Mawnbridge Drain and Laceby Beck achieved a chemical status of 'fail' due to exceedance of priority hazardous substances, in particular mercury and its compounds and Polybrominated diphenyl ethers (PBDE).

- 6.5.17 Summary details of the current status for the WFD water bodies are provided in **Table 6.5** with further detail regarding reasons for not achieving good status (RNAG) and WFD objectives provided in **PEI Report Volume 3 Part C Route-wide Appendix 5B Preliminary Water Framework Directive Screening Assessment**. Information on groundwater water bodies is included in **PEI Report Volume 2 Part B Section 1 Chapter 7 Geology and Hydrogeology**.

Table 6.5 WFD water bodies in direct connectivity with Section 1

Water Body (ID)	Water Body Type	Water Body Type (Cycle 3)	Overall Water Body status (2022)*
Mawnbridge Drain Water Body (GB104029067540)	River	Heavily modified	Moderate
Laceby Beck/River Freshney Catchment (GB104029067530)	River	Heavily modified	Poor

* These are the 2022 statuses as obtained from the Catchment Data Explorer

- 6.5.18 The Section 1 Study Area is not located within a surface water Drinking Water Protected Area. Information on groundwater Safeguard Zones is included in **PEI Report Volume 2 Part B Section 1 Chapter 7 Geology and Hydrogeology**. Section 1 is located within two Nitrate Vulnerable Zones (NVZs), namely the North Beck Drain NVZ and the Laceby Beck NVZ.

Surface Water-Dependent Nature Conservation Sites

- 6.5.19 No statutory or non-statutory nature conservation sites that are dependent on surface water have been identified within the Section 1 Study Area for Water Environment and Flood Risk.
- 6.5.20 Statutory or non-statutory nature conservation sites outside the Section 1 Study Area for Water Environment and Flood Risk, such as the Humber Estuary SSSI, have been assessed in **PEI Report Volume 2 Part B Section 1 Chapter 4 Ecology and Biodiversity** and will be assessed further in the ES.
- 6.5.21 Groundwater Dependent Terrestrial Ecosystems (GWDTEs) will be addressed separately in the ES.

Water Resources

- 6.5.22 Data to characterise existing water resources has been collected from the EA and Local Authorities. Based on the available data for the Section 1 Study Area, there are no licenced surface water abstractions present. One watercourse in the Section 1 draft Order Limits has consented discharge into a freshwater tributary. Furthermore, communication with North East Lincolnshire Council reveals that details about private water supplies are currently unknown in this assessment phase and will be investigated further during preparation of the ES, to enable a detailed assessment.
- 6.5.23 An assessment of effects upon any identified groundwater abstractions, including private water supplies, is provided in **PEI Report Volume 2 Part B Section 1 Chapter 7 Geology and Hydrogeology**.

- 6.5.24 The Grimsby, Ancholme and Louth Abstraction Licensing Strategy (Ref 31) indicates the Section 1 Study Area is located in an area under considerable existing water resources abstraction pressure, with water resource being available for new abstractions less than 30 per cent of the time.
- 6.5.25 The identified water resource receptors within the Section 1 Study Area and their associated values are listed in **Table 6.6** below.

Table 6.6 Water resource receptors within the Section 1 Study Area

Receptor	Value	Rationale
Licensed discharge to freshwater tributary by The National Grid (PR3NFF554)	Low	Within the Section 1 draft Order Limits. Daily discharge of 1 m ³

Flood Risk and Land Drainage

- 6.5.26 The Environment Agency's Flood Map for Planning (Ref 24) provides an indication of the likelihood of flooding from fluvial and tidal sources, with Flood Zones 1, 2 and 3 indicating a Low, Medium and High (Ref 24) likelihood of flooding respectively. Flood Zone 2 and 3 extents are shown on **PEI Report Volume 2 Part B Section 1 Figure 6.1 Water Environment Receptors and Study Area**.
- 6.5.27 According to the Environment Agency Flood Map for Planning (Ref 24) the Section 1 Study Area is located almost entirely in Flood Zone 1 (low risk), equivalent to an annual chance of flooding from rivers and the sea of less than 1 in 1,000 (0.1 per cent).
- 6.5.28 According to the Environment Agency Asset Information and Maintenance (AIMS) database (Ref 32), there are no flood formal defences present within the Section 1 Study Area.
- 6.5.29 The Risk of Flooding from Surface Water map (Ref 25) shows that most of the land at the location of the proposed new Grimsby West Substation is at very low risk of surface water flooding (annual chance of flooding of less than 0.1 per cent). However, the northern boundary of the proposed substation has a surface water flow path flowing from northeast to southwest, indicating there is a risk of flooding between 3.33 per cent and 0.1 per cent (shown on **PEI Report Volume 2 Part B Section 1 Figure 6.3 Surface Water Flood Risk**).
- 6.5.30 In addition, the proposed access road to the substation is at low to high risk of surface water flooding (annual chance of flooding between 3.3 per cent and 0.1 per cent) associated with a land drain parallel to the eastern boundary flowing from/to Wybers Wood.
- 6.5.31 Risk of flooding from sewers is not considered as a significant source of flooding in the Section 1 Study Area, due to the predominantly rural setting of the Project.
- 6.5.32 Tidal flooding does not pose a risk to Section 1 of the Project due to the height of the land across the Study Area (>10 mAOD).
- 6.5.33 The Environment Agency on-line flood risk mapping for reservoirs (Ref 27) shows watercourses that could convey floodwater originating from the failure of upstream

reservoirs. There is no risk of flooding from reservoir failure identified within the Section 1 Study Area.

- 6.5.34 A number of external receptors for flood risk effects from the Project have been identified within the Section 1 Study Area. The receptors identified and their associated value are listed in **Table 6.7** below.

Table 6.7 Identified flood risk receptors and associated value

Receptor	Value	Rationale
Agricultural land and undeveloped land	Low	Water compatible development.
Agricultural premises and commercial property designated as 'Less Vulnerable'	Medium	Less vulnerable development.
Residential properties and other 'Highly Vulnerable' development types and access roads designated as 'More Vulnerable'. This includes Wybers Wood residential area, Pyewipe Farm and residential properties to the north of the draft Order Limits along Carr Lane	High	More vulnerable development.
The existing National Grid Grimsby West substation is identified as 'Essential Infrastructure' with a higher vulnerability to flooding.	Very High	Essential infrastructure or highly vulnerable development.

Future Baseline

- 6.5.35 The future baseline relates to known or foreseeable changes to the current baseline in the future, against which the effects of the Project during construction and operation can be assessed. Specifically, it accounts for anticipated changes including: those caused by changing climatic conditions, policy, legislation, advances in technology and by other confirmed development projects which will be complete prior to construction of the Project.
- 6.5.36 At this preliminary stage, a full assessment of the implications of any committed development projects with regard to future baseline conditions has not been undertaken. A list of the currently known developments which are anticipated to be included within the future baseline scenario is provided within **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope Annex A Developments for Consideration Within the Future Baseline**. This will be reviewed and updated as appropriate during development of the ES, as with other information which informs assessment of the future baseline.

Climate and Flood Risk

- 6.5.37 Climate change is likely to lead to significant changes in hydrological conditions within the Section 1 Study Area over the lifetime of the Project. Outputs from

UKCP18 (Ref 33) and the Future Flows and Groundwater Levels (FFGWL) Project (Ref 34) will be used to assess likely changes in ambient conditions for the purposes of the future baseline.

- 6.5.38 The FFGWL project is the first of its kind to conduct a consistent assessment of the impact of climate change on river flows and groundwater levels across Great Britain. The project modelled a total of 282 river catchments and 24 boreholes to capture the range of climate, land use, geological and geographical characteristics found in England, Wales and Scotland. The outputs aid the study of the impact of climate change on water availability and allows river basin management plans to be tested for robustness (Ref 35). Analysis of the impact of climate change on transient flows for watercourses traversing the Section 1 Study Area has not been conducted due to the lack of location specific data. However, a datapoint from an upstream catchment of the River Lud (29003), crossed by the Section 2 draft Order Limits, indicates that transient flows are predicted to decrease at all flow percentiles across all models. For the Q30 flow percentile, a decrease of up to 20 per cent by 2080 is predicted by most models. At the Q90 flow percentile, decrease in transient flows range between 10 and 30 per cent by 2080, depending on the model used (Ref 36). An assessment of seasonal average changes within the region of the Section 1 Study Area indicates that in the 2050s winter flows will increase up to 20 per cent or even 40 per cent in some scenarios, spring flows will decrease by up to 20 per cent in most scenarios, summer flows will decrease up to 40 per cent in most scenarios and autumn flows will decrease by up to 20 per cent in most scenarios (Ref 37).
- 6.5.39 For the FRA to be completed in support of the ES, the impacts of climate change on future flood risk will be assessed in line with current EA guidance (Ref 38). Current EA recommendations for climate change factors to be applied to extreme rainfall and river flows for the Project area are summarised in **Table 6.8**, **Table 6.9** and **Table 6.10** below. These factors are based on analysis of UKCP18 climate model outputs for rainfall and from hydrological models driven by UKCP18 rainfall outputs.

Table 6.8 Peak river flow climate change allowances for the Louth Grimsby and Ancholme Management Catchment (Ref 39)

Allowance Category	Potential Change Anticipated for the 2020s	Potential Change Anticipated for the 2050s	Potential Change Anticipated for 2080s
Upper	21%	19%	33%
Higher	9%	5%	12%
Central	4%	-1%	4%

Table 6.9 3.3 per cent Annual exceedance probability (AEP) peak rainfall climate change allowances for the Louth Grimsby and Ancholme Management Catchment (Ref 39)

Allowance Category	Potential Change Anticipated for the 2050s	Potential Change Anticipated for the 2070s
Upper	35%	35%
Central	20%	25%

Table 6.10 1 per cent AEP peak rainfall climate change allowances for the Louth Grimsby and Ancholme Management Catchment (Ref 39)

Allowance Category	Potential Change Anticipated for the 2050s	Potential Change Anticipated for the 2070s
Upper	40%	40%
Central	20%	25%

6.5.40 Net sea level rise in northern England will be lower than in the south due to glacial isostatic adjustment¹, which causes the northern parts of the UK to rise slowly. In the Humber region, net sea level rise from the year 2000 is projected to increase by 1.15 to 1.55 m by 2125, based on higher central and upper end allowances (Ref 38). In the Anglian region, net sea level rise from the year 2000 is expected to increase by 1.20 to 1.60 m by 2125, according to the same allowances (Ref 38).

¹ **Glacial Isostatic Adjustment (GIA):** During the last Ice Age, massive ice sheets covered much of northern Europe, including parts of the UK. The weight of these ice sheets caused the Earth's crust to depress.

1. **Post-Glacial Rebound:** After the ice sheets melted, the crust began to slowly rebound or rise. This process is still ongoing today. In northern England, the land is rising more significantly due to this rebound effect.
2. **Relative Sea Level Changes:** Because the land in northern England is rising, the relative sea level rise is lower compared to the south. In southern England, the land is not rising as much, and in some areas, it might even be subsiding slightly. This makes the relative sea level rise appear higher in the south

This difference in land movement due to GIA is why you see varying rates of sea level rise across different parts of the UK.

Topography and Land Use

- 6.5.41 Land use change can affect the permeability of the ground, which can affect surface water run-off. Given that most of the land within the Section 1 Study Area is productive agricultural land outside of established settlement boundaries, it is unlikely that the run-off regime will change significantly. However, the surrounding areas of the New Grimsby West Substation, on the western edge of Grimsby, could be subject to further suburban development in the future (e.g. for housing). Developers will be obliged by the requirements of the NPPF to ensure that surface runoff is managed within developments, so as not to increase flood risk to others.

Water Quality and Water Framework Directive Status

- 6.5.42 Given the current status of the WFD water bodies within the Study Area is moderate or poor, it is anticipated the future status will improve, ultimately to good, as required by the WFD. Improvements to WFD waterbody status associated with improvements to individual quality elements (i.e., PBDE) would result in higher-quality aquatic environments in these water bodies. Given that the sensitivity of WFD water bodies is not determined by their status, this does not influence the assessment relative to the existing or future baseline.
- 6.5.43 The WFD reasons for not achieving good status within the Study Area are included in **PEI Report Volume 3 Part C Route-wide Appendix 5B Preliminary Water Framework Directive Screening Assessment**.

Water Resources

- 6.5.44 The location and rate of surface water abstractions in the area could vary over time. The Grimsby, Ancholme and Louth ALS (Ref 31) suggests that there is existing restricted water availability in the region of Section 1. Therefore, any new licences would be subject to volume, hands-off flow and/or minimum residual flow restrictions, to ensure sufficient flow remains for environmental purposes.

6.6 Design, Control and Additional Mitigation Measures

Design Mitigation Measures

- 6.6.1 The Project and draft Order Limits have been designed to avoid sensitive receptors as far as practicable. This is in accordance with the 'Holford Rules' (Ref 40) applicable to routing of new overhead lines and the 'Horlock Rules' (Ref 41) which apply to design and siting of substations. These approaches are explained in further detail within the Corridor Preliminary Routeing and Siting Study (CPRSS) (Ref 42) and **PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered**. Principles include, but are not limited to, seeking to avoid areas of highest amenity, cultural or scientific value, taking advantage of natural screening provided by existing landform and features (e.g. woodland) and keeping visual, noise and other environmental effects to a minimum.
- 6.6.2 In Section 1 this has included locating the draft Order Limits to avoid sensitive Water Environment and Flood Risk receptors, where practicable, which is also consistent with the sequential approach to management of flood risk advocated in NPS EN-1 (Ref 43); and NPPF (Ref 9).

- 6.6.3 As part of the process of ongoing Project design, the Water Environment and Flood Risk team will work alongside other environmental disciplines and the design team to ensure that appropriate mitigation is incorporated into the final design for permanent infrastructure to minimise effects on Water Environment and Flood Risk receptors. These include, but are not limited to, the following:
- i. Any flood protection measures required for the new substation will be designed in accordance with National Grid internal guidance on substation flood resilience and consistent with planning policy requirements to ensure no increased flood risk to third parties.
 - ii. New substation surface water drainage systems will provide attenuation of runoff from impermeable surfaces to greenfield rates and incorporate appropriate pollution prevention measures, incorporating the use of Sustainable Urban Drainage Systems (SuDS) as far as practicable.
 - iii. If watercourse diversions are required to provide sufficient space for the new substation platform, then these will be designed to provide an equivalent conveyance capacity to the existing watercourses and will incorporate morphological features to promote aquatic biodiversity to a level that is consistent with maintaining effective land drainage. Culverting will be avoided as far as practicable.
 - iv. Any requirements for water supply and foul water treatment and disposal for office and welfare facilities at substations will be designed to minimise impacts on water resources and receiving water quality.
- 6.6.4 The preliminary assessment of effects presented herein assumes that the additional design mitigation set out above will be implemented. The specific details of these measures will be developed for the ES for the DCO application.

Control Mitigation Measures

- 6.6.5 A Preliminary CoCP is provided in **PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice**. General measures included within the Preliminary CoCP relevant to the Water Environment and Flood Risk assessment of Section 1 include:
- i. GG03: Suitably experienced Environmental Advisers will be appointed for the duration of the construction phase. In addition, qualified and experienced Environmental Clerks of Works (EnvCoW) will be available during the construction phase to advise, supervise and report on the delivery of the mitigation methods and controls outlined in the Management Plans. The EnvCoW(s) will monitor that the works proceed in accordance with relevant environmental DCO requirements and adhere to the required good practice and mitigation measures. The EnvCoW(s) will be supported as necessary by appropriate specialists, including ecologists and arboriculturists, soils and land drainage experts.
 - ii. GG04: Construction workers will undergo training to increase their awareness of environmental issues as applicable to their role on the Project. Topics will include where appropriate:
 - pollution prevention and pollution incident response;
 - dust management and control measures;

- location and protection of sensitive environmental sites and features;
 - adherence to protected environmental areas around sensitive features;
 - working hours and noise and vibration reduction measures;
 - working with potentially contaminated materials;
 - waste management and storage;
 - flood risk response actions;
 - agreed traffic routes, access points, etc.;
 - soil management; and
 - drainage management.
- iii. GG05: A record of condition will be carried out (photographic and descriptive) of the working areas that may be affected by the construction activities, prior to works commencing. This record will be available for comparison following reinstatement after the works have been completed to ensure that the standard of reinstatement at least meets that recorded in the pre-condition survey.
- iv. GG06: A Construction Environmental Management Plan (CEMP), a Landscape and Ecological Management Plan (LEMP), a Materials and Waste Management Plan (MWMP) and a Construction Traffic Management Plan (CTMP), Emergency Action Plan, Public Rights of Way Management Plan (PRoWMP), Overarching Written Scheme of Investigation (WSI), Biodiversity Management Plan, Noise and Vibration Management Plan, Pollution Prevention Plan, Foundation Works Risk Assessment, Carbon efficiency Plan, Dust Management Plan (DMP), DrMP along with a Soil Management Plan (SMP) will be produced prior to construction. These are collectively referred to as ‘the environmental control Plans.’
- i. GG07: The CEMP will set out site specific measures and construction methodologies to avoid or reduce potential effects of the Project on the environment during construction. The contractor(s) shall undertake regular site inspections to check conformance to the Management Plans.
- ii. GG15: Fuels, oils and chemicals will be stored responsibly, away from sensitive water receptors. Where practicable, they will be stored >15 m from watercourses, ponds and groundwater dependent terrestrial ecosystems. Where it is not practicable to maintain a >15 m distance, additional measures will be identified. All refuelling, oiling and greasing of construction plant and equipment will take place above drip trays or other suitable controls and also away from drains as far as is reasonably practicable. Vehicles and plant will not be left unattended during refuelling. Appropriate spill kits will be made easily accessible for these activities. Potentially hazardous materials used during construction will be safely and securely stored including use of secondary containment where appropriate. Stored flammable liquids such as diesel will be protected either by double walled tanks or stored in a bunded area with a capacity of 110% of the maximum stored volume. Spill kits will be located nearby.
- iii. GG16: Runoff across the site will be controlled through a variety of methods including header drains, buffer zones around watercourses, on-site ditches, silt traps and bunding. There will be no intentional discharge of site runoff to ditches, watercourses, drains or sewers without appropriate treatment and agreement of the appropriate authority (except in the case of an emergency).

- iv. GG17: Wash down of vehicles and equipment will take place in designated areas within construction compounds. Wash water will be prevented from passing untreated into watercourses and groundwater. Appropriate measures will include use of sediment traps, daily checks and ongoing monitoring.
- v. GG23: Stone pads or similar will be installed in areas where heavy equipment, such as cranes and piling rigs, are to be used. The stone pads will provide stable working areas and will reduce disturbance to the ground. The stone pad area will be stripped of the topsoil, which will be stored and reinstated in accordance with the Soil Management Plan.

6.6.6 The control and management measures included within the Preliminary CoCP specific to the Water Environment and Flood Risk include:

- i. W01: All works affecting watercourses or within the relevant permitting stand-off distance from the top of bank or landward toe of a flood defence on main rivers and IDB-maintained watercourses will be in accordance with a method approved under consents issued under the Environmental Permitting Regulations 2016, Land Drainage Act 1991, IDB Byelaws (where relevant) or the protective provisions of the DCO for the benefit of the Environment Agency, LLFAs and IDBs. Where possible, a stand-off distance from the top of bank of all watercourses/waterbodies will be established (with the exception of crossings and where existing field access roads are already located adjacent to watercourses are to be utilised). To align with Environment Agency and IDB consenting requirements, it is proposed that this will be: 16m for tidal main rivers; 8m for non-tidal main rivers; and 9m for IDB-maintained watercourses. No statutory stand-off distances are specified for ordinary watercourses, but any works liable to cause an obstruction to flow would be subject to consent under the Land Drainage Act 1991. Appropriate stand-off distances should also be implemented where Project construction activities coincide with water supply and sewerage infrastructure. These are to be agreed on a case-by-case basis. For any instances where the stand-off distances stated above cannot be achieved between construction works and watercourses, these works would be subject to the appropriate consent by the relevant drainage authority (Flood Risk Activity Permit (FRAP) for main rivers, Ordinary Watercourse Consent (OWC) for ordinary watercourses).
- ii. W02: For open cut watercourse crossings and installation of vehicle crossing points, good practice measures will include but not be limited to, where practicable:
 - reducing the working width for open cut crossings of a main or ordinary watercourse whilst still providing safe working;
 - installation of a pollution boom downstream of open cut works;
 - the use and maintenance of temporary lagoons, tanks, bunds, silt fences or silt screens as required;
 - have spill kits and straw bales readily available at all crossing points for downstream emergency use in the event of a pollution incident;
 - the use of all static plant such as pumps in appropriately sized spill trays;
 - prevent refuelling of any plant or vehicle within 15 m of a watercourse;
 - prevent storing of soil stockpiles within 15 m of a main river;

- inspect all plant prior to work adjacent to watercourses for leaks of fuel or hydraulic fluids; and
 - reinstating the riparian vegetation and natural bed of the watercourse, using the material removed when appropriate, on completion of the works and compacting as necessary. If additional material is required, appropriately sized material of similar composition will be used.
- iii. W03: Riverbank and in-channel vegetation will be retained where not directly affected by installation works. As far as possible, natural substrate will be provided through temporary watercourse crossing culverts.
 - iv. W04: Where watercourses are to be crossed by construction traffic, measures to be applied include the use of temporary culverts or temporary clear span bridges. Once the temporary culvert is installed, the area above the temporary culvert will be backfilled and construction mats placed over the backfilled area to permit the passage of plant, equipment, materials, and people. Temporary culverts will be sized to reflect the span width and the estimated flow characteristics of the watercourse under peak flow conditions and kept free from debris. Where used, temporary bridges will be designed specifically to consider the span length and the weight and size of plant and equipment that will cross the bridge. Where flood defences are present, crossing design should ensure that their integrity and standard of protection are preserved. Watercourse bed, banks and any flood defences will be subject to full reinstatement on removal of temporary watercourse crossings on completion of construction works. Specific detailed designs for each watercourse crossing, consistent with these design principles, will be prepared by the construction contractor. These will be subject to the appropriate consent by the relevant drainage authority (FRAP from the Environment Agency for main rivers; OWC from the LLFA or IDB for ordinary watercourses).
 - v. W05: The contractor(s) will comply with all relevant consent conditions or DCO provisions regarding de-watering and other discharge activities. This will particularly be with regard not only to volumes and discharge rates, but also to water quality (particularly suspended solids, pH and hydrocarbons) and will include discharges to land, water bodies or third-party drains/sewers.
 - vi. W06: The Project will incorporate appropriate surface water drainage measures into its final design for the haul roads, access tracks, works compounds and laydown areas so that they do not lead to a significant increase in flood risk. Access roads (and working areas) in the floodplain are to be as close to ground level as possible (a slight raised surface, relative to the adjacent land, is often required to allow for drainage). This is to minimise the loss of floodplain storage volumes associated with raised structures such as raised access roads, working areas and associated topsoil stockpiles. Cross drainage would be provided as necessary at topographic low points. Stockpiles would be located outside of the floodplain as far as reasonably practicable. Approaches to bridges and culverts in Flood Zones would minimise ramping up to the bridge deck so as not to impede flood flow conveyance.
 - vii. W07: The contractor(s) will subscribe to the EA's Floodline service, which provides advance warning of potential local flooding events, and subscribe to the Met Office's Weather Warnings email alerts system and any other relevant flood warning information. The contractor(s) will implement a suitable flood risk action

- plan, which would form part of the Emergency Action Plan, and will include appropriate evacuation procedures should a flood occur or be forecast.
- viii. W08: Active private water supplies will be identified with landowners through the landowner discussions. Appropriate measures would be considered during construction to prevent any water quality deterioration from pollution. In the event of a landowner or tenant reporting that installation activities have affected their private water supplies, an initial response will be provided within 24 hours. Where the installation works have affected a private water supply, an alternative water supply will be provided, as appropriate.
 - ix. W09: In the event of a significant spill during construction, all relevant landowners/tenants will be contacted within 24 hours, within 250 m of the spill, to determine if there are any private water supplies that might be affected; an assessment of the likelihood of groundwater contamination reaching identified private water supplies will be undertaken, and where a private water supply is judged likely to be affected, an alternative water supply will be provided, as appropriate.
 - x. W10: Severance of existing land drainage routes, including agricultural field drainage systems would be managed during construction through provision of temporary alternative drainage routes, and these drainage systems would be permanently reinstated to ensure their existing function is maintained.
 - xi. W11: Appropriate control of runoff from working areas will be achieved through implementation of a DrMP for the construction phase. The DrMP will use sustainable urban drainage systems (SuDS) principles, promoting infiltration of runoff wherever possible and specifying appropriate treatment and attenuation storage to ensure any discharges to watercourses are uncontaminated and limited to greenfield rates. The DrMP will cover all aspects of construction works and temporary infrastructure. Drainage measures will be phased to be completed before the commencement of earthwork operations, in a specific area, and will be retained until the drainage system of the completed Project is fully operational, or site restoration works are completed. This will include the temporary diversion of existing agricultural drainage around working areas, if required, followed by reinstatement on completion of works. At this stage of the design process, preliminary work has already been done to identify runoff treatment and attenuation requirements for temporary access tracks and working areas associated with overhead line construction, including defining potential locations of water treatment areas and discharge outfalls. Further work is required to develop drainage strategies for substations, considering arrangements for both construction and operational phases of the Project, which will be reported as part of the ES chapter and FWRA in submission with the DCO application.

Additional Mitigation Measures

- 6.6.7 Additional mitigation measures are those required to reduce likely significant adverse environmental effects which may still occur despite the inclusion of the embedded design and control measures described above.
- 6.6.8 Based upon the preliminary assessment, additional mitigation measures are not anticipated to be required within Section 1 in relation to Water Environment and

Flood Risk effects. However, this will remain under review during the completion of further assessment and development of the ES.

- 6.6.9 No additional mitigation measures have been assumed within the Preliminary Assessment of Effects reported in the following sections.

6.7 Preliminary Assessment of Effects

- 6.7.1 The following section presents the findings of the preliminary assessment of effects upon Water Environment and Flood Risk receptors identified within the Section 1 Study Area, as a result of construction, operational and/or maintenance activities.
- 6.7.2 The preliminary assessment of effects reported below takes into account the Design and Control mitigation measures previously described.
- 6.7.3 For a summary of the likely significant effects please refer to **PEI Report Volume 2 Part B Section 1 Chapter 13 Summary**. A supplementary summary of all non-significant effects is also included within this Section in **Table 6.11**, based upon the assessment scope detailed in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
- 6.7.4 It is noted that this is an ongoing assessment and is subject to change due to the ongoing design development of the Project, statutory consultation feedback and further stakeholder engagement. A full assessment will be included within the ES submitted with the DCO application.

Infrastructure Overview

- 6.7.5 The receptors listed in section 10.5 have the potential to be directly or indirectly impacted due to the construction and permanent presence of the new pylons, the new Grimsby West Substation, including the associated permanent access road, and modified existing overhead line.
- 6.7.6 The proposed temporary and permanent features within Section 1 are illustrated on the following figures:
- i. **PEI Report Volume 2 Part B Section 1 Figure 1.2 Permanent and Operational Features;**
 - ii. **PEI Report Volume 2 Part B Section 1 Figure 1.3 Temporary and Construction Features**
- 6.7.7 The permanent access road for the new Grimsby West Substation would require a permanent watercourse crossing of an existing ordinary watercourse to the west of Wybers Wood.
- 6.7.8 The proposed location of the new Grimsby West Substation would require works to ordinary watercourses, including watercourse crossings (closed culverts) and/or diversions. Design of any permanent diversions of these watercourses is ongoing and further information on this element will be provided within the ES.
- 6.7.9 Temporary watercourse crossing would also be required to facilitate access during construction of new overhead line and modification of existing overhead lines. As set out within **PEI Report Volume 3 Part A Appendix 5C Indicative Bridge and Culvert Schedule**, five temporary crossings are currently assumed to be required

within Section 1. Temporary construction compounds would also be established adjacent the proposed new Grimsby West Substation site.

- 6.7.10 Lattice pylons, used in the Project, minimally obstruct water flow and do not significantly affect floodplain storage or conveyance. Furthermore, pylons are resilient to water damage from occasional flooding, and the conductors are located sufficiently above the highest flood level conceivable over the lifetime of the Project, ensuring that they would remain operational during a flood event and would not pose a safety risk.

Likely Significant Effects

Construction

- 6.7.11 Based upon the preliminary assessment, no significant effects are predicted upon Water Environment and Flood Risk receptors within the Section 1 Study Area, as a result of the construction phase of the Project. Further discussion is provided in the following sections in relation to the predicted non-significant effects of the Project.

Operation and Maintenance

- 6.7.12 Based upon the preliminary assessment, no significant effects are predicted upon Water Environment and Flood Risk receptors within the Section 1 Study Area, as a result of the operational phase of the Project. Further discussion is provided in the following sections in relation to the predicted non-significant effects of the Project.

Non-Significant Effects

- 6.7.13 For completeness, **Table 6.11** summarises the findings of the preliminary assessment with respect to those impacts that are not predicted to result in significant Water Environment and Flood Risk effects.

Table 6.11 Preliminary summary of non-significant Water Environment and Flood Risk effects – Section 1

Impact	Receptor	Value of Receptor ¹	Magnitude of Change ²	Significance ³	Rationale
Construction					
Aquatic Environment Receptors					
Deterioration in the water quality of aquatic environment receptors via generation of sediment laden run-off as a result of construction activities, e.g., watercourse crossings and excavations	WFD river water bodies (referred to in Table 6.4 and Table 6.5)	High	Negligible	Not Significant (Negligible)	During construction of the substation and associated overhead line connections there is potential to generate sediment laden runoff which could, in absence of an appropriate embedded measures, adversely affect water quality in surface water receptors. Activities that could potentially produce sediment-laden runoff include:
	IDB-maintained watercourses and ordinary watercourses (referred to in Table 6.4)	Low – Medium	Small adverse	Not Significant (Minor)	<ul style="list-style-type: none"> • Construction and removal of access routes, construction compounds and working areas (including topsoil stripping, earthworks and excavations); • Runoff from installed access routes, temporary construction compounds and working areas; • Direct sediment disturbance from in channel works for the construction of access crossings; • Potential diversion/realignment of ordinary watercourses and IDB watercourses; and • The use and management of soil stockpiles. <p>The assessment of suspended sediment-related effects is considered precautionary, given that the watercourses across the Study Area are likely to experience baseline variation in suspended sediment due to agricultural practice in the area.</p>

					Assuming the implementation of embedded environmental measures included in the Preliminary CoCP (including GG04, GG16, W01, W02, W05 and W11) predicted effects on the watercourses due to sediment laden run-off are Negligible or Minor and therefore not significant.
Potential impacts on hydromorphology and flow conveyance as a result of increased sediment inputs from watercourse disturbance (including from new watercourse crossings).	WFD river water bodies (referred to in Table 6.4 and Table 6.5)	High	Negligible	Not Significant (Negligible)	<p>Works directly affecting watercourses, such as crossings and diversions, could result in a direct impact on hydromorphology. The direct impacts would be mitigated through the implementation of the measures set out within the Preliminary CoCP. This includes W01, W02 and W04. As a result, predicted effects are not significant.</p> <p>Where there is a requirement to undertake works in and around the watercourses, including installation of access crossings (assumed to be culverts for most watercourses), the footprint of these would be kept to a practicable minimum and ensure minimum change to existing morphology and flow conveyance by adhering to environmental measure W02.</p> <p>Excess sediment ingress via runoff from working areas could indirectly influence these characteristics, for example due to a subsequent build-up of sediment within the channel.</p> <p>Any potential increases in sediment-laden runoff from working areas would be mitigated through the embedded environmental measures outlined in the Preliminary CoCP (including GG03, GG16, W01, W02, W04, W05 and W11). As a result, effects are not significant.</p>
	IDB-maintained watercourses and ordinary watercourses (referred to in Table 6.4)	Low – Medium	Small adverse	Not Significant (Minor)	

Deterioration in the water quality of aquatic environment receptors affected by mobilisation of contaminants from contaminated soil or accidental spillage of pollutants (e.g.. fuel or oil).	WFD river water bodies (referred to in Table 6.4 and Table 6.5)	High	Negligible	Not Significant (Negligible)	<p>The construction works have the potential to affect water quality conditions within surface water features via:</p> <ul style="list-style-type: none"> • accidental spillage of fuel, oil, concrete or other chemicals used during construction; • mobilisation/leaching of contaminants from historical soil contamination during excavation works; and • contaminated water pumped from excavations.
	IDB-maintained watercourses and ordinary watercourses (referred to in Table 6.4)	Low – Medium	Small adverse	Not Significant (Minor)	<p>The proposed embedded measures to prevent surface water pollution are set out in the Preliminary CoCP and include GG03, GG15, GG16, GG22, W02, W05, W09 and W11.</p> <p>Assuming the implementation of these measures, predicted effects on surface water receptors and water resources/WFD receptors due to potential mobilisation and release of pollutants are not significant.</p>
Deterioration in the water quality of aquatic environment receptors affected by mobilisation of contaminants in groundwater and subsequently surface water	WFD river water bodies (referred to in Table 6.4 and Table 6.5)	High	Negligible	Not Significant (Negligible)	<p>The risk of pollution of groundwater as a result of project construction activities would be controlled through preparation of a Foundation Works Risk Assessment (FWRA) in accordance with measures GH02 of the Preliminary CoCP. This would specify the use of suitable piling methods to prevent the creation of pathways for vertical groundwater movement between superficial and deeper aquifers.</p>
	IDB-maintained watercourses and ordinary watercourses (referred to in Table 6.4)	Low – Medium	Small adverse	Not Significant (Minor)	<p>Therefore, in this preliminary assessment, effects upon surface water receptors resulting from the mobilisation of ground contaminants are not significant.</p>

Impact from any dewatering for construction from temporary works impacting groundwater – surface water interactions.	WFD river water bodies (referred to in Table 6.4 and Table 6.5)	High	Negligible	Not Significant (Negligible)	<p>Any discharge of water generated during construction (e.g. from pylon foundation excavations) to land would be of unpolluted water only and undertaken in accordance with control measure W05 within the Preliminary CoCP.</p> <p>There is generally a sufficient cover of superficial deposits so it is not proposed to investigate the underlying chalk bedrock strata. The majority of construction work would be in the superficial deposits and not within the bedrock, so there would be no requirement for dewatering of the bedrock aquifers and therefore, no significant effects.</p> <p>The risk of mobilisation of pre-existing contamination would be managed through control measures within the Preliminary CoCP, including GH02 and GH11.</p>
	IDB-maintained watercourses and ordinary watercourses (referred to in Table 6.4)	Low – Medium	Small adverse	Not Significant (Minor)	<p>For the superficial deposits, limited groundwater level information is available at this stage of the assessment. It is assumed dewatering within the superficial deposits would be required to facilitate construction. Where dewatering is required, temporary measures would be undertaken in accordance with EA guidance and in line with control measures. Groundwater effects on flows and levels are predicted to be limited and as a result, there is a limited scope for groundwater dependent surface water flows to be affected.</p> <p>Therefore, predicted effects upon surface water receptors due to dewatering of temporary works areas are not significant.</p>

Water Resource Receptors

<p>The potential effects noted above for surface water aquatic environment receptors could also have implications for surface water resource availability.</p>	<ul style="list-style-type: none"> • Licensed surface water abstractions • Unlicensed surface water abstractions for private water supply • Discharges to surface waters 	Low	Negligible	Not Significant (Negligible)	<p>No surface water abstractions were identified within the Section 1 Study Area. The consented discharge identified within the Section 1 draft Order Limit is upstream of Project works. There is therefore no scope for a direct effect on the discharge infrastructure as a result of the Project. Any indirect effects on flow or quality in receiving watercourses as a result of the construction of the Project would not affect the ability of the discharge to operate as consented. It is therefore concluded that predicted effects on water resource receptors within the Section 1 Study Area are not significant.</p>
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Flood Risk Receptors

<p>Changes to fluvial flood risk associated with loss of floodplain storage and/or change in floodplain flow conveyance.</p> <p>and</p> <p>Changes to fluvial flood risk associated with compartmentalisation of the floodplain.</p>	Property and Infrastructure at risk of flooding	Low – Very High	Negligible	Not Significant (Negligible to Minor)	<p>The land within the Section 1 draft Order Limit is within Flood Zone 1. As a result, the construction of infrastructure within this zone has no potential to reduce or displace floodplain storage and subsequently adversely impact flood risk.</p> <p>It is assumed temporary works would include stockpiling of materials within the floodplain, due to both the temporary storage of soils and the import of aggregate for the design elements. As the Study Area is within Flood Zone 1, the construction of access routes, presence of stockpiles, watercourse crossings and working areas would not have the potential to compartmentalise the floodplain and therefore, would not obstruct water flow.</p> <p>The construction of the overhead line and substation would not result in a loss of functional</p>
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floodplain as the Study Area is within Flood Zone 1. Therefore, the predicted effects of the operation of Section 1 Project infrastructure on flood risk receptors are considered negligible to minor and are not significant.

Changes to watercourse flow conveyance arising from the presence of new or modified temporary watercourse crossings. This has the potential not only to affect the morphology of aquatic environment receptors, but to increase the risk of flooding to flood risk receptors.	Property and Infrastructure at risk of flooding	Low – Very High	Negligible	Not Significant (Negligible to Minor)	<p>There are 5 new temporary watercourse crossings proposed within the draft Order Limits within Section 1. In the absence of appropriate measures, these crossings could impact flow conveyance, which could potentially influence flood risk upstream of the watercourse crossing.</p> <p>The proposed embedded measures to prevent an increase in surface water flood risk due to changes in existing watercourse flow conveyance are set out in the Preliminary CoCP and include W02, W04 and W10.</p> <p>Based upon the implementation of these measures, predicted effects upon flood risk due to new or temporary watercourse crossing are not significant.</p>
Changes to surface water flood risk due to changes in runoff rates resulting from ground disturbance and creation of impermeable surfaces, and to changes in surface water runoff pathways due to changes in ground surface levels.	Property and Infrastructure at risk of flooding	Low – Very High	Negligible	Not Significant (Negligible to Minor)	<p>During construction, there would be temporary changes to land surface permeabilities. Temporary surfaces with lower permeability relative to the baseline include stone aggregate surfaces on the following: access tracks, pylon working areas, stringing platforms, contractor compounds and laydown areas. It is assumed Type 1 aggregate would be used, which has a lower permeability than the soils present across the majority of the Study Area. However, this finish is not as impermeable as tarmac or concrete.</p> <p>Changes to surfacing resulting from temporary works could reduce rainfall infiltration rates,</p>

increase runoff rates, and induce overland flow during construction. This could contribute to localised changes to the land drainage regime, resulting in ponding of water or waterlogging of soils. Areas with a sloping topography where topsoil has been stripped would be particularly vulnerable to these changes. Any potential watercourse diversions may also disrupt or sever existing field drainage systems, dependent on the alignment of any diversions.

The proposed embedded measures to prevent an increase in surface water flood risk during construction are set out in the Preliminary Code of Construction Practice, and include W06, W10 and W11.

Based upon the implementation of these embedded measures, effects on flood risk receptors due to changes in run-off rates and pathways during the construction phase are predicted to be negligible to minor adverse, and therefore not significant.

Impacts on the integrity of flood defence and land drainage infrastructure as a result of physical impingement of Project infrastructure.	Property and Infrastructure at risk of flooding	Low – Very High	Negligible	Not Significant (Negligible)	<p>No flood defence or land drainage infrastructure is present within the Section 1 Study Area, therefore there is no pathway to effect.</p> <p>As a result, associated effects on flood risk receptors during the construction phase are predicted to be negligible, and therefore not significant.</p>
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Operational Phase

Aquatic Environment and Water Resources Receptors

Increased pollution from storage of	WFD river water bodies (referred	High	Negligible	Not Significant (Negligible)	The substation has the potential to affect water quality conditions and therefore, aquatic
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potential pollutants such as oil-filled transformers.	to in Table 6.4 and Table 6.5)				environment receptors within the associated water features via the introduction of contaminants.
	IDB-maintained watercourses and ordinary watercourses (referred to in Table 6.4)	Low - Medium	Small adverse	Not Significant (Minor)	Substation drainage design would incorporate suitable pollution prevention measures for surface runoff through the use of SuDS, plus containment and oil interceptors for transformers as required. Foul drainage arisings from welfare facilities on the site would either be discharged to the mains sewer network or tankered off site to an appropriate permitted treatment facility. Overhead line maintenance would involve light vehicles using existing agricultural access, and would not involve significant ground disturbance. Therefore, the predicted effects of the operation of Section 1 on aquatic environment receptors and water resources are considered negligible to minor and are not significant.

Flood Risk Receptors

Changes to surface water flood risk due to changes in runoff rates resulting from the creation of impermeable surfaces, and to changes in surface water runoff pathways due to changes in ground surface levels.	Property and Infrastructure at risk of flooding	Low – Very High	Negligible	Not Significant (Negligible to Minor)	There would be no significant increase in permanent impermeable area associated with the foundation elements of pylons within the Section 1 Study Area. Permanent impermeable surfaces would include tarmac access roads to and within the substation and concrete and/or tarmac hardstanding within the substation boundary and associated building footprints. The proposed measures for the impermeable surfaces associated with the New Grimsby West Substation during operation include mitigation through drainage design. This would incorporate the use of SuDS as required. Foul drainage arisings from welfare facilities on the site would either be discharged to the mains sewer network or
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tankered off site to an appropriate permitted treatment facility.

Overhead line maintenance would likely involve light goods vehicles using existing agricultural access and would not involve significant ground disturbance. Therefore, the predicted effects of the operation of Section 1 Project infrastructure on flood risk receptors are considered negligible to minor and are not significant.

Changes to fluvial flood risk associated with loss of floodplain storage and/or change in floodplain flow conveyance.	Property and infrastructure at risk of flooding	Low – Very High	Negligible	Not Significant (Negligible to Minor)	<p>The effects on flood risk receptors from the operation of the Project have been scoped into the assessment for the overhead line. There is one new overhead line pylon and two gantry towers located within Flood Zone 1 within the Section 1 draft Order Limits.</p> <p>There would be no significant increase in permanent impermeable area associated with the foundation elements of pylons along this Section of the route and therefore these elements alone are not likely to result in significant loss of floodplain storage capacity. The presence of pylons and the substation are unlikely to result in significant effects upon flood risk due to impacts upon floodplain storage or flow conveyance.</p> <p>The operational overhead line and substation would not result in significant loss of functional floodplain. Therefore, the predicted effects of the operation of Section 1 Project infrastructure on flood risk receptors are considered negligible to minor and are not significant.</p>
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¹ The value of receptor is defined using the criteria set out in Appendix 4B Environmental Impact Assessment Methodologies and Scope and is defined as Low, Medium, High and Very High.

² The magnitude of change on a receptor resulting from activities relating to the development is defined using the criteria set out in Appendix 4B Environmental Impact Assessment Methodologies and Scope and is defined as negligible, small, medium, large adverse and beneficial.

³ The significance of the environmental effects is based on the combination of the value of a receptor and the magnitude of change and is expressed as major (significant), moderate (potentially significant) or minor/negligible (not significant), subject to the evaluation methodology outlined in Appendix 4A EIA Technical Assessment Methodologies and Scope.

6.8 Monitoring

- 6.8.1 Although no significant effects have been identified within this assessment, given the hydrological sensitivity within Section 1, it may be necessary to undertake monitoring during the construction phase for assurance purposes. The requirement for this will be assessed further within the ES when further characterisation of the hydrological regime has been undertaken.

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7. Geology and Hydrogeology

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7. Geology and Hydrogeology

7.1 Introduction

- 7.1.1 This chapter presents the Preliminary Environmental Information (PEI) in relation to the Geology and Hydrogeology assessment of the New Grimsby West Substation section (Section 1) of the Grimsby to Walpole Project (the Project). Specifically, the chapter includes the following sections:
- i. An introduction to the topic (section 7.1)
 - ii. Identification of key local and regional policy relevant to the assessment (section 7.2). A full overview of the legislation and national, regional onshore and marine planning policy context that applies to the Project is presented within **PEI Report Volume 2 Part A Chapter 2 Legislative, Regulatory and Planning Policy Context** and supporting appendices;
 - iii. A summary of the assessment scoping process and the subsequent scope of the Geology and Hydrogeology assessment (section 7.3). Further detail is provided within **PEI Report Volume 3 Part A Appendix 4A Planning Inspectorate Scoping Opinion Responses**;
 - iv. A high-level summary of the methodology of the Geology and Hydrogeology assessment within Section 1 (section 7.4). A detailed description of the assessment methods and scope, applicable to the whole Project, is contained in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**;
 - v. A description of the environmental baseline within the Section 1 Study Area relevant to the Geology and Hydrogeology assessment (section 7.5);
 - vi. A description of mitigation measures included for the purposes of the Geology and Hydrogeology assessment reported within the PEI Report (section 7.6). Further information regarding design development can be found in **PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered** and the **Grimsby to Walpole Design Development Report**;
 - vii. The likely significant and non-significant Geology and Hydrogeology effects arising during construction and operation of the Project within Section 1, based upon the assessment completed to date (section 7.7); and
 - viii. An outline of the proposed monitoring requirements in relation to Geology and Hydrogeology (section 7.8).
- 7.1.2 Further supporting information is set out in **Table 7.1** below, including supporting figures and technical appendices.

Table 7.1 Supporting documentation

Supporting Information	Description
Topic Specific Supporting Documentation	
PEI Report Volume 2 Part B Section 1 Figures	<p>Figure 7.1 Superficial Geology</p> <p>Figure 7.2 Bedrock Geology</p> <p>Figure 7.3 Source Protection Zones</p> <p>Figure 7.4 Aquifer Designations – Superficial Deposits</p> <p>Figure 7.5 Aquifer Designations – Bedrock Geology</p> <p>Figure 7.6 Landfills, Waste and Potentially Contaminative Uses</p>
PEI Report Volume 3 Part B Section 1 Appendix 7A Initial Contamination Risk Classification	A list of identified sites with potentially contaminative uses within the Section 1 Study Area, a table identifying the risk classification criteria and an initial risk classification for each feature, to allow a proportionate assessment of potential effects within the PEI Report.
PEI Report Volume 3 Part B Sections 1 to 7 Appendix 7B Minerals Safeguarding Report	A report for the full Study Area across the Project which identifies any safeguarded minerals and provides an appraisal of the effects of the Project against relevant minerals policy.
Project Supporting Documentation	
PEI Report Volume 2 Part B Section 1 Chapter 1 Overview of the Section and Description of the Project	A summary of the works within Section 1, including permanent infrastructure, temporary construction works, and operational activities.
PEI Report Volume 3 Part A Appendix 2A Environmental Legislation	A list of identified environmental legislation considered relevant to the Project, which will be updated and amended as required to inform the Environmental Statement (ES).
PEI Report Volume 3 Part A Appendix 2B National and Regional Planning Policy	A list of national and regional policies generally applicable to the assessment principles which underpin the PEI Report and ES.
PEI Report Volume 3 Part A Appendix 2Ci Local Plan Policy: Section Specific	An outline of the potentially relevant local planning policy allocations affecting each of the specific sections of the Project.
PEI Report Volume 3 Part A Appendix 2Cii Local Plan Policy: Route-wide	Details of planning policies applicable route-wide within the relevant Local Authority areas.
PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered	Provides a summary of the main alternatives considered in relation to the Project during the

Supporting Information	Description
	design development process, including the main reasons for selecting the chosen option.
PEI Report Volume 2 Part A Chapter 4 Approach to Preliminary Environmental Information	Sets out the Environmental Impact Assessment (EIA) approach and general methodology that has been used in developing the PEI Report for the Project.
PEI Report Volume 2 Part A Chapter 5 Project Description	An overarching description of the Project and its key components, including available construction information.
PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice	Sets out control and management measures that will be undertaken during construction of the Project if granted consent. The Final Code of Construction Practice (CoCP) will be submitted in support of the Development Consent Order (DCO) application.

- 7.1.3 There are also interrelationships between the potential effects on Geology and Hydrogeology and other environmental topics. Therefore, please also refer to the following chapters within **PEI Report Volume 2 Part B** and **Part C**:
- i. **PEI Report Volume 2 Part B Section 1 Chapter 4 Ecology and Biodiversity** should be consulted in relation to effects identified by the Geology and Hydrogeology assessment including impacts on land and groundwater quality and groundwater quality, that may affect ecological receptors, such as Groundwater Dependent Terrestrial Ecosystems (GWDTE) and Sites of Specific Scientific Interest (SSSI);
 - ii. **PEI Report Volume 2 Part B Section 1 Chapter 6 Water Environment** should be consulted in relation to the effects on groundwater, including impacts on groundwater quality and quantity, identified by the Geology and Hydrogeology assessment that may affect hydrological receptors, such as surface water receptors;
 - iii. **PEI Report Volume 2 Part B Section 1 Chapter 8 Agriculture and Soils** should be consulted in relation to temporary and permanent loss of soils and soil functions and how the Project may impact the shallow soils across the Study Area;
 - iv. **PEI Report Volume 2 Part B Section 1 Chapter 13 Summary** provides a concise, consolidated summary of the likely significant effects reported for all topics, based upon the preliminary assessment; and
 - v. **PEI Report Volume 2 Part C Route-wide Chapter 10 Cumulative Effects** reports those intra-project effects which could potentially act in combination to result in cumulative environmental effects. It also identifies a shortlist of other Committed Developments with which there may be potential for cumulative effects, and the relevant environmental topics for such effects (inter-project). The full cumulative effects assessment will be reported within the ES.

7.2 Legislation and Policy Framework

Legislation and National Policy

- 7.2.1 Legislation and national policy relevant to the Project and this chapter is described in **PEI Report Volume 2 Part A Chapter 2 Legislative, Regulatory and Planning Policy Context** and supporting appendices, detail of which is set out in **Table 7.1**.

Regional and Local Policy

- 7.2.2 Regional and local plans or policies relevant to this assessment are as follows:

- i. North East Lincolnshire Local Plan (Adopted 2018) (Ref 1):
 - Policy 5 Development boundaries and Policy 31 Renewable and Low Carbon Infrastructure: specifies that land contamination is a relevant consideration for all development proposals;
 - Policy 34 Water Management: discusses how water resources are managed within the Borough, and sets out considerations for development proposals to minimise effects on groundwater resources and quality, including Source Protection Zones (SPZ);
 - Policy 41 Biodiversity and Geodiversity: sets out considerations for development proposals to minimise or mitigate impacts on designated sites, including Local Geological Sites; and
 - Policy 44 Safeguarding minerals and related infrastructure: details the safeguarded minerals within the council area and sets out requirements for development proposals within areas of safeguarded minerals to ensure resources within the area are not needlessly sterilised.
- ii. Central Lincolnshire Local Plan (Adopted April 2023) (Ref 2);
 - Policy S21: Flood Risk and Water Resources: this policy is relevant for hydrogeology receptors and sets out the requirements for development proposals to reduce impacts to groundwater;
 - Policy S56: Development on Land Affected by Contamination: sets out the requirements for risk assessment where development proposals include construction on land affected by contamination;
 - Policy S60: Protecting Biodiversity and Geodiversity: sets out considerations for development proposals with regard to minimising impacts on features of geodiversity value;
- iii. Greater Lincolnshire Nature Partnership, 2021. Geodiversity Strategy 2022 – 26 (Ref 3); this document sets out the Geodiversity Action Plan (GAP) and a summary of geodiversity sites within Lincolnshire, along with planning and conservation advice for sites of geodiversity value; and
- iv. Lincolnshire County Council, 2017. Lincolnshire Minerals and Waste Local Plan Core Strategy and Development Management Policies (Ref 4): sets out the key principles for working of minerals and waste management development in Lincolnshire and the development management policies for minerals and waste which will be considered for any future planning applications.

7.3 Scope of Assessment

- 7.3.1 The scope of the assessment has been informed by the Scoping Opinion (Ref 5) provided by the Planning Inspectorate in September 2024 on behalf of the Secretary of State, following the submission of the EIA Scoping Report (Ref 6). The scope has also been informed through consultation and engagement with relevant consultees. A summary of the Scoping Opinion together with a response against each point of relevance to the Geology and Hydrogeology chapter is provided in **PEI Report Volume 3 Part A Appendix 4A Planning Inspectorate Scoping Opinion Responses**. A summary of the stakeholder engagement undertaken to date is provided in **PEI Report Volume 3 Part A Appendix 4D Summary of Stakeholder Engagement**.
- 7.3.2 Non statutory consultation feedback is summarised within the **Grimsby to Walpole Stage 1 Consultation Feedback Report**.
- 7.3.3 The scope of the construction assessment covers the following receptor groups:
- Human health (construction workers, adjacent land users) – only in the context of land contamination assessments (various other aspects of human health are addressed in **PEI Report Volume 2 Part C Chapter 8 Health and Wellbeing**);
 - Groundwater aquifers;
 - Groundwater abstractions;
 - Soil/land quality – only in the context of land contamination assessments (other aspects being addressed in **PEI Report Volume 2 Part B Section 1 Chapter 8 Agriculture and Soils**);
 - Structures; and
 - Designated geological conservation sites (none present within the Section 1 Study Area).
- 7.3.4 The scope of the operation and maintenance assessment covers the following receptor groups:
- Human health (future land users) – only in the context of land contamination assessments (various other aspects of human health are addressed in **PEI Report Volume 2 Part C Chapter 8 Route-wide Health and Wellbeing**);
 - Groundwater aquifers;
 - Groundwater abstractions; and
 - Structures.

7.4 Assessment Methodology

- 7.4.1 The assessment scope, methodology, relevant guidance, key assumptions and limitations for the Geology and Hydrogeology assessment are set out in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**. This includes a description of how receptor sensitivity, magnitude of impact and significance of effects are all defined and assigned to the assessment. A summary of the key components are outlined below.

- 7.4.2 The assessment for Geology and Hydrogeology has been undertaken in line with Land Contamination Risk Management (LCRM) guidance (Ref 7), which includes an approach for contaminated land assessments in relation to human health, land and groundwater receptors. This guidance is based on the source-pathway-receptor approach, which forms the basis of the approach used for assessing effects relating to contamination. This approach is also consistent with the Environment Agency's (EA's) approach to Groundwater Protection (Ref 8) including the requirements noted in that guidance in relation to Nationally Significant Infrastructure Projects. The EA's guidance (Ref 8) also applies to physical effects on groundwater, forming the framework used for the assessment of those effects.
- 7.4.3 The assessment has been carried out using recognised criteria based on Construction Industry Research and Information Association (CIRIA) Publication 552 Contaminated Land Risk Assessment: A Guide to Good Practice (Ref 9), adapted as necessary to support environmental impact assessment.
- 7.4.4 The assessment is expected to be developed further in the ES, where further relevant information becomes available, for example from ongoing consultation or additional data collection.

Assessment Assumptions and Limitations

- 7.4.5 All general assumptions and limitations for the topic are listed within **PEI Report Volume 3 Part A Appendix 4B EIA Technical Assessment Methodologies and Scope**.
- 7.4.6 The decommissioning works at the existing Grimsby West Substation are yet to be defined, therefore a limitation of this preliminary assessment of Geology and Hydrogeology effects is that it does not assess these works. The decommissioning works will be assessed as part of the ES.
- 7.4.7 The key parameters and assumptions which inform the assessment will be reviewed based on the design presented in the DCO application and, where required, updated, or refined, for the ES. The ES will present the final key limitations and assumptions applicable to the full assessment, particularly drawing attention to any areas that may have changed from that presented in this preliminary assessment.

7.5 Baseline Conditions

Study Area

- 7.5.1 For the purposes of the Geology and Hydrogeology assessment, a general Study Area of the draft Order Limits plus a 250 m buffer for geological receptors and a 500 m buffer for hydrogeological receptors has been applied. This is considered to be a proportionate and suitable approach for this assessment, in line with the Scoping Opinion (Ref 5). As outlined within the Scoping Report (Ref 6), hydrogeological receptors further from the draft Order Limits are more susceptible to effects from the Project than geological receptors due to the mobile nature of groundwater and corresponding potential for the Project to affect receptors at a greater distance, hence the larger Study Area for the hydrogeological assessment.

Data Collection

- 7.5.2 The following data has been used to inform the baseline conditions:
- i. Published historical mapping to identify potentially contaminative former land uses (National Library of Scotland mapping) (Ref 10);
 - ii. UK Health Security Agency radon mapping (Ref 11);
 - iii. Geological mapping published by the British Geological Survey (BGS) (1:50,000 scale) (Ref 12);
 - iv. Historical borehole records held by the BGS (Ref 12);
 - v. Groundwater abstraction details (public and private), discharge consents, historical pollution incident records, and historical and authorised landfills, as available from the EA, obtained through formal data requests;
 - vi. Department for Environment, Food and Rural Affairs (DEFRA) groundwater aquifer information, provided through MAGIC (Multi-Agency Geographic Information for the Countryside) (Ref 13);
 - vii. Source Protection Zones (SPZ) data, available under Open Government License (Ref 14);
 - viii. EA Catchment Data Explorer records on groundwater quality (Ref 15);
 - ix. Natural England designated Sites, i.e. Geological Sites of Special Scientific Interest (SSSI) (Ref 13);
 - x. Zetica Unexploded Ordnance (UXO) online hazard mapping (Ref 16); and
 - xi. Review of relevant local planning documentation and readily available local geo-conservation documents.
- 7.5.3 The data sources listed above are as specified in the Scoping Report (Ref 6). Furthermore, where additional information over and above this is available from geotechnical assessments being undertaken in support of the engineering design of the Project, this supplementary information has also been used. This includes Groundsure historical feature polygons and geo-environmental data search records for partial coverage within the Study Area (approximately 2,900 hectares in a 100 m wide swathe for the Project), originally obtained relative to earlier provisional engineering design alignment options. This dataset covers approximately 10 – 20 per cent of the draft Order Limits for Section 1.

Existing Baseline

- 7.5.4 The following section outlines the Geology and Hydrogeology baseline. The baseline section should be read in conjunction with the following supporting Figures and Appendices as found within **PEI Report Volume 2** and **Volume 3** respectively:
- i. **PEI Report Volume 2 Part B Section 1 Figure 7.1 Superficial Geology;**
 - ii. **PEI Report Volume 2 Part B Section 1 Figure 7.2 Bedrock Geology;**
 - iii. **PEI Report Volume 2 Part B Section 1 Figure 7.3 Groundwater Source Protection Zones;**

- iv. **PEI Report Volume 2 Part B Section 1 Figure 7.4 Aquifer Designations – Superficial Deposits;**
- v. **PEI Report Volume 2 Part B Section 1 Figure 7.5 Aquifer Designations – Bedrock Geology;**
- vi. **PEI Report Volume 2 Part B Section 1 Figure 7.6 Landfills, Waste and Potentially Contaminative Previous Land Uses;**
- vii. **PEI Report Volume 3 Part B Section 1 Appendix 7A Initial Contamination Risk Classification;** and
- viii. **PEI Report Volume 3 Part B Sections 1 to 7 Appendix 7B Minerals Safeguarding Report.**

Topography and Historical and Current Land Use

- 7.5.5 Section 1 covers the proposed new Grimsby West Substation and a short section of overhead line which requires diverting into the substation. Section 1 lies to the south of Healing and the north of Aylesby. The land within Section 1 is primarily used for agricultural purposes, with some areas of woodland within the centre and east. Existing electricity infrastructure is present within this Section, with overhead electricity lines oriented west to east through the Section and the existing Grimsby West Substation in the east. The topography across this Section is shown to be generally flat-lying on Ordnance Survey (OS) mapping, gently sloping down towards the east.
- 7.5.6 Historical mapping (Ref 10) shows the Section 1 Study Area to be undeveloped on the earliest available mapping (1840's to 1880's) with local roads, small areas of woodland and Wybers Wood in the east. Between the 1930's and 1970's, areas of woodland named Drakes Gorse and Wybers Wood are shown within and immediately east of the draft Order Limits in the location now occupied by the existing Grimsby West Substation, which is first recorded on historical mapping in 1987.
- 7.5.7 Electrical infrastructure is shown on historical mapping (1940's to 1970's) as passing through the Section 1 Study Area from the north west to south east, before diverting to the east beyond the Section 1 Study Area, along a different alignment to that shown at present day. The remaining land is shown on both historical mapping and present day aerial imagery as agricultural land.

Geology

Made Ground

- 7.5.8 There are no recorded artificial deposits on published geological mapping (Ref 12) within the Section 1 Study Area, although Made Ground would be expected in minor deposits within isolated areas along roads and access tracks within the Section 1 Study Area, such as Aylesby Lane which crosses through the south of the Section 1 Study Area but not within the draft Order Limits. Made Ground may also be present in minor deposits surrounding the existing electricity pylons and existing Grimsby West Substation.

Superficial Deposits

- 7.5.9 The Section 1 Study Area is recorded to be entirely underlain by superficial deposits, with the majority of the Section underlain by Devensian Till (Glacial Till), typically described as heterogenous clay, sand, gravel and boulders. There are also isolated areas of the following superficial deposits within the Section 1 Study Area:
- i. Lacustrine Deposits – comprising sand, silt and clay, present within one small area in the west of the draft Order Limits and localised areas beyond the draft Order Limits but within the Section 1 Study Area; and
 - ii. Glaciofluvial Deposits – comprising sand and gravel, present in the centre and east of the draft Order Limits for Section 1, adjacent to the west of the new Grimsby West Substation (and slightly encroaching into the south western corner of the indicative new substation boundary), and localised areas beyond the draft Order Limits but within the Section 1 Study Area.
- 7.5.10 The distribution of the superficial deposits within the Section 1 Study Area is shown on **PEI Report Volume 2 Part B Section 1 Figure 7.1 Superficial Geology**.

Bedrock

- 7.5.11 The Section 1 Study Area is almost entirely underlain by solid strata comprising chalk of the Burnham Chalk Formation, typically described as thinly bedded chalk with common and discontinuous flint bands. The Burnham Chalk Formation is recorded to be the bedrock geology present beneath the full footprint of the new Grimsby West Substation and pylons.
- 7.5.12 The north east of the Section 1 Study Area and an area of indicative temporary highway improvements within the draft Order Limits are underlain by chalk of the Flamborough Chalk Formation, typically described as well-bedded flint-free chalk with common marl seams.
- 7.5.13 The distribution of the bedrock strata within the Section 1 Study Area is shown on **PEI Report Volume 2 Part B Section 1 Figure 7.2 Bedrock Geology**.

Geological Setting

- 7.5.14 No linear geological features (e.g. faults, breaklines, etc.) are recorded within the Section 1 Study Area. Published geological mapping (Ref 12) shows the bedrock strata as being broadly very shallowly dipping or horizontal across the Section 1 Study Area, with no indication of strata dip.
- 7.5.15 Borehole records published by the BGS (Ref 12) have been reviewed as part of this assessment to help confirm the anticipated geological sequence in line with the published geological mapping. No borehole records are available within the draft Order Limits in Section 1. Boreholes records outside the draft Order Limits and still within the Section 1 Study Area typically showed the ground profile to contain at least 16 m of superficial deposits that are primarily cohesive deposits (recorded as 'clay', 'marl clay' and 'boulder clay') with minor interbedded layers of sand (typically less than 1 m in thickness). The recorded solid geology beneath the superficial deposits is chalk.
- 7.5.16 No Local Geological Sites or sites nationally designated for their geological importance (e.g. SSSI) are located within the Section 1 Study Area.

- 7.5.17 Relevant information from the BGS geohazards database that is available is summarised below. The limitations associated with this dataset, including the basis of its spatial extent, are discussed within **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**. The geohazards classifications are described relative to the superficial geology, so reference to **PEI Report Volume 2 Part B Section 1 Figure 7.1 Superficial Geology** should be made for the areas affected by the classifications described.
- 7.5.18 No areas of possible or probable geohazards were noted within this dataset in the area of data coverage for Section 1, with all geohazards (collapsible deposits, compressible deposits, ground dissolution of soluble rock, landslides, shrink swell clays, running sands) noted as Class A (not present) or Class B (unlikely to be present). However, given the nature of Glaciofluvial and Lacustrine deposits and their classifications elsewhere within the Study Area for the Project, there is a possibility of running sands and compressible hazards in the localised areas where these strata are recorded.
- 7.5.19 The bedrock geology in Section 1 comprises chalk. Whilst this is a soluble rock that is prone to dissolution, this is not reflected in the BGS geohazards data, which is assumed to be due to the presence of superficial deposits over the chalk across the Section 1 Study Area.

Hydrogeology

- 7.5.20 The superficial deposits within the Section 1 Study Area are designated as follows:
- i. Secondary A Aquifer:
 - Glaciofluvial deposits – present on the western edge of the substation footprint and localised areas within the draft Order Limits and Section 1 Study Area;
 - ii. Secondary B Aquifer:
 - Lacustrine deposits – present in one area in the west of the draft Order Limits and localised areas within the Section 1 Study Area;
 - iii. Secondary Undifferentiated Aquifer:
 - Glacial Till – present across the majority of the Section 1 Study Area.
- 7.5.21 The bedrock strata within the Section 1 Study Area (chalks of the Burnham Chalk Formation and Flamborough Chalk Formation) are designated as Principal Aquifers.
- 7.5.22 The designations and spatial distribution of the superficial and bedrock aquifers within the Section 1 Study Area are shown on **PEI Report Volume 2 Part B Section 1 Figure 7.4 Aquifer Designations – Superficial Deposits** and **PEI Report Volume 2 Part B Section 1 Figure 7.5 Aquifer Designations – Bedrock Geology**. A brief summary of the aquifer descriptions is provided below in **Table 7.2**.

Table 7.2 Summary of aquifer designations

Aquifer Designation	Hydrogeological Description
Principal	Layers of rock that have high intergranular and/or fracture permeability and a high level of water storage, they may support water supply and/or river baseflow on a strategic scale.
Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of baseflow to rivers.
Secondary B	Lower permeability layers which may store or yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering.
Secondary Undifferentiated	Rock layers or drift deposits with low permeability that have negligible significance for water supply or river baseflow, and when neither Secondary A or B aquifer designation can be applied.
Unproductive	These strata have negligible significance for water supply or baseflows to rivers, lakes and wetlands. They typically consist of strata with low permeability that naturally offer protection to any aquifers that may be present beneath.

- 7.5.23 The BGS borehole records (Ref 12) have been reviewed within the Section 1 Study Area to help confirm the anticipated geology in line with the published geological mapping, although no records are present within the draft Order Limits and, therefore, areas of construction or ground disturbance for the Project. Borehole records within the Section 1 Study Area indicate that the bedrock aquifer is overlain by a significant thickness of superficial deposits (>16 m), primarily comprising Glacial Till. The BGS report on the Chalk aquifer system of Lincolnshire (Ref 17) notes that the chalk aquifer in this area is confined by the Glacial Till deposits.
- 7.5.24 The Section 1 Study Area lies entirely within the North Lincolnshire Chalk Unit groundwater body, which is monitored as part of the Water Framework Directive (WFD) and has been classified by the EA as having Poor status in 2019, due to poor nutrient management from agriculture and groundwater abstractions.
- 7.5.25 The north and west of the Section 1 Study Area is located within a Drinking Water Safeguard Zone for groundwater (ID: GWSGZ0283), designated for nitrate. The draft Order Limits for Section 1 are also located within two nitrate vulnerable zones (NVZ): Lincolnshire Chalk (for groundwater) and North Beck Drain (for surface water). A third NVZ (Laceby Beck/River Freshney Catchment (to N Sea)) is located outside the draft Order Limits, but within the south of the Section 1 Study Area.

Groundwater Levels

- 7.5.26 The EA does not hold any records for groundwater levels within the Section 1 Study Area. The closest boreholes monitored by the EA for groundwater levels are located 1.7 km south of the draft Order Limits (borehole references Laceby STW No. 1 (8/923) and Laceby STW No. 2 (8/922)) which monitor the levels within the superficial deposits, recorded within this area to comprise Glacial Till and Alluvium. Borehole 8/923 has recorded a groundwater level within the superficial deposits as ranging

between 5.6 and 9.0 m AOD (0.9 and 4.3 m bgl) and borehole 8/922 has shown levels ranging between 7.8 and 8.8 m AOD (1.0 and 2.0 m bgl).

- 7.5.27 South of these boreholes and 1.75 km south of the draft Order Limits is a borehole installed within the North Lincolnshire Chalk bedrock (borehole reference Laceby STW Support (5/910)). This borehole shows a groundwater level variation within the chalk bedrock of between 5.5 and 9.5 m AOD (1.0 and 4.5 m bgl). It should be noted that, given the prevalence of low permeability superficial deposits in the Section 1 Study Area, groundwater levels in this borehole may reflect sub-artesian conditions rather than the actual level of groundwater in the ground.
- 7.5.28 The BGS also provide groundwater level information on a series of boreholes which are monitored periodically. The closest of these to the Section 1 Study Area is located approximately 2 km south west of the draft Order Limits, to the west of Aylesby and Laceby. This borehole records groundwater levels varying around 17 m Above Ordnance Datum (AOD) within the chalk, with an annual variation of 7 – 10 m, with the recorded ground level at 31.25 m AOD, compared to that of approximately 10 – 20 m AOD within the draft Order Limits for Section 1.

Source Protection Zones

- 7.5.29 The Section 1 Study Area is located within a SPZ, with the west and centre located within SPZ II (outer catchment) and the east within SPZ III (total catchment). The north of the Section 1 Study Area enters a SPZ I (inner catchment), but this is not within the draft Order Limits. The spatial distribution of the SPZs within the Section 1 Study Area is shown on **PEI Report Volume 2 Part B Section 1 Figure 7.3 Groundwater Source Protection Zones**.

Abstractions

- 7.5.30 There are no groundwater abstractions within the Section 1 Study Area. The closest known abstraction is located approximately 1.7 km south of the draft Order Limits for Section 1 and is located within the Section 2 Study Area. However, it should be noted that the SPZ I area to the north will be associated with a groundwater abstraction. As this is beyond the Project Study Area, and therefore outside of the extent of the data request submitted to the EA for use within this assessment, the location of this abstraction is unknown. The centre of the SPZ I area is located approximately 1 km north of the draft Order Limits for Section 1.

Environmental Setting

- 7.5.31 Zetica UXO online risk mapping (Ref 16) shows Section 1 to be located within an area of Low bomb risk with no strategic targets within the Section 1 Study Area. The closest strategic target is located approximately 3.2 km east of the draft Order Limits for Section 1 and recorded to be an industrial site.
- 7.5.32 There are no recorded current or historical landfills within the Section 1 Study Area.
- 7.5.33 Two waste exemptions are noted in the same location within the draft Order Limits in the south east of Section 1 (Reference No. WEX268968 and WEX092407), recorded to be for storage of sludge on a farm. These features are shown on **PEI Report Volume 2 Part B Section 1 Figure 7.6 Landfills, Waste and Potentially Contaminative Previous Land Uses**.

Pollution Incidents

- 7.5.34 There are no recorded historical pollution incidents, from the EA's records, within the Section 1 Study Area.

Discharge Consents

- 7.5.35 There is only one recorded discharge consent within the Section 1 Study Area, although this is recorded to be a discharge to surface water and not to land or groundwater. Therefore, this has not been referenced further within this assessment. Surface water is considered within **PEI Report Volume 2 Part B Section 2 Chapter 6 Water Environment**.

Radon

- 7.5.36 The radon potential within the Section 1 Study Area is considered to be low risk. The full Section 1 Study Area is recorded as being within an area where less than 1 per cent of homes are at or above the radon Action Level, which is the lowest risk category defined by the UK Health Security Agency (Ref 11).

Minerals

- 7.5.37 A Minerals Safeguarding Report has been prepared for the Project, which is provided in **PEI Report Volume 3 Part B Sections 1 to 7 Appendix 7B Minerals Safeguarding Report**. This report identifies the safeguarded minerals and safeguarded areas within the draft Order Limits and any potential effects on these as a result of the Project, within the context of relevant mineral safeguarding policy. One safeguarded mineral within the Section 1 Study Area is Glaciofluvial Sand and Gravel, which is recorded beneath the west of the new Grimsby West Substation and localised areas within the Section 1 Study Area. These areas are isolated and the quantity of sand and gravel within each of these areas is considered too small to be commercially viable as a standalone mineral extraction site.
- 7.5.38 The Minerals Safeguarding Report has not identified any potentially significant effects on safeguarded minerals. Therefore, these have not been assessed subsequently in this Chapter of the PEI Report, in line with the approach agreed within the Scoping Opinion (Ref 5).

Future Baseline

- 7.5.39 The future baseline relates to known or foreseeable changes to the current baseline in the future, against which the effects of the Project during construction and operation are assessed. Specifically, it accounts for anticipated changes including: those caused by changing climatic conditions, policy, legislation, advances in technology and by other confirmed development projects which will be complete prior to construction of the Project.
- 7.5.40 At this preliminary stage, a full assessment of the implications of any committed development projects with regard to future baseline conditions has not been undertaken. A list of the currently known developments which are anticipated to be included within the future baseline scenario is provided within **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope Annex A Developments for Consideration within the Future Baseline**.

This will be reviewed and updated as appropriate during development of the ES, as with other information which informs assessment of the future baseline.

- 7.5.41 It is currently anticipated that, subject to gaining development consent in 2028, construction works would begin in 2029 and be completed by 2033. Up to and including that period, it is not expected that ground conditions, with respect to land contamination and geology, would change significantly. This assumes that any future activities undertaken within the Study Area would be permitted or controlled in accordance with current contaminated land legislation.
- 7.5.42 Hydrogeological conditions are more susceptible to change and therefore may be affected by the following factors:
- i. Climate change – changes in rainfall can affect aquifer recharge, groundwater levels and flow gradients (including consequent effects on the movement of contaminants in the ground).
 - ii. Future developments, should there be any such developments that are completed prior to the construction start date of the Project, including housing. Increases in housing within the areas surrounding the Study Area would also have the potential to affect recharge to the underlying aquifers. Increased demand for drinking water associated with these can also affect future water resources and groundwater levels in aquifers, including the SPZ areas present across the Section 1 Study Area.
 - iii. Change in nitrate concentrations due to changes in land use or leaks from infrastructure – leaking waste water infrastructure represents a potential diffuse source of nutrients (nitrogen and phosphorus), other contaminants (e.g. heavy metals) and coliform bacteria to groundwater.
- 7.5.43 It is not considered likely at this stage that any change to the baseline conditions would be likely to significantly affect the assessment of effects within Section 1. This will remain under review prior to submission of the ES, to ensure that any change in circumstances are considered on a case-by-case basis.

7.6 Design, Control and Additional Mitigation Measures

Design Mitigation Measures

- 7.6.1 The Project and draft Order Limits have been designed to avoid sensitive receptors as far as practicable. This is in accordance with the 'Holford Rules' (Ref 18) applicable to routing of new overhead lines and the 'Horlock Rules' (Ref 19) which apply to design and siting of substations. These approaches are explained in further detail within the Corridor Preliminary Routeing and Siting Study (CPRSS) (Ref 20) and **PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered**. Principles include, but are not limited to, seeking to avoid areas of highest amenity, cultural or scientific value, taking advantage of natural screening provided by existing landform and features (e.g. woodland) and keeping visual, noise and other environmental effects to a minimum. The CPRSS included the siting of the new Grimsby West Substation outside of the Drinking Water Safeguard Zones for groundwater, present in the north and west of the Study Area for Section 1.
- 7.6.2 Following selection of the preferred route corridor, environmental specialists have been integral to ongoing design refinement of works within Section 1. This has further

contributed to the avoidance or reduction of the potential environmental impacts of the Project.

Control Mitigation Measures

- 7.6.3 Control and management measures, comprising management activities and techniques, will be implemented during construction of the Project to limit effects through adherence to good site practices and achieving legal compliance.
- 7.6.4 A Preliminary CoCP has been prepared for this project, provided in **PEI Report Volume 3 Part B Appendix 5A Preliminary Code of Construction Practice**. The control and management measures included within this document relevant to Geology and Hydrogeology within Section 1 include:
- i. GH01: Intrusive ground investigations and assessment will be undertaken prior to construction which will inform appropriate geotechnical design in relation to the Study Area/structure specific ground conditions including ground instability/adverse ground conditions.
 - ii. GH02: Construction methods such as appropriate piling techniques (if required) to minimise the risk of mixing of aquifer bodies through the creation of new pathways. This includes the provision of a Foundation Works Risk Assessment (FWRA), which would be undertaken once the proposed foundation solutions are known, in accordance with CL:AIRE guidance 'Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention' (CL:AIRE, 2025) (Ref 21).
 - iii. GH03: Appropriate training of construction and maintenance workers in the handling and use of potentially hazardous substances and the associated risks.
 - iv. GH04: All use and storage of chemicals to be undertaken in accordance with The Control of Pollution (Oil Storage) Regulations 2001 and Environment Agency guidance 'Protect groundwater and prevent groundwater pollution' (Ref 22).
 - v. GH05: Any temporary dewatering activities during construction will be undertaken in accordance with EA guidance (Ref 8), and if required, an Abstraction Licence and Environmental Permit (for the discharge) and will be limited to the depth and time required to facilitate construction activities.
 - vi. GH06: General good environmental and waste management procedures for construction sites (e.g. regular vehicle checks, use of spill kits, correct waste storage and disposal).
 - vii. GH07: If required (e.g. for maintenance during the operational phase), herbicides to be used in accordance with relevant DEFRA guidance (Ref 23).
 - viii. GH08: Application of salt grit (for example, to prevent access tracks freezing) to comply with recommended rates in CIRIA 648 'Control of water pollution from linear construction projects (C648)' (Ref 24), with control of run-off during any application in SPZs.
 - ix. GH10: Vehicle parking, fuel storage, de-icer storage, rock salt storage, and washout/cleaning of ready-mix concrete vehicles and equipment will be sited outside of SPZ I (inner catchment) wherever possible.

- x. GH11: A protocol for dealing with any unexpected contamination will be included in the Construction Environmental Management Plan (CEMP).
- xi. W05: The contractor(s) will comply with all relevant consent conditions or DCO provisions regarding de-watering and other discharge activities. This will particularly be with regard to volumes and discharge rates, but also to water quality (particularly suspended solids, pH and hydrocarbons) and will include discharges to land, water bodies or third-party drains/sewers.
- xii. GG21: A Material and Waste and Management Plan (MWMP) will be developed prior to construction. The MWMP shall include but not be limited to:
 - Waste forecasts;
 - Identification of recovery routes; and
 - Actual waste figures once work has begun

Consideration will be given to the guidance in the Code of Practice developed by Contaminated Land: Applications in Real Environments (CL:AIRE) “A Definition of Waste: Development Industry Code of Practice (DoWCoP)” (Ref 25). Dedicated waste management areas will be designed to sufficiently accommodate the types and volumes of waste produced and to reduce the environmental risk of storing waste on-site (covered, secured and away from drainage).

The control of earthworks and the movement of excavated materials (including any re-use of excavated materials) will be achieved under appropriate Environmental Permits, exemptions or the DoWCoP.

Additional Mitigation Measures

- 7.6.5 Additional mitigation measures are those required to reduce likely significant adverse environmental effects which may still occur despite the inclusion of the embedded design and control measures described above.
- 7.6.6 Additional mitigation measures are not anticipated to be required in relation to Geology and Hydrogeology effects. However, this will remain under review during the completion of further assessment and development of the ES.

7.7 Preliminary Assessment of Effects

- 7.7.1 The following section presents the findings of the preliminary assessment of effects upon the receptors, identified within the Study Area, as a result of construction, operational and/or maintenance activities within Section 1.
- 7.7.2 The preliminary assessment of effects reported below takes into account the Design and Control mitigation measures previously described.
- 7.7.3 For a summary of the likely significant effects please refer to **PEI Report Volume 2 Part B Section 1 Chapter 13 Summary**. A supplementary summary of all non-significant effects is also included within this Section in **Table 7.3** based upon the assessment scope detailed in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.

- 7.7.4 Where it has been concluded that effects are not significant but may still be considered notable from a stakeholder perspective, a more detailed explanation is provided in support of the summaries included within **Table 7.3**. Examples include consideration of receptors of particularly high sensitivity or effects which have been identified of interest during previous consultation and engagement.
- 7.7.5 It should be noted that the assessment which has informed the conclusions presented remains ongoing and is subject to change, due to the ongoing data collection and further design development of the Project. A full assessment will be included within the ES submitted with the DCO application.

Likely Significant Effects

Construction

- 7.7.6 Based on the preliminary assessment, no significant effects are predicted for Geology and Hydrogeology receptors within Section 1 as a result of the construction phase of the Project.

Operation and Maintenance

- 7.7.7 Based on the preliminary assessment, no significant effects are predicted for Geology and Hydrogeology receptors within Section 1 as a result of the operation and maintenance of the Project.

Likely Non-Significant Effects

- 7.7.8 Further to the approach described in Paragraph 7.7.4, a detailed explanation of the non-significant effects on the chalk aquifer and associated SPZ is provided below. The effects on these receptors have been selected for this detailed explanation due to the regional importance of the aquifer.

Chalk Aquifer and Source Protection Zones

- 7.7.9 The Section 1 Study Area is located within SPZs associated with the underlying chalk aquifer, with the new Grimsby West Substation located within SPZ II and SPZ III. A SPZ I area is located in the north of the Section 1 Study Area but not within the draft Order Limits.
- 7.7.10 Control measures within the Preliminary CoCP (provided in **PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice**) would prevent the release of new contaminants from construction activities, through measures GH03 (appropriate training of workers in handling of potentially hazardous substances), GH04 (use and storage of chemicals), GH06 (general good environmental and waste management procedures) and GG21 (materials movement controls). The expectation of low permeability superficial cover across the majority of the draft Order Limits for Section 1 also provides further assurance of protection of the chalk aquifer in this regard.
- 7.7.11 There are no instances in which the construction of the Project would be expected to disturb ground affected by historical contamination (i.e. moderate or above previous land uses, as identified within **PEI Report Volume 3 Part B Section 1 Appendix 7A Initial Contamination Risk Classification**) other than any contamination associated with the existing Grimsby West Substation in the east of the draft Order Limits. A

number of potential contaminants may be present within this area, including fuel hydrocarbons, polychlorinated biphenyls (PCBs) and Made Ground deposits, resulting from its historical use as a substation.

- 7.7.12 The chalk aquifer within Section 1 is recorded to have a protective cover of primarily cohesive superficial deposits comprising Glacial Till, expected to be in excess of 16 m (based on nearby BGS borehole records). It is likely that this would provide protection from the leaching of near surface contaminants during shallow construction work. However, there is potential for adverse effects to occur through installation of piled foundations for substations and pylons, which may introduce a risk of creating a pathway for vertical migration and mixing of groundwater between different aquifers (including groundwater potentially affected by contamination from previous land use in the vicinity of the existing Grimsby West Substation). Should engineering design identify that piled foundations are required for the substation or pylons, then such effects would be prevented through the use of suitable piling methods to prevent inadvertent mixing of shallow groundwater within deeper, sensitive aquifers (control measure GH02 within the Preliminary CoCP (provided in **PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice**). Control measure GH02 would include the preparation of a Foundation Works Risk Assessment (FWRA) which would include appropriate controls to prevent any significant effects. Examples include the selection of specific piling techniques that prevent the creation of open pathways and minimising any physical downward transport of soils. This would include consideration of any pre-existing contamination that may be present during construction within the vicinity of the existing Grimsby West Substation.
- 7.7.13 Control measure GH01 within the Preliminary CoCP would ensure adequate pre-construction ground investigation to verify the ground conditions and inform the FWRA. Additionally, control measure GH11 would ensure a suitable protocol in the instance of encountering unexpected contamination.
- 7.7.14 In addition to the chemical and contamination effects discussed above, physical effects on the SPZs and chalk aquifer require consideration in relation to any construction activities that could mobilise sediment and increase turbidity within the chalk. The majority of construction work would involve near surface construction activities that would not be expected to interact with the chalk, given the expected nature and thickness of the superficial deposits within this area. Exceptions may include piling for substation and pylon foundations. Any piling work would be controlled in accordance with control measure GH02 within the Preliminary CoCP (provided in **PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice**) through a FWRA, which would require careful controls and monitoring, particularly if the piling is within the SPZ II area. The construction of the Project would not involve ground disturbance (or any other work) in the SPZ I area, which is outside the draft Order Limits.
- 7.7.15 Given the expected depth of the chalk aquifer and the nature of the construction activities, it is not anticipated that any pumping or dewatering of the chalk aquifer would be required during construction, nor that there would be any discharges directly to the aquifer.
- 7.7.16 Considering all of the above potential effects, it is concluded that the magnitude of effect on the chalk aquifer and SPZ, for all effect types identified in the Scoping Report (Ref 6), is negligible. Together with the high receptor sensitivity, this shows that the Project would have a negligible effect on these receptors.

7.7.17 For completeness, **Table 7.3** below summarises the findings of the preliminary assessment with respect to those impacts that are not predicted to result in significant Geology and Hydrogeology effects.

Table 7.3 Preliminary summary of non-significant Geology and Hydrogeology effects – Section 1

Receptor ¹	Impact	Sensitivity/ Importance /Value of Receptor	Magnitude of Change	Significance	Rationale
Construction					
Construction workers and adjacent land users (Human health)	Harm to human health through exposure to contamination, including dust and vapours, through disturbance of the ground during construction that is affected by pre-existing contamination	Medium (construction workers)	Negligible	Negligible – not significant	<p>The contamination sources within the Section 1 Study Area are summarised within PEI Report Volume 3 Part B Section 1 Appendix 7A Initial Contamination Risk Classification. There is one identified potential source of contamination with a moderate contamination potential within the Section 1 Study Area, which is the existing Grimsby West Substation.</p> <p>Surrounding this feature, there is a possibility of ground contamination with fuel hydrocarbons, PCBs and Made Ground deposits (e.g. potential for asbestos etc.).</p> <p>With the use of appropriate personal protective equipment (PPE) and the implementation of control measures (GH01 – pre-construction ground investigation, GH11 – protocol for unexpected contamination, and GG21 – control of earthworks and materials movement) included within the Preliminary CoCP (provided in PEI Report Volume 3</p>

¹ The groundwater abstractions and Geological Conservation Sites have not been included within this assessment due to their absence within the Section 1 Study Area.

Receptor ¹	Impact	Sensitivity/ Importance /Value of Receptor	Magnitude of Change	Significance	Rationale
					<p>Part A Appendix 5A Preliminary Code of Construction Practice), the exposure pathways would be reduced/prevented such that the effects on construction workers would not be significant.</p>
		High (adjacent land users)	Negligible	Negligible – not significant	<p>The potential contamination sources within the draft Order Limits are summarised within PEI Report Volume 3 Part B Section 1 Appendix 7A Initial Contamination Risk Classification.</p> <p>With the implementation of control measures (GH01, GH06 – which would include dust and leachate control, and GH11) detailed within the Preliminary CoCP the exposure pathways would be reduced/prevented such that the effects on adjacent land users would not be significant.</p>
Groundwater Aquifers	Deterioration in chemical quality of the groundwater through disturbance of the ground during construction that is affected by pre- existing contamination	High – Bedrock (Burnham Chalk Formation and Flamboroug h Chalk Formation)	Negligible	Negligible – not significant	<p>With the exception of the Grimsby West Substation, no specific known sources of contamination were identified within Section 1 as outlined within the initial contamination screening assessment within PEI Report Volume 3 Part B Section 1 Appendix 7B Initial Contamination Risk Classification. The existing Grimsby West Substation is considered to be of moderate contamination potential due to the possibility of ground contamination with</p>

Receptor ¹	Impact	Sensitivity/ Importance /Value of Receptor	Magnitude of Change	Significance	Rationale
		Medium – Glacial Till and Glaciofluvial deposits Low - Lacustrine deposits			<p>fuel hydrocarbons, polychlorinated biphenyls (PCBs) and Made Ground deposits.</p> <p>It is considered that the low permeability superficial deposits across Section 1 would act as a protective cover for the bedrock strata from disturbance of pre-existing contamination during shallow construction work.</p> <p>Control measure GH02 within the Preliminary CoCP would include the use of suitable piling methods, in accordance with a foundation works risk assessment, to prevent pathway creation into the sensitive aquifers.</p> <p>With the implementation of control measures GH01, GH02, GH11 and GG21, the pathways would be reduced/prevented such that the effects on the groundwater aquifers would not be significant.</p>
Groundwater Aquifers	Physical effects on aquifers, such as depletion of the aquifer and increased solids/turbidity, through dewatering activities (e.g. during excavations	High – Bedrock (Burnham Chalk Formation and Flamborough Chalk Formation)	Negligible	Negligible - not significant	<p>The bedrock aquifer within Section 1 is of high sensitivity. The likely thickness of superficial deposits within the area from published borehole records is considered to be in excess of 16 m.</p> <p>The majority of construction (with the possible exception of piling) would be expected to be within the superficial deposits and not within the bedrock. Therefore, it is not considered that the</p>

Receptor ¹	Impact	Sensitivity/ Importance /Value of Receptor	Magnitude of Change	Significance	Rationale
	for foundations for new structures) and changes to groundwater flows caused by construction activities and generation of solids through ground disturbance				<p>bedrock aquifers would require dewatering to facilitate construction.</p> <p>It is considered that the low permeability superficial deposits across Section 1 would act as a protective cover for the bedrock strata from disturbance of pre-existing contamination during shallow construction work.</p> <p>It is considered that the low permeability superficial deposits across Section 1 would act as a protective cover for the chalk aquifer from any solids/turbidity generated by shallow construction work.</p> <p>In relation to piling (if required), control measure GH02 within the Preliminary CoCP would prevent migration of solids towards the underlying chalk aquifers and adequately control any release of solids from the chalk during piling activities for substation and pylon construction. Therefore, there is not considered to be a significant effect.</p>
		Medium – Glacial Till and Glaciofluvial deposits	Low	Minor – not significant	<p>The proposed new Grimsby West Substation footprint is recorded on geological mapping to be almost entirely underlain by Glacial Till deposits with a localised area of Glaciofluvial deposits recorded along the west of the substation.</p> <p>As the groundwater level is unknown within this area, the worst-case scenario</p>

Receptor ¹	Impact	Sensitivity/ Importance /Value of Receptor	Magnitude of Change	Significance	Rationale
					<p>has been assumed, where dewatering would be required for the construction within the superficial deposits. This has the possibility to reduce groundwater levels locally and increase suspended solids/turbidity.</p> <p>Earthworks within Section 1 are not likely to be of substantive depth for substation and pylon construction. It is likely that any dewatering during construction of the new Grimsby West Substation and the excavation of pylon foundations would be restricted to temporary groundwater control/pumping to manage surface water accumulation and localised perched water, which would be undertaken in accordance with EA guidance (control measure GH05 within the Preliminary CoCP).</p> <p>With the implementation of control measures GH02 and GH05 included in the Preliminary CoCP to ensure physical effects are appropriately minimised and controlled, the effects on the medium sensitivity groundwater aquifers would not be significant.</p>
		Low – Lacustrine deposits	Negligible	Negligible – not significant	Lacustrine deposits are only present in isolated areas within the Section 1 Study Area and only one area within the draft Order Limits, not beneath the footprint of the new Grimsby West Substation.

Receptor ¹	Impact	Sensitivity/ Importance /Value of Receptor	Magnitude of Change	Significance	Rationale
					<p>No groundwater level data is available within the Lacustrine deposits, therefore dewatering may be required to facilitate construction within these deposits. If it is required, then temporary groundwater control/pumping would be undertaken in accordance with EA guidance (control measure GH05).</p> <p>With the implementation of control measures GH02 and GH05 included in the Preliminary CoCP to ensure physical effects are appropriately minimised and controlled, the effects on the low sensitivity groundwater aquifer would not be significant.</p>
Groundwater Aquifers	Physical and chemical effects on groundwater, as a result of the discharge of groundwater, such as increased solids/turbidity and reduction in chemical quality, arising from dewatering or surface water control	High – Bedrock (Burnham Chalk Formation and Flamborough Chalk Formation) Medium – Glaciofluvial deposits and Glacial Till	Negligible	Negligible – not significant	Any discharge of water generated during construction (e.g. from pylon and substation foundation excavations) to land would be of unpolluted water only and undertaken in accordance with control measure W05 (compliance with discharge conditions) within the Preliminary CoCP. Discharges directly to groundwater are not anticipated. Therefore, the effects on groundwater aquifers would not be significant.

Receptor ¹	Impact	Sensitivity/ Importance /Value of Receptor	Magnitude of Change	Significance	Rationale
		Low – Lacustrine deposits			
Soil/land quality	Deterioration in chemical quality of the land through release of contamination by construction activities	Medium	Negligible	Negligible – not significant	Soil/land quality can be negatively affected by construction due to the inadvertent release of contamination and/or incorrect storage and re-use of excavated soils. With the implementation of control measures (GH03 – adequate training of workers in managing hazardous substances, GH04 – appropriate storage of chemicals, and health and safety measures for construction sites) within the Preliminary CoCP, the effects on soil/land quality would not be significant.
Groundwater Aquifers	Deterioration in chemical quality of the groundwater through release of contamination by construction activities (e.g. loss of fuels to an aquifer)	High – Bedrock (Burnham Chalk Formation and Flamborough Chalk Formation) Medium – Glaciofluvial deposits	Negligible	Negligible – not significant	Releases of contamination from construction activities would be adequately prevented through the implementation of control measures (GH03, GH04, GH06 and GH08) within the Preliminary CoCP. The anticipated superficial cover of primarily cohesive, low permeability deposits would also act as a protective cover to the high sensitivity bedrock. As a result, releases of contamination should be adequately prevented and the pathways would be reduced/prevented such that the

Receptor ¹	Impact	Sensitivity/ Importance /Value of Receptor	Magnitude of Change	Significance	Rationale
		and Glacial Till			effects on the groundwater aquifers would not be significant.
		Low – Lacustrine deposits			
Adjacent land users, construction workers (Human health)	Explosion or asphyxiation as a result of ingress and accumulation of ground gas within buildings or other confined spaces	High	Negligible	Negligible – not significant	<p>No specific sources of ground gas or potential ground gas-generating material were identified within the Section 1 Study Area (within PEI Report Volume 3 Part B Section 1 Appendix 7A Initial Contamination Risk Classification).</p> <p>Should ground investigations undertaken prior to construction (control measure GH01 within the Preliminary CoCP, identify the presence of hazardous ground gases, with the use of appropriate PPE, as well as suitable construction at any temporary structures (i.e. construction compounds) to prevent accumulation of ground gas, the exposure pathways would be identified and mitigated such that the effects on construction workers are not significant. The FWRA (within control measure GH02) would consider migration of ground gas if disturbed during construction, to ensure that there are no risks to occupants/users of nearby buildings.</p>

Receptor ¹	Impact	Sensitivity/ Importance /Value of Receptor	Magnitude of Change	Significance	Rationale
Structures	Explosion as a result of ingress and accumulation of ground gas within buildings or other confined spaces	Medium	Negligible	Negligible – not significant	No specific sources of ground gas or potential ground gas-generating material were identified within the assessment of baseline conditions. With the implementation of control measures (GH01 and GH02) within the Preliminary CoCP, as well as suitable construction at any temporary structures (i.e. construction compounds) to prevent accumulation of ground gas, the pathways would be reduced/mitigated such that effects on structures would not be significant.
Adjacent land users, construction workers (Human health) Structures	Unstable ground and damage to human health and/or structures through disturbance of unstable ground by construction activities	High (Human health) Medium (Structures)	Negligible	Negligible – not significant	Based on the mapped geology and currently available information from the BGS geohazards data set, it is considered that natural geohazards can be mitigated through suitable engineering design (in accordance with standard good practice) such that adverse effects should not be significant.
Soil/land quality Adjacent land users, construction workers (Human health)	Ground stability issues through dissolution of soluble rocks, due to changed patterns or groundwater flow/discharges	High (Human health) Medium (Structures and	Negligible	Negligible – not significant	The bedrock beneath the Section 1 Study Area comprises chalk, which can be susceptible to dissolution through changes in the groundwater regime, which could affect human health, structures and the soil/land quality through stability issues. However, the thickness of superficial deposits within Section 1 (in excess of 16

Receptor ¹	Impact	Sensitivity/ Importance /Value of Receptor	Magnitude of Change	Significance	Rationale
Structures	caused by construction activities	soil/land quality)			<p>m) is such that it is not considered likely that, with the exception of piling, construction activities would affect the deeper bedrock strata. Discharges to the bedrock would not be undertaken within this Project.</p> <p>Piling work would not be expected to affect groundwater flow patterns and induce dissolution, with this activity subject to control measure GH02 within the Preliminary CoCP.</p> <p>Therefore, effect from either shallow construction work or piling would not be significant.</p>
Groundwater Aquifers	Deterioration in chemical quality of the groundwater through dissolution of soluble rocks, due to changed patterns or groundwater flow/discharges caused by construction activities	High – Bedrock (Burnham Chalk Formation and Flamborough Chalk Formation)	Negligible	Negligible – not significant	<p>The aquifer under consideration for this effect is the chalk bedrock, which is of high sensitivity. It is not considered that discharges to or disturbance of the bedrock aquifer would be undertaken within Section 1 for this Project, due to the thickness of superficial cover within the Section 1 Study Area.</p> <p>Piling work would not be expected to affect groundwater flow patterns and induce dissolution, with this activity subject to control measure GH02 within the Preliminary CoCP, which would include suitable risk assessment of any works.</p> <p>Therefore, it is considered that the construction does not have the potential to</p>

Receptor ¹	Impact	Sensitivity/ Importance /Value of Receptor	Magnitude of Change	Significance	Rationale
					induce chalk dissolution that could affect the quality of groundwater in the chalk aquifer, and therefore there would be no associated effects.
Operation and Maintenance					
Future land users (human health)	Explosions or asphyxiation (harm to health of substation operatives) as a result of ingress and accumulation of ground gas within structures	High (Human health)	Negligible	Negligible – not significant	No specific sources of ground gas or ground gas generating potential were identified for Section 1 as outlined within the initial contamination screening assessment (provided in PEI Report Volume 3 Part B Section 1 Appendix 7A Initial Contamination Risk Classification). Should ground investigations undertaken prior to construction (control measure GH01 within the Preliminary CoCP, identify the presence of hazardous ground gases or materials with the potential to generate these (e.g. Made Ground or natural materials with degradable content), the substation would be designed to incorporate appropriate gas protection, if required. Therefore, effects upon future land users and/or structures would not be significant.
Structures		Medium (Structures)			
Groundwater Aquifers (note the effects on the Lacustrine	Changes to infiltration and corresponding effects on	High – Bedrock (Burnham Chalk	Negligible	Negligible – not significant	The construction of the proposed new Grimsby West Substation in Section 1 would introduce new impermeable surfacing. However, the proposed new

Receptor ¹	Impact	Sensitivity/ Importance /Value of Receptor	Magnitude of Change	Significance	Rationale
deposits are not discussed, due to the absence of proposed permanent impermeable surfacing in locations that are underlain by these deposits)	groundwater levels as a result of the presence of new structures and surfaces	Formation, Flamboroug h Chalk Formation)			<p>Grimsby West Substation is entirely underlain by superficial deposits predominantly comprising Glacial Till deposits, which are likely to be primarily cohesive and of low permeability/infiltration capacity. Therefore, the chalk aquifer that underlies the Glacial Till is unlikely to be fed by surface run-off/infiltration at the substation site at present, so the installation of impermeable surfacing and engineered drainage presents minimal change to this situation.</p> <p>Although localised Glaciofluvial deposits (i.e. granular, rather than cohesive, materials) are present along the west of the substation footprint and Glacial Till can also have variable contents of more permeable granular materials, it is considered that the contribution from any current recharge to the regional chalk aquifer from the substation footprint is likely to be sufficiently small that the magnitude of effect on groundwater levels in the chalk from the presence of impermeable surfacing at the substation site would be negligible. Therefore, there would not be a significant effect on groundwater.</p>
		Medium – Glacial Till	Negligible	Negligible – not significant	Glacial Till deposits are located in areas of proposed hardstanding, including the proposed substation and access road.

Receptor ¹	Impact	Sensitivity/ Importance /Value of Receptor	Magnitude of Change	Significance	Rationale
					However, as described above, these deposits are generally cohesive and impermeable and the construction of new impermeable surfaces is not considered likely to alter infiltration and recharge substantively. Therefore, effects would not be significant.
		Medium – Glaciofluvial deposits	Negligible	Negligible – not significant	Glaciofluvial deposits are located within one localised area of Section 1 along the west of the new Grimsby West Substation. The construction of the substation would include creation of new impermeable surfaces, although this would only be across a small section of these deposits, as they extend west beyond the substation footprint, and therefore this is not considered likely to significantly alter overall recharge to, or groundwater levels within, these deposits. Therefore, effects would not be significant.
Future land users, adjacent land users	Harm to human health through exposure to contamination, including dust and vapours through disturbance of pre-existing contamination (Disturbance of	Medium	Negligible	Negligible – not significant	With the exception of the existing Grimsby West Substation within the east of the draft Order Limits for Section 1, there are no specific moderate or greater potential sources of contamination identified within the baseline conditions assessment (provided within PEI Report Volume 3 Part B Section 1 Appendix 7A Initial Contamination Risk Classification). It is understood that any decommissioning of

Receptor ¹	Impact	Sensitivity/ Importance /Value of Receptor	Magnitude of Change	Significance	Rationale
	pre-existing contamination may occur through infrequent maintenance or repair activities requiring excavations for inspection/access to utilities, below ground infrastructure or foundations)				this feature would be undertaken during the construction phase, although the scope of these works is unknown at present. It is therefore considered unlikely that soils affected by contamination would be encountered during maintenance activities involving ground disturbance, as maintenance would not be required in the area of the existing substation (since this would have been decommissioned). Furthermore, in the unlikely event that contamination was present in areas where maintenance may be required (i.e. around the proposed substation) then it would be known from the construction phase and risks to health prevented by suitable health and safety measures. Therefore, effects would not be significant.
Groundwater Aquifers	Deterioration in chemical quality of the aquifers through disturbance of pre-existing contamination (Disturbance of pre-existing contamination may occur through infrequent maintenance or	High – Bedrock (Burnham Chalk Formation and Flamborough Chalk Formation) Medium – Glaciofluvial	Negligible	Negligible – not significant	With the exception of the existing Grimsby West Substation, no specific moderate or greater potential contamination sources are identified within the baseline conditions assessment (provided within PEI Report Volume 3 Part B Section 1 Appendix 7A Initial Contamination Risk Classification). This feature would be decommissioned during the construction phase, it is therefore considered unlikely that soils affected by contamination would be encountered during maintenance activities involving ground disturbance, as

Receptor ¹	Impact	Sensitivity/ Importance /Value of Receptor	Magnitude of Change	Significance	Rationale
	repair activities requiring excavations for inspection/access to utilities, below ground infrastructure or foundations)	deposits and Glacial Till Low – Lacustrine deposits			<p>maintenance would not be required in the area of the existing substation (since this would have been decommissioned). Furthermore, in the unlikely event that contamination was present in areas where maintenance may be required (i.e. around the proposed substation) then it would be known from the construction phase and any work involving disturbance of the ground planned and carried out accordingly, in compliance with suitable environmental controls, to prevent the release of contaminants to the sensitive aquifers. Maintenance activities are also typically much less intrusive than construction activities and any resulting effects therefore would be smaller than during the construction phase, where these effects were determined to be negligible (not significant). Therefore, effects would not be significant.</p>

7.8 Monitoring

- 7.8.1 Although no significant effects have been identified within this assessment, given the hydrogeological sensitivity within Section 1, it may be necessary to undertake monitoring during the construction phase for assurance purposes. The requirement for this will be assessed further within the ES when further characterisation of the hydrogeological regime has been undertaken.

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8. Agriculture and Soils

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8. Agriculture and Soils

8.1 Introduction

- 8.1.1 This chapter presents the Preliminary Environmental Information (PEI) in relation to the Agriculture and Soils assessment for the Grimsby West Substation Section (Section 1) of the Grimsby to Walpole Project (the Project). Specifically, the chapter includes the following sections:
- i. An introduction to the topic (section 8.1);
 - ii. Identification of key local and regional policy relevant to the assessment (section 8.2). A full overview of the legislation and national, regional onshore and marine planning policy context that applies to the Project is presented within **PEI Report Volume 2 Part A Chapter 2 Legislative, Regulatory and Planning Policy Context** and supporting appendices;
 - iii. A summary of the assessment scoping process and the subsequent scope of the Agriculture and Soils assessment (section 8.3). Further detail is provided within **PEI Report Volume 3 Part A Appendix 4A Planning Inspectorate Scoping Opinion Responses**;
 - iv. A high-level summary of the methodology of the Agriculture and Soils assessment within Section 1 (section 8.4). A detailed description of the assessment methods and scope, applicable to the whole Project, is contained in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**;
 - v. A description of the environmental baseline within the Section 1 Study Area relevant to the Agriculture and Soils assessment (section 8.5);
 - vi. A description of mitigation measures included for the purposes of the Agriculture and Soils assessment reported within the PEI Report (section 8.6). Further information regarding design development can be found in **PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered** and the **Grimsby to Walpole Design Development Report**;
 - vii. The likely significant and non-significant Agriculture and Soils effects arising during construction and operation of the Project within Section 1, based upon the assessment completed to date (section 8.7); and
 - viii. An outline of the proposed monitoring requirements in relation to Agriculture and Soils (section 8.8).
- 8.1.2 Further supporting information is set out in **Table 8.1** below, including supporting figures and technical appendices.

Table 8.1 Supporting documentation

Supporting Information	Description
Topic Specific Supporting Documentation	
PEI Report Volume 2 Part B Section 1 Figures	<p>Figure 8.1 National Soil Map</p> <p>Figure 8.2 Provisional Agricultural Land Classification</p> <p>Figure 8.3 Detailed Agricultural Land Classification</p> <p>Figure 8.4 Woodland and Forestry Schemes</p> <p>Figure 8.5 Agri-environment Schemes</p>
Project Supporting Documentation	
PEI Report Volume 2 Part B Section 1 Chapter 1 Overview of the Section and Description of the Project	A summary of the works within Section 1, including permanent infrastructure, temporary construction works, and operational activities.
PEI Report Volume 3 Part A Appendix 2A Key Legislation	A list of identified environmental legislation considered relevant to the Project, which will be updated and amended as required to inform the Environmental Statement (ES).
PEI Report Volume 3 Part A Appendix 2B National and Regional Planning Policy	A list of national and regional policies generally applicable to the assessment principles which underpin the PEI Report and ES.
PEI Report Volume 3 Part A Appendix 2Ci Local Plan Policy: Section Specific	An outline of the potentially relevant local planning policy allocations affecting each of the specific Sections of the Project.
PEI Report Volume 3 Part A Appendix 2Cii Local Plan Policy: Route Wide	Details of planning policies applicable route-wide within the relevant Local Authority areas.
PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered	A summary of the main alternatives considered in relation to the Project during the design development process, including the main reasons for selecting the chosen option.
PEI Report Volume 2 Part A Chapter 4 Approach to Preliminary Environmental Information	Sets out the Environmental Impact Assessment (EIA) approach and general methodology that has been used in developing the PEI Report for the Project.
PEI Report Volume 2 Part A Chapter 5 Project Description	An overarching description of the Project and its key components, including available construction information.
PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice	Sets out control and management measures that will be undertaken during construction of the Project if granted consent. The final Code

- 8.1.3 There are also interrelationships between the potential effects on Agriculture and Soils and other environmental topics. Therefore, please also refer to the following chapters within **PEI Report Volume 2 Part B** and **Part C**:
- i. **PEI Report Volume 2 Part B Section 1 Chapter 2 Landscape** should be consulted in relation to the landscape setting (for example topography) which can influence land use in any given location;
 - ii. **PEI Report Volume 2 Part B Section 1 Chapter 4 Ecology and Biodiversity** should be consulted in relation to the ecology receptors and biodiversity value which can, in part, be influenced by the presence of Agri-environment and Woodland and Forestry Schemes and which may, in turn, be relevant to soil ecosystem services (such as potential for soil carbon sequestration associated with some habitat types);
 - iii. **PEI Report Volume 2 Part B Section 1 Chapter 6 Water Environment** should be consulted in relation to the details of the water environment which interacts with the soil, for example in relation the land drainage, infiltration rates, erosion risk and flood risk;
 - iv. **PEI Report Volume 2 Part B Section 1 Chapter 7 Geology and Hydrogeology** should be consulted in relation to geology present within the Section and how the underlaying geology influences soil characteristics and how soil characteristics may influence groundwater recharge;
 - v. **PEI Report Volume 2 Part B Section 1 Chapter 13 Summary** which provides a concise, consolidated summary of the likely significant effects reported for all topics, based upon the preliminary assessment;
 - vi. **PEI Report Volume 2 Part C Chapter 6 Agriculture and Soils** (route-wide summary) should be consulted in relation to the route-wide impacts upon Best and Most Versatile (BMV) soils across the entire Project and any significant effects; and
 - vii. **PEI Report Volume 2 Part C Route-wide Chapter 10 Cumulative Effects** reports those intra-project effects which could potentially act in combination to result in cumulative environmental effects. It also identifies a shortlist of other Committed Developments with which there may be potential for cumulative effects, and the relevant environmental topics for such effects (inter-project). The full cumulative effects assessment will be reported within the ES.

8.2 Legislation and Policy Framework

- 8.2.1 Legislation and national policy relevant to the Project and this chapter is described in **PEI Report Volume 2 Part A Chapter 2 Legislative, Regulatory and Planning Policy Context** and supporting appendices, detail of which is set out in **Table 8.1**.

Regional and Local Policy

8.2.2 Regional and local plans or policies relevant to this assessment are as follows.:

- i. North East Lincolnshire Local Plan 2013 to 2032 (Adopted 2018) (Ref 1):
 - Policy 5 Development boundaries: All development proposals located within or outside of the defined boundaries will be considered with regard to suitability and sustainability, having regard to factors including the quality of agricultural land.
 - Policy 31 Renewable and low carbon infrastructure: Proposals for renewable and low carbon energy generating systems will be supported where any significant adverse impacts are satisfactorily minimised and the residual harm is outweighed by the public benefits of the proposal. Developments and their associated infrastructure will be assessed on their merits and subject to the consideration of their effects, individually or cumulatively, on the land, including land stability, contamination, soils resources and loss of agricultural land.
 - Policy 46 Restoration and aftercare (minerals): requires that displaced soils should be protected to maintain their quality, especially if the site was high-quality agricultural land (Grades 1, 2, and 3a).

8.3 Scope of Assessment

- 8.3.1 The scope of the assessment has been informed by the Scoping Opinion (Ref 2) provided by the Planning Inspectorate in September 2024 on behalf of the Secretary of State, following the submission of the EIA Scoping Report (Ref 3). The scope has also been informed through consultation and engagement with relevant consultees. A summary of the Scoping Opinion together with a response against each point of relevance to the Agriculture and Soils chapter is provided in **PEI Report Volume 3 Part A Appendix 4A Planning Inspectorate Scoping Opinion Responses**. A summary of the stakeholder engagement undertaken to date is provided in **PEI Report Volume 3 Part A Appendix 4D Summary of Stakeholder Engagement**.
- 8.3.2 Non statutory consultation feedback is summarised within the **Grimsby to Walpole Stage 1 Consultation Feedback Report**.
- 8.3.3 The scope of the construction, and operation and maintenance assessment covers the following receptor groups:
- i. Agricultural Land Classification (ALC), including BMV land;
 - ii. Soil function; and
 - iii. Agricultural Landholdings.

8.4 Assessment Methodology

- 8.4.1 The assessment scope, methodology, relevant guidance, key assumptions and limitations for the Agriculture and Soils assessment are set out in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**. This includes a description of how receptor sensitivity,

magnitude of impact and significance of effects are all defined and assigned to the assessment. A summary of the key components is outlined below.

- 8.4.2 The preliminary assessment presented is supported by an initial collation and review of available baseline data. The data sources used to develop the baseline conditions are set out in section 8.5.
- 8.4.3 To fully inform the assessment of Agriculture and Soils, a detailed ALC and soil survey is being undertaken from January to October 2025 to determine the sensitivities of soils and the grades of agricultural land within the draft Order Limits. The information from the detailed ALC and soil survey was not available for this preliminary assessment but will inform the assessment presented in the ES. The survey and assessment will be undertaken in accordance with the Soil Survey Field Handbook (Ref 4) and the ALC guidelines (Ref 5) and will characterise soil properties based on an examination of soil profiles, from which agricultural land grade as well as soil resilience can be calculated and assessed. An Agriculture and Soils survey strategy document is provided within Annex II to the **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
- 8.4.4 The assessment presented in the PEI Report is based on publicly available Provisional ALC data, and detailed data (where available). The Provisional ALC mapping does not differentiate between Grade 3a (BMV) and Grade 3b (non-BMV); as such a worst-case approach has been taken for the assessment presented, with all land provisionally mapped as Grade 1, 2 and 3 being considered to comprise BMV land. The ES submitted with the DDCO application will include detailed ALC survey data that will show the split between Grade 3a and 3b land. This information will further refine the assessment as presented in this Chapter for the ES. A Detailed ALC Survey Report will be included as an appendix within the ES.
- 8.4.5 To inform the assessment of impacts on farm holdings, broad data on agricultural landholdings will be collected through on-going discussions by the Project's Lands Team with landowner/occupiers or land agents. A preliminary overview of landowner/occupier information has been used to inform the preliminary assessment. This does not, for the PEI Report, include an assessment of individual landholdings in terms of viability (such as disruption or proportion of landholding taken temporarily or permanently). An assessment will be presented in the ES based on the level of further information gained and with a focus on the permanent impacts and on any land uses which may be considered more sensitive (such as orchards, high value cropping systems or livery stables). The assessment in relation to landholdings takes account of the framework associated with financial compensation for disruption and temporary/permanent loss of land (in accordance with the compensation code) which would include consideration of any active agri-environment and/or forestry/woodland schemes.
- 8.4.6 Land taken temporarily during construction, for example, construction compounds, would be reinstated following completion of construction activities. Land taken permanently during construction, for example, pylon foundations, would not be available for on-going agricultural use. Temporary and permanent impacts associated with land being taken are therefore addressed as part of the construction phase as the land is taken at that point in the project.
- 8.4.7 Maintenance or repair works which would result in disturbance to soils during the operation of the Project (for example creation of temporary access routes and contractor compounds) would be undertaken in accordance with good practice soil handling methods. As these are likely to be small-scale and temporary, no likely

significant effects on agricultural land during operational, maintenance or repair activities are predicted. Whilst operational impacts are proposed to be scoped out of the assessment, the Scoping Opinion (Ref 2) requested further detail on the location and extent of access tracks and compounds for maintenance activities to demonstrate the limited extent/duration. Further information on the scale and duration of likely standard operational activities which could affect Agriculture and Soils will be provided in the ES.

Assessment Assumptions and Limitations

- 8.4.8 All general assumptions and limitations for the topic are listed within **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
- 8.4.9 The following assumptions and limitations are specific to the Agriculture and Soils of Section 1.
- i. It should be noted that while all land in Section 1 is provisionally mapped as ALC Grade 3 land, this classification must be confirmed by detailed surveys before the final magnitude of effects can be calculated. Furthermore, provisional ALC mapping is at a scale of 1:250,000 and does not split Grade 3 into Grades 3a and 3b, which is critical for assessing impacts on BMV land. As such, for the purpose of the preliminary assessment all provisional ALC Grade 1, 2 and 3 land will be considered BMV land.
 - ii. The existing Grimsby Substation will be decommissioned as part of the Project. Details of the requirements for decommissioning (in full or part) of the existing Grimsby West Substation are yet to be defined and as such any impacts on Agriculture and Soil receptors from the proposals will be included within the ES.
- 8.4.10 The key parameters and assumptions which inform the assessment will be reviewed based on the design presented in the DCO application and, where required, updated, or refined, for the ES. The ES will present the final key limitations and assumptions used within that assessment, particularly drawing attention to any areas that may have changed from that presented in this preliminary assessment.

8.5 Baseline Conditions

Study Area

- 8.5.1 The Study Area for the assessment of Agriculture and Soils comprises the draft Order Limits within Section 1, as agreed within the Scoping Opinion (Ref 2). The assessment is confined to within this boundary as no land will be affected outside of this.

Data Collection

- 8.5.2 The following data has been used to inform the baseline conditions:
- i. British Geological Survey (BGS) Geology Viewer (Ref 6);
 - ii. Ordnance Survey (OS) mapping and aerial photography (Ref 7);
 - iii. Agricultural Land Classification – Provisional (England) (Ref 8);

- iv. Post-1988 Agricultural Land Classification (England) (Ref 8);
- v. National Soil Association Map of East Midlands and Eastern England and soil data from National Soils Resources Institute at Cranfield university (NSRI) (Ref 9);
- vi. Likelihood of BMV Agricultural Land map (Ref 10);
- vii. Relevant agriculture and soils data from other projects which overlap with the draft Order Limits; and
- viii. Climate data sets for ALC assessment (Ref 11).

Existing Baseline

8.5.3 The following section outlines the Agriculture and Soils baseline. The baseline section should be read in conjunction with the following supporting Figures as found within **PEI Report Volume 2**:

- i. **PEI Report Volume 2 Part B Section 1 Figure 8.1 National Soil Map;**
- ii. **PEI Report Volume 2 Part B Section 1 Figure 8.2 Provisional Agricultural Land Classification;**
- iii. **PEI Report Volume 2 Part B Section 1 Figure 8.3 Detailed Agricultural Land Classification;**
- iv. **PEI Report Volume 2 Part B Section 1 Figure 8.4 Woodland and Forestry Schemes;** and
- v. **PEI Report Volume 2 Part B Section 1 Figure 8.5 Agri-environment Schemes.**

Geology

8.5.4 Geology plays a crucial role in shaping the soil types and characteristics as the parent material from which the soils are formed. Available geological maps show Section 1 comprises one underlying bedrock formation. This is the Burnham Chalk Formation (chalk), described as thinly bedded chalk with common and discontinuous flint bands formed between 93.9 and 83.6 million years ago during the Cretaceous period.

8.5.5 Superficial drift present is predominantly Devensian Till (Diamicton), a sedimentary superficial deposit formed between 11.6 and 11.8 thousand years ago during the Quaternary period. One localised area of Lacustrine Deposits, recorded to comprise sand, silt and clay, is present within the west of the draft Order Limits for Section 1 and two areas of Glaciofluvial Deposits, comprising sand, are recorded as being present in the centre/east of the draft Order Limits for Section 1.

Soils

8.5.6 The Soil Associations describe the different types of soil found within the UK. Available national soil survey mapping data indicates that only the Holderness Soil Association is present within Section 1 (as shown on **PEI Report Volume 2 Part B Section 1 Figure 8.1 National Soil Map**).

- 8.5.7 The Holderness Association consists mainly of slowly permeable fine loamy and moderately permeable coarse loamy soils on chalky till and glaciofluvial drift. It also includes narrow strips of clayey alluvial soils. The till is usually clay loam but can be sandy clay loam in texture, with a clay content of 25 to 30 per cent. The soils are seasonally waterlogged slowly permeable soils, formed above 3 m AOD and prominently mottled above 40 cm depth. They have no relatively permeable material starting within and extending below 1 m of the surface.
- 8.5.8 The soils in Section 1 will be providing a range of soil functions, and as such are considered to have a range of sensitivities from very high to medium.

Agricultural Land Classification

- 8.5.9 ALC is a classification system used to assess the agricultural quality within England and Wales. The Provisional ALC mapping shows that the draft Order Limits within Section 1 is entirely Grade 3 land. This is shown on **PEI Report Volume 2 Part B Section 1 Figure 8.2 Agricultural Land Classification**.
- 8.5.10 Please note limitations associated with using provisional ALC mapping, with particular reference to Grade 3 including Grades 3a and 3b, as described in paragraph i.
- 8.5.11 There is no pre-existing detailed ALC survey data available within the draft Order Limits for Section 1, as shown in **PEI Report Volume 2 Part B Section 1 Figure 8.3 Detailed Agricultural Land Classification**. Detailed ALC surveys are only found where a detailed ALC survey has previously been conducted and accepted by Natural England.

Woodland and Forestry Scheme

- 8.5.12 Woodland and Forestry Schemes are government provided incentives that reward landowners for the creation and management of woodlands. There are no Woodland and Forestry Schemes within the draft Order Limits for Section 1 (as shown on **PEI Report Volume 2 Part B Section 1 Figure 8.4 Woodland and Forestry Schemes**).

Agri Environment Schemes

- 8.5.13 Agri-environment Schemes comprise government funding to farmers and land managers to support activities which improve the local environment. There are different levels of Environmental Stewardship Schemes which have increasing complexity and land management requirements but also therefore have greater environmental benefits. There are no Agri Environment Schemes within the draft Order Limits for Section 1 (as shown on **PEI Report Volume 2 Part B Section 1 Figure 8.5 Agri Environment Schemes**).

Land Use

- 8.5.14 Aerial imagery and OS mapping indicate that the agricultural land use within Section 1 is predominantly arable, with some grassland and woodland areas. Field boundaries generally comprise hedges, trees and roads.

Agricultural Landholdings

- 8.5.15 There are two landowners affected within Section 1. The land is predominantly arable land with small sections of woodlands and grassland. Given the predominant land use this receptor is considered to have a low sensitivity.

Future Baseline

- 8.5.16 The future baseline relates to known or foreseeable changes to the current baseline in the future, against which the effects of the Project during construction and operation are assessed. Specifically, it accounts for anticipated changes including: those caused by changing climatic conditions, policy, legislation, advances in technology and by other confirmed development projects which will be complete prior to construction of the Project.
- 8.5.17 At this preliminary stage, a full assessment of the implications of any confirmed development projects with regard to future baseline conditions has not been undertaken. A list of the currently known developments which are anticipated to be included within the future baseline scenario is provided within **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope Annex A Developments for Consideration Within the Future Baseline**. This will be reviewed and updated as appropriate during development of the ES, as with other information which informs assessment of the future baseline.
- 8.5.18 It is considered that the baseline conditions for soils and ALC grades will remain unchanged from those described in the baseline during the construction period of the Project. While there may be potential changes in relation to climate change, including greater rainfall intensity and frequency of droughts, that could affect soil conditions, land grade, and farming practices, it is likely that these would only become apparent over longer time frames.
- 8.5.19 There could potentially be future changes to land management practices and business approaches across the landowners/land managers irrespective of whether this Project goes ahead; these cannot be known or assessed currently as any future changes would be driven by third parties.
- 8.5.20 The baseline details as presented above are not anticipated to change in the absence of the Project.

8.6 Design, Control and Additional Mitigation Measures

Design Mitigation Measures

- 8.6.1 The Project and draft Order Limits have been designed to avoid sensitive receptors as far as practicable. This is in accordance with the 'Holford Rules' (Ref 12) applicable to routing of new overhead lines and the 'Horlock Rules' (Ref 13) which apply to design and siting of substations. These approaches are explained in further detail within the Corridor Preliminary Routeing and Siting Study (CPRSS) (Ref 14) and **PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered**. Principles include, but are not limited to, rationalising the design to minimise the land take required, seeking to avoid areas of highest amenity, cultural or scientific value, taking advantage of natural screening provided by existing landform and features (e.g. woodland) and keeping visual, noise and other environmental effects to a minimum.

- 8.6.2 Following selection of the preferred route corridor, environmental specialists have been integral to ongoing design refinement of works within Section 1. This has further contributed to the avoidance or reduction of the potential environmental impacts of the Project. For example, the Project design has been and will continue to be rationalised to minimise the extent of land take required to construct, maintain and operate the proposed assets and position infrastructure (such as pylons and access routes) as close as is practicable to field boundaries to minimise impacts to agricultural operations.

Control Mitigation Measures

Construction

- 8.6.3 A Preliminary CoCP is provided in **PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice**. The control measures included within the Preliminary CoCP relevant to the Agriculture and Soils assessment of Section 7 include:
- i. GG01: The Project will be compliant with all relevant legislation, consents and permits.
 - ii. GG02: The Project will be designed to comply with existing National Grid standards and the guidelines and policies detailed in NPS-EN5 including the International Commission on Non-Ionizing Radiation Protection guidelines for electric and magnetic fields (EMFs) and associated precautionary policy.
 - iii. GG05: A record of condition will be carried out (photographic and descriptive) of the working areas that may be affected by the construction activities, prior to works commencing. This record will be available for comparison following reinstatement after the works have been completed to ensure that the standard of reinstatement at least meets that recorded in the pre-condition survey.
 - iv. GG08: Land used temporarily will be reinstated where practicable to its pre-construction condition (including ALC grade) and use. Hedgerows, fences, and walls (including associated earthworks and boundary features) will be reinstated to a similar style and quality to those that were removed, in consultation with the landowner.
 - v. GG11: Any activity carried out or equipment located within a construction compound that may produce a noticeable nuisance, including but not limited to dust, noise, vibration and lighting, will be located away from sensitive receptors such as residential properties or ecological sites where practicable.
 - vi. GG19: Earthworks and stockpiled soil will be managed as per the SMP.
 - vii. AS01: Where land is being returned to agricultural use, the appropriate soil conditions (for example through the replacement of stripped layers and the removal of any compaction) will be recreated. This will be achieved to a depth of 1.2 m (or the maximum natural soil depth if this is shallower).
 - viii. AS02: The intention is to maintain access where possible; this may have to be done using localised diversions/restrictions. Although not envisaged at this stage it may be that temporarily access isn't maintained but, in all instances, those impacted will be consulted on the proposals. This may require signed diversions or temporary restrictions to access. The means of access to affected properties,

facilities and land parcels will be communicated to affected parties during the pre-construction period. with any changes communicated in advance of the change being implemented. Where field-to-field access points require alteration as a result of construction, alternative field access will be provided in consultation with the landowner/occupier.

- ix. AS03: Existing water supplies for livestock will be identified pre-construction. Where supplies will be lost or access compromised by construction works, temporary alternative supplies will be provided. Water supplies will be reinstated following construction.
- x. AS04: A scheme of pre-construction land drainage will be designed with the intent of maintaining the efficiency of the existing land drainage system and to assist in maintaining the integrity of the working area during construction. The Project may include a system of 'cut-off' drains which feed into a new header drain and the Project will also take into account surface water runoff measures.
- xi. AS05: Should animal bones be discovered during construction, which may indicate a potential burial site, works will cease, and advice will be sought from the Animal Health Regional Office on how to proceed, relevant to the origin and age of the materials found
- xii. AS06: All movement of plant and vehicles between fields will cease in the event of a notification by the Department for Environment, Food and Rural Affairs (Defra) of a disease outbreak in the vicinity of the site that requires the cessation of activities. Advice will be sought from Defra in order to develop suitable working methods required to reduce the biosecurity risk associated with the continuation of works.
- xiii. AS07: Stone pads or alternatives such as soil stabilisation will be installed in areas where heavy equipment, such as cranes and piling rigs, and access routes are to be used. The stone pads will provide stable working areas and will reduce disturbance to the ground. The stone pad area will be stripped of the topsoil, which will be stored and reinstated in accordance with the soil management measures.
- xiv. AS08: Soil management measures will be set out in the SMP. The SMP, will include, but not be limited to the following:
 - details of the soil resources present;
 - roles and responsibilities (and required competencies and training);
 - how topsoil and subsoil will be stripped and stockpiled;
 - suitable conditions for when handling soil will be undertaken, for example avoiding handling of waterlogged soil;
 - indicative soil storage locations;
 - how soil stockpiles will be designed taking into consideration site conditions and the nature/composition of the soil;
 - specific measures for managing sensitive soils;
 - suitable protective surfacing where soil stripping can be avoided, based on sensitivity of the environment and proposed works;
 - approach to reinstating soil that has been compacted, where required;

- details of measures required for soil restoration; and
- requirements for monitoring.

Additional Mitigation Measures

- 8.6.4 Additional mitigation measures are those required to reduce likely significant adverse environmental effects which may still occur despite the inclusion of the embedded design and control measures described above.
- 8.6.5 Additional mitigation measures are not anticipated to be required in relation to Agriculture and Soils effects. However, this will remain under review during the completion of further assessment and development of the ES.

8.7 Preliminary Assessment of Effects

- 8.7.1 The following section presents the findings of the preliminary assessment of effects upon the receptors, identified within the Study Area, as a result of construction, operational and/or maintenance activities within Section 1.
- 8.7.2 The preliminary assessment of effects reported below takes into account the Design and Control mitigation measures previously described.
- 8.7.3 For a summary of the likely significant effects please refer to **PEI Report Volume 2 Part B Section 1 Chapter 13 Summary**. A supplementary summary of all non-significant effects is also included within this section in **Table 8.2**, based upon the assessment scope detailed in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
- 8.7.4 It is noted that this is an ongoing assessment and is subject to change due to the ongoing design development of the Project, statutory consultation feedback and further stakeholder engagement. A full assessment will be included within the ES submitted with the DCO application.

Likely Significant Effects

Construction

Agricultural Land Classification

- 8.7.5 To undertake this assessment, publicly available Provisional ALC data has been used to determine the likely presence of BMV land. Land provisionally mapped as Grade 3 has been assumed to comprise BMV land. This approach has been taken at PEI Report stage as currently detailed ALC surveys have not been undertaken. The ES submitted with the DCO application will include detailed ALC survey data that will show the split between Grade 3a and Grade 3b land.
- 8.7.6 During construction there would be a potential loss of BMV land (defined as ALC Grades 1, 2 and 3a) from agricultural productivity.
- 8.7.7 For Section 1, it is assumed that all land within the draft Order Limits may be temporarily impacted and temporarily removed from agricultural production during the construction phase. This is based on the requirement to secure land temporarily for

both the construction of infrastructure and the stringing of conductors between pylons.

- 8.7.8 The agricultural land required in Section 1 is provisionally mapped as Grade 3, and as such is considered likely to comprise BMV land. Grade 3 is considered to have a high sensitivity. The total extent of land required during construction would be 86.3 ha. Of this, 57.6 ha would be reinstated to its preconstruction condition and grade; the impacts of the temporary land take would therefore comprise an impact of small magnitude which would be a moderate adverse effect and likely significant (following the assessment criteria set out in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**). The land required includes all agricultural land needed for the construction of the proposed Project infrastructure including the substation, pylons, access roads and temporary land requirements.
- 8.7.9 Of the land required during construction, 28.7 ha would be required for permanent infrastructure (the substation, pylon footings and foundations). The permanent loss of this land (assumed to be BMV land) would be of a large magnitude and a major adverse effect and likely significant.

Soil Function

- 8.7.10 There would be disturbance to soils, from the soil stripping required for the Substation development, pylons, access routes, and areas required temporarily (such as construction compounds and haul roads).
- 8.7.11 The soils in Section 1 will be providing a range of soil functions, and as such are considered to have a sensitivity of very high to medium.
- 8.7.12 The stripping and stockpiling of soil resources would have a temporary effect on the soil ecosystem services. This could include affecting soil hydrology as well as a soils' natural carbon storage ability. The implementation of effective soil handling, storage and reinstatement measures, which will be detailed in an Outline Soil Management Plan (SMP) (submitted as part of the DCO application), would therefore be critical in ensuring minimisation of effects on these functions and the successful restoration and re-use of soils.
- 8.7.13 For Section 1, it is assumed that all land within the draft Order Limits will be temporarily impacted by construction activities involving soil handling or trafficking, with soils temporarily affected reinstated to their pre-construction condition. The magnitude of the impact on soil quality and ecosystem function as a result of temporary disturbance is assessed as being small; however, due to the spectrum of soil functions likely to be present within the draft Order Limits for Section 1, this would result in a range of major, moderate or minor adverse effects and therefore likely significant.
- 8.7.14 The permanent loss of 28.7 ha of soils would affect the associated soil ecosystem services. However, where practicable, all surplus soil resources would be re-used within the Project where, depending on the proposed land use, some soil ecosystem services will be retained, restored or potentially enhanced. Until it can be confirmed how practicable it will be to re-use the soil resources it is considered that this would result in an impact of large magnitude, which would be considered a major adverse effect on soil function and is considered likely significant. The land grades and soil types (including peat if present) affected permanently will be confirmed following surveys and will be fully assessed in the ES submitted with the DCO application.

Operation and Maintenance

- 8.7.15 Based upon the preliminary assessment, no likely significant effects are expected to occur on Agriculture and Soil receptors during the operation and maintenance phase of the Project in Section 1. Further discussion is provided in the following sections in relation to the predicted non-significant effects of the Project.
- 8.7.16 During the operation of the Project, land taken temporarily by the Project will have been reinstated and returned to agricultural use, whilst land taken permanently would no longer be for agricultural use and any likely significant effects accounted for during the construction phase assessment.

Likely Non-Significant Effects

- 8.7.17 For completeness, **Table 8.2** summarises the findings of the preliminary assessment with respect to those impacts that are not predicted to result in significant Agriculture and Soils effects.

Table 8.2 Preliminary summary of likely non-significant Agriculture and Soils effects – Section 1

Source	Receptor	Impact	Sensitivity/ Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
Construction Phase						
Construction on agricultural land in use as part of an agricultural business	Agricultural Landholdings	Temporary loss of productive land	Low	Medium	Likely not significant	Land use is predominantly arable, and so of low sensitivity. Land required temporarily would be reinstated to its pre-construction condition and impacts on individual agricultural businesses would be dealt with through financial compensation in accordance with the compensation code (which would include consideration of any active agri-environment and/or forestry/woodland schemes).
Operation and Maintenance Phase						
Any operational activity on agricultural land for operational and maintenance purposes.	Agricultural Land Classification	Temporary loss of BMV land from agricultural production due to activities required for operational and maintenance purposes.	High	Low/negligible	Likely not significant	Maintenance or repair works which would result in disturbance to BMV land during the operation of the Project (such as creation of access routes, use of trackway or creation of compounds) would be undertaken in accordance with good practice soil handling methods which would be set out in a Soil Management Plan for

Source	Receptor	Impact	Sensitivity/ Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
						the works. As these are likely to be small-scale and temporary, no likely significant effects on BMV land during operational, maintenance or repair activities are predicted.
Impacts on soil function due to any activities required for operational and maintenance purposes.	Soil Function	Temporary disturbance to soils and loss of function due to activities required for operational and maintenance purposes.	Moderate	Low/negligible	Likely not significant	Maintenance or repair works which would result in disturbance to soils during the operation of the Project (such as creation of access routes, use of trackway or creation of compounds) would be undertaken in accordance with good practice soil handling methods which would be set out in a Soil Management Plan for the works. As these are likely to be small-scale and temporary, no likely significant effects on soil function during operational, maintenance or repair activities are predicted.
Impacts on agricultural business due to any activities required for operational and maintenance purposes.	Agricultural Landholdings	Temporary loss of productive land due to activities required for operational and maintenance purposes.	Low/negligible	Low/negligible	Likely not significant	Land use is predominantly arable, and so of low sensitivity. Land required temporarily would be reinstated to its pre-construction condition and impacts on individual agricultural businesses would

Source	Receptor	Impact	Sensitivity/ Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
						<p>be dealt with through financial compensation in accordance with the compensation code (which would include consideration of any active agri-environment and/or forestry/woodland schemes). The overhead line will not result in any further permanent impacts in relation to on-going agricultural activities above and beyond the permanent effects assessed during the construction phase, and any maintenance or repair works are likely to be small-scale and temporary, with works undertaken in accordance with good practice at the time of the works</p>

8.8 Monitoring

- 8.8.1 Monitoring of soil handling, storage and reinstatement activities will be required during construction, and full details of what would be monitored, and the roles and responsibilities associated with the monitoring will be set out in the Outline SMP (submitted as part of the DCO application).
- 8.8.2 Monitoring may be required during the aftercare period. The Outline SMP will set out the commitments associated with the aftercare period, with full details confirmed prior to the end of construction and prior to any land hand back.

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9. Traffic and Movement

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9. Traffic and Movement

9.1 Introduction

- 9.1.1 This chapter presents the Preliminary Environmental Information (PEI) in relation to the Traffic and Movement assessment of the New Grimsby West Substation Section (Section 1) of the Grimsby to Walpole Project (the Project). Specifically, the chapter includes the following sections:
- i. An introduction to the topic (section 9.1);
 - ii. Identification of key local and regional policy relevant to the assessment (section 9.2). A full overview of the legislation and national, regional onshore and marine planning policy context that applies to the Project is presented within **PEI Report Volume 2 Part A Chapter 2 Legislative, Regulatory and Planning Policy Context** and supporting appendices;
 - iii. A summary of the assessment scoping process and the subsequent scope of the Traffic and Movement assessment (section 9.3). Further detail is provided within **PEI Report Volume 3 Part A Appendix 4A Planning Inspectorate Scoping Opinion Responses**;
 - iv. A high-level summary of the methodology of the Traffic and Movement assessment within Section 1 (section 9.4). A detailed description of the assessment methods and scope, applicable to the whole Project, is contained in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**;
 - v. A description of the environmental baseline within the Section 1 Study Area relevant to the Traffic and Movement assessment (section 9.5);
 - vi. A description of mitigation measures included for the purposes of the Traffic and Movement assessment reported within the PEI Report (section 9.6). Further information regarding design development can be found in **PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered** and the **Grimsby to Walpole Design Development Report**;
 - vii. The likely significant and non-significant Traffic and Movement effects arising during construction and operation of the Project within Section 1 based upon the assessment completed to date (section 9.7); and
 - viii. An outline of the proposed monitoring requirements in relation to Traffic and Movement (section 9.8).
- 9.1.2 Further supporting information is set out in **Table 9.1** below, including supporting figures and technical appendices.

Table 9.1 Supporting documentation

Supporting Information	Description
Topic Specific Supporting Documentation	
PEI Report Volume 2 Part B Section 1 Figures	<p>Figure 9.1 Overall Context Plan</p> <p>Figure 9.2 Primary Access Routes and Workers Access Routes</p> <p>Figure 9.3 Existing Public Rights of Way (PRoW)</p> <p>Figure 9.4 Route Sensitivity</p> <p>Figure 9.5 Preliminary Impact Analysis</p>
PEI Report Volume 3 Part B Sections 1-7 Appendix 9A Traffic and Movement Baseline	Presents baseline traffic information for key highway links including type of link, traffic flows, congestion rating, collision clusters and sensitive receptors.
PEI Report Volume 3 Part B Sections 1-7 Appendix 9B Preliminary Construction Information	Provides preliminary construction traffic information for new substations, compounds and bellmouths providing access to the construction haul routes. This includes construction Heavy Goods Vehicles (HGVs) and construction staff traffic flows.
PEI Report Volume 3 Part B Sections 1-7 Appendix 9C Future Baseline and Impact Analysis	Presents the traffic analysis, including calculated future baseline and forecast construction traffic flows, to determine the likely percentage change in traffic flows on key highway links as a result of the Project. This is used to determine whether the impact (change) meets the threshold for more detailed assessment based on the sensitivity of the links.
Project Supporting Documentation	
PEI Report Volume 2 Part B Section 1 Chapter 1 Overview of the Section and Description of the Project	A summary of the works within Section 1, including permanent infrastructure, temporary construction works, and operational activities.
PEI Report Volume 3 Part A Appendix 2A Key Legislation	A list of identified environmental legislation considered relevant to the Project, which will be updated and amended as required to inform the Environmental Statement (ES).
PEI Report Volume 3 Part A Appendix 2B National and Regional Planning Policy	A list of national and regional policies generally applicable to the assessment principles which underpin the PEI Report and ES.

PEI Report Volume 3 Part A Appendix 2Ci Local Plan Policy: Section Specific	An outline of the potentially relevant local planning policy allocations affecting each of the specific sections of the Project.
PEI Report Volume 3 Part A Appendix 2Cii Local Plan Policy: Route-wide	Details of planning policies applicable route-wide within the relevant Local Authority areas.
PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered	Provides a summary of the main alternatives considered in relation to the Project during the design development process, including the main reasons for selecting the chosen option.
PEI Report Volume 2 Part A Chapter 4 Approach to Preliminary Environmental Information	Sets out the Environmental Impact Assessment (EIA) approach and general methodology that has been used in developing the PEI Report for the Project.
PEI Report Volume 2 Part A Chapter 5 Project Description	An overarching description of the Project and its key components, including available construction information.
PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice	Sets out control and management measures that will be undertaken during construction of the Project if granted consent. The final Code of Construction Practice (CoCP) will be submitted in support of the Development Consent Order (DCO) application.

- 9.1.3 There are interrelationships between the potential effects on Traffic and Movement and other environmental topics. Therefore, please also refer to the following chapters within **PEI Report Volume 2 Part B** and **Part C**:
- i. **PEI Report Volume 2 Part B Section 1 Chapter 10 Noise and Vibration** considers the noise and vibration impacts of changes in traffic flow on those road links utilised by traffic generated by the Project.
 - ii. **PEI Report Volume 2 Part B Section 1 Chapter 11 Socio-economics, Recreation and Tourism** considers potential in-combination effects to users of promoted/recreational routes including PRoW.
 - iii. **PEI Report Volume 2 Part B Section 1 Chapter 12 Air Quality** considers the air quality impacts of changes in traffic flow on those road links utilised by traffic generated by the Project, including vehicle emissions and dust (trackout).
 - iv. **PEI Report Volume 2 Part B Section 1 Chapter 13 Summary** provides a concise, consolidated summary of the likely significant effects reported for all topics, based upon the preliminary assessment.
 - v. **PEI Report Volume 2 Part C Route-wide Chapter 8 Health and Wellbeing** considers potential impacts on neighbourhood quality and access to open space and health and social infrastructure, including those associated with traffic generated by the Project.
 - vi. **PEI Report Volume 2 Part C Route-wide Chapter 9 Climate Change** considers the potential greenhouse gas emissions from traffic resulting from the

Project. It should be noted that at this preliminary stage, this does not include quantitative calculations.

- vii. **PEI Report Volume 2 Part C Route-wide Chapter 10 Cumulative Effects** reports those intra-project effects which could potentially act in combination to result in cumulative environmental effects. It also identifies a shortlist of other Committed Developments with which there may be potential for cumulative effects, and the relevant environmental topics for such effects (inter-project). The full cumulative effects assessment will be reported within the ES.

9.2 Legislation and Policy Framework

Legislation and National Policy

- 9.2.1 Legislation and national policy relevant to the Project and this chapter is described in **PEI Report Volume 2 Part A Chapter 2 Legislative, Regulatory and Planning Policy** and supporting appendices, detail of which is set out in **Table 9.1**.

Regional and Local Policy

- 9.2.2 Regional and local plans or policies relevant to this assessment are as follows:
- i. Lincolnshire County Council's Local Transport Plan 5 (Adopted 2022) (Ref 1):
 - Aims to use the local and strategic development management processes to ensure that development is planned, delivered and managed to reduce the need to travel and to support the delivery of sustainable transport modes. Supports the provision of improved walking, cycling and public transport services and facilities as part of new development and actively encourage innovative solutions to travel.
 - ii. North East Lincolnshire Local Plan 2013-2032 (Ref 2):
 - Policy 36 - Promoting sustainable transport: which sets out the Council's support for measures that promote more sustainable transport choices and identifies a number of objectives for development proposals.
 - Policy 37 - Safeguarding transport infrastructure: the Council will safeguard routes of, and support measures which deliver, maintain and improvement key transport infrastructure, namely, South Humber Bank Link Road, Grimsby West Link Road and Network Rail improvements.

9.3 Scope of Assessment

- 9.3.1 The scope of the assessment has been informed by the Scoping Opinion (Ref 3) provided by the Planning Inspectorate in September 2024 on behalf of the Secretary of State, following the submission of the EIA Scoping Report (Ref 4). The scope has also been informed through consultation and engagement with relevant consultees. A summary of the Scoping Opinion together with a response against each point of relevance to the Traffic and Movement chapter is provided in **PEI Report Volume 3 Part A Appendix 4A Planning Inspectorate Scoping Opinion Responses**. A summary of the stakeholder engagement undertaken to date is provided in **PEI Report Volume 3 Part A Appendix 4D Summary of Stakeholder Engagement**.

- 9.3.2 Non statutory consultation feedback is summarised within the **Grimsby to Walpole Stage 1 Consultation Feedback Report**.
- 9.3.3 The scope of the construction assessment considers potential effects upon a range of receptor groups in accordance with the Institute of Environmental Management and Assessment (IEMA) guidance (Ref 5) which is based on consideration of the impacts upon the following transport infrastructure: highways (including footpaths and cycleways), railways, waterways and PRow. The receptors assessed and potential effects considered are summarised in **Table 9.2**.

Table 9.2 Scope of Traffic and Movement assessment

Receptor	Potential effects
Highway Network (including footways and cycleways)	
Road users	Effects as a result of construction traffic and road closures/diversions leading to potential severance, driver delay and highway safety effects. Effects as a result of the movement of abnormal indivisible loads (AIL) and hazardous loads during construction.
Public transport users (bus)	Effects as a result of construction traffic and road closures/diversions leading to potential journey time delays.
Pedestrians and cyclists	Effects as a result of construction traffic leading to severance and pedestrian/cycle delay. Effects on footway closures/diversions leading to severance and/or increased journey time. Effects of general construction works leading to a decline in pedestrian and cycle amenity ¹ and additional fear and intimidation.
Railways	
Railway users	Effects upon users of the rail network due to potential impacts upon railway infrastructure.
Navigable Waterways	
Waterway users	Effects upon users of navigable waterways due to temporary closures leading to reduced access/increased journey time.
Public Rights of Way and Promoted/Recreational Routes	
Pedestrians, Cyclists and Equestrians	Effects as a result of route closures/diversions leading to potential increased journey time. Effects due to a decline in pedestrian, cycle and equestrian amenity due to interaction with traffic.

- 9.3.4 The EIA Scoping Report Traffic and Movement chapter sought to scope out effects associated with the operation of the Project, however it is noted that the Scoping

¹ Pedestrian amenity is broadly defined as the relative pleasantness of a journey and is considered to be affected by traffic flow, composition and pavement width/separation from traffic.

Opinion received requested further information relating to operational traffic to support this position. This PEI Report, including supporting appendices, therefore provides an initial assessment of potential effects during operation. The scope of the operational assessment also considers potential effects on users of PRow and promoted/recreational routes, i.e. pedestrians, cyclists and equestrians.

9.4 Assessment Methodology

- 9.4.1 The assessment scope, methodology, relevant guidance, key assumptions and limitations for the Traffic and Movement assessment are set out in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**. This includes a description of how receptor sensitivity, magnitude of impact and significance of effects are all defined and assigned to the assessment. A summary of the key components is outlined below.
- 9.4.2 The IEMA Guidance assesses the effect on users by assessing the transport infrastructure upon which they rely.
- 9.4.3 For users of the highway network during construction, the assessment is based on the impact criteria set out within the IEMA Guidance, which sets out two broad rules for identifying potential highway links for analysis:
- i. Rule 1: include highway links where traffic flows will increase by more than 30 per cent (or the number of HGVs will increase by more than 30 per cent); and
 - ii. Rule 2: include highway links of high sensitivity where traffic flows have increased by 10 per cent or more.
- 9.4.4 Based on the IEMA Guidance, highway links have therefore been identified where traffic flows are expected to increase by 30 per cent or more, and where there are increases of 10 per cent or more in an area identified as high or very high sensitivity. Sensitive areas are those where there is a presence of sensitive receptors as defined by the IEMA Guidance, and are also defined through consideration of congestion and accident data.
- 9.4.5 To determine likely increases in traffic flows on highway links, projected volumes of construction traffic have been distributed across the highway network. Construction traffic has been assigned based upon an assessment of the connection points between the works areas and the highway network, and the most suitable/likely routes that will be used to access the draft Order Limits. This approach is based upon identification of bellmouths, Primary Access Routes and Worker Access Routes, which are defined in **Table 9.3** and described further in section 9.5 Baseline Conditions.

Table 9.3 Distribution of Project traffic – definitions

Accesses used by Project traffic	Definition
Bellmouths	Access points (junctions) from the existing highway network, facilitating access to construction compounds and site haul roads.

Accesses used by Project traffic	Definition
Primary Access Routes	Identified as a series of roads and junctions, between the Strategic Road Network (SRN) ² and the bellmouths, suitable for access by large construction vehicles, that are planned to be used by HGVs. Identification of these routes is based on existing conditions, potential for improvements and professional judgement.
Worker Access Routes	Identified as a series of additional roads and junctions which are not promoted as construction HGV routes but which could be used by workers to travel to site. These are identified as likely routes between residential areas, key employment/skills centres and the bellmouths.

- 9.4.6 A qualitative assessment of impacts to bus users during construction has been undertaken based on the projected increase in traffic flows as a result of the Project and potential impacts to bus services. More detailed assessment will be provided within the ES if the projected increase in traffic flows on the highway links where bus services operate exceed the IEMA Guidance screening criteria defined above.
- 9.4.7 A qualitative assessment of impacts to railway users and waterway users during construction has been undertaken based on any identified requirement to restrict access or close these routes to enable construction of the Project within Section 1. An initial assessment of sensitivity is based on consideration of the likely numbers of users of the infrastructure; for railways this is considered High as there are likely to be high numbers of passengers, for waterways this is considered Low as the number of users will likely be less. More detailed assessment, where required, will be provided in the ES following further consultation with the infrastructure operators.
- 9.4.8 A qualitative assessment of impacts to pedestrians and cyclists has been undertaken based on the projected increase in traffic flows as a result of the Project during construction, and potential to impact upon pedestrians and cyclists using the affected highway routes. More detailed assessment will be provided in the ES where the projected increase in traffic flows exceed the IEMA Guidance criteria and the impact thresholds defined with the Scoping Report or if required by the highway authority.
- 9.4.9 In addition, PRoW and promoted/recreational routes that are expected to be crossed by works within Section 1 have been identified and qualitative assessment of impacts to pedestrians, cyclists and equestrians undertaken where routes are anticipated to require temporary diversion or closure. The significance of effects on PRoW and promoted/recreational routes is determined through professional judgement, based on the sensitivity (national, regional, local importance and potential usage of the routes) and magnitude of impact, based on requirements for crossing, diversion or closure of routes. More details assessment will be provided within the ES where requested by the local authority.
- 9.4.10 A high-level summary of potential effects (without mitigation) is then provided within this chapter based on professional judgement and experience on other similar National Grid Electricity Transmission plc (National Grid) projects. Residual effects will be assessed and reported in the ES.

² The Strategic Road Network is the national network of motorways and major A roads maintained and operated by National Highways

- 9.4.11 While the Scoping Report Traffic and Movement chapter sought to scope out effects associated with the operation of the Project, this PEI Report assessment presents details of forecast operational traffic movements and provides an initial assessment of potential effects of the forecast flows on baseline flows.

Assessment Assumptions and Limitations

- 9.4.12 All general assumptions and limitations for the topic are listed within **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
- 9.4.13 The decommissioning works at the existing Grimsby West Substation are yet to be defined, therefore a limitation of this preliminary assessment of Traffic and Movement effects upon NSRs is that it does not assess these works. The decommissioning works will be assessed as part of the ES.
- 9.4.14 The key parameters and assumptions which inform the assessment will be reviewed based on the design presented in the DCO application and, where required, updated, or refined, for the ES. The ES will present the final key limitations and assumptions used within that assessment, particularly drawing attention to any areas that may have changed from that presented in this preliminary assessment.

9.5 Baseline Conditions

Study Area

- 9.5.1 The Traffic and Movement Study Area for Section 1 comprises highway links assumed to be used to provide access for construction vehicles and considers the impacts to traffic, bus routes and pedestrian/cycle routes along these highway access routes. The Study Area for Construction Traffic Routes is defined in further detail below.
- 9.5.2 The Study Area also includes pedestrian/cycle/equestrian routes and PRow networks, railways and waterways that are crossed by the Section 1 draft Order Limits.
- 9.5.3 **PEI Report Volume 2 Part B Section 1 Figure 9.1 Overall Context Plan** provides the wider Project context showing the SRN and main A roads that provide access to all Sections of the Project. The access routes and proposed Section 1 Study Area are shown in **PEI Report Volume 2 Part B Section 1 Figure 9.2 Primary Access Routes and Workers Access Routes**.

Construction traffic routes - HGVs

- 9.5.4 Initial construction information (including construction traffic, compound locations, bellmouth accesses and haul roads) has been used to determine the Primary Access Routes which form the basis of the initial assessment presented in this PEI Report. Primary Access Routes have been developed using the following criteria where possible:
- Construction traffic would access site bellmouths from the Primary Access Routes along the local road network. The Primary Access Routes would then connect to an appropriate close junction with the SRN and classified road network. Whilst it is acknowledged that the SRN is part of the classified road

network, the report makes a distinction between the two because of the capacity of the SRN to carry trunk road traffic and abnormal loads.

- ii. From the site bellmouths, construction vehicles would be routed off the public highway along haul roads to access the construction compounds and construction areas. Haul roads will be temporary in nature and will be reinstated upon completion of the construction phase. Haul roads and permanent access roads are illustrated on **PEI Report Volume 2 Part B Section 1 Figure 1.2 Temporary and Construction Features** and **Figure 1.3 Permanent and Operational Features** respectively.
- iii. Shorter available routes between the SRN and classified road network and site access bellmouths have been selected where possible, balancing distance and suitability of links to accommodate construction traffic.
- iv. Existing known highway constraints, such as road geometry, height and weight restrictions, junction arrangements and other physical constraints have been avoided where possible.
- v. Settlements and sensitive locations such as schools or hospitals have been avoided where possible to reduce potential effects on receptors.

9.5.5 **Table 9.4** provides a summary of the SRN and classified road network that would be used by construction traffic accessing the Section 1 draft Order Limits and their strategic connections for delivery of materials/equipment.

Table 9.4 Construction traffic route – SRN connections

Strategic/classified road network	SRN Connections
A180	West to SRN M180, M18, M62 and A1(M) East to Port of Grimsby and West to Immingham Docks

9.5.6 Primary Access Routes are formed of one or more roads within the road network between the SRN/classified road network and the site access bellmouths. The Primary Access Routes are made up of Core Routes (CR series), which are the main A roads providing connections across the wider Study Area, and Local Links (LK series), which are roads providing local access from the Core Routes to the individual bellmouth accesses.

9.5.7 These are summarised in **Table 9.5** and presented on **PEI Report Volume 2 Part B Section 1 Figure 9.2 Primary Access Routes and Workers Access Routes**. Further details of the roads forming the Primary Access Routes and Workers Access Routes are presented in **PEI Report Volume 3 Part B Sections 1-7 Appendix 9A Traffic and Movement Baseline**.

Table 9.5 Primary access routes

Bellmouth Access	Core Routes forming Primary Access Routes	Local Links forming Primary Access Routes
New Grimsby West Substation and compound	CR1 (A180)/CR2 (A180)	LK1 (A1136)/LK2 (A1136)/LK3 (Aylesby Road)

Construction traffic routes – Worker Access Routes

- 9.5.8 In addition to the Primary Access Routes, construction workers cars/light goods vehicles (LGVs) will use highway links which are not planned to be used by HGVs to access the site. Therefore, additional access routes have been identified that construction workers are expected to use (W series), which provide access from local urban areas where workers are assumed to live.
- 9.5.9 **Table 9.6** summarises the main construction Worker Access Routes relevant to Section 1. These are presented on **PEI Report Volume 2 Part B Section 1 Figure 9.2 Primary Access Routes and Worker Access Routes**.

Table 9.6 Worker access routes – additional highways for construction workers

Access Ref	Roads forming Workers Access Routes
New Grimsby West Substation and compound	CR3 (A180), CR4 (A16), CR5 (A16), CR6 (A16), CR7 (A16), CR18 (A18). CR20 (A18), CR24 (A46), W1 (Main Road/Aylesby Lane), W2 (A1136 Great Coates Rd), W3 (A1136 Yarborough Road), W4 (Cambridge Road), W5 (A46 Grimsby Road), W6 (A46 Laceby Road), W7 (A46 Weelsby Road), W8 (Scartho Road), W9 (Louth Road), W10 (Bradley Road), W11 (Cheapside), W12 (A153 Horncastle Road)

Data Collection

- 9.5.10 The following data has been used to inform the baseline conditions:
- highway network – Ordnance Survey open map (Ref 6), Google Maps (Ref 7), OpenStreetBrowser (Ref 8);
 - bus route information – local bus operators, traveline.info (Ref 9), Google Maps (Ref 7);
 - rail information – National Rail (Ref 10), Google Maps (Ref 7);
 - waterways – Environment Agency, Navigation Authority and The Inland Waterway Association (Ref 11);
 - designated non-motorised user routes for pedestrian, cyclists and equestrians and PRow – Sustrans (Ref 12), Local Authority Definitive/PRow map(s);
 - Other promoted/recreational routes for pedestrians obtained from the Long Distance Walkers Association and through stakeholder engagement undertaken to date;

- vii. Annual Average Daily Traffic (AADT) flows obtained from the Department for Transport (DfT) traffic count data (Ref 13);
- viii. traffic count data from surveys undertaken for the Project – the surveys record road users, pedestrians, cyclists and equestrians as required – Automatic Traffic Count (ATC) data/PRoW count data collected in August and October 2024;
- ix. Traffic Regulation Orders restricting movement and constraints such as height and weight restrictions as viewed on Google Maps;
- x. Personal Injury Collision (PIC) DfT accident data over a five year period (Ref 14);
- xi. Traffic growth factors have been obtained from Trip End Model Presentation Program (TEMPPro)/National Trip End Model; and
- xii. Identification of pedestrian, cycle and horse-riding infrastructure provision along the Primary Access Routes, obtained from Google Maps imagery of the highway network.

9.5.11 The following data was not available at the time of writing this PEI Report but will be included within the ES:

- i. traffic and PRoW user survey data has been obtained for August and October 2024, additional surveys will be undertaken in 2025 to understand baseline conditions;
- ii. traffic information on other developments (committed) within the Study Area received from relevant planning authorities;
- iii. committed transport schemes along and in vicinity of the Primary Access Routes; and
- iv. construction and operational traffic flows for Eastern Green Link 3 and 4 projects for cumulative sensitivity testing.

Existing Baseline

9.5.12 The following section outlines the Traffic and Movement baseline. The baseline section should be read in conjunction with the following supporting Figures and Appendices as found within **PEI Report Volume 2** and **Volume 3** respectively:

- i. **PEI Report Volume 3 Part B Sections 1-7 Appendix 9A Traffic and Movement Baseline;**
- ii. **PEI Report Volume 2 Part B Section 1 Figure 9.1 Overall Context Plan;**
- iii. **PEI Report Volume 2 Part B Section 1 Figure 9.2 Primary Access Routes and Worker Access Routes;**
- iv. **PEI Report Volume 2 Part B Section 1 Figure 9.3 Existing Public Rights of Way (PRoW); and**
- v. **PEI Report Volume 2 Part B Section 1 Figure 9.4 Route Sensitivity.**

Highway network

9.5.13 Links forming Primary Access Routes and Workers Access Routes and a description of the road network along each route can be found within **PEI Report Volume 3 Part B Sections 1-7 Appendix 9A Traffic and Movement Baseline.**

9.5.14 **Table 9.7** provides a description of each link which forms part of the Primary Access Routes and Worker Access Routes within the Section 1 Study Area, including the type of carriageway, character, speed limits, highway constraints, presence of street lighting, bus routes and on-carriageway parking, and pedestrian, equestrian and cycle provision. These roads are presented on **PEI Report Volume 2 Part B Section 1 Figure 9.2 Primary Access Routes and Worker Access Routes**.

Table 9.7 Highway network – links

Route Ref	Highway Links	Description
CR1/CR2	A180	Dual carriageway through rural area, national speed limit = 70 mph, no footways or street lighting.
CR3	A180	Dual carriageway through built up area of Grimsby, national speed limit = 70 mph reduces to 50 mph to east of Westgate roundabout, street lighting, generally no footways with shared footway/cycleway on northern side of Westgate section
CR4	A16	Wide single carriageway road through Grimsby, localised widening at main road junctions, 30 mph speed limit increases to 40 mph on Peaks Parkway, footways and street lighting, numerous local junctions (priority and traffic signal control) and commercial frontages, bus stops, pedestrian crossing provision, generally double yellow line restrictions although some on street parking
CR5	A16	Wide single carriageway, more rural road to south of Grimsby, 40 mph speed limit increases to 50 mph and national speed limit (60 mph) to south, street lighting, generally no footways. Speed limit reduces (30 mph/40 mph) and sections of footway/cycleway in built up areas at New Waltham, bus stops on A16 at a few locations including North Thoresby and New Waltham
CR6	A16	Wide single carriageway, generally national (60 mph) and 50 mph speed limits reduces to 40 mph near residential properties, no street lighting or footways except where some residential properties front, bus stops on A16 to north of Utterby
CR7	A16	Wide single carriageway, national speed limit (60 mph), no street lighting, some narrow footways
CR18	A18	Single carriageway, rural route, generally 50 mph speed limit reducing to 40 mph on approaches to junction with Waltham Road (Barnoldby le Beck) and to 30 mph close to Ludborough, no street lighting except at main road junctions, no footways
CR20	A18	Wide single carriageway to north becomes dual carriageway north west of Aylesby, rural route, national speed limit (60 mph/70 mph) applies, street lighting on single carriageway section, no street lighting on dual carriageway, no footways
CR24	A46	Wide single carriageway, national speed limit (60 mph), no street lighting, narrow footway on one side along part of the route

Route Ref	Highway Links	Description
LK1	A1136 (north-south)	Wide single carriageway, speed limit = 50 mph, street lighting, no footways.
LK2	A1136 (east-west)	Wide single carriageway, speed limit = 40 mph, street lighting, footways on southern side. Signed cycleway (Healing Way) – shared footway/cycleway on southern side.
LK3	Aylesby Road	Narrow single carriageway, speed limit = 30 mph/40 mph (increasing to national limit (60 mph) to south of urban area), street lighting, narrow footway on western side, double yellow line restrictions apply, 7.5t weight restriction (except for loading). No footway to south of the urban area and in vicinity of site access point. Signed cycleway – no infrastructure.
W1	Main Road/ Aylesby Lane	Single carriageway road, 40/60 mph speed limit with no street lighting or footways except in Aylesby where speed limit is 30 mph and narrow footways and street lighting.
W2	A1136 Great Coates Rd	Wide single carriageway through urban area, 30 mph speed limit with footways and street lighting. Bus route with on street bus stops, segregated shared footway/cycleway and on carriageway cycle lanes in places.
W3	A1136 Yarborough Road	Wide single carriageway through urban area, 30 mph speed limit with footways and street lighting. Bus route with on street bus stops.
W4	Cambridge Road	Wide single carriageway through urban area, 30 mph speed limit with footways and street lighting.
W5	A46 Grimsby Road	Dual carriageway through urban area, 30/40 mph, street lighting and footways.
W6	A46 Laceby Road	Wide single carriageway through urban area, 30 mph speed limit with footways and street lighting, bus route with on street bus stops, on street cycle lanes.
W7	A46 Weelsby Road	Wide single carriageway through urban area, 30 mph speed limit with footways and street lighting, bus route with laybys and on street bus stops, on street cycle lanes.
W8	Scartho Road	Wide single carriageway through urban area, 30 mph speed limit with footways and street lighting, bus route with on street bus stops
W9	Louth Road	Wide single carriageway through urban area, 30 mph speed limit with footways and street lighting, bus route with on street bus stops, shared pedestrian/cycle route, some sections of bus lanes on carriageway
W10	Bradley Road	Single carriageway urban road, 30 mph speed limit with street lighting and narrow footways to the north, changes to 40pmh rural route to south with no street lighting and narrow footway on one side

Route Ref	Highway Links	Description
W11	Cheapside	Single carriageway rural route, 60 mph speed limit, no street lighting or footway. 40 mph with footways and street lighting though Waltham
W12	A153 Horncastle Road	Single carriageway rural route, 60 mph speed limit, no street lighting or footways.

9.5.15 For the PEI Report no assessment of junction impacts along the Primary Access Routes and Worker Access Routes has been undertaken. However, the baseline review of link congestion and accident data provided in **PEI Report Volume 3 Part B Sections 1-7 Appendix 9A Traffic and Movement Baseline** does consider junctions as part of the route sensitivity. More detailed assessment of junction operation will be undertaken as required and presented with the Transport Assessment and ES to be submitted with the DCO application.

9.5.16 In addition to the Primary Access Routes and Worker Access Routes, there are roads located on the local highway network where a crossover point is proposed to be provided. This allows construction vehicles to cross over the road (likely via a priority crossing arrangement) and progress along the proposed haul roads. Construction traffic will not access the local highway at these points, therefore these roads have not been assessed within this PEI Report. These cross over points are listed within **PEI Report Volume 3 Part B Sections 1-7 Appendix 9A Traffic and Movement Baseline**.

Traffic flows

9.5.17 Where available, baseline traffic flows are taken from DfT's traffic counters for road links forming the Primary Access Routes and Worker Access Routes. The DfT traffic counter sites are shown on **PEI Report Volume 2 Part B Section 1 Figure 9.2 Primary Access Routes and Worker Access Routes**.

9.5.18 Traffic surveys were undertaken in August and October 2024 on links that do not have available or recent DfT counts. The location of the traffic surveys are also shown on **PEI Report Volume 2 Part B Section 1 Figure 9.2 Primary Access Routes and Worker Access Routes**.

9.5.19 Appropriate growth factors derived from the DfT's Trip End Model Presentation Program (TEMPro), which is used for viewing the National Trip End Model information, have been applied to count data where required. This is to present all traffic data for a consistent 2024 Base Year.

9.5.20 Baseline traffic flows on road links forming the Primary Access Routes and Worker Access Routes where surveys have been undertaken are presented in **PEI Report Volume 3 Part B Sections 1-7 Appendix 9A Traffic and Movement Baseline**. All traffic data is presented as AADT flows for total vehicles and for HGVs.

9.5.21 In addition, a Congestion rating is set out within **PEI Report Volume 3 Part B Sections 1-7 Appendix 9A Traffic and Movement Baseline** and presented on **PEI Report Volume 2 Part B Section 1 Figure 9.4 Route Sensitivity**. This is based on a review of Google traffic flow categories for typical weekday peak hours; coloured grading of fast to slow represented as green = 0, orange = 1, red = 2, dark red = 3.

Congestion along the whole link has been considered and where congestion varies along the link or over different time periods a judgement has been made for the overall link rating.

Collision data

- 9.5.22 Personal injury collision data has been obtained from DfT Road Safety Data for the roads along the Primary Access Routes and Worker Access Routes. The latest five-year PIC data (2019-2023) is presented on **PEI Report Volume 2 Part B Section 1 Figure 9.4 Route Sensitivity**.
- 9.5.23 A collision cluster has been determined by the following criteria:
- i. a location where there are nine or more injury collisions occurring within a junction or a 100 m stretch; and
 - ii. a location with four or more fatal and/or serious collisions happening either within a junction or within a 100 m stretch.
- 9.5.24 From the collision data analysis, collision clusters have been identified at the following locations:
- i. at the junction of A180/Estate Rd 1/Estate Rd 2/Gilbey Rd and junction of A180/Moody Lane/Birchin Way/Pyewipe Rd to the north west of Grimsby;
 - ii. at the junction of A180/Lockhill/A16 and junction of A16/A1136 in Grimsby;
 - iii. at the A46/Bradley Road Roundabout, A46/A1243 Scartho Road Roundabout in Grimsby;
 - iv. on A46 Weelsby Road between Legsby Avenue and Fareborther Street in Grimsby;
 - v. on Scartho Road between Sutcliffe Avenue and Frusher Avenue in Grimsby
 - vi. at the junction of A16/B1219 to the south of Grimsby;
 - vii. on the A16 between Cordeaux Corner and Bolingbroke Road to the north of Louth; and
 - viii. at the junction of A16/Greenfield Road/Bluestone Heath Road to the south of Louth.

Highway link sensitivity

- 9.5.25 Sensitive receptors include users of highway links including drivers, walkers, cyclists, horse riders and public transport passengers. Sensitive areas comprise urban areas where there are likely to be more people (including vulnerable users (younger, older, socially disadvantaged people) and include residential properties, retail areas, schools and hospitals.
- 9.5.26 Receptor/area sensitivity has been assigned to all assessed highway links which constitute the Primary Access Routes and Worker Access Routes for Section 1. The sensitivity level follows IEMA guidance and is categorised as Negligible, Low, Medium, High and Very High. Sensitivity of a link has been determined based on the identified receptors which are present, alongside the assessment of each highway link's congestion rating and any associated collision clusters. Further detail is

included in **PEI Report Volume 3 Part A Appendix 4A EIA Assessment Methodologies and Scope**.

- 9.5.27 A description, location, and the sensitivity level within the Section 1 Study Area are summarised in **Table 9.8** and **PEI Report Volume 3 Part B Sections 1-7 Appendix 9A Traffic and Movement Baseline** and presented on **PEI Report Volume 2 Part B Section 1 Figure 9.4 Route Sensitivity**.

Table 9.8 Highway link sensitivity within the Section 1 Study Area

Route Ref	Road	Description	Sensitivity Level
CR1/CR2	A180	No receptors are identified on this link	Negligible
CR3	A180	Urban area with a range of commercial premises although limited direct local accesses or frontages, segregated shared pedestrian/cycle route along Westgate. Some peak hour congestion, collision cluster identified at two junctions	Medium
CR4	A16	Urban area through central Grimsby. Multiple commercial properties with local accesses and direct frontages, busy pedestrian area with varying width/quality of footways and crossings, on road cycling, bus route, some peak hour congestion, collision cluster identified at one junction	Very High
CR5	A16	A few residential and commercial properties with some frontages/direct accesses. Sections of footway and limited off road cycle infrastructure, bus route, collision cluster identified at one junction	Medium
CR6	A16	A few residential and commercial properties, occasional footways near properties, bus route, one collision cluster identified along a short section	Medium
CR7	A16	A few residential properties along this link	Low
CR18	A18	A few residential properties at southern end of link	Low
CR20	A18	A few residential and commercial properties at southern end of link	Low
CR24	A46	A few adjacent residential properties, short section of footway	Low
LK1	A1136 (n-s)	No receptors are identified on this link	Negligible
LK2	A1136 (e-w)	Pedestrians/cyclists – segregated shared route	Low
LK3	Aylesby Road	Pedestrians/cyclists – narrow footway. Edge of urban area but no direct frontages	Medium

Route Ref	Road	Description	Sensitivity Level
W1	Main Road/ Aylesby Lane	Residential properties in Aylesby	Medium
W2	A1136 Great Coates Rd	Residential area although limited direct accesses, bus route, cycles and pedestrians	High
W3	A1136 Yarborough Road	Residential and commercial properties with direct accesses, bus route	High
W4	Cambridge Road	Residential and commercial properties with some direct accesses, passes two schools, some on street parking	High
W5	A46 Grimsby Road	Some residential and commercial accesses along this link	Medium
W6	A46 Laceby Road	Residential properties, further education college, direct accesses, bus route, cycle route	High
W7	A46 Weelsby Road	Residential properties and some commercial properties, bus route, cycle route	High
W8	Scarho Road	Residential and commercial properties, bus route	High
W9	Louth Road	Residential and commercial properties, bus and cycle route	High
W10	Bradley Road	Residential properties to north and south, access to care home	Medium
W11	Cheapside	A few residential and commercial properties along this link	Low
W12	A153 Horncastle Road	A few residential properties along this link	Low

Bus routes

- 9.5.28 No bus stops are present in the immediate vicinity of the New Grimsby West Substation or on the Primary Access Routes for HGVs. Buses run through the residential areas within Grimsby, which will form potential access routes for construction workers. Regular bus services run along the A16, A1136 Great Coates Road/Yarborough Road, A46 Laceby Road/Weelsby Road, Scarho Road, Louth Road through Grimsby providing access to a range of local destinations including Grimsby town centre, Hewitts Circus, Waltham, Laceby, Louth, Cleethorpes, Immingham, Hull, Market Rasen and employment destinations such as Europarc.
- 9.5.29 The nearest bus stop is on A1136 Great Coates Road, approximately 1 km north-east of the Section 1 draft Order Limits.

Railway infrastructure

- 9.5.30 There are no railways close to the proposed New Grimsby West Substation within Section 1. The nearest rail station is at Great Coates, which is located approximately 2 km north-east of the draft Order Limits and will not be affected by Section 1 of the Project. No rail lines are crossed by the Section 1 draft Order Limits.

Waterways

- 9.5.31 There are no navigable waterways within the Section 1 draft Order Limits or crossed by the Primary Access Routes providing access to the Section 1 draft Order Limits. The River Freshney runs south-westwards from the River Humber approx. 1 km to the east of the Section 1 draft Order Limits, however, it is not a navigable waterway. Therefore, no waterways have been identified which are likely to be impacted by Section 1 of the Project.

Public Rights of Way and Promoted/Recreational Routes

- 9.5.32 PRoWs and promoted/recreational routes potentially affected by the proposed works within the Section 1 draft Order Limits are summarised in **Table 9.9** and presented on **PEI Report Volume 2 Part B Section 1 Figure 9.3 Existing Public Rights of Way (PRoW)**. ‘P’ series references have been applied to each PRoW which is crossed by the Section 1 draft Order Limits for ease of reference.
- 9.5.33 The proposed haul route crosses two PRoW to the west of the new substation site. This includes a bridleway running approximately north-south via Aylesby Lane north and south connecting Healing and Laceby, and a footpath connecting to it from Stallingborough Road to the north.
- 9.5.34 The sensitivity of these PRoWs has been considered and is summarised in **Table 9.9**. The assignment of sensitivity considers potentially highly used routes and routes that have extensive connectivity and/or social significance, such as long distance trails, recreational circular routes or Local Authority promoted routes. For the purposes of the PEI Report, the sensitivity assessment is subjective. Further detail, including surveyed usage, will be determined in consultation with the local highway authority and provided within the ES. The sensitivity of routes along the highway are included within the highway link sensitivity at **Table 9.8**
- 9.5.35 Further details of promoted/recreational routes are included within **PEI Report Volume 2 Part B Section 1 Chapter 11 Socio-economics, Recreation and Tourism**. Discussions with PRoW officers from all relevant Local Authorities will continue to be undertaken to confirm the key routes for assessment reported within the ES.

Table 9.9 Public Rights of Way

PRoW Ref	Type	Location	Sensitivity
P151	Bridleway	Runs north-south between Healing and Laceby	Local route connecting small urban areas, likely leisure route lightly used, low sensitivity

P152	Footpath	Provides a connection from bridleway (P151) to Healing	Local route connecting small urban areas, likely leisure route lightly used, low sensitivity
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Future Baseline

- 9.5.36 The future baseline relates to known or foreseeable changes to the current baseline in the future, against which the effects of the Project during construction and operation are assessed. Specifically, it accounts for anticipated changes including those caused by changing climatic conditions, policy, legislation, advances in technology and by other confirmed development projects which will be complete prior to construction of the Project.
- 9.5.37 At this preliminary stage, a full assessment of the implications of any confirmed development projects with regard to future baseline conditions has not been undertaken, including future highway schemes. A list of the currently known developments which are anticipated to be included within the future baseline scenario is provided within **PEI Report Volume 2 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope Annex A Developments for Consideration Within the Future Baseline**. This will be reviewed and updated as appropriate during development of the ES, as with other information which informs assessment of the future baseline.
- 9.5.38 Based on the proposed construction programme for the Project, the peak year for construction activities that would affect each road link comprising the Primary Access Routes and Worker Access Routes has been identified as 2031. The future baseline traffic along these road links has been calculated by applying an appropriate growth factor derived from DfT's Trip End Model Presentation Program (TEMPPro) to the 2024 Baseline traffic flows. These flows are summarised in **PEI Report Volume 3 Part B Sections 1-7 Appendix 9C Future Baseline and Impact Analysis**.
- 9.5.39 A review of all committed developments will be undertaken for the assessment to be presented within the ES. This will identify any other developments anticipated to be operational prior to construction of the Project commencing, that could generate additional traffic along the identified construction traffic routes.
- 9.5.40 Based upon available information, existing public transport and cycle infrastructure are likely to remain unchanged in the future baseline assessment years.

9.6 Design, Control and Mitigation Measures

Design Mitigation Measures

- 9.6.1 The Project is being designed to avoid sensitive receptors as far as practicable. This is in accordance with the 'Holford Rules' (Ref 15) applicable to routing of new overhead line and the 'Horlock Rules' (Ref 16) which apply to design and siting of substations. These approaches are explained in further detail within the Corridor Preliminary Routeing and Siting Study (CPRSS) (Ref 17) and **PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered**. Principles include, but are not limited to, seeking to avoid areas of highest amenity, cultural or scientific value, taking advantage of natural screening provided by existing landform and features

(e.g. woodland) and keeping visual, noise and other environmental effects to a minimum.

9.6.2 Following selection of the preferred route corridor, environmental specialists have been integral to ongoing design refinement of works within Section 1. This has further contributed to the avoidance or reduction of the potential environmental impacts of the Project. Specific examples relevant to the Traffic and Movement assessment include:

- i. Construction traffic would be routed along classified roads as far as possible, and haul roads would be used to minimise construction vehicle movements on local roads where the impact of the forecast traffic movement is deemed to be unacceptable.
- ii. Primary Access Routes and Worker Access Routes will be further discussed and determined with Local Highway Authority input with a view of utilising the classified road network and SRN as much as practicably possible. Where narrow roads form part of the Primary Access Routes (i.e. closer to bellmouths), areas of temporary highway improvement works (e.g. road widening and creation of passing places) will be considered for implementation to maintain a safe operational highway.
- iii. Where further assessment identifies the need for off-site road and junction improvements (i.e. mitigation works), these will be designed in collaboration with the local highway authorities to maintain a safe and operational highway network. Any improvements will be set out in the Transport Assessment (TA) and ES.
- iv. Construction traffic crossing of rail lines or navigable waterways will be avoided or use existing vehicle crossings where possible to minimise the impact on railway and waterway users.
- v. Where road closures are required, the period of the closure would be kept to a minimum and diversions would be via the most appropriate alternative route. Access to properties would be maintained at all times. Any route diversions or closures will be discussed with the Local Highway Authority.
- vi. PRoWs will only be closed or diverted on safety grounds to protect PRoW users or workers. Haul roads crossing PRoWs will be designed such that the PRoW remains open by default and passing construction traffic affords priority of movement to PRoW users. In the locality of PRoW crossing points, the haul road will be fenced and gated to prevent PRoW users and animals from straying into a construction site.
- vii. Where more than one PRoW crosses the haul road in close proximity to another, local diversions will be required to merge PROWs routes across a single passing point to reduce the likelihood of pedestrian-vehicular conflict (including equestrians and horses).
- viii. PRoWs will be closed when necessary on safety grounds. This is likely to be over a couple of months during the overhead line stringing. Where PRoW closures are required, the period of the closure would be kept to a minimum, and a diversion provided where necessary and practicable. Any route diversions or closures will be discussed with the local authority.

Control Mitigation Measures

Construction

- 9.6.3 Standard mitigation measures, comprising management activities and techniques, would be implemented during construction of the Project to limit effects through adherence to good site practices and achieving legal compliance.
- 9.6.4 A Preliminary CoCP is provided in **PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice**. The control measures included within the Preliminary CoCP relevant to the Traffic and Movement assessment of Section 1 include:
- i. GG06: A Construction Environmental Management Plan (CEMP), a Landscape and Ecological Management Plan (LEMP), a Materials and Waste Management Plan (MWMP), a Construction Traffic Management Plan (CTMP), Emergency Action Plan, Public Rights of Way Management Plan (PRoWMP), Overarching Written Scheme of Investigation (WSI), Biodiversity Management Plan, Noise and Vibration Management Plan, Pollution Prevention Plan, Foundation Works Risk Assessment, Carbon efficiency Plan, Dust Management Plan (DMP), Drainage Management Plan (DrMP) along with a Soil Management Plan (SMP) will be produced prior to construction. These are collectively referred to as 'the environmental control Plans.'
 - ii. GG12: Appropriate site layout and housekeeping measures will be implemented by the contractor(s) at all construction sites. This will include but not be limited to: preventing pests and vermin control and treating any infestation promptly, including arrangements for the proper storage and disposal of waste produced on site;
 - inspecting and collecting any waste or litter found on site;
 - locating or designing site offices and welfare facilities to limit the overlooking of residential properties;
 - locating designated smoking/vaping areas to avoid nuisance to neighbours;
 - managing staff/vehicles entering or leaving site, especially at the beginning and end of the working day; and
 - managing potential off-site contractor and visitor parking.
 - iii. GG13: Vehicles will be correctly maintained and operated in accordance with manufacturer's recommendations and in a responsible manner. All plant and vehicles will be required to switch off their engines when not in use and when it is safe to do so. Electric, or other low carbon plant and equipment should be used where available and where practicable.
 - iv. GG14: Materials and equipment will not be moved or handled unnecessarily. When loading and unloading materials from vehicles, including excavated materials, drop heights will be limited.
 - v. TT01: The contractor(s) will implement a monitoring and reporting system to check compliance with the measures set out within the CTMP.
 - vi. TT02: All affected Public Rights of Way (PRoWs) will be identified, and any potential permanent or temporary closures detailed in the DCO. All designated

PRoWs crossing the working area will be managed with access only closed for periods while construction activities occur. Any required diversions will be clearly marked at both ends with signage explaining the diversion, the duration of the diversion and a contact number for any concerns and will be subject to a PRoWMP. PRoWs crossing the working areas will be managed in discussion with the relevant local authorities and potential temporary closures applied for discussed with the relevant local authority. Access disruption would be reduced as reasonably practicable while construction activities occur.

- vii. TT03: The CTMP will set out measures to reduce route and journey mileage to and from and around site, and prevent nuisance to the residents, businesses and the wider community caused by parking, vehicle movements and access restrictions. It will also provide suitable control for the means of access and egress to the public highway and set out measures for the maintenance and upkeep of the public highway. The plan will also identify access for emergency vehicles. It will also set out measures to reduce safety risks through construction vehicle and driver quality standards and measures to manage abnormal loads.
- viii. W04: Where watercourses are to be crossed by construction traffic, measures to be applied include the use of temporary culverts or temporary spanned bridges. Once the temporary culvert is installed, the area above the temporary culvert will be backfilled and a suitable surface finish established to permit the passage of plant, equipment, materials, and people. Temporary culverts will be sized to reflect the span width and the estimated flow characteristics of the watercourse under peak flow conditions and kept free from debris. Where used, temporary bridges will be designed specifically to consider the span length and the weight and size of plant and equipment that will cross the bridge. Specific detailed designs for each watercourse crossing, consistent with these design principles, will be prepared by the construction contractor. These will be subject to the appropriate consent by the relevant drainage authority (Flood Risk Activities Permit from the EA for main rivers, Ordinary Watercourse Consent from the Lead Local Flood Authority or Internal Drainage Board for ordinary watercourses).
- ix. AS02: The intention is to maintain access where possible; this may have to be done using localised diversions/restrictions. Although not envisaged at this stage it may be that temporarily access isn't maintained but, in all instances, those impacted will be consulted on the proposals. This may require signed diversions or temporary restrictions to access. The means of access to affected properties, facilities and land parcels will be communicated to affected parties during the pre-construction period. with any changes communicated in advance of the change being implemented. Where field-to-field access points require alteration as a result of construction, alternative field access will be provided in consultation with the landowner/occupier.

9.6.5 The CTMP referred to in measures GG06, TT01 and TT03 above will include, but not be limited to:

- i. measures to reduce route and journey mileage to and from and around site, and prevent nuisance to the residents, businesses and the wider community caused by parking, vehicle movements and access restrictions;
- ii. measures for the maintenance and upkeep of the public highway;
- iii. identification of access routes for emergency vehicles;

- iv. measures to reduce safety risks through construction vehicle and driver quality standards; and
- v. measures to manage abnormal loads.

Additional Mitigation Measures

- 9.6.6 Additional mitigation measures are those required to reduce likely significant adverse environmental effects which may still occur despite the inclusion of the embedded design and control measures described above.
- 9.6.7 Additional mitigation measures are not anticipated to be required in relation to Traffic and Movement effects. However, this will remain under review during the completion of further assessment and development of the ES.

9.7 Preliminary Assessment of Effects

- 9.7.1 The following section presents the findings of the preliminary assessment of effects upon the receptors, identified within the Study Area, as a result of construction, operational and/or maintenance activities within Section 1.
- 9.7.2 The preliminary assessment of effects reported below takes into account the Design and Control Measures previously described.
- 9.7.3 For a summary of the likely significant effects please refer to **PEI Report Volume 2 Part B Section 1 Chapter 13 Summary**. A supplementary summary of all non-significant effects is also included within this Section in **Table 9.12**, based upon the assessment scope detailed in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
- 9.7.4 It should be noted that the assessment which has informed the conclusions presented remain ongoing and is subject to change, due to the ongoing survey activities and further design development of the Project. A full detailed assessment will be included within the ES submitted with the DCO application.

Likely Significant Effects

Construction

Highway Network

- 9.7.5 The primary Traffic and Movement effects on users of the highway network will be as a result of an increase in traffic flows on those roads used by vehicles associated with the Project. An assessment has been undertaken to calculate the percentage increases in total and HGV AADT flows as a result of the Project due to construction traffic using the local road network. This is based upon projected changes relative to a future baseline.
- 9.7.6 Traffic and Movement effects associated with the construction phase on receptors relate to the change in traffic flow and the sensitivity of highway links. **PEI Report Volume 3 Part B Sections 1-7 Appendix 9C Future Baseline and Impact Analysis** sets out the predicted worst-case increase in traffic on the local road network for each Primary Access Route and Worker Access Routes used by

construction traffic. These increases were then assessed against the assigned sensitivity of each road link.

- 9.7.7 Within this PEI Report the assessment identifies highway links where an increase in baseline traffic flows due to construction traffic exceeds 10 percent for sensitive roads and 30 percent for non-sensitive roads, in accordance with the IEMA Guidance thresholds. On these links there is potential for negative effects on receptors and users of the highway network that may lead to potential significant effects. Therefore, these links have been identified for further consideration within the TA and ES. **PEI Report Volume 3 Part B Section 1 Figure 9.5 Preliminary Impact Analysis** shows the location of highway links that are below or above the IEMA thresholds.
- 9.7.1 At this stage of assessment, baseline data for some of the identified construction traffic access routes is not currently available (from either DfT counts or 2024 traffic surveys). For these routes, a qualitative analysis has been undertaken to consider whether the volume of projected construction traffic is likely to be significant, given the type of road and type of construction vehicles (HGVs or Workers cars/vans). These links will be considered further within the TA and ES if the total number of all construction vehicles exceeds 50 per day or the number of HGVs exceeds 20 per day.
- 9.7.2 The receptors/users on the highway links exceeding the appropriate sensitivity threshold for potential significant effects are summarised in **Table 9.10**. At this preliminary stage of the assessment, significant effects upon users of these highway links cannot be ruled out. However, no detailed assessment, in terms of severance, delay (junction assessment), highway safety and fear and intimidation, has yet been undertaken to determine the magnitude of impacts upon these road links. As such, an assessment of the scale of effects upon the receptors identified in **Table 9.10** has not yet been completed.
- 9.7.3 Following further assessment of the projected increases in traffic flow upon severance, congestion (potentially resulting in increases in journey time and driver delay), highway safety and fear and intimidation, the subsequent effects upon users of the highway network as a result of the Project will be reported in the ES.

Table 9.10 Preliminary assessment of effects upon users of highway links – Section 1

Receptor	Potential Significant Effects	Route/Link
Drivers (all vehicles including HGVs and Emergency Services)	Severance, changes in journey time, driver delay and highway safety effects due to increased traffic	CR6 (A16), CR7 (A16), CR18 (A18), CR20 (A18), CR21 (A1173), LK1 (A1136), LK2 (A1136 Great Coates), LK3 (Aylesby Road)
Bus passengers	Potential for delay due to congestion as a result of increased traffic	CR6 (A16)
Pedestrians and cyclists	Potential for severance, delay, increased journey time, decline in amenity, additional fear and intimidation and safety effects as a result of increased traffic	CR6 (A16), LK2 (A1136 Great Coates), LK3 (Aylesby Road)

All Users	Potential for severance, delay, increased journey time due to potential road closures and/or diversion to facilitate AILs	Routes to be determined
All users	Potential for impact as a result of a road traffic accident leading to Hazardous Load spill	Routes to be determined

Abnormal Indivisible Loads/Hazardous Loads

- 9.7.4 The requirements and routeing of AIL and Hazardous Loads are still being determined and therefore detail to inform the assessment is not available at this stage. The ES will include preferred routes for the movement of AILs including vehicle type, load, route, anticipated time of movement(s) and the nature of any highway works/temporary closures required to accommodate the movement. Whilst this may lead to some congestion/increased journey times from temporary road closures/diversions and risks, experience from other projects will be employed to seek to minimise disruption and delay other road users. However, at this stage associated significant effects cannot be ruled out entirely.
- 9.7.5 The likely AIL movements set out in **Table 9.11** will be assessed, with the results presented within the ES.

Table 9.11 Potential abnormal indivisible load routes

Route	Vehicle Type and Load	Frequency of Movement	Links Use
Immingham Dock to New Grimsby West Substation	Long articulated low loader to transport transformer from dock to New Grimsby West Substation.	Single delivery	TBC
Grimsby Dock to New Grimsby West Substation	Long articulated low loader to transport transformer from dock to New Grimsby West Substation.	Single delivery	TBC

Operation and Maintenance

- 9.7.6 Based upon the preliminary assessment, no significant effects upon Transport and Movement receptors within the Section 1 Study Area are predicted during operation and maintenance of the Project. Further discussion is provided in the following sections in relation to the predicted non-significant effects of the Project.

Likely Non-Significant Effects

- 9.7.7 For completeness, **Table 9.12** summarises the findings of the preliminary assessment with respect to those impacts that are not predicted to result in significant Traffic and Movement effects.

Construction

Highway Network

- 9.7.8 **Table 9.12** identifies the highway links that form part of the Primary Access Route and Worker Access Route network where construction traffic impacts are below the assessment thresholds and are therefore not likely to have significant effects on users/receptors on these highway links. It is not currently anticipated that these links will be subject to further assessments within the ES, subject to further screening of final construction traffic projections and discussions with the Local Highway Authority. **PEI Report Volume 3 Part B Section 1 Figure 9.5 Preliminary Impact Analysis** shows the location of highway links that are below or above the IEMA thresholds.

Public Rights of Way and Promoted/Recreational Routes

- 9.7.9 From an accessibility and connectivity perspective, PRoW and promoted/recreational route users are unlikely to be significantly affected during the delivery of the Project. Routes will remain open by default during both construction working hours and outside working hours. Where feasible, there will be a break in the haul road³ so that the route is not impacted. Haul road crossings are designed such that pedestrian/cycle/equestrian users are afforded priority of movement.
- 9.7.10 Where more than one route crosses the haul road within close proximity of each other, these will be merged to provide a single passing point to reduce the likelihood of conflict with vehicular traffic.
- 9.7.11 PRoWs are anticipated to be closed/diverted for short periods when necessary on safety grounds. This is likely to be during the overhead line stringing works. Routes would be reopened at the earliest opportunity following completion of these works
- 9.7.12 Therefore, the PRoW and promoted/recreational routes within the Section 1 draft Order Limits where development impacts are not considered significant are listed below and summarised in **Table 9.12**:
- i. P151 – haul route managed crossing of low sensitivity route; and
 - ii. P152 – short diversion (<100 m) of low sensitivity route.

Operation and Maintenance

- 9.7.13 The Scoping Report Traffic and Movement chapter sought to scope out effects associated with operation of the Project. However, the Scoping Opinion requested further information relating to traffic associated with operation of the Project. This PEI Report assessment therefore presents details of forecast operational traffic movements and provides an initial assessment of potential effects.

³ There are a number of breaks in haul road routes to avoid direct conflicts within existing routes. In these instances, the haul road routes are not continuous.

- 9.7.14 The operational traffic flows of the New Grimsby West Substation are anticipated to comprise vehicles associated with routine visits and fault maintenance. Based upon existing precedent and National Grid estimates, typical routine maintenance vehicle movements would comprise approximately two visits per month by two people.
- 9.7.15 With regards to operational visits for the overhead line, based upon existing precedent and National Grid estimates, typical routine maintenance vehicle movements would comprise approximately two vehicle trips per permanent pylon, per year (i.e. one arrival and departure respectively). The movement itself could comprise a light goods vehicle access via the permanent access route. There could also be a drone or helicopter survey taken from the air, taking off from a nearby vantage point. Less than 10 pylons are proposed within the Section 1 draft Order Limits therefore less than one vehicle per month is anticipated to access the Section 1 draft Order Limits.
- 9.7.16 Whilst there may be occasional variation in traffic flows associated with maintenance or refurbishment as required, the projected volume of traffic is predicted to be low.
- 9.7.17 On the basis of the information provided, operational/maintenance traffic will not have material impact on traffic flows and no likely significant effects are expected on users of highway links.
- 9.7.18 Operational traffic flows will be very occasional therefore no impact to users of bus services is expected. No railway lines are crossed as part of Section 1 operations, therefore impact to rail users is not expected. No likely significant effects on public transport users are expected.
- 9.7.19 No navigable waterways are impacted by operation of Section 1 of the Project, therefore no likely significant effects are expected.
- 9.7.20 PRoW crossed and/or diverted during construction will be reinstated, therefore no PRoW are permanently affected by Section 1, therefore no significant effects are expected.

Table 9.12 Preliminary summary of non-significant Traffic and Movement effects – Section 1

Receptor	Impact	Sensitivity	Magnitude of Change	Significance of Effect	Rationale
Construction					
Highway Network					
Road users of highway links CR1, CR2, CR3, CR5, CR24, W1, W5, W12	Increased traffic due to construction of the Project, potentially resulting in severance, changes in journey time, driver delay and highway safety effects upon road users	Negligible, Low, Medium	<30 per cent	Low – Not significant	The percentage increase in traffic flows as a result of the Project does not meet IEMA threshold for significant impact
Road users of links CR4, W2, W4, W6, W7, W8, W9,	Increased traffic due to construction of the Project, potentially resulting in severance, changes in journey time, driver delay and highway safety effects upon road users	High	<10 per cent	Low – Not significant	The percentage increase in traffic flows as a result of the Project does not meet IEMA threshold for significant impact
Road users of links W3, W10, W11,	Increased traffic due to construction of the Project, potentially resulting in severance, changes in journey time, driver delay and highway safety effects upon road users	Low, Medium and High	Daily no. of construction workers cars/LGVs <50	Low – Not significant	The volume of cars/LGVs is low across the day
Bus passengers in services on highway links W1-W12	Increased traffic due to construction of the Project, potentially resulting in delay due to congestion on bus routes	Low, Medium, High	Daily no. of construction workers cars/LGVs between 0-100	Low – Not significant	The volume of construction does not meet IEMA thresholds or volume of cars/LGVs is low and unlikely to impact bus movements

Receptor	Impact	Sensitivity	Magnitude of Change	Significance of Effect	Rationale
Pedestrians and cyclists of links W1-W12	Potential for severance, delay, increased journey time, decline in amenity, additional fear and intimidation and safety effects as a result of increased traffic	Low, Medium, High	Daily no. of construction workers cars/LGVs between 0-100	Low – Not significant	The volume of construction does not meet IEMA thresholds or volume of cars/LGVs is low and unlikely to impact pedestrian and cycle movements
Railway Infrastructure					
Railway users	Potential for disruption of the railway network and/or operational safety	High	Negligible	Negligible – Not significant	No railway lines are crossed by the Section 1 draft Order Limits, therefore no likely significant effects on railway users are expected.
Waterways					
Waterway Users	Potential for severance, delay, increased journey time, decline in amenity, additional fear and intimidation and safety effects as a result of construction traffic/haul road crossings	Low	Negligible	Negligible – Not significant	No navigable waterways are crossed by the Section 1 draft Order Limits, therefore no likely significant effects on users of waterways are expected
Public Rights of Way and Promoted/Recreational Routes					
Pedestrians, cyclists and equestrians on P151	Potential for severance, delay, increased journey time, decline in amenity, additional fear and intimidation and safety effects as a result of temporary route closures/diversions to enable construction	Low	no change	Low – Not significant	The haul route crossing of the PRow will be managed with minimal disruption to users of the PRow for a temporary period during construction

Receptor	Impact	Sensitivity	Magnitude of Change	Significance of Effect	Rationale
Pedestrians on P152	Potential for severance, delay, increased journey time, decline in amenity, additional fear and intimidation and safety effects as a result of temporary route closures/diversions to enable construction	Low	<100 m diversion	Low – Not significant	A short diversion of the PRoW will be required for a temporary period during construction
Operation					
Highway Network					
Users of highway links including drivers, public transport users, pedestrians, cyclists and equestrians	Operational traffic resulting in potential for severance, delay, increased journey time, decline in amenity, additional fear and intimidation and safety effects.	Low, Medium, High	2 visits/month by 2 people and 1 visit per year per pylon	Negligible – Not significant	The volume of traffic associated with operation and maintenance is very low and will not impact receptors
Railway Infrastructure					
Railway users	Potential for disruption of the railway network and/or operational safety	High	No impact	Negligible – Not significant	No railway lines are crossed by the Section 1 draft Order Limits, therefore no likely significant effects on railway users are expected.
Waterways					
Waterway Users	Potential for disruption of navigable waterways	Low	No impact	Negligible – Not significant	No navigable waterways are crossed by the Section 1 draft Order Limits, therefore no likely significant effects on

Receptor	Impact	Sensitivity	Magnitude of Change	Significance of Effect	Rationale
					users of waterways are expected
Public Rights of Way and Promoted/Recreational Routes					
Pedestrians, cyclists and equestrians on PRow	Potential for severance, delay, increased journey time, decline in amenity, additional fear and intimidation and safety effects	Low	No impact	Negligible – Not significant	PRow will be reinstated and not impacted by operation of the overhead line

9.8 Monitoring

- 9.8.1 As set out within the Preliminary CoCP, the Contractor will implement a CTMP, which will detail the environmental and control measures in relation to the traffic generated during construction of the Project.
- 9.8.2 This will include undertaking of dilapidation surveys prior to the start of the relevant phase of construction and identification of any remedial works required to access routes.
- 9.8.3 The contractor will also implement a monitoring and reporting system to check compliance with the measures set out within the CTMP, as per measure TT01 of the Preliminary CoCP.
- 9.8.4 Otherwise, no monitoring relevant to the Traffic and Movement assessment and reported impacts and effects is proposed during operation and maintenance of the Project within Section 1 Study Area.

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10. Noise and Vibration

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10. Noise and Vibration

10.1 Introduction

- 10.1.1 This chapter presents the Preliminary Environmental Information (PEI) in relation to the Noise and Vibration assessment on noise sensitive receptors (NSR) of the New Grimsby West Substation Section (Section 1) of the Grimsby to Walpole Project (the Project). Specifically, the chapter includes the following sections:
- i. An introduction to the topic (section 10.1);
 - ii. Identification of key local and regional policy relevant to the assessment (section 10.2). A full overview of the legislation and national, regional onshore and marine planning policy context that applies to the Project is presented within **PEI Report Volume 2 Part A Chapter 2 Legislative, Regulatory and Planning Policy Context** and supporting appendices;
 - iii. A summary of the assessment scoping process and the subsequent scope of the Noise and Vibration assessment (section 10.3). Further detail is provided within **PEI Report Volume 3 Part A Appendix 4A Planning Inspectorate Scoping Opinion Responses**;
 - iv. A high-level summary of the methodology of the Noise and Vibration assessment within Section 1 (section 10.4). A detailed description of the assessment methods and scope, applicable to the whole Project, is contained in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**;
 - v. A description of the environmental baseline within the Section 1 Study Area relevant to the Noise and Vibration assessment (section 10.5);
 - vi. A description of mitigation measures included for the purposes of the Noise and Vibration assessment reported within the PEI Report (section 10.6). Further information regarding design development can be found in **PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered** and the **Grimsby to Walpole Design Development Report**;
 - vii. The likely significant and non-significant Noise and Vibration effects arising during construction and operation of the Project within Section 1 based upon the assessment completed to date (section 10.7); and
 - viii. An outline of the proposed monitoring requirements in relation to Noise and Vibration (section 10.8).
- 10.1.2 Further supporting information is set out in **Table 10.1** below, including supporting figures and technical appendices.

Table 10.1 Supporting documentation

Supporting Information	Description
Topic Specific Supporting Documentation	
PEI Report Volume 2 Part B Section 1 Figures	Figure 10.1 Noise and Vibration Study Area Figure 10.2 Noise and Vibration Baseline Figure 10.3 Initial Construction Noise Assessment Outputs Figure 10.4 Initial Construction Vibration Assessment Outputs Figure 9.1 Primary Access Routes
PEI Report Volume 3 Part B Section 1 Appendix 10A Baseline Noise Survey Data	Presents results of the baseline noise survey conducted at locations representative of NSR within the Section 1 Study Area.
PEI Report Volume 3 Part B Section 1 Appendix 10B Construction Noise and Vibration Data	Includes information and data used within the assessment of Noise and Vibration effects from construction activities at Noise and Vibration sensitive receptors.
PEI Report Volume 3 Part B Section 1 Appendix 10C Initial Construction Traffic Noise Assessment	Includes the assessment of construction traffic noise on construction traffic routes within Section 1.
PEI Report Volume 3 Part B Section 1 Appendix 10D Initial Operational Substation Noise Assessment	Provides further details of the initial assessment of operational noise from the proposed New Grimsby West Substation on NSR in the Section 1 Study Area.
Project Supporting Documentation	
PEI Report Volume 2 Part B Section 1 Chapter 1 Overview of the Section and Description of the Project	A summary of the works within Section 1, including permanent infrastructure, temporary construction works, and operational activities.
PEI Report Volume 3 Part A Appendix 2A Key Legislation	A list of identified environmental legislation considered relevant to the Project, which will be updated and amended as required to inform the Environmental Statement (ES).
PEI Report Volume 3 Part A Appendix 2B National and Regional Planning Policy	A list of national and regional policies generally applicable to the assessment principles which underpin the PEI Report and ES.
PEI Report Volume 3 Part A Appendix 2Ci Local Plan Policy: Section Specific	An outline of the potentially relevant local planning policy allocations affecting each of the specific Sections of the Project.
PEI Report Volume 3 Part A Appendix 2Cii Local Plan Policy: Route-wide	Details of planning policies applicable route-wide within the relevant Local Authority areas.

Supporting Information	Description
PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered	Provides a summary of the main alternatives considered in relation to the Project during the design development process, including the main reasons for selecting the chosen option.
PEI Report Volume 2 Part A Chapter 4 Approach to Preliminary Environmental Information	Sets out the Environmental Impact Assessment (EIA) approach and general methodology that has been used in developing the PEI Report for the Project.
PEI Report Volume 2 Part A Chapter 5 Project Description	An overarching description of the Project and its key components, including available construction information.
PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice	Sets out control and management measures that will be undertaken during construction of the Project if granted consent. The final Code of Construction Practice (CoCP) will be submitted in support of the Development Consent Order (DCO) application.

- 10.1.4 There are also interrelationships between the potential effects on Noise and Vibration and other environmental topics. Therefore, please also refer to the following chapters within **PEI Report Volume 2 Part B** and **Part C**:
- i. **PEI Report Volume 2 Part B Section 1 Chapter 4 Ecology and Biodiversity** assesses the effects of the Project upon ecological receptors, including those resulting from Noise and Vibration.
 - ii. **PEI Report Volume 2 Part B Section 1 Chapter 5 Historic Environment** which assesses the impacts of the Project upon heritage assets, including the potential effects of vibration.
 - iii. **PEI Report Volume 2 Part B Section 1 Chapter 9 Traffic and Transport** which assesses the potential change in traffic movements during construction and operation, which are relevant to the assessment of noise effects associated with changes in traffic flow.
 - iv. **PEI Report Volume 2 Part B Section 1 Chapter 11 Socio-economics, Recreation and Tourism** assesses potential effects upon recreational areas that could be affected by Noise and Vibration and thus suffer a reduction in amenity value.
 - v. **PEI Report Volume 2 Part B Section 1 Chapter 13 Summary** provides a concise, consolidated summary of the likely significant effects reported for all topics, based upon the preliminary assessment.
 - vi. **PEI Report Volume 2 Part C Route-wide Chapter 8 Health and Wellbeing** assesses the potential effects of Noise and Vibration generated by the Project upon health and wellbeing.
 - vii. **PEI Report Volume 2 Part C Route-wide Chapter 10 Cumulative Effects** reports those intra-project effects which could potentially act in

combination to result in cumulative environmental effects. It also identifies a shortlist of other Committed Developments with which there may be potential for cumulative effects, and the relevant environmental topics for such effects (inter-project). The full cumulative effects assessment will be reported within the ES.

10.2 Legislation and Policy Framework

Legislation and National Policy

- 10.2.1 Legislation and national policy relevant to the Project and this chapter is described in **PEI Report Volume 2 Part A Legislative, Regulatory and Planning Policy Context** and supporting appendices, the details of which are set out in **Table 10.1**.

Regional and Local Policy

- 10.2.2 Regional and local plans or policies relevant to this assessment are as follows:
- i. North East Lincolnshire Council Local Plan 2013 to 2032 (Adopted 2018) (Ref 1):
 - Policy 5 Development boundaries: which indicates that development proposals will be considered with regard to a number of factors, including noise; and
 - Policy 31 Renewable and low carbon infrastructure: which indicates that renewable and low carbon infrastructure development proposals will be considered with regard to a number of factors, including Noise and Vibration.

10.3 Scope of Assessment

- 10.3.1 The scope of the assessment has been informed by the Scoping Opinion (Ref 2) provided by the Planning Inspectorate in September 2024 on behalf of the Secretary of State, following the submission of the EIA Scoping Report (Ref 3). A summary of the Scoping Opinion together with a response against each point of relevance to the Noise and Vibration chapter is provided in **PEI Report Volume 3 Part A Appendix 4A Planning Inspectorate Scoping Opinion Responses**.
- 10.3.2 Non statutory consultation feedback is summarised within the **Grimsby to Walpole Stage 1 Consultation Feedback Report**.
- 10.3.3 The scope of the Noise and Vibration assessment includes consideration of effects due to:
- i. construction noise;
 - ii. construction vibration on people within buildings;
 - iii. construction vibration on buildings and structures;
 - iv. construction traffic noise;
 - v. operational noise from proposed operational plant (e.g. transformers) within proposed new substations; and
 - vi. operational noise and vibration from substantial maintenance activities.

- 10.3.4 As set out in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**, the scope of the assessment excludes:
- i. construction traffic vibration;
 - ii. operational noise impacts from auxiliary plant (e.g. back-up generators and switchgear) within proposed new substations;
 - iii. operational noise impacts from typical maintenance activities due to their infrequent and localised nature; and
 - iv. operational noise from proposed overhead lines, on the basis that a low noise conductor system is proposed. Further information regarding the scoping out of overhead line noise is provided in paragraph 10.6.3.

10.4 Assessment Methodology

- 10.4.1 The assessment methodology, relevant guidance, key assumptions and limitations for the Noise and Vibration assessment are set out in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**. This includes a description of how receptor sensitivity, magnitude of impact and significance of effects are all defined and assigned to the assessment. A summary of the key components are outlined below.
- 10.4.2 Construction Noise and Vibration has been assessed in accordance with the methodology described in British Standard (BS) 5228-1:2009+A1:2014 Code of practice for Noise and Vibration control on construction and open sites – Part 1: Noise (BS 5228-1) (Ref 4), and Part 2: Vibration (BS 5228-2) (Ref 5), respectively. The assessment Study Area for construction noise is 300 m from the proposed works, based on guidance from BS 5228-1. The assessment Study Area for construction vibration is 100 m from the proposed works, based on guidance from BS 5228-2.
- 10.4.3 Construction traffic noise has been predicted in accordance with the methodology described in Calculation of Road Traffic Noise (CRTN) (Ref 6) and assessed in accordance with the methodology described in the Design Manual for Roads and Bridges LA 111 Noise and vibration (DMRB LA 111) (Ref 7).
- 10.4.4 Operational noise has been assessed in accordance with the methodology described in BS 4142:2014+A1:2019. Methods for rating and assessing industrial and commercial sound (BS 4142) (Ref 8). The assessment Study Area for operational noise is 1 km from the proposed new Grimsby West Substation, based on guidance from International Standard (ISO) 9613-2:2014. Acoustics — Attenuation of sound during propagation outdoors. Part 2: Engineering method for the prediction of sound pressure levels outdoors (ISO 9613-2) (Ref 9).
- 10.4.5 Other applicable guidance has also been used to inform the assessments, where appropriate. These are detailed in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
- 10.4.6 The noise survey methodology is described in **PEI Report Volume 3 Part B Section 1 Appendix 10A Baseline Noise Survey Data**.

Assessment Assumptions and Limitations

- 10.4.7 All general assumptions and limitations for the topic are listed within **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**. The following limitations and assumptions have been identified for the assessment:
- 10.4.8 The decommissioning works at the existing Grimsby West Substation are yet to be defined, therefore a limitation of this preliminary assessment of Noise and Vibration effects upon NSRs is that it does not assess these works. The decommissioning works will be assessed as part of the ES.
- 10.4.9 The key parameters and assumptions which inform the assessment will be reviewed based on the design presented in the DCO application and, where required, updated, or refined, for the ES. The ES will present the final key limitations and assumptions applicable to the full assessment, particularly drawing attention to any areas that may have changed from that presented in this preliminary assessment.

10.5 Baseline Conditions

Study Area

- 10.5.1 The Section 1 Study Area for the assessment of the Noise and Vibration baseline is illustrated in **PEI Report Volume 2 Part B Section 1 Figure 10.1 Noise and Vibration Study Area**. The baseline Study Area includes an additional 1 km buffer from the Section 1 draft Order Limits.

Data Collection

- 10.5.2 The following data has been used to inform the baseline conditions:
- Ordnance Survey (OS) AddressBase Plus data, as presented within **PEI Report Volume 2 Part B Section 1 Figure 10.1 Noise and Vibration Study Area**;
 - Department for Environment, Food and Rural Affairs (Defra) strategic noise mapping, presented as noise contours within **PEI Report Volume 2 Part B Section 1 Figure 10.2 Noise and Vibration Baseline**. This represents the daytime ambient noise levels from road and rail sources and Noise Important Areas (NIAs);
 - current OS mapping; and
 - baseline noise survey data.

Existing Baseline

- 10.5.3 The following section outlines the Noise and Vibration baseline for the Section 1 Study Area. The baseline section should be read in conjunction with the following supporting Figures and Appendices as found within **PEI Report Volume 2** and **Volume 3** respectively:
- PEI Report Volume 2 Part B Section 1 Figure 10.1 Noise and Vibration Study Area**;

- ii. **PEI Report Volume 2 Part B Section 1 Figure 10.2 Noise and Vibration Baseline**; and
 - iii. **PEI Report Volume 3 Part B Section 1 Appendix 10A Baseline Noise Survey Data**.
- 10.5.4 The proposed New Grimsby West Substation and associated overhead line connections are located within a mixed rural and suburban environment to the west of Grimsby. With regards to NSRs in the Section 1 Study Area, these are generally located in the built up residential areas of:
- i. Great Coates to the west of Grimsby, approximately 100 m east of the main extent of the draft Order Limits (excluding accesses); and
 - ii. Healing, immediately to the north of the draft Order Limits.
- 10.5.5 There are also isolated dwellings, farmhouses, and settlements within the Section 1 Study Area. **PEI Report Volume 2 Part B Section 7 Figure 10.1 Noise and Vibration Study Area** shows the assessed NSR locations, including residential and non-residential receptors.
- 10.5.6 The baseline noise environment is expected to vary around the Section 1 Study Area, depending on the nature of the area. For example, close to noise sources, such as roads and railways and in built up areas, ambient noise levels are expected to be higher. Further away from road and rail sources and in rural areas, ambient and background noise levels would be expected to be lower. Daytime noise level contours from existing road and railway sources are presented in **PEI Report Volume 2 Part B Section 1 Figure 10.2 Noise and Vibration Baseline**, showing how existing noise levels vary along the draft Order Limits. Areas outside of the contours are generally considered to have low ambient and background noise levels. Areas where the road and rail contours overlap are considered to experience noise effects from both sources.
- 10.5.7 NIAs are determined via strategic noise maps and highlight the residential areas experiencing the highest one per cent of noise levels from road and rail sources in England and are shown in **PEI Report Volume 2 Part B Section 1 Figure 10.2 Noise and Vibration Baseline**. There are several NIAs close to the Section 1, including:
- i. NIA_6541 approximately 900 m to the north east of the draft Order Limits on the A1136; and
 - ii. NIA_6542 approximately 1.2 km to the east of the draft Order Limits on the A1136.
- 10.5.8 The main sources of environmental noise include the A180 to the north, the A1136 to the east, and the Barton Line railway line to the north, as well as traffic on local roads. In terms of industrial sources, there is the existing Grimsby West Substation, two wind turbines located between approximately 1.0 and 1.5 kilometre (km) to the west of the existing Grimsby West Substation, as well as agricultural activity.
- 10.5.9 Acceptable levels of vibration during construction are higher than those that would be acceptable during normal conditions. It is therefore assumed that existing vibration levels at NSR within the draft Order Limits are negligible compared to the construction vibration threshold values, as described in **PEI Report Volume 2 Part A Chapter 4 Approach to Preliminary Environmental Information**. Construction

vibration impacts are therefore assessed against fixed thresholds, rather than relative thresholds informed by an assessment of the baseline.

Noise Survey Data

- 10.5.10 Baseline noise surveys have been conducted at three locations in Section 1, representative of nearby NSRs. Details and results of the noise survey are provided in **PEI Report Volume 3 Part B Section 1 Appendix 10A Baseline Noise Survey Data**.
- 10.5.11 Average ambient noise levels at nearby NSR range from 46 to 50 dB $L_{Aeq,16h}$ during daytime periods and 40 to 48 dB $L_{Aeq,8h}$ during night-time periods.
- 10.5.12 Typical background sound levels at nearby NSR range from 33 to 36 dB $L_{A90,16h}$ during daytime periods and 23 to 31 dB $L_{A90,16h}$ during night-time periods.
- 10.5.13 The measured ambient and background sound levels are generally low and characteristic of a mixed rural and suburban environment.

Future Baseline

- 10.5.14 The future baseline relates to known or foreseeable changes to the current baseline in the future, against which the effects of the Project during construction and operation are assessed. Specifically, it accounts for anticipated changes including: those caused by changing climatic conditions, policy, legislation, advances in technology and by other confirmed development projects which will be complete prior to construction of the Project.
- 10.5.15 Section 1 includes part of the strategic allocation location of the proposed Grimsby West Urban Expansion. The proposed urban expansion aims to deliver 3,500 new homes and associated facilities, as well as new transport links. Limited information is currently available regarding this project. However, the site allocation is understood to be located on land to the northeast of the existing Grimsby West Substation and draft Order Limits between Aylesby Road and Great Coates Road, and to the south of the existing Grimsby West Substation on land between Aylesby Road and the A46 Grimsby Road, thus dissected by the draft Order Limits. National Grid and the promotor are continuing to engage on this matter, and an update will be provided at ES stage. However, this development is currently assumed to be included within the cumulative effects assessment, rather than the future baseline, and is therefore identified in **PEI Report Volume 3 Part C Appendix 10B Cumulative Effects Assessment Shortlist of Committed Developments**.
- 10.5.16 At this preliminary stage, a full assessment of the implications of any committed development projects with regard to future baseline conditions has not been undertaken, including future highway schemes. A list of the currently known developments which are anticipated to be included within the future baseline scenario is provided within **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope Annex A Developments for Consideration Within the Future Baseline**. This will be reviewed and updated as appropriate during development of the ES, as with other information which informs assessment of the future baseline.
- 10.5.17 With regards to construction, no significant changes to the future Noise and Vibration baseline that would affect the assessment are anticipated owing to the largely rural and agricultural nature of the draft Order Limits. Should there be any changes to the

characterisation of the future baseline in this PEI Report, these would be assessed within the ES.

- 10.5.18 Additionally, the decommissioning (in full or part) of the existing Grimsby West Substation has the potential to alter the future baseline noise environment as operational noise from the existing substation would be reduced. This will be considered as part of the assessment in the ES.

10.6 Design, Control and Additional Mitigation Measures

Design Mitigation Measures

- 10.6.1 The Project and draft Order Limits have been designed to avoid sensitive receptors as far as practicable. This is in accordance with the 'Holford Rules' (Ref 10) applicable to routing of new overhead lines and the 'Horlock Rules' (Ref 11) which apply to design and siting of substations. These approaches are explained in further detail within the Corridor Preliminary Routeing and Siting Study (CPRSS) (Ref 12) and **PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered**. Principles include, but are not limited to, seeking to avoid areas of highest amenity, cultural or scientific value, taking advantage of natural screening provided by existing landform and features (e.g. woodland) and keeping visual, noise and other environmental effects to a minimum.
- 10.6.2 Following selection of the preferred route corridor, environmental specialists have been integral to ongoing design refinement of works within Section 1. This has and will continue to contribute to the avoidance or reduction of the potential environmental impacts of the Project as the design is finalised.
- 10.6.3 The proposed overhead line system is a 'Triple Araucaria' conductor bundle. Noise from high voltage overhead lines is primarily due to a phenomenon called corona discharge. Overhead line noise is generated when the conductor surface voltage gradient (electric stress, or E_{max} expressed in kilovolts per centimetre (kV/cm)) exceeds the inception level for corona discharge activity which is released as acoustic energy and radiates into the air as sound. In UK conditions the corona inception level is regarded to occur when electric stress is in the range 17 to 20 kV/cm. Whilst most high voltage overhead lines are designed to operate below this level, those that operate close to this may produce audible noise when enhancement of conductor surface electric stress occurs due to rainfall (wet noise) or the presence of conductor surface contamination (dry noise). Overhead lines that operate significantly below the corona inception level are much less likely to produce audible noise. 'Triple Araucaria' is regarded as practically quiet during both dry and wet weather conditions as it typically operates with an electrical stress below the inception level for corona discharge. Operational noise from the proposed overhead line would therefore not lead to significant adverse effects at nearby NSR, even if directly underneath the line. This supports the rationale for scoping operational noise out of the assessment.
- 10.6.4 In addition, pylon fittings, such as insulators, dampers, spacers, and clamps, are designed and procured in accordance with a series of National Grid Electricity Transmission plc (National Grid) Technical Specifications and must be type registered (rigorously tested) to ensure the fitting conforms to National Grid standards. These design, testing, and procurement processes reduce the potential for audible noise and tones to occur from all types of fittings, including insulators.

Where noise does occur, it is likely to be localised and of short duration. If this is due to a fault, action can be taken to rectify it. Where noise from fittings does occur which results in a complaint, appropriate action can be taken to seek to remedy the cause of the noise where practicable, usually through cleaning or replacing the relevant fitting.

- 10.6.5 Appropriate noise mitigation measures will be considered in the proposed New Grimsby West Substation design. This will include consideration of plant selection, site layout, screening, and enclosures, as may be considered appropriate. For the purposes of the assessment, it is assumed that substation transformers are housed within standard acoustic enclosures providing a reduction of 20 dB.
- 10.6.6 Substation plant would also include vibration isolation measures. This is principally to protect the plant from potential external sources of vibration, but also serves to attenuate vibration from the plant such that vibration levels would be well below significant levels, even immediately adjacent to the plant.

Control Mitigation Measures

- 10.6.7 A Preliminary CoCP is provided in **PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice**. The control measures included within the Preliminary CoCP relevant to the Noise and Vibration assessment of Section 1 include:
- i. GG01: The Project will be compliant with all relevant legislation, consents and permits.
 - ii. GG03: Suitably experienced Environmental Advisers will be appointed for the duration of the construction phase. In addition, qualified and experienced EnvCoW(s) will be available during the construction phase to advise, supervise and report on the delivery of the mitigation methods and controls outlined in the Management Plans. The EnvCoW(s) will monitor that the works proceed in accordance with relevant environmental DCO requirements and adhere to the required good practice and mitigation measures. The EnvCoW(s) will be supported as necessary by appropriate specialists, including ecologists and arboriculturists, soils and land drainage experts.
 - iii. GG04: Construction workers will undergo training to increase their awareness of environmental issues as applicable to their role on the Project. Topics will include where appropriate:
 - pollution prevention and pollution incident response;
 - dust management and control measures;
 - location and protection of sensitive environmental sites and features;
 - adherence to protected environmental areas around sensitive features;
 - working hours and noise and vibration reduction measures;
 - working with potentially contaminated materials;
 - waste management and storage;
 - flood risk response actions;
 - agreed traffic routes, access points, etc.;

- soil management; and
 - drainage management.
- iv. GG06: A Construction Environmental Management Plan (CEMP), a Landscape and Ecological Management Plan (LEMP), a Materials and Waste Management Plan (MWMP), a Construction Traffic Management Plan (CTMP), Emergency Action Plan, Public Rights of Way Management Plan (PRoWMP), Overarching Written Scheme of Investigation (WSI), Biodiversity Management Plan, Noise and Vibration Management Plan, Pollution Prevention Plan, Foundation Works Risk Assessment, Carbon efficiency Plan, Dust Management Plan (DMP), Drainage Management Plan (DrMP) along with a Soil Management Plan (SMP) will be produced prior to construction. These are collectively referred to as 'the environmental control Plans'.
 - v. GG07: The CEMP will set out site specific measures and construction methodologies to avoid or reduce potential effects of the Project on the environment during construction. The contractor(s) shall undertake daily site inspections to check conformance to the Management Plans.
 - vi. GG10: The name and contact details for the Project will be displayed at the entrance to all compounds. This will include an emergency number.
 - vii. GG11: Any activity carried out or equipment located within a construction compound that may produce a noticeable nuisance, including but not limited to dust, noise, vibration and lighting, will be located away from sensitive receptors such as residential properties or ecological sites where practicable.
 - viii. GG13: Vehicles will be correctly maintained and operated in accordance with manufacturer's recommendations and in a responsible manner. All plant and vehicles will be required to switch off their engines when not in use and when it is safe to do so. Electric, or other low carbon plant and equipment should be used where available and where practicable.
 - ix. GG14: Materials and equipment will not be moved or handled unnecessarily. When loading and unloading materials from vehicles, including excavated materials, drop heights will be limited.
 - x. GG24: Working areas will be appropriately fenced. The type of fencing installed will depend on the area to be fenced and will take into consideration the level of security required in relation to the surrounding land and public access, rural or urban environment and arable or stock farming. For some locations the fence used may also serve to provide acoustic and visual screening of the work sites and reduce the potential for disturbance of users in the surrounding areas. Fencing will be regularly inspected and maintained and removed as part of the demobilisation unless otherwise specified.
 - xi. GG25: Members of the community and local businesses will be kept informed regularly of the works through active community liaison and groups with local membership. This will include notification of noisy activities, heavy traffic periods and start and end dates of key phasing. A contact number will be provided which members of the public can use to raise any concerns or complaints about the Project. All construction related complaints will be logged by the contractor(s) in a complaints register, together with a record of the responses given and actions taken.

- xii. TT03: The CTMP will set out measures to reduce route and journey mileage to and from and around site, and prevent nuisance to the residents, businesses and the wider community caused by parking, vehicle movements and access restrictions. It will also provide suitable control for the means of access and egress to the public highway and set out measures for the maintenance and upkeep of the public highway. The plan will also identify access for emergency vehicles. It will also set out measures to reduce safety risks through construction vehicle and driver quality standards and measures to manage abnormal loads.
- xiii. NV01: Construction working will be undertaken within the agreed working hours set out within the DCO unless the works are under an exception to the set working hours in which case they will be carried out in a manner that minimises Noise and Vibration at all times. Best practicable means (BPM) to reduce construction noise will be set out within the CEMP.
- xiv. NV02: BPM measures, as defined by The Control of Pollution Act 1974 and detailed in BS 5228-1:2009+A1:2014 Code of practice for Noise and Vibration control on construction and open sites – Part 1: Noise, and Part 2: Vibration, will be identified within the CoCP and may include consideration of construction plant and methods, siting semi-static equipment as far as reasonably practicable away from sensitive areas, screening, enclosures, and temporal restrictions.
- xv. NV03: The contractor will conduct detailed construction noise and vibration assessments to determine whether there are likely to be any new or different significant adverse effects at noise and vibration sensitive receptors (NSR) and therefore whether additional measures, including site-specific BPM, may be required.

Control of Pollution Act 1974

- 10.6.8 The Control of Pollution Act 1974 (CoPA) (Ref 13) sets out the framework for the legislative control of construction Noise and Vibration on any given site. It also sets out the principle of BPM (as defined in Section 72 of the Act) and how that should be applied to construction activity noise. BS 5228-1 and BS 5228-2 gained Approved Code of Practice status in England under the powers conferred by sections 71(1)(b), (2) and (3) of CoPA 1974, as enacted under The Control of Noise (Code of Practice for Construction and Open Sites) (England) Order 2015 (Ref 14). Compliance with the best practice Noise and Vibration mitigation requirements stated within BS 5228-1 and BS 5228-2 became a statutory obligation under the Act. Compliance with the requirements of the CoPA would be secured via control measure NV02, included within the Preliminary CoCP.
- 10.6.9 Section 61 of the CoPA states that consent may be sought from the relevant local authorities prior to the construction works commencing. If prior consent is sought, the relevant local authorities will need to be provided with information about the proposed construction works and how construction noise will be managed, including the use of BPM.

Additional Mitigation Measures

- 10.6.10 Additional mitigation measures are those required to reduce likely significant adverse environmental effects which may still occur despite the inclusion of the embedded design and control measures described above.

- 10.6.11 Additional mitigation measures are not anticipated to be required in relation to Noise and Vibration effects. However, this will remain under review during the completion of further assessment and development of the ES.

10.7 Preliminary Assessment of Effects

- 10.7.1 The following section presents the findings of the preliminary assessment of effects upon the receptors, identified within the Section 1 Study Area, as a result of construction, operational and/or maintenance activities.
- 10.7.2 The preliminary assessment of effects reported below takes into account the Design and Control mitigation measures previously described. No additional mitigation measures have been assumed within the preliminary assessment of effects reported in the following sections.
- 10.7.3 For a summary of the likely significant effects please refer to **PEI Report Volume 2 Part B Section 1 Chapter 13 Summary**. A supplementary summary of all non-significant effects is also included within this Section in **Table 10.5**, based upon the assessment scope detailed in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
- 10.7.4 Where it has been concluded that effects are not significant, but may still be considered notable from a stakeholder perspective, a more detailed explanation is provided in support of the summaries included within **Table 10.5**. Examples include consideration of receptors of particularly high sensitivity or effects which have been identified of interest during previous consultation and engagement.
- 10.7.5 It is noted that this is an ongoing assessment and is subject to change due to the ongoing design development of the Project, statutory consultation feedback and further stakeholder engagement. A full assessment will be included within the ES submitted with the DCO application.

Likely Significant Effects

Construction

- 10.7.6 Based upon the preliminary assessment, no significant effects have been identified due to construction Noise and Vibration, assuming the implementation of the embedded measures set out in section 10.6. The assessment is discussed in further detail below in relation to likely non-significant effects.

Operation

- 10.7.7 No significant effects have been identified due to Noise and Vibration during operation and maintenance of the Project in Section 1. The assessment is discussed in further detail below in relation to likely non-significant effects.

Likely Non-Significant Effects

Construction

Construction Noise

- 10.7.8 The construction noise assessment is based on the construction noise data presented in **PEI Report Volume 3 Part B Section 1 Appendix 10B Construction Noise and Vibration Data** for the various proposed construction activities, which in Section 1 include:
- Preparation and establishment of temporary access/egress to the Site and haul routes;
 - Establishment and operation of construction compounds and laydown areas;
 - Construction of pylon foundations and erection of pylons;
 - Stringing of overhead line;
 - Construction of the proposed New Walpole B Substation;
 - Ancillary works, such as drainage;
 - Removal of compounds and haul roads and site reinstatement.
- 10.7.9 Although BPM to reduce construction noise impacts would be employed by the contractor for all work areas, for the purposes of the assessment, it is assumed that no noise mitigation, such as screening, is included. This is so that potential noise 'hot-spots' can be identified which would require specific mitigation measures to avoid significant adverse effects. However, BPM to reduce construction noise impacts would be employed by the contractor for all work areas, as discussed in section 10.6 Control Mitigation Measures.
- 10.7.10 The initial construction noise assessment outputs are presented in **PEI Report Volume 2 Part B Section 1 Figure 10.3 Initial Construction Noise Assessment Outputs** and are summarised in **Table 10.2**.

Table 10.2 Summary of construction noise assessment

NSR Type/Sensitivity	Total Number of NSR in Section 1 Study Area	Number of NSR experiencing magnitude of impact:			
		Negligible	Small	Medium	Large
Residential	482	434	48	0	0
High sensitivity non-residential	1	1	0	0	0
Medium sensitivity non-residential	3	2	1	0	0
Low sensitivity non-residential	0	0	0	0	0

- 10.7.11 The assessment indicates that the magnitude of impacts from construction noise without specific mitigation measures would be negligible or small at all residential and medium sensitivity non-residential NSR, and negligible at the one high-sensitivity non-residential NSR assessed. As such, there are no likely significant adverse effects from construction noise in the Section 1 Study Area, even without specific BPM mitigation measures. This is due to the distance between proposed construction works and nearby NSR being relatively large and noise levels reducing accordingly.

Construction Vibration

- 10.7.12 The construction vibration assessment is based on the construction noise data presented in **PEI Report Volume 3 Part B Section 1 Appendix 10B Construction Noise and Vibration Data** for the various proposed construction activities, which include:
- i. Construction of access tracks (compaction);
 - ii. Construction and operation of construction compounds (compaction);
 - iii. Construction of the proposed New Grimsby West Substation; and
 - iv. Construction of pylons (piling).

Construction vibration on people in buildings

- 10.7.13 Although BPM to reduce construction vibration impacts would be employed by the contractor for all work areas, the assessment assumes no vibration mitigation, such as the use of alternative methods, is included. Additionally, on a precautionary basis, the assessment assumes typical worst-case methodologies, such as use of percussive piling for pylon foundation construction. As with the noise assessment, this is so that potential vibration 'hot-spots' can be identified which would require specific mitigation measures to avoid significant adverse effects.
- 10.7.14 The initial construction noise assessment outputs are presented in **PEI Report Volume 2 Part B Section 1 Figure 10.4 Initial Construction Vibration Assessment Outputs**, and are summarised in **Table 10.3**.

Table 10.3 Summary of construction vibration assessment

NSR Type/Sensitivity	Total Number of NSR in Section 1 Study Area	Number of NSR experiencing magnitude of impact:			
		Negligible	Small	Medium	Large
Residential	128	128	0	0	0
High sensitivity non-residential	0	0	0	0	0
Medium sensitivity non-residential	1	1	0	0	0
Low sensitivity non-residential	0	0	0	0	0

- 10.7.15 The assessment indicates that the magnitude of impact from construction vibration without specific mitigation measures is negligible at all NSR. As such, there are no likely significant adverse effects from construction vibration in the Section 1 Study Area, even without specific BPM mitigation measures. This is due to the distance between proposed construction works and nearby NSR.

Construction vibration on buildings and structures

- 10.7.16 No buildings or structures have been identified within the threshold distances of applicable construction activities where the level of construction vibration would have the potential to cause damage. There are therefore no likely significant adverse effects from construction vibration on structures and buildings in the Section 1 Study Area. This will be reviewed further at ES stage and by the contractor prior to starting works.

Construction Traffic Noise

- 10.7.17 The initial construction noise assessment outputs are presented in **PEI Report Volume 3 Part B Section 1 Appendix 10C Construction Traffic Noise Assessment**.
- 10.7.18 Construction traffic noise impacts have been assessed on 14 construction traffic road links in Section 1 where data is available. The assessment indicates that construction traffic would lead to the following impacts:
- i. no change in noise level on six road links;
 - ii. a negligible increase in noise level on five road links; and
 - iii. a small magnitude increase on three road links (which doesn't include NIAs).
- 10.7.19 No medium or large magnitude construction traffic noise impacts are expected in the Section 1 Study Area. Additionally, there are no small magnitude impacts in locations which include NIAs (where a small magnitude impact may be considered significant). Therefore, there are no likely significant effects from construction traffic noise in the Section 1 Study Area.

Operation and Maintenance

Operational Substation Noise

- 10.7.20 The initial operational substation noise assessment is presented in **PEI Report Volume 3 Part B Section 1 Appendix 10D Initial Operational Substation Noise Assessment** and is summarised in **Table 10.4**.

Table 10.4 Summary of operational substation noise assessment

NSR Type/Sensitivity	Total Number of NSR in Section 1 Study Area	Number of NSR experiencing magnitude of impact:			
		Negligible	Small	Medium	Large
Residential	786	786	0	0	0
High sensitivity non-residential	4	4	0	0	0
Medium sensitivity non-residential	4	4	0	0	0
Low sensitivity non-residential	10	10	0	0	0

- 10.7.21 The assessment indicates that with appropriate standard noise mitigation measures incorporated in the design, the magnitude of impact of operational noise from the proposed new Grimsby West Substation would be negligible at all nearby NSR. As such, there are no likely significant adverse effects from operational substation noise in the Section 1 Study Area.

Operational Maintenance Noise and Vibration

- 10.7.22 As noted in section 10.3, noise impacts from standard operational maintenance activities are scoped out of the assessment. However, there may be instances where more substantial activity would be required as part of maintenance, such as replacement of components of the Project, such as overhead line re-stringing, or transformer replacement. Such activities would be expected to be similar to those during the construction phase, as assessed above. As such, in the Section 1 Study Area there are no likely significant adverse effects from noise and vibration generated during operational maintenance, even without specific BPM mitigation measures.

Summary

- 10.7.23 For completeness, **Table 10.5** summarises the findings of the preliminary assessment with respect to those impacts that are not predicted to result in significant Noise and Vibration effects.

Table 10.5 Preliminary summary of non-significant Noise and Vibration effects – Section 1

Receptor	Impact	Sensitivity/ Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
Construction					
All residential NSR within the Study Area	Construction noise	Residential	Negligible to small	Negligible to minor adverse. Not significant	Due to the distance between proposed construction activities and receptors, construction noise levels would be below the threshold for potential significant adverse effects at all nearby residential NSR, with standard construction noise mitigation measures.
Medium and low sensitivity Non-residential NSR within the Study Area	Construction noise	Medium and low	Negligible to small	Negligible to minor adverse. Not significant	Due to the distance between proposed construction activities and receptors, construction noise levels would be below the threshold for potential significant adverse effects at all nearby non-residential NSR, even without specific noise mitigation measures.
All NSR within Study Area	Construction vibration	Residential, and medium and low sensitivity non-residential	Negligible	Minor adverse. Not significant	Due to the distance between proposed construction activities and receptors, construction vibration levels would be below the threshold for potential significant adverse effects at all nearby medium and low sensitivity NSR, even without specific vibration mitigation measures.
Buildings and structures within Study Area	Construction vibration	Buildings and structures	Below threshold for potential damage	Not significant	Due to the distance between proposed construction activities and receptors, construction vibration levels would be below the threshold for potential significant adverse

Receptor	Impact	Sensitivity/ Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
					effects at all nearby buildings and structures, even without specific vibration mitigation measures.
All NSR within Study Area	Construction traffic noise	Residential	Negligible to small	Negligible to Minor adverse. Not significant	No medium or large magnitude construction traffic noise impacts are expected in Section 1. Additionally, there are no small magnitude impacts in locations which include NIAs (where a small magnitude impact may be considered significant). Therefore there are no likely significant effects from construction traffic noise in Section 1.
Operation					
All NSR within Study Area	Operational noise from proposed new substation	Residential, and medium and low sensitivity non-residential	Negligible	Negligible to minor adverse. Not significant	With the implementation of standard noise mitigation measures (e.g. transformer enclosures), operational noise levels from the proposed new Grimsby West Substation would be below the threshold for potential significant adverse effects at all nearby NSR.
All NSR within Study Area	Operational Noise and Vibration from substantial maintenance activities	Residential, and medium and low sensitivity non-residential	Negligible to small	Negligible to minor adverse. Not significant	Operational Noise and Vibration from substantial maintenance activities is expected to be similar to that during construction, and would BPM to reduce the effects of Noise and Vibration. The effects of substantial maintenance during operation are therefore expected to be not significant.

10.8 Monitoring

- 10.8.1 The following processes and monitoring would be undertaken in the management of Noise and Vibration in accordance with the Preliminary CoCP:
- i. Further detailed construction Noise and Vibration assessments will be conducted by the contractor based on their specific proposed construction methodologies prior to construction.
 - ii. Based on the findings of the contractor's detailed construction Noise and Vibration assessments, specific BPM mitigation measures will be determined to avoid significant adverse effects and reduce and minimise adverse effects.
- 10.8.2 It is anticipated that the Preliminary CoCP will be secured through DCO requirements.
- 10.8.3 If appropriate, through consultation with the local authority, the contractor may apply for prior approval under section 61 of the CoPA (Ref 13) for certain construction activities.
- 10.8.4 Further detailed operational substation noise assessments will be undertaken as the design progresses, with appropriate mitigation specified where required to avoid significant adverse effects and reduce and minimise adverse effects.

References

- Ref 1 North East Lincolnshire Local Plan 2013 to 2032 (Adopted 2018) [online]. Available at <https://www.nelincs.gov.uk/assets/uploads/2018/05/20180518-AdoptedLocalPlan2018-WEB.pdf> [Accessed 25 March 2025].
- Ref 2 The Planning Inspectorate (2024). Scoping Opinion: Proposed Grimsby to Walpole Project [online]. Available at: <https://nsip-documents.planninginspectorate.gov.uk/published-documents/EN020036-000109-Scoping%20Opinion%202017%20EIA%20Regs.pdf> [Accessed 18 October 2024].
- Ref 3 National Grid Electricity Transmission (2024). Grimsby to Walpole Environmental Impact Assessment Scoping Report [online]. Available at: <https://nsip-documents.planninginspectorate.gov.uk/published-documents/EN020036-000004-EN020036%20-%20Scoping%20Report%20Volume%201%20Main%20Report.pdf> [Accessed 18 October 2024].
- Ref 4 BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise, British Standard Institution, 2014.
- Ref 5 BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration, British Standard Institution, 2014.
- Ref 6 Department for Transport (1988). Calculation of Road Traffic Noise
- Ref 7 Highways England et al. (2020). Design Manual for Roads and Bridges LA 111 Noise and vibration.
- Ref 8 BS 4142:2014+A1:2019. Methods for rating and assessing industrial and commercial sound, British Standard Institution, 2019.
- Ref 9 ISO 9613-2:2014. Acoustics — Attenuation of sound during propagation outdoors. Part 2: Engineering method for the prediction of sound pressure levels outdoors. International Organization for Standardization, 2024.
- Ref 10 National Grid. The Holford Rules: Guidelines on Overhead Line Routeing. [online] Available at: <https://www.nationalgrid.com/sites/default/files/documents/13795-The%20Holford%20Rules.pdf> [Accessed 20 September 2024].
- Ref 11 National Grid. NGC Substations and the Environment: Guidelines on Siting and Design. [online] Available at: <https://www.nationalgrid.com/sites/default/files/documents/13796-The%20Horlock%20Rules.pdf> [Accessed 20 September 2024].
- Ref 12 Grimsby to Walpole Corridor Preliminary Routeing and Siting Study. January 2024 [online]. Available at: <https://www.nationalgrid.com/document/352621/download> [Accessed 18 September 2024].
- Ref 13 Control of Pollution Act 1974 [online]. Available at: <https://www.legislation.gov.uk/ukpga/1974/40/contents> [Accessed 18 September 2024].

- Ref 14 The Control of Noise (Code of Practice for Construction and Open Sites) (England) Order 2015 [online]. Available at: <https://www.legislation.gov.uk/uksi/2015/227> [Accessed 21 January 2025].

11. Socio- economics, Recreation and Tourism

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11. Socioeconomics, recreation and tourism

11.1 Introduction

- 11.1.1 This chapter presents the Preliminary Environmental Information (PEI) in relation to the Socioeconomics, recreation and tourism assessment of the New Grimsby West Substation section (Section 1) of the Grimsby to Walpole Project (the Project). Specifically, the chapter includes the following sections:
- i. An introduction to the topic (section 11.1);
 - ii. Identification of key local and regional policy relevant to the assessment (section 11.2). A full overview of the legislation and national, regional onshore and marine planning policy context that applies to the Project is presented within **PEI Report Volume 2 Part A Chapter 2 Legislative, Regulatory and Planning Policy Context** and supporting appendices;
 - iii. A summary of the assessment scoping process and the subsequent scope of the Socio-economics, recreation and tourism assessment (section 11.3). Further detail is provided within **PEI Report Volume 3 Part A Appendix 4A Planning Inspectorate Scoping Opinion Responses**;
 - iv. A high-level summary of the methodology of the Socio-economics, recreation and tourism assessment within Section 1 (section 11.4). A detailed description of the assessment methods and scope, applicable to the whole Project, is contained in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**;
 - v. A description of the environmental baseline within the Section 1 Study Area relevant to the Socio-economics, recreation and tourism assessment (section 11.5);
 - vi. A description of mitigation measures included for the purposes of the assessment reported within the PEI Report (section 11.6). Further information regarding design development can be found in **PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered** and the **Grimsby to Walpole Design Development Report**;
 - vii. The likely significant and non-significant Socio-economics, recreation and tourism effects arising during construction and operation of the Project within Section 1, based upon the assessment completed to date (section 11.7); and
 - viii. An outline of the proposed monitoring requirements in relation to Socio-economics, recreation and tourism (section 11.8).
- 11.1.2 Further supporting information is set out in **Table 11.1** below, including supporting figures and technical appendices.

Table 11.1 Supporting documentation

Supporting Information	Description
Topic Specific Supporting Documentation	
PEI Report Volume 2 Part B Section 1 Figures	<p>Figure 11.1 Local Business Receptors and Community Facilities Within the Study Area</p> <p>Figure 11.2 Development Land Allocations and Open Space Within the Study Area</p> <p>Figure 11.3 PRow and Promoted/Recreational Routes Within the Study Area</p>
Project Specific Supporting Documentation	
PEI Report Volume 2 Part B Section 1 Chapter 1 Overview of the Section and Description of the Project	A summary of the works within Section 1, including permanent infrastructure, temporary construction works, and operational activities.
PEI Report Volume 3 Part A Appendix 2A Key Legislation	A list of identified environmental legislation considered relevant to the Project, which will be updated and amended as required to inform the Environmental Statement (ES).
PEI Report Volume 3 Part A Appendix 2B National and Regional Planning Policy	A list of national and regional policies generally applicable to the assessment principles which underpin the PEI Report and ES.
PEI Report Volume 3 Part A Appendix 2Ci Local Plan Policy: Section Specific	An outline of the potentially relevant local planning policy allocations affecting each of the specific sections of the Project.
PEI Report Volume 3 Part A Appendix 2Cii Local Plan Policy: Route-wide	Details of planning policies applicable route-wide within the relevant Local Authority areas.
PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered	A summary of the main alternatives considered in relation to the Project during the design development process, including the main reasons for selecting the chosen option.
PEI Report Volume 2 Part A Chapter 4 Approach to Preliminary Environmental Information	Sets out the Environmental Impact Assessment (EIA) approach and general methodology that has been used in developing the PEI Report for the Project.
PEI Report Volume 2 Part A Chapter 5 Project Description	An overarching description of the Project and its key components, including available construction information.
PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice	Sets out control and management measures that will be undertaken during construction of the Project if granted consent. The final Code of Construction Practice (CoCP) will be submitted in support of the Development Consent Order (DCO) application.

- 11.1.4 There are also interrelationships between the potential effects on Socio-economics, recreation and tourism and other environmental topics. Therefore, please also refer to the following chapters within **PEI Report Volume 2 Part B** and **Part C**:
- i. **PEI Report Volume 2 Part B Section 1, Chapter 3 Visual** should be consulted in relation to amenity effects on users of Public Rights of Way (PRoWs) and promoted/recreational routes;
 - ii. **PEI Report Volume 2 Part B Section 1, Chapter 8 Agriculture and Soils** should be consulted in regard to effects on agricultural landholdings;
 - iii. **PEI Report Volume 2 Part B Section 1, Chapter 9 Traffic and Movement** should be consulted in relation to impacts on access, PRoWs and promoted/recreational routes;
 - iv. **PEI Report Volume 2 Part B Section 1, Chapter 10 Noise and Vibration** should be consulted in relation to effects on noise and vibration sensitive receptors. This includes residential and community receptors, local businesses, and users of PRoWs and promoted/recreational routes;
 - v. **PEI Report Volume 2 Part B Section 1, Chapter 12 Air Quality** should be consulted in relation to effects on residential and community receptors, and local businesses;
 - vi. **PEI Report Volume 2 Part B Section 1 Chapter 13 Summary** provides a concise, consolidated summary of the likely significant effects reported for all topics, based upon the preliminary assessment;
 - vii. **PEI Report Volume 2 Part C Route-wide Chapter 7 Socio-economics, recreation and tourism** should be consulted in relation to the assessment of impact on affected communities, the labour market and effects on tourism bedspaces, and strategic visitor attractions;
 - viii. **PEI Report Volume 2 Part C Route-wide Chapter 8 Health and Wellbeing** should be consulted in relation to the indirect amenity effects on population and users of PRoWs and promoted/recreational routes; and
 - ix. **PEI Report Volume 2 Part C Route-wide Chapter 10 Cumulative Effects** reports those intra-project effects which could potentially act in combination to result in cumulative environmental effects. It also identifies a shortlist of other Committed Developments with which there may be potential for cumulative effects, and the relevant environmental topics for such effects (inter-project). The full cumulative effects assessment will be reported within the ES.

11.2 Legislation and Policy Framework

Legislation and National Policy

- 11.2.1 Legislation and national policy relevant to the Project and this chapter is described in **PEI Report Volume 2 Part A Chapter 2 Legislative, Regulatory and Planning Policy** and supporting appendices, detail of which is set out in **Table 11.1**.

Regional and Local Policy

11.2.2 Regional and local plans or policies relevant to this assessment are as follows:

- i. Lincolnshire County Council Minerals and Waste Local Plan (Ref 1):
 - Lincolnshire Minerals and Waste Local Plan: Core Strategy and Development Management Policies - this outlines the principles for the future working of minerals and the form of waste management, including the criteria under which applications are considered.
 - Lincolnshire Minerals and Waste Local Plan Site Locations: includes specific proposals and policies for the provision of land for mineral and waste development.
- ii. North East Lincolnshire Local Plan 2013 to 2032 (Adopted in 2018) (Ref 2):
 - Policy 1 Employment land supply: provides a portfolio of sites to enable the development growth of renewables and energy, chemicals and process, food processing and ports and logistics industries.
 - Policy 6 Infrastructure: outlines the authorities' support for developments to create, expand or alter service facilities, including schools, health facilities and key infrastructure to meet the needs of existing and new communities.
 - Policy 7 Employment allocations: outlines specific areas of land allocated for employment development under use classes B1, B2 and B8.
- iii. North East Lincolnshire Local Plan Review Draft Plan with Options (Ref 3):
 - Draft Strategic Policy 4 Infrastructure: is directly comparable to Policy 6 Infrastructure of the existing local plan, summarised above.
 - Draft Policy 5 Existing Employment Sites: outlines the Council's aims to safeguard existing land allocated for employment and business uses. Proposals for the development or reuse of vacant sites within these areas for employment purposes will be supported by the Council.
- iv. Central Lincolnshire Local Plan (Adopted April 2023) (Ref 4):
 - Policy S29 Strategic Employment Sites: identifies a number of land parcels within the local plan area to be ear-marked for the development of strategic employment opportunities to meet large scale investment needs.
 - Policy S47 Accessibility and Transport: identifies the need for development proposals to contribute to an efficient and safe transport network, including for walkers and cyclists, and integrating this within the existing network.
 - Policy S48 Walking and Cycling Infrastructure: identifies the need for development proposals to facilitate active travel.
 - Policy S50 Community Facilities: identifies the need for development proposals to acknowledge the importance of community facilities and ensure that they are integrated into future development.

11.3 Scope of Assessment

- 11.3.1 The scope of the assessment has been informed by the Scoping Opinion (Ref 5) provided by the Planning Inspectorate in September 2024 on behalf of the Secretary of State, following the submission of the EIA Scoping Report (Ref 6). The scope has also been informed through consultation and engagement with relevant consultees. A summary of the Scoping Opinion together with a response against each point of relevance to the Socio-economics, recreation and tourism chapter is provided in **PEI Report Volume 3 Part A Appendix 4A Planning Inspectorate Scoping Opinion Responses**. A summary of the stakeholder engagement undertaken to date is provided in **PEI Report Volume 3 Part A Appendix 4D Summary of Stakeholder Engagement**.
- 11.3.2 Non statutory consultation feedback is summarised within the **Grimsby to Walpole Stage 1 Consultation Feedback Report**.
- 11.3.3 The scope of the assessment covers the following receptor groups:
- i. Local businesses;
 - ii. Development land;
 - iii. Community facilities;
 - iv. Open space;
 - v. Users of PRoW and promoted/recreational routes; and
 - vi. Aviation.
- 11.3.4 Where effects may be felt regionally, such as those relating to the local labour market (including employment, supply chain effects, training and apprenticeship opportunities, as well as any impact on tourism bedspace from the construction workforce), affected communities (local communities including populations of towns and villages) and strategic visitor attractions that are of importance to the economy during construction, this is considered in **PEI Report Volume 2 Part C Route-wide Assessment, Chapter 7 Socio-economics, recreation and tourism**.
- 11.3.5 As outlined in the Scoping Report (Ref 5), the effects of the Projects operation and maintenance phases on the receptor groups outlined above are not likely to give rise to significant effect and are therefore scoped out of the assessment. However, acknowledging the Scoping Opinion (Ref 6), where significant effects have the potential to be felt, this is reported on as appropriate.

11.4 Assessment Methodology

- 11.4.1 The assessment scope, methodology, relevant guidance, key assumptions and limitations for the Socioeconomic, Recreation and Tourism assessment are set out in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**. This includes a description of how receptor sensitivity, magnitude of impact and significance of effects are all described and assigned to the assessment. A summary of the key components is outlined below.
- 11.4.2 There is limited technical guidance available for Socioeconomic, recreation and tourism assessments. As such, the methodology for assessing impacts has followed standard EIA guidance and entails:

- i. assessment of the likely scale, permanence and significance of effects associated with Socio-economics, recreation and tourism receptors; and
- ii. an assessment of the potential cumulative impacts with other projects within the surrounding area.

Assessment Assumptions and Limitations

- 11.4.3 All general assumptions and limitations for the topic are listed within **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
- 11.4.4 The decommissioning works at the existing Grimsby West Substation are yet to be defined, therefore a limitation of this preliminary assessment of Socio-economic, recreation and tourism effects upon noise sensitive receptors is that it does not assess these works. The decommissioning works will be assessed as part of the ES.
- 11.4.5 The key parameters and assumptions which inform the assessment will be reviewed based on the design presented in the DCO application and, where required, updated, or refined, for the ES. The ES will present the final key limitations and assumptions used within that assessment, particularly drawing attention to any areas that may have changed from that presented in this preliminary assessment.

11.5 Baseline Conditions

Study Area

- 11.5.1 The Study Area for the assessment of Socioeconomic, recreation and tourism effects varies dependent on the likely spatial extent of the effect under consideration, as agreed via the Scoping Opinion (Ref 5).
- 11.5.2 The proposed Study Area for Section 1 is shown on:
 - i. **PEI Report Volume 2 Part B Section 1 Figure 11.1 Local Business Receptors and Community Facilities Within the Study Area;**
 - ii. **PEI Report Volume 2 Part B Section 1 Figure 11.2 Development Land Allocations and Open Space Within the Study Area;** and
 - iii. **PEI Report Volume 2 Part B Section 1 Figure 11.3 PRow and Promoted/Recreational Routes Within the Study Area.**
- 11.5.3 Professional judgement has been applied to determine the Study Area for each receptor type and is consistent with other similar linear nationally significant infrastructure projects.
- 11.5.4 **Table 11.2** below summarises the Study Areas considered for each receptor type that are considered within this Chapter.

Table 11.2 Study Areas

Receptor Type	Study Area
Local businesses – Indirect effects	Within 500 m of the draft Order Limits
Development land – Direct effects	Within the draft Order Limits
Development land – Indirect effects	Within 500 m of the draft Order Limits
Community facilities – Indirect effects	Within 500 m of the draft Order Limits
Open space – Direct effects	Within the draft Order Limits
Open space – Indirect effects	Within 500 m of the draft Order Limits
PRoW of local significance – Direct effects	Within the draft Order Limits
PRoW of local significance – Indirect effects	Within 500 m of the draft Order Limits
Users of promoted/recreational routes – Direct effects	Within the draft Order Limits
Users of promoted/recreational routes – Indirect effects	Within 500 m of the draft Order Limits
Aviation – Indirect effects	Within 5 km of the proposed overhead line alignment

11.5.5 The Study Area for aviation receptors is 5 km from the proposed overhead line infrastructure, as opposed to the draft Order Limits in their entirety. This is because of the nature of this specific receptor group, and the subsequent elements of the Project that has the potential to cause adverse or beneficial effects being limited to the placement of overhead line infrastructure only.

11.5.6 For the purposes of this assessment, direct effects can be defined as those that involve loss or severance of land and property. Indirect effects can be defined as impacts on the environment as a result of the Project. For example, a change in a persons' experience of a place.

11.5.7 The local labour market, effects on the construction workforce and tourism bed spaces, affected communities and strategic visitor attractions will be considered as part of the **PEI Report Volume 2 Part C Route-wide Assessment Chapter 7 Socio-economics, recreation and tourism**, owing to the nature of the impacts which will be felt at a regional level.

Data Collection

11.5.8 The following data has been used to inform the baseline conditions:

- i. Lincolnshire County Council Minerals and Waste Local Plan (Ref 1);
- ii. North East Lincolnshire Adopted Local Plan (Ref 2);
- iii. Central Lincolnshire Adopted Local Plan (Ref 4);
- iv. Ordnance Survey (OS) Open Greenspace (Ref 7);

- v. OS Local Important Buildings (Ref 8);
- vi. OS AddressBase (Ref 9);
- vii. Traffic count data from surveys, which include pedestrians, cyclists and equestrians;
- viii. Designated non-motorised user (NMU) routes and PRowS from Sustrans (Ref 10 and Ref 11) and Local Authority Definitive Maps where applicable; and
- ix. Great Coates Village Council Walks (Ref 12).

Existing Baseline

11.5.9 The following section outlines the Socioeconomics, recreation and tourism baseline. The baseline section should be read in conjunction with the following supporting Figures as found within **PEI Report Volume 2**:

- i. **PEI Report Volume 2 Part B Section 1 Figure 11.1 Local Business Receptors and Community Facilities Within the Study Area;**
- ii. **PEI Report Volume 2 Part B Section 1 Figure 11.2 Development Land Allocations and Open Space Within the Study Area;** and
- iii. **PEI Report Volume 2 Part B Section 1 Figure 11.3 PRow and Promoted/Recreational Routes Within the Study Area.**

Local Businesses

- 11.5.10 The local businesses in this area generally possess some economic value, with potential for substitution, and as such are assigned a Medium sensitivity. This is the case for The Lakeside Lodge, however Healing Manor Hotel which would likely have limited potential for substitution by virtue of its nature and scale is considered to have a High sensitivity.
- 11.5.11 **Table 11.3** identifies the local businesses, including farms, local tourist attractions and tourist accommodation, which fall within the Study Area. These are also shown on **PEI Report Volume 2 Part B Section 1 Figure 11.1 Local Business Receptors and Community Facilities Within the Study Area.**
- 11.5.12 Pyewipe Farm is a business receptor partly within the Section 1 Study Area. However, it is omitted from this assessment as it is located primarily within the draft Order Limits of Section 2 and so has been assessed within **PEI Report Volume 2 Part B Section 2 Chapter 11 Socio-economics, recreation and tourism.**

Table 11.3 Local businesses within the Study Area

Receptor	Description of location	Sensitivity
Healing Manor Hotel	At its closest point, this receptor is approximately 415 m from the draft Order Limits (access road). The receptor is situated along Stallingborough Road.	High
The Lakeside Lodge	At its closest point, this receptor is approximately 70 m from the draft Order	Medium

Receptor	Description of location	Sensitivity
	Limits. The receptor is situated along Carr Lane.	
Leonardos Pizzeria	At its closest point, this receptor is approximately 485 m from the draft Order Limits. The receptor is situated along St Nicholas Drive.	Medium
Co-Operative	At its closest point, this receptor is approximately 490 m from the draft Order Limits. The receptor is situated along St Nicholas Drive.	Medium
Go Tan	At its closest point, this receptor is approximately 490 m from the draft Order Limits. The receptor is situated along St Nicholas Drive.	Medium
J J's Barber Shop	At its closest point, this receptor is approximately 485 m from the draft Order Limits. The receptor is situated along St Nicholas Drive.	Medium
Wybers Chippy	At its closest point, this receptor is approximately 495 m from the draft Order Limits. The receptor is situated along St Nicholas Drive.	Medium

Development Land

- 11.5.13 For the purposes of assessment, 'development land' includes existing and proposed land used for above ground renewable energy generation (solar and onshore wind farms), alongside development land allocations set out in local planning policy.
- 11.5.14 **Table 11.4** identifies key development land allocations and above-ground renewable energy generation infrastructure (solar and onshore wind farms) which fall within the Study Area. These are also shown on **Report Volume 2 Part B Section 1 Figure 11.2 Development Land Allocations and Open Space Within the Study Area**.
- 11.5.15 Generally, the allocations are strategic in nature and are therefore considered to have limited potential for substitution. As such they are considered to have a High sensitivity.
- 11.5.16 The exception to this is the Petroleum Exploration Development Licence (PEDL) Block which is allocated on the same land as the Central Lincolnshire Local Plan Policy S22 (Affordable Housing). This is considered to have a Medium sensitivity because a PEDL does not give permission for operations, but it grants exclusivity to licensees, in relation to hydrocarbon exploration and extraction within a defined area.

Table 11.4 Development land allocations, solar and onshore wind farms within the Study Area

Local authority area	Receptor	Description and location	Sensitivity
North East Lincolnshire Local Plan	Grimsby West Housing Allocation – HOU342 Grimsby	Housing Allocation Grimsby West Urban Extension site area of 206.70Ha, total capacity yield 3,337 dwellings. The allocation partly sits within the north and mid-east section of the draft Order Limits.	High
North East Lincolnshire Local Plan	Proposed New Road	The land west of Laceby Acres and Wybers Wood ('Grimsby West'), will, once developed, form a major strategic extension to the west of the Grimsby urban area. It will also establish a new road link between the A46 and A180, via the A1136. The allocation partly sits within the draft Order Limits.	High
Central Lincolnshire Local Plan	Value Zone B – Policy S22 Affordable Housing	The strategic aim will be to deliver the c.12,000 affordable dwellings that are needed during the plan period to meet the needs of residents unable to meet their own housing need through the open market. The allocation partly sits within the western section of the Study Area.	High
Lincolnshire Minerals and Waste Local Plan	Petroleum Exploration Development Licence (PEDL) Block	A PEDL grants exclusive rights to search and bore for, and get, petroleum within a specified area. The allocation partly sits within the western section of the Study Area.	Medium

Community Facilities

- 11.5.17 **Table 11.5** below identifies the community facilities which fall within the Study Area. These are also shown on **PEI Report Volume 2 Part B Section 1 Figure 11.1 Local Business Receptors and Community Facilities Within the Study Area**.
- 11.5.18 Generally, the community facilities have some social and/or community value and would likely have limited potential for substitution in the immediately surrounding area, and as such should be considered to have a High sensitivity.

Table 11.5 Community facilities within the Study Area

Receptor	Description of location	Sensitivity
Healing Village Hall and Youth Centre	At its closed point, this receptor is approximately 360 m from the draft Order Limits and is situated along Great Coates Road.	High
Healing School – Specialist Science College	At its closest point, this receptor is approximately 460 m from the draft Order Limits and is situated along Great Coates Road.	High
Wybers Wood Pharmacy	At its closest point, this receptor is approximately 450 m from the draft Order Limits. The receptor is situated along St Nicholas Drive.	Medium
St Peter and St Paul's Church	At its closest point, this receptor is approximately 420 m from the draft Order Limits. The receptor is situated along Stallingborough Road.	High
Wybers Wood Academy	At its closest point, this receptor is approximately 335 m from the draft Order Limits. The receptor is situated along Timberley Drive.	High
St Nicholas Church	At its closest point, this receptor is approximately 285 m from the draft Order Limits. The receptor is situated along Great Coates Road.	High
Healing Youth Centre	At its closest point, this receptor is approximately 385 m from the draft Order Limits. The receptor is located along Low Road.	High
Church View Care Home	At its closest point, this receptor is approximately 300 m from the draft Order Limits. The receptor is located along Aylesby Road.	High
Recycling Centre along Great Coates Road	At its closest point, this receptor is approximately 350 m from the draft Order Limits. The receptor is located along Great Coates Road.	Medium
Recycling Centre along St Nicholas Drive	At its closest point, this receptor is approximately 485 m from the draft Order Limits. The receptor is located along St Nicholas Drive.	Medium

Open Space

- 11.5.19 Open space, which includes all open space of public value, can take many forms, from formal sports pitches to open areas within a development, linear corridors and country parks (Ref 13).
- 11.5.20 **Table 11.6** below identifies the areas of open space, either allocated via the relevant local development plan or recognised as an area of green space by local communities, within the Study Area. This is also shown on **PEI Report Volume 2 Part B Section 1 Figure 11.2 Development Land Allocations and Open Space Within the Study Area**.
- 11.5.21 The areas of open space have some social and/or community value with potential for substitution, and as such should be considered to have Medium sensitivity.
- 11.5.22 It should be noted that the Land at the Healing Comprehensive School is considered to be open space. However, it forms part of the education facility which has been considered as a community facility. As such the open space has not been assessed separately to avoid double counting.

Table 11.6 Open space within the Study Area

Receptor	Description of location	Sensitivity
Open Space at Oakwood Drive	At its closest point, this receptor is within approximately 300 m of the draft Order Limits and is situated along Oakwood Drive.	Medium
Manor Garth Open Space	At its closest point, this receptor is within approximately 55 m of the draft Order Limits and is situated along Aylesby Road.	Medium

Users of Public Rights of Way (PRoW) and Promoted/Recreational Routes

- 11.5.23 This section of the baseline considers people using PRoW for walking, wheeling, cycling and horse riding. PRoW have the same legal status and protection as highways and remain in existence until legally closed, diverted or extinguished. The PRoWs within the Study Area are shown on **PEI Report Volume 2 Part B Section 1 Figure 11.3 PRoW and Promoted/Recreational Routes Within the Study Area**.
- 11.5.24 Promoted/recreational routes generally involve national cycle routes, the local cycle network, long-distance paths and national trails, which have also been identified within the Study Area. These have been identified through the use of desk-top research (Ref 12). Such routes, paths and trails generally follow alignments utilising combinations of PRoW.
- 11.5.25 PRoW are typically considered as:
- Public footpaths, open to walkers only.
 - Public bridleways, open to walkers, cyclists and horse-riders.

- iii. Restricted byways, open to walkers, cyclists, horse-riders, and drivers and riders of non-mechanically propelled vehicles (such as horse-drawn carriages).
 - iv. Byways open to all traffic (BOATs), open to all including motor vehicles.
- 11.5.26 People using wheelchairs or mobility scooters can use all of the above designations.
- 11.5.27 Considering the potential sensitivity of these receptors, generally:
- i. National trails have a very high sensitivity because they are likely to be used for both commuting and recreational purposes, with daily/frequent use and the route has limited potential for substitution.
 - ii. Other promoted/recreational routes have a high sensitivity because they are likely to be well signed long distance/regional trails used daily/frequently for recreation.
 - iii. Bridleways, footpaths, restricted byways and byways open to all traffic (BOATS) have a medium or low sensitivity because of their value to communities and subject to available alternative routes.
- 11.5.28 Relevant transport surveys are ongoing, which are reported in **PEI Report Volume 2 Part B Section 5 Chapter 9 Traffic and Movement**. At ES stage survey results will help further inform the consideration of sensitivity of routes by providing information about usage and condition, which are relevant to determining value and potential for substitution.
- 11.5.29 **Table 11.7** identifies the PRow and promoted/recreational routes in this Section by local authority area, its unique reference number relevant to the local authority definitive map(s), its proximity to the Project and its sensitivity. It should be noted that some PRow and recreational routes cross Section boundaries and they are reported within each of the Sections they are present within. To avoid the double counting of likely significant effects, where practicable, a receptor will only be assessed within the Section where there is the most adverse effect. Preliminary effects upon PRowS during construction of the Project are assessed within **PEI Report Volume 2 Part B Section 5 Chapter 9 Traffic and Movement**.

Table 11.7 Promoted/recreational routes within the Study Area

Receptor	Description	Sensitivity
Promoted/recreational routes		
The Freshney Wildlife and Wetlands	This receptor is a long distance walk that runs along the River Freshney. The route is 4 miles in total length, and is located within the Study Area only.	High
The Healing Circle	This receptor is a long distance walk that runs crosses the A1136, and is 5.7 miles in total length. It is located within the Study Area only.	High
Freshney Valley	This receptor is a long distance walk that runs across the Freshney Valley towards Laceby. At its closest point, this route is within the draft Order Limits. The route is 6.6 miles in total length.	High

Aviation

- 11.5.30 The study area for aviation receptors is 5 km from the proposed overhead line infrastructure, as opposed to the draft Order Limits in their entirety. This is because of the nature of this specific receptor group, and the subsequent elements of the Project that has the potential to cause adverse or beneficial effects being limited to the placement of overhead line infrastructure only.
- 11.5.31 It should be noted that Lindens Farm Airstrip crosses both Section 1 and Section 2. To avoid the double counting of likely significant effects, the receptor has been assessed within **PEI Report Volume 2 Part B Section 2, Chapter 11 Socio-economics, recreation and tourism** where its impact from the Project is likely to be greatest.
- 11.5.32 No other aviation receptors were identified within the Section 1 Study Area.

Future Baseline

- 11.5.33 The future baseline relates to known or foreseeable changes to the current baseline in the future, against which the effects of the Project during construction and operation are assessed. Specifically, it accounts for anticipated changes including: those caused by changing climatic conditions, policy, legislation, advances in technology and by other confirmed development projects which will be complete prior to construction of the Project.
- 11.5.34 In addition to **Table 11.4**, which describes existing key development land allocations (and above ground renewable energy generation), Aura Power Solar Farm (Grimsby Solar Farm) is a proposed development that has recently been granted planning permission, situated within the draft Order Limits, with a High sensitivity. The likely significance of effects for solar developments considered in the future baseline will be determined at ES stage when the necessary information from all relevant topic specialists is available and confirmed in addition to further engagement with the developer by National Grid Electricity Transmission plc (National Grid).
- 11.5.35 It is understood that a promotor has undertaken public consultation in December 2024 in relation to a proposed masterplan to bring forward the land allocated under policy Grimsby West Housing Allocation – HOU342 Grimsby within the North East Lincolnshire Local Plan, hereby referred to as Grimsby West Urban Extension (Ref 14). Limited information is currently available regarding the Grimsby West Urban Extension. National Grid and the promotor are continuing to engage on this matter, and an update will be provided at ES stage. However, this development is currently assumed to be included within the cumulative effects assessment, rather than the future baseline, and is therefore identified in **PEI Report Volume 3 Part C Appendix 10B Cumulative Effects Assessment Shortlist of Committed Developments**.
- 11.5.36 At this preliminary stage, a full assessment of the implications of any committed development projects with regard to future baseline conditions has not been undertaken. A list of the currently known developments which are anticipated to be included within the future baseline scenario is provided within **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope Annex A Developments for Consideration within the Future Baseline**. This will be reviewed and updated as appropriate during development of the ES, as with other information which informs assessment of the future baseline.

- 11.5.37 Population projections relevant to the local labour market and affected communities is considered as part of **Volume 2 Part C Route-wide Chapter 9 Socio-economics, recreation and tourism**, owing to the nature of the impacts which will be felt at a regional level.
- 11.5.38 The future baseline for local businesses, community facilities, open spaces, solar and wind farms, and visitor attractions over the medium to longer-term is uncertain beyond where allocated and planned development sites have been identified. Due to this uncertainty, it is assumed the future baseline for the Study Area would be unchanged from the current baseline to the completion of the Project, except where new development is expected to be delivered in line with allocated and planned development sites as set out above.

11.6 Design, Control and Additional Mitigation Measures

Design Mitigation Measures

- 11.6.1 The Project and draft Order Limits have been designed to avoid sensitive receptors as far as practicable. This is in accordance with the 'Holford Rules' (Ref 15) applicable to routing of new overhead lines and the 'Horlock Rules' (Ref 16) which apply to design and siting of substations. These approaches are explained in further detail within the Corridor Preliminary Routeing and Siting Study (CPRSS) (Ref 17) and **PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered**. Principles include, but are not limited to, seeking to avoid areas of highest amenity, cultural or scientific value, taking advantage of natural screening provided by existing landform and features (e.g. woodland) and keeping visual, noise and other environmental effects to a minimum.
- 11.6.2 Following selection of the preferred route corridor, environmental specialists have been integral to ongoing design refinement of works within Section 1. This has further contributed to the avoidance or reduction of the potential environmental impacts of the Project.

Control Mitigation Measures

- 11.6.3 A Preliminary CoCP is provided in **PEI Report Volume 3 Appendix 5A Preliminary Code of Construction Practice**. The control measures included within the Preliminary CoCP relevant to the Socio-economic, recreation and tourism assessment of Section 1 include:
- i. TT02: All affected Public Rights of Way (PRoWs) will be identified, and any potential permanent or temporary closures detailed in the DCO. All designated PRoWs crossing the working area will be managed with access only closed for periods while construction activities occur. Any required diversions will be clearly marked at both ends with signage explaining the diversion, the duration of the diversion and a contact number for any concerns and will be subject to a PRoWMP. PRoWs crossing the working areas will be managed in discussion with the relevant local authorities and potential temporary closures applied for discussed with the relevant local authority. Access disruption would be reduced as reasonably practicable while construction activities occur.
 - ii. NV01: Construction working will be undertaken within the agreed working hours set out within the DCO unless the Celtic Lakes Power, Welsh Government

(2023-Present)Project Description: Nia acted as planning agent on behalf of Welsh Government to secure planning permission for a proposed National Grid Electricity Distribution substation and associated infrastructure in Newport, contributing towards the delivery of employment development. Nia worked collaboratively with stakeholders including NGED, Welsh Government, Natural Resources Wales, Cadw, Glamorgan-Gwent Archaeological Trust to develop the proposals with the design team, taking into account the site constraints and opportunities. These included an employment allocation within the Local Development Plan (LDP), a SINC, an Archaeologically Sensitive Area and an adjacent Site of Special Scientific Interest. Nia led the preparation of an EIA Screening Opinion and a pre-application enquiry to the Local Planning Authority (LPA) and led the co-ordination of the statutory PAC stage and the planning application submission. As a result, Nia has gained a good understanding of mitigation measures required to support development, including methods of securing compensation areas for ecological and biodiversity enhancement and methods of ensuring limited impact to protected species and designated sites.

- iii. Relevance to A6 HVDC: Direct experience as planning agent for National Grid substation infrastructure.
- iv. Works are under an exception to the set working hours in which case they will be carried out in a manner that minimises noise and vibration at all times. Best practicable means to reduce construction noise will be set out within the CEMP.
- v. GG08: Land used temporarily will be reinstated where practicable to its pre-construction condition (including Agricultural Land Classification (ALC) grade) and use. Hedgerows, fences, and walls (including associated earthworks and boundary features) will be reinstated to a similar style and quality to those that were removed, in consultation with the landowner.
- vi. GG11: Any activity carried out or equipment located within a construction compound that may produce a noticeable nuisance, including but not limited to dust, noise, vibration and lighting, will be located away from sensitive receptors such as residential properties or ecological sites where practicable.

Additional Mitigation Measures

- 11.6.4 Additional mitigation measures are those required to reduce likely significant adverse environmental effects which may still occur despite the inclusion of the embedded design and control measures described above.
- 11.6.5 Additional mitigation measures are not anticipated to be required in relation to Socio-economics, recreation and tourism effects. However, this will remain under review during the completion of further assessment and development of the ES.

11.7 Preliminary Assessment of Effects

- 11.7.1 The following section presents the findings of the preliminary assessment of effects upon the receptors, identified within the Section 1 Study Area, as a result of construction, operational and/or maintenance activities.
- 11.7.2 The preliminary assessment of effects reported below takes into account the Design and Control mitigation measures previously described.

- 11.7.3 For a summary of the likely significant effects please refer to **PEI Report Volume 2 Part B Section 1 Chapter 13 Summary**. A supplementary summary of all non-significant effects is also included within this Section in **Table 11.8**, based upon the assessment scope detailed in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
- 11.7.4 This PEI Report has assumed that following the implementation of all Design, Control and Mitigation Measures there is unlikely to be a significant intra-project cumulative effect upon the amenity value of any Socioeconomic, recreation and tourism receptors. This will be reviewed and updated accordingly at ES stage.
- 11.7.5 It is noted that this is an ongoing assessment and is subject to change due to the ongoing design development of the Project, statutory consultation feedback and further stakeholder engagement. A full assessment will be included within the ES submitted with the DCO application.

Likely Significant Effects

Construction, Operation and Maintenance

- 11.7.6 An assessment of the direct effects of the Project on above ground renewable energy generating infrastructure (solar and onshore wind farms) as Socio-economics, recreation and tourism receptors will be presented in the ES.
- 11.7.7 For this PEI Report, a reasonable worst-case scenario approach has been applied in relation to solar farms that intercept with the draft Order limits. Within Section 1 there is one receptor (Aura Solar Farm) considered in the Future Baseline. The assumption is that these receptors will be directly impacted and would therefore have potential for likely significant effects by virtue of potential temporary or permanent loss of land during construction.
- 11.7.8 The likely level of effect and magnitude of changes will be determined within the ES following completion of the relevant interrelated assessments and landowner consultation.
- 11.7.9 Based upon the preliminary assessment, no other likely significant effects are predicted for Socioeconomic, recreation and tourism receptors within Section 1, as a result of the construction or operation and maintenance phases of the Project.

Likely Non-Significant Effects

- 11.7.10 For completeness, **Table 11.8** summarises the findings of the preliminary assessment with respect to those impacts that are not predicted to result in significant Socio-economics, recreation and tourism effects.
- 11.7.11 As outlined in the Scoping Report (Ref 6), the effects of the Projects operation and maintenance phases on the receptor groups outlined in **Table 11.8** are not likely to give rise to significant effects and are therefore scoped out of the assessment. However, acknowledging the Scoping Opinion (Ref 5) and the request to report on significant effects resulting from the Projects operation and maintenance phases where they do arise, National Grid has considered this as part of this assessment.
- 11.7.12 Owing to the nature of the operational and maintenance phases of the Project and acknowledging the mitigation that will be in place to ensure continued access, it is considered that there would be a negligible impact on all receptors assessed as part

of Section 1. This is due to the fact that access will be maintained or reinstated for all receptors and amenity impacts will be minimised through the implementation of mitigation.

- 11.7.13 An assessment of the direct effects of the Project on users of PRoW and promoted/recreational routes in relation to diversions, closures and management measures will be presented at ES stage in **PEI Report Volume 2 Part B Section 1 Chapter 9 Traffic and Movement**. This Socio-economics, recreation and tourism assessment, also at ES stage, will consider the in-combination effects of any proposed diversions and/or closures and changes to amenity value resulting from noise, visual and air quality impacts. The likely significance of effects will be determined at ES stage when the necessary information from all relevant topic specialists is available and confirmed, to help inform determination of the receptors' magnitude of change.

Table 11.8 Preliminary summary of non-significant Socio-economics, recreation and tourism effects – Section 1

Receptor	Impact	Sensitivity/ Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
Local businesses					
Healing Manor Hotel, situated along Stallingborough Road	At its closest point, this receptor is approximately 415 m from the draft Order Limits and may be affected from adverse noise/vibration, air quality/dust, and visual impacts during construction.	High	Small, adverse	Minor adverse, not significant	Owing to its limited potential for substitution by virtue of its nature and scale, this receptor has a high sensitivity. It is anticipated that there would be a small, adverse change given likely construction activities in the surrounding area which would have a limited impact on the receptor's amenity. Additionally, it is assumed that access would be maintained at all times.
The Lakeside Lodge, situated along Carr Lane	At its closest point, this receptor is approximately 70 m from the draft Order Limits and may be affected from adverse noise/vibration, air quality/dust, and visual impacts during construction.	Medium	Small, adverse	Minor adverse, not significant	It is considered that this receptor possesses some economic value and has potential for substitution. It has therefore been assigned a medium sensitivity. It is anticipated that there would be a small, adverse change likely given construction activities in the surrounding areas which would have a limited impact on the receptor's amenity. Additionally, it is assumed that access would be maintained at all times.

Receptor	Impact	Sensitivity/ Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
Leonardos Pizzeria situated along St Nicholas Drive	At its closest point, this receptor is approximately 485 m from the draft Order Limits and may be affected from adverse noise/vibration, air quality/dust, and visual impacts during construction.	Medium	Small, adverse	Minor adverse, not significant	<p>It is considered that this receptor possesses some economic value and has potential for substitution. It has therefore been assigned a medium sensitivity.</p> <p>It is anticipated that there would be a small, adverse change likely given construction activities in the surrounding areas which would have a limited impact on the receptor's amenity. Additionally, it is assumed that access would be maintained at all times.</p>
Co-operative situated along St Nicholas Drive	At its closest point, this receptor is approximately 490 m from the draft Order Limits and may be affected from adverse noise/vibration, air quality/dust, and visual impacts during construction.	Medium	Small, adverse	Minor adverse, not significant	<p>It is considered that this receptor possesses some economic value and has potential for substitution. It has therefore been assigned a medium sensitivity.</p> <p>It is anticipated that there would be a small, adverse change likely given construction activities in the surrounding areas which would have a limited impact on the receptor's amenity. Additionally, it is assumed that access would be maintained at all times.</p>
Go Tan situated along St Nicholas Drive	At its closest point, this receptor is approximately 490 m from the draft Order	Medium	Small, adverse	Minor adverse, not significant	It is considered that this receptor possesses some economic value and has potential for substitution.

Receptor	Impact	Sensitivity/ Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
	Limits and may be affected from adverse noise/vibration, air quality/dust, and visual impacts during construction.				It has therefore been assigned a medium sensitivity. It is anticipated that there would be a small, adverse change likely given construction activities in the surrounding areas which would have a limited impact on the receptor's amenity. Additionally, it is assumed that access would be maintained at all times.
J J's Barber Shop situated along St Nicholas Drive	At its closest point, this receptor is approximately 485 m from the draft Order Limits and may be affected from adverse noise/vibration, air quality/dust, and visual impacts during construction.	Medium	Small, adverse	Minor adverse, not significant	It is considered that this receptor possesses some economic value and has potential for substitution. It has therefore been assigned a medium sensitivity. It is anticipated that there would be a small, adverse change likely given construction activities in the surrounding areas which would have a limited impact on the receptor's amenity. Additionally, it is assumed that access would be maintained at all times.
Wybers Chip Shop situated along St Nicholas Drive	At its closest point, this receptor is approximately 495 m from the draft Order Limits and may be affected from adverse noise/vibration, air quality/dust, and visual	Medium	Small, adverse	Minor adverse, not significant	It is considered that this receptor possesses some economic value and has potential for substitution. It has therefore been assigned a medium sensitivity.

Receptor	Impact	Sensitivity/ Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
	impacts during construction.				It is anticipated that there would be a small, adverse change likely given construction activities in the surrounding areas which would have a limited impact on the receptor's amenity. Additionally, it is assumed that access would be maintained at all times.
Development land allocations					
Central Lincolnshire Local Plan - Value Zone B – Policy S22 Affordable Housing	The receptor is located immediately adjacent to the draft Order Limits and may be affected from access, adverse noise/vibration, air quality/dust, and visual impacts during construction. Temporary loss of land (minor) as a direct impact is anticipated during construction.	High	Small, adverse	Minor adverse, not significant	Development land allocations are strategic in nature and therefore considered to have limited potential for substitution, and as such, are considered to have a high sensitivity. It is anticipated that a small, adverse change will be felt, given likely construction activities in the surrounding areas which would have a limited impact on the receptor's amenity, coupled with a temporary minor loss in land felt during construction. It is also assumed that access would be maintained at all times.
Lincolnshire Minerals and Waste Local Plan: Core Strategy and Development	The receptor is located immediately adjacent to the draft Order Limits and may be affected from	Medium	Small, adverse	Minor adverse, not significant	The PEDL Block has been assigned a Medium sensitivity because a PEDL does not give permission for operations, but it

Receptor	Impact	Sensitivity/ Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
Management Policies - Petroleum Exploration Development Licence (PEDL) Block	construction related activities. Temporary loss of land (minor) as a direct impact is anticipated during construction.				grants exclusivity to licensees, in relation to hydrocarbon exploration and extraction within a defined area. It is anticipated that a small change will be felt, given likely construction activities in the surrounding areas leading to a temporary loss of land during construction. It is also assumed that access would be maintained at all times.
Community facilities					
Healing Village Hall and Youth Centre situated along Great Coates Road	The receptor is located approximately 360 m from the draft Order Limits and may be affected from adverse noise/vibration, air quality/dust, and visual impacts during construction.	High	Small, adverse	Minor adverse, not significant	Community facilities have some social and/or community value and would likely have limited potential for substitution in the immediate surrounding area and are therefore assigned a high sensitivity. It is anticipated that there would be a small, adverse change likely given to the construction activities in the surrounding areas which would have a limited impact on the receptor's amenity. Additionally, it is assumed that access would be maintained at all times.

Receptor	Impact	Sensitivity/ Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
Healing School – Specialist Science College situated along Great Coates Road.	The receptor is located approximately 460 m from the draft Order Limits and may be affected from adverse noise/vibration, air quality/dust, and visual impacts during construction.	High	Small, adverse	Minor adverse, not significant	<p>Community facilities have some social and/or community value and would likely have limited potential for substitution in the immediate surrounding area and are therefore assigned a high sensitivity.</p> <p>It is anticipated that there would be a small, adverse change likely given construction activities in the surrounding areas which would have a limited impact on the receptor's amenity. Additionally, it is assumed that access would be maintained at all times.</p>
Wybers Wood Pharmacy situated along St Nicholas Drive	The receptor is located approximately 450 m from the draft Order Limits and may be affected from adverse noise/vibration, air quality/dust, and visual impacts during construction.	Medium	Small, adverse	Minor adverse, not significant	<p>Community facilities have some social and/or community value. This receptor would likely have some potential for substitution in the immediate surrounding area, is therefore assigned a medium sensitivity.</p> <p>It is anticipated that there would be a small, adverse change likely given construction activities in the surrounding areas which would have a limited impact on the receptor's amenity. Additionally, it is assumed that access would be maintained at all times.</p>

Receptor	Impact	Sensitivity/ Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
St Peter and St Paul's Church situated along Stallingborough Road	The receptor is located approximately 420 m from the draft Order Limits and may be affected from adverse noise/vibration, air quality/dust, and visual impacts during construction.	High	Small, adverse	Minor adverse, not significant	<p>Community facilities have some social and/or community value and would likely have limited potential for substitution in the immediate surrounding area and are therefore assigned a high sensitivity.</p> <p>It is anticipated that there would be a small, adverse change likely given construction activities in the surrounding areas which would have a limited impact on the receptor's amenity. Additionally, it is assumed that access would be maintained at all times.</p>
Wybers Wood Academy situated along Timberley Drive	The receptor is located approximately 335 m from the draft Order Limits and may be affected from adverse noise/vibration, air quality/dust, and visual impacts during construction.	High	Small, adverse	Minor adverse, not significant	<p>Community facilities have some social and/or community value and would likely have limited potential for substitution in the immediate surrounding area and are therefore assigned a high sensitivity.</p> <p>It is anticipated that there would be a small, adverse change likely given construction activities in the surrounding areas which would have a limited impact on the receptor's amenity. Additionally, it is assumed that access would be maintained at all times.</p>

Receptor	Impact	Sensitivity/ Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
St Nicholas Church situated along Great Coates Road	The receptor is located approximately 285 m from the draft Order Limits and may be affected from adverse noise/vibration, air quality/dust, and visual impacts during construction.	High	Small, adverse	Minor adverse, not significant	Community facilities have some social and/or community value and would likely have limited potential for substitution in the immediate surrounding area and are therefore assigned a high sensitivity. It is anticipated that there would be a small, adverse change likely given construction activities in the surrounding areas which would have a limited impact on the receptor's amenity. Additionally, it is assumed that access would be maintained at all times.
Healing Youth Centre, Low Road	The receptor is located approximately 385 m from the draft Order Limits and may be affected from adverse noise/vibration, air quality/dust, and visual impacts during construction.	High	Small, adverse	Minor adverse, not significant	Community facilities have some social and/or community value and would likely have limited potential for substitution in the immediate surrounding area and are therefore assigned a high sensitivity. It is anticipated that there would be a small, adverse change likely given construction activities in the surrounding areas which would have a limited impact on the receptor's amenity. Additionally, it is assumed that access would be maintained at all times.

Receptor	Impact	Sensitivity/ Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
Church View Care Home, Aylesby Road	The receptor is located approximately 300 m from the draft Order Limits and may be affected from adverse noise/vibration, air quality/dust, and visual impacts during construction.	High	Small, adverse	Minor adverse, not significant	<p>Community facilities have some social and/or community value and would likely have limited potential for substitution in the immediate surrounding area and are therefore assigned a high sensitivity.</p> <p>It is anticipated that there would be a small, adverse change likely given construction activities in the surrounding areas which would have a limited impact on the receptor's amenity. Additionally, it is assumed that access would be maintained at all times.</p>
Recycling Centre along Great Coates Road	The receptor is located approximately 350 m from the draft Order Limits and may be affected from adverse noise/vibration, air quality/dust, and visual impacts during construction.	Medium	Small, adverse	Minor adverse, not significant	<p>Community facilities have some social and/or community value. This receptor would likely have some potential for substitution in the immediate surrounding area, is therefore assigned a medium sensitivity.</p> <p>It is anticipated that there would be a small, adverse change likely given construction activities in the surrounding areas which would have a limited impact on the receptor's amenity. Additionally, it is assumed that access would be maintained at all times.</p>

Receptor	Impact	Sensitivity/ Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
Recycling Centre along St Nicholas Drive	The receptor is located approximately 485 m from the draft Order Limits and may be affected from adverse noise/vibration, air quality/dust, and visual impacts during construction.	Medium	Small, adverse	Minor adverse, not significant	<p>Community facilities have some social and/or community value. This receptor would likely have some potential for substitution in the immediate surrounding area, is therefore assigned a medium sensitivity.</p> <p>It is anticipated that there would be a small, adverse change likely given construction activities in the surrounding areas which would have a limited impact on the receptor's amenity. Additionally, it is assumed that access would be maintained at all times.</p>
Open space					
Open space at Oakwood Drive	The receptor is located approximately 300 m from the draft Order Limits and may be affected from adverse noise/vibration, air quality/dust, and visual impacts during construction.	Medium	Small, adverse	Minor adverse, not significant	<p>The identified Open space receptor has some social and/or community value, but has potential for substitution, and is therefore considered to have a medium sensitivity.</p> <p>It is anticipated that there would be a small, adverse change likely given construction activities in the surrounding areas which would have a limited impact on the receptor's amenity. Additionally, it</p>

Receptor	Impact	Sensitivity/ Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
					is assumed that access would be maintained at all times.
Manor Garth Open Space	The receptor is located approximately 55 m from the draft Order Limits and may be affected from adverse noise/vibration, air quality/dust, and visual impacts during construction.	Medium	Small, adverse	Minor adverse, not significant	<p>The identified Open space receptor has some social and/or community value, but has potential for substitution, and is therefore considered to have a medium sensitivity.</p> <p>It is anticipated that there would be a small, adverse change likely given construction activities in the surrounding areas which would have a limited impact on the receptor's amenity. Additionally, it is assumed that access would be maintained at all times.</p>

11.8 Monitoring

- 11.8.1 The control measures set out in section 11.6 will secure a PRoWMP as part of the Preliminary CoCP. No further monitoring requirements have been identified at the time of writing over and above this requirement for the Socioeconomic, recreation and tourism assessment. This will be reviewed and updated accordingly as part of the ES.

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- Ref 10 Sustrans (no date). Temporary diversions of National Cycle Network routes [online]. Available at: <https://www.sustrans.org.uk/for-professionals/infrastructure/temporary-diversions-of-national-cycle-network-routes/> [Accessed October 2024]
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12. Air Quality

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12. Air Quality

12.1 Introduction

- 12.1.1 This chapter presents the Preliminary Environmental Information (PEI) in relation to the Air Quality assessment of the New Grimsby West Substation section (Section 1) of the Grimsby to Walpole Project (the Project). Specifically, the chapter includes the following sections:
- i. An introduction to the topic (section 12.1);
 - ii. Identification of key local and regional policy relevant to the assessment (section 12.2). A full overview of the legislation and national, regional onshore and marine planning policy context that applies to the Project is presented within **PEI Report Volume 2 Part A Chapter 2 Legislative, Regulatory and Planning Policy Context** and supporting appendices;
 - iii. A summary of the assessment scoping process and resulting scope of the Air Quality assessment (section 12.3). Further detail is provided within **PEI Report Volume 3 Part A Appendix 4A Planning Inspectorate Scoping Opinion Responses**;
 - iv. A high-level summary of the methodology of the Air Quality assessment within Section 1 (section 12.4). A detailed description of the assessment methods and scope, applicable to the whole Project, is contained in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**;
 - v. A description of the environmental baseline within the Section 1 Study Area relevant to the Air Quality assessment (section 12.5);
 - vi. A description of mitigation measures included for the purposes of the Air Quality assessment reported within the PEI Report (section 12.6). Further information regarding design development can be found in **PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered** and the **Grimsby to Walpole Design Development Report**;
 - vii. The likely significant and non-significant Air Quality effects arising during construction and operation of the Project within the Section 1 Study Area, based upon the assessment completed to date (section 12.7); and
 - viii. An outline of the proposed monitoring requirements in relation to air quality (section 12.8).
- 12.1.2 Further supporting information is set out in **Table 12.1** below, including supporting figures and technical appendices.

Table 12.1 Supporting documentation

Supporting Information	Description
Topic Specific Supporting Documentation	
PEI Report Volume 2 Part B Section 1 Figures	Figure 12.1 Construction Dust Study Area Figure 12.2 Preliminary Affected Road Network and Local Authority Monitoring Locations
Project Supporting Documentation	
PEI Report Volume 2 Part B Section 1 Chapter 1 Overview of the Section and Description of the Project	A summary of the works within Section 1, including permanent infrastructure, temporary construction works, and operational activities.
PEI Report Volume 3 Part A Appendix 2A Key Legislation	A list of identified environmental legislation considered relevant to the Project, which will be updated and amended as required to inform the Environmental Statement (ES).
PEI Report Volume 3 Part A Appendix 2B National and Regional Planning Policy	A list of national and regional policies generally applicable to the assessment principles which underpin the PEI Report and ES.
PEI Report Volume 3 Part A Appendix 2Ci Local Plan Policy: Section Specific	An outline of the potentially relevant local planning policy allocations affecting each of the specific sections of the Project.
PEI Report Volume 3 Part A Appendix 2Cii Local Plan Policy: Route-wide	Details of planning policies applicable route-wide within the relevant Local Authority areas.
PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered	A summary of the main alternatives considered in relation to the Project during the design development process, including the main reasons for selecting the chosen option.
PEI Report Volume 2 Part A Chapter 4 Approach to Preliminary Environmental Information	Sets out the Environmental Impact Assessment (EIA) approach and general methodology that has been used in developing the PEI Report for the Project.
PEI Report Volume 2 Part A Chapter 5 Project Description	An overarching description of the Project and its key components, including available construction information.
PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice	Sets out control and management measures that will be undertaken during construction of the Project if granted consent. The final CoCP will be submitted in support of the Development Consent Order (DCO) application.

- 12.1.3 There are also interrelationships between the potential effects on Air Quality and other environmental topics. Therefore, please also refer to the following chapters within **PEI Report Volume 2 Part B** and **Part C**:
- i. **PEI Report Volume 2 Part B Section 1 Chapter 4 Ecology and Biodiversity** assesses the potential for changes in Air Quality to effect ecological receptors, such as changes in pollutant concentrations or dust deposition.
 - ii. **PEI Report Volume 2 Part B Section 1 Chapter 9 Traffic and Movement** assesses the potential change in traffic movements during construction and operation, which are relevant to the assessment of Air Quality effects associated with vehicle emissions.
 - iii. **PEI Report Volume 2 Part B Section 1 Chapter 11 Socio-economics, Recreation and Tourism** assesses potential effects upon local businesses and recreational areas that could be affected by changes in air quality acting in combination with other impacts, to result in effects upon amenity.
 - iv. **PEI Report Volume 2 Part B Section 1 Chapter 13 Summary** provides a concise, consolidated summary of the likely significant effects reported for all topics, based upon the preliminary assessment.
 - v. **PEI Report Volume 2 Part C Route-wide Chapter 8 Health and Wellbeing** assesses the potential for Air Quality effects on health and wellbeing.
 - vi. **PEI Report Volume 2 Part C Route-wide Chapter 10 Cumulative Effects** reports those intra-project effects which could potentially act in combination to result in cumulative environmental effects. It also identifies a shortlist of other Committed Developments with which there may be potential for cumulative effects, and the relevant environmental topics for such effects (inter-project). The full cumulative effects assessment will be reported within the ES.

12.2 Legislation and Policy Framework

Legislation and National Policy

- 12.2.1 Legislation and national policy relevant to the Project and this chapter is described in **PEI Report Volume 2 Part A Chapter 2 Legislative, Regulatory and Planning Policy Context** and supporting appendices, details of which are set out in **Table 12.1**.

Regional and Local Policy

- 12.2.2 Regional and local plans or policies relevant to this assessment are as follows:
- i. North East Lincolnshire Local Plan 2013 to 2032 (Adopted 2018) (Ref 1):
 - Policy 5 – Development boundaries: all development needs to consider the use of mitigation to limit impacts on neighbouring land uses.
 - Policy 31 – Renewable and low carbon infrastructure: the air quality and dust impacts due to the installation of infrastructure associated with renewable and low carbon projects will be assessed individually and cumulatively.

- Policy 36 – Promoting sustainable transport: the use of active and sustainable transport measures should be considered to limit congestion and improve environmental quality.
- ii. North East Lincolnshire Local Plan Review is currently being undertaken, including consultation on measures to be included within the local plan (Ref 2). The policies outlined above have been retained as Draft Strategic Policy 2 and 7 respectively.
- iii. North East Lincolnshire Council Air Quality Strategy 2021-2026 (Ref 3). This strategy outlines where the council is seeking to influence reductions in air pollution within its administrative area.

12.3 Scope of Assessment

- 12.3.1 The scope of the assessment has been informed by the Scoping Opinion (Ref 4) provided by the Planning Inspectorate in September 2024 on behalf of the Secretary of State, following the submission of the EIA Scoping Report (Ref 5). A summary of the Scoping Opinion together with a response against each point of relevance to the Air Quality chapter is provided in **PEI Report Volume 3 Part A Appendix 4A Planning Inspectorate Scoping Opinion Responses**.
- 12.3.2 Non statutory consultation feedback is summarised within the **Grimsby to Walpole Stage 1 Consultation Feedback Report**.
- 12.3.3 The scope of the assessment considers the impact of:
- i. Dust from on-site construction activities (including enabling works) and off-site trackout by construction vehicles on sensitive (human and ecological) receptors. The main potential impacts are dust soiling (which can lead to the loss of amenity) and the deterioration of human health (as a result of increases in concentrations of Particulate Matter (PM₁₀ and PM_{2.5})); and,
 - ii. Vehicular tail-pipe emissions containing air pollutants released by construction, operation and maintenance vehicles associated with the Project using the local road network. The emissions from vehicles include but are not limited to Nitrogen Oxides (NO_x) (comprising Nitrogen Monoxide, NO, and Nitrogen Dioxide, NO₂), Ammonia (NH₃) and Particulate Matter (PM₁₀ and PM_{2.5}). Emissions from vehicles also include those associated with brake and tyre wear.
- 12.3.4 The projected number, type and location of plant and Non-Road Mobile Machinery (NRMM) are yet to be determined and are therefore not detailed within the PEI Report. An assessment of any likely significant effects due to use of NRMM will be included in the ES, in accordance with the Scoping Opinion (Ref 4).
- 12.3.5 As proposed within the Scoping Report and subsequently agreed in principle in the Scoping Opinion, the assessment of emissions from diverted traffic and road closures has been provisionally scoped out. However, further details of any potential changes in traffic flows due to the diversion of traffic will be presented in the ES.

12.4 Assessment Methodology

- 12.4.1 The assessment scope, methodology, relevant guidance, key assumptions and limitations for the Air Quality assessment are set out in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.

This includes a description of how receptor sensitivity, magnitude of impact and significance of effects are all defined and assigned in the assessment. A summary of the key components is provided below.

- 12.4.2 This PEIR chapter presents a baseline appraisal of air quality within Section 1. It assesses the impact of dust and PM₁₀ on human and ecological receptors before concluding whether the effects are likely to be significant or not.
- 12.4.3 The assessment of construction dust impacts has been undertaken in line with Institute of Air Quality Management (IAQM) Guidance on the Assessment of Dust from Demolition and Construction (Ref 6). This guidance provides a risk-based approach to the assessment of the potential for dust impacts from four types of activities taking account of the sensitivity of the environment surrounding the works: demolition; earthworks; construction; and trackout (the movement of dust/mud onto the public highway via construction vehicles) on sensitive (human and ecological) receptors.
- 12.4.4 For the purposes of the PEI Report, an initial screening assessment of construction traffic flows has been completed based on preliminary construction traffic projections. Projected changes in Annual Average Daily Traffic (AADT) flows for both Light Goods Vehicles (LGVs) and Heavy Goods Vehicles (HGVs) have been screened to determine where a detailed assessment (using dispersion modelling) is likely to be required, the findings of which will be reported in the ES submitted with the DCO application. This screening exercise is intended to provide an indication of where there is greatest potential for changes in air quality as a result of construction traffic, but it is noted that no dispersion modelling has been completed at this stage.
- 12.4.5 The impact of construction traffic vehicle emissions on sensitive (human and ecological) receptors within 200 m of affected roads will be considered, beyond this distance no significant effects are expected (Ref 7).
- 12.4.6 Where changes in traffic flows resulting from the construction of the Project meet the assessment criteria within the Environmental Protection UK (EPUK)/IAQM Land Use Planning & Development Control guidance (Ref 8), and set out below, then detailed dispersion modelling will be undertaken to determine the impact on existing human sensitive receptors:
- i. a change in Light Duty Vehicle (LDV)¹ flows of more than 100 Annual Average Daily Traffic (AADT, vehicles/day) within or adjacent to an Air Quality Management Area (AQMA) or more than 500 AADT elsewhere; and
 - ii. a change in Heavy Duty Vehicle (HDV) (>3.5 tonnes)² flows of more than 25 AADT within or adjacent to an AQMA or more than 100 AADT elsewhere.
- 12.4.7 Based on an initial review of the draft Order Limits and the existing road network that may be used by construction traffic to access the Project, an assessment of vehicle emission impacts on ecological sensitive receptors within 200 m of the affected roads may be required as there are a number of road links where the predicted change in HDV flows (of 200 AADT) exceeds the change criteria outlined within the IAQM's Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites (Ref 9). There are no road links where the projected change in total traffic (LDV + HDV) flows exceeds the 1000 AADT criteria also given in the IAQM guidance.

¹ Light Duty Vehicles = cars and light goods vehicles (LGVs).

² Heavy Duty Vehicles = Heavy Goods Vehicles (HGVs) plus Public Service Vehicles, e.g., buses and coaches.

- 12.4.8 An initial review of operation/maintenance vehicle movements associated with the Project has also been undertaken against the EPUK/IAQM screening criteria described above (Ref 8) for human sensitive receptors and the IAQM criteria (Ref 9) for ecological sensitive receptors.
- 12.4.9 Once updated construction and operational/maintenance traffic data is made available, projected changes in traffic flows as a result of the Project will be re-screened against the criteria within the EPUK/IAQM and IAQM guidance. A detailed assessment of impacts will be undertaken where traffic flows exceed the criteria and reported within the ES.

Assessment Assumptions and Limitations

- 12.4.10 All general assumptions and limitations for the topic are listed within **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
- 12.4.11 The decommissioning works at the existing Grimsby West Substation are yet to be defined, therefore a limitation of this preliminary assessment of Air Quality effects is that it does not assess these works. The decommissioning works will be assessed as part of the ES.
- 12.4.12 The key parameters and assumptions which inform the assessment will be reviewed based on the design presented in the DCO application and, where required, updated, or refined, for the ES. The ES will present the final key limitations and assumptions applicable to the full assessment, particularly drawing attention to any areas that may have changed from that presented in this preliminary assessment.

12.5 Baseline Conditions

Study Area

Construction Dust

- 12.5.1 For the construction phase dust impacts, the Study Area has been defined by the screening criteria from the IAQM guidance (Ref 6) and additional guidance given by Natural England during the Scoping Opinion (Ref 4). The construction dust Study Area is shown within **PEI Report Volume 2 Part B Section 1 Figure 12.1 Construction Dust Study Area** and is dictated by the screening criteria below:
- human receptors within the draft Order Limits plus those within the surrounding area extending 250 m from the draft Order Limits, or within 50 m of the proposed routes used by construction traffic on the public highway or up to 250 m from a site entrance; and
 - ecological designated sites within the draft Order Limits plus those within the surrounding area extending 200 m from the draft Order Limits, or within 50 m of the proposed routes used by construction traffic on the public highway or up to 250 m from a site entrance. The 200 m screening distance from the draft Order Limits is more conservative than that stipulated in the IAQM guidance (Ref 6), and has been used following the advice given by Natural England within their Scoping Opinion consultation response (Ref 4).

- 12.5.2 Background NO_x, NO₂, PM₁₀ and PM_{2.5} concentrations presented in the baseline assessment for the existing and future years have been extracted from Defra's background maps³ (Ref 10) for the area extending 500 m from the draft Order Limits.
- 12.5.3 Where ecological receptors have been identified within 200 m of the draft Order Limits, baseline data for pollutants which affect nutrient nitrogen deposition, such as NH₃ concentrations and nitrogen deposition rates, have been taken from Air Pollution Information System (APIS) (Ref 11), along with acid deposition rates and the relevant critical levels and loads for the designated sites.

Road Traffic Emissions

- 12.5.4 The Section 1 Study Area for the assessment of impacts upon human receptors due to road traffic emissions associated with the Project has been defined with reference to the criteria given in the EPUK/IAQM guidance described in section 12.4 Methodology (Ref 8). This Section 1 Study Area comprises any roads where these criteria are exceeded, and any human receptors within 200 m of these roads. The Section 1 Study Area described within this chapter will be updated as required for the ES, based upon further analysis of traffic projections for the Project.
- 12.5.5 The Section 1 Study Area for the assessment of impacts upon ecological receptors due to road traffic emissions associated with the Project includes ecological sensitive receptors within 200 m of any road links where the projected changes in traffic flow exceed IAQM guidance thresholds (Ref 9).
- 12.5.6 Roadside concentrations from local authority monitoring sites within 200 m of the routes within the Section 1 Study Area that are expected to be used by construction and operational/maintenance traffic, have therefore been used to determine baseline conditions.

Data Collection

- 12.5.7 The following data has been used to inform the baseline Air Quality conditions:
- i. Defra's Background Air Quality Archive (2021-base year) (Ref 10);
 - ii. Air Pollution Information System (APIS) (Ref 11);
 - iii. Defra's AQMA dataset (Ref 12);
 - iv. Defra's Multi-Agency Geographic Information for the Countryside (MAGIC) (Ref 13);
 - v. Local Air Quality Management Reports (Ref 14);
 - vi. Ordnance Survey (OS) AddressBase Plus dataset;
 - vii. Google Earth Imagery; and

³ Defra's background maps of modelled air pollutant concentrations are provided on a 1km x 1km basis for the whole of the UK. To capture the grid squares that fall within the draft Order Limits boundary and those immediately adjacent, a 500 m buffer has been applied.

viii. Data on Part A1⁴ Permitted Installations held by the Environment Agency and Part A2 and B⁵ Installations held by the local authorities within the Section 1 Study Area (Ref 15, Ref 16).

- 12.5.8 As previously stated, preliminary projections of changes in traffic flow as a result of the Project have been used to complete an initial screening exercise. Further detail regarding traffic data is provided within **PEI Report Volume 2 Part B Section 1 Chapter 9 Traffic and Movement** and supporting appendices.

Existing Baseline

- 12.5.9 The following section outlines the Air Quality baseline for the Section 1 Study Area. There are two main potential sources of air pollution associated with the Project, construction dust emissions and construction road traffic emissions. The baseline presented is therefore based upon an assessment of likely background concentrations of NO_x, NO₂, PM₁₀ and PM_{2.5} taken from Defra's modelled data and a review of available local authority monitoring data.
- 12.5.10 The baseline section should be read in conjunction with **PEI Report Volume 2 Part B Section 1 Figure 12.1 Construction Dust Study Area**.
- 12.5.11 The Section 1 Study Area is rural in nature and predominantly consists of open agricultural land. The New Grimsby West Substation is located to the west of the Grimsby urban area, near the village of Great Coates, and to the south of the village of Healing.
- 12.5.12 As **PEI Report Volume 2 Part B Section 1 Figure 12.1 Construction Dust Study Area** illustrates, the majority of human sensitive receptors within the Section 1 Study Area are located at the outer extents of these settlements, but receptors also include individual scattered properties within the wider rural area.
- 12.5.13 There are no statutory or non-statutory designated ecological sites within the Section 1 Study Area.

Local Authority Air Quality Monitoring Data

- 12.5.14 Section 1 is located within the administrative boundary of North East Lincolnshire Council (NELC).
- 12.5.15 There was one AQMA within NELC's administrative area declared due to exceedances of annual mean NO₂ concentrations along Cleethorpes Road in Grimsby in August 2010, approximately 5 km northeast of the draft Order Limits. However, this was revoked in May 2024 (Ref 14).
- 12.5.16 NELC measures pollutant concentrations for NO₂. Monitoring of annual mean NO₂ levels is undertaken through a network of passive diffusion tubes and two automatic monitors (Ref 14). Monitoring data is reported in NELC's 2024 Annual Status Report (ASR), which presents the concentrations from the calendar years 2019 to 2023. The locations and annual mean NO₂ concentrations of roadside diffusion tubes in NELC's administrative areas, that are within 200 m of construction traffic routes, are

⁴ Large-scale industrial processes emitting to land, air and/or water.

⁵ This would relate to smaller industrial processes regulated by the Local Authority under the Pollution Prevention and Control guidance, including Part A2 processes (which may release to land, air and water) or Part B processes (which only release to air).

presented in **Table 12.2** and shown in **PEI Report Volume 2 Part B Section 1 Figure 12.2 Preliminary Affected Road Network and Local Authority Monitoring Locations**.

Table 12.2 Section 1 Local Authority NO₂ Monitoring Data

ID	Location	Distance to draft Order Limits (km)	Annual Mean NO ₂ Concentration (µg/m ³)				
			2019	2020	2021	2022	2023
NEL S1	8 Town Hall Street, Grimsby	4.1	28.9	26.3	32.2	28.1	29.0
NEL S7	Toll Bar Roundabout, New Waltham	3.1	23.9	20.6	21.6	19.8	16.8
NEL S8	Toll Bar A16 side, New Waltham	3.1	17.4	12.0	17.5	15.1	12.3
NEL S13 S14, S15	Peaks Parkway Grimsby Air Quality Station C	3.7	-	20.0	23.6	21.9	18.6
NEL S16	Aylesby Road, Grimsby	0.3	19.9	16.4	18.9	16.6	12.2
NEL S22	9 Pyewipe Road, Grimsby	4.7	25.2	22.5	27.2	23.8	23.9
NEL S34	Victoria Street South, Grimsby	4.1	27.0	22.6	29.6	26.7	24.4
Air Quality Objective		40					
Note:							
- Denotes no data							

- 12.5.17 **Table 12.2** shows that concentrations generally decreased from 2019 to 2020 before increasing in 2021 (as consistent with national trends due to behavioural change during coronavirus lockdowns). Concentrations generally decreased between 2021 and 2023 and there are no exceedances of the Air Quality Objective (AQO) recorded within the scoped-in monitoring locations.
- 12.5.18 NELC only undertakes monitoring of PM₁₀ and PM_{2.5} in Immingham (at an urban background station adjacent to the docks) and therefore current (2024) levels have been derived from modelled estimates of background concentrations provided by Defra (**Table 12.3**). These are unlikely to be fully representative of roadside PM₁₀ and PM_{2.5} concentrations, but given prevailing levels are lower than the standards, it is unlikely that roadside concentrations would exceed the relevant objectives.
- 12.5.19 A review of permitted industrial sources within 2 km of the draft Order Limits was completed (Ref 15, Ref 16). Nine sources were identified within this Study Area however, they are unlikely to substantially contribute to dust and PM₁₀ levels within the Section 1 Study Area as those present will have limits on emissions to air

imposed by the relevant regulator. These sources are represented within the background concentrations outlined within **Table 12.3**.

Background Air Quality Data

12.5.20 **Table 12.3** displays the arithmetic mean, minimum and maximum of modelled annual mean background pollutant concentrations of NO_x, NO₂, PM₁₀, and PM_{2.5} for 2024 within Section 1 Study Area (Ref 10).

Table 12.3 2024 modelled Defra background concentrations within the Section 1 Study Area

Average (Minimum - Maximum) 2024 Annual Mean Concentration (µg/m³)			
NO _x	NO ₂	PM ₁₀	PM _{2.5}
10.6 (9.4 - 12.5)	8.2 (7.3 - 9.6)	13.2 (12.2 - 13.5)	6.1 (5.9 - 6.6)

- 12.5.21 The background concentrations of NO₂ and PM₁₀ are generally low within the Section 1 Study Area, given they are under half of the limit value of 40 µg/m³ for both pollutants.
- 12.5.22 Background NO_x concentrations (relevant to ecological receptors) are also generally low within the Section 1 Study Area. However as previously stated there are no designated ecological sites of local, national or international importance within the Section 1 Study Area. The average NO_x concentration across the Study Area is 10.6 µg/m³, which falls below the critical level for the protection of vegetation of 30 µg/m³.
- 12.5.23 Concentrations of PM_{2.5} are below the relevant limit value (20 µg/m³) where the average concentration within the Section 1 Study Area is 6.1 µg/m³. PM_{2.5} is the pollutant for which background concentrations are closest to the limit value in 2024.

Summary

12.5.24 Overall, the Air Quality within the Section 1 Study Area is very good. There are no exceedances of the annual mean NO₂ objective in the Local Authority monitoring data and the background concentrations within the Section 1 Study Area are low in comparison to the Air Quality objectives.

Future Baseline

- 12.5.25 The future baseline relates to known or foreseeable changes to the current baseline, against which the effects of the Project during construction and operation are assessed. Specifically, it accounts for the anticipated changes including those caused by changing climatic conditions, policy, legislation, advances in technology and by other confirmed development projects which will be completed prior to construction of the Project.
- 12.5.26 At this preliminary stage, a full assessment of the implications of any committed developments with regard to future baseline conditions has not been undertaken. A list of the currently known developments which are anticipated to be included within the future baseline scenario is provided within **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**

Annex A Developments for Consideration Within the Future Baseline. This will be reviewed and updated as appropriate during development of the ES.

- 12.5.27 Projected background air pollutant concentrations available from a base year of 2021 (Ref 10) have been used to determine future baseline conditions. Levels of NO_x, NO₂, PM₁₀ and PM_{2.5} are predicted to improve over time due to reductions in emissions resulting from:
- reductions in transport exhaust gas pollutants due to improvements in fuel efficiency and the uptake of low emission vehicles;
 - the reduction in the use of fossil fuels prior to the ban on the sale of new petroleum and diesel cars in the UK by 2030;
 - reductions in pollutant emissions from agricultural sources due to improvements in management envisaged in the 2019 Clean Air Strategy (Ref 17); and
 - improved emission standards for NRMM and static generators.
- 12.5.28 As concentrations of air pollutants are projected to decrease with time, the earlier the assessment year the higher the level of projected background pollution. Therefore, the earlier the assumed opening year, the more conservative the assessment result. The earliest year by which the Project could potentially be operational is 2033 and construction is predicted to begin in 2029. Therefore, 2029 air pollutant data have been used to provide a conservative representation of opening year background concentrations (Ref 10).
- 12.5.29 The arithmetic mean, minimum and maximum of predicted pollutant concentrations for the future baseline Section 1 Study Area for 2029 is shown in **Table 12.4**. There are reductions in both NO_x and NO₂ levels within the Section 1 Study Area compared to the 2024 forecast as shown in **Table 12.3**. There is a steady reduction in both NO_x and NO₂ concentrations of about 1.0 – 1.4 µg/m³, and whilst there is a reduction in PM₁₀ and PM_{2.5} it is of a lower magnitude of 0.3 - 0.4 µg/m³.

Table 12.4 2029 modelled Defra background concentrations within the Section 1 Study Area

Average (Minimum - Maximum) 2029 Annual Mean Concentration (µg/m³)			
NO_x	NO₂	PM₁₀	PM_{2.5}
9.2 (8.2 - 10.7)	7.2 (6.4 - 8.3)	12.8 (11.7 - 13.1)	5.8 (5.6 - 6.2)

12.6 Design, Control and Additional Mitigation Measures

Design Mitigation Measures

- 12.6.1 The Project and draft Order Limits have been designed to avoid sensitive receptors as far as practicable. This is in accordance with the 'Holford Rules' (Ref 18) applicable to routing of new overhead lines and the 'Horlock Rules' (Ref 19) which apply to design and siting of substations. These approaches are explained in further detail within the Corridor Preliminary Routeing and Siting Study (CPRSS) (Ref 20) and **PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered**. Principles include, but are not limited to, seeking to avoid areas of highest amenity, cultural or scientific value, taking advantage of natural screening provided by existing

landform and features (e.g. woodland) and keeping visual, noise and other environmental effects to a minimum.

- 12.6.2 Following selection of the preferred route corridor, environmental specialists have been integral to ongoing design refinement of works within Section 1. This has further contributed to the avoidance or reduction of the potential environmental impacts of the Project. Specific examples relevant to the assessment include:
- i. Maximising separation between sensitive receptors and the proposed temporary and permanent access roads as far as practicable. This evolving process has ensured that the number of receptors exposed to impacts associated with the Project has been minimised; and,
 - ii. Rerouting of a haul road and movement of a pylon location around a priority habitat area. This limited the potential impact on the priority habitat area from pollutants from vehicle emissions and dust associated with the construction of the overhead line.

Control Mitigation Measures

- 12.6.3 A Preliminary CoCP is provided in **PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice**. The general control measures included within the Preliminary CoCP relevant to the Air Quality assessment of Section 7 include:
- i. GG01: The Project will be compliant with all relevant legislation, consents and permits.
 - ii. GG03: Suitably experienced Environmental Advisers will be appointed for the duration of the construction phase. In addition, qualified and experienced Environmental Clerks of Works will be available during the construction phase to advise, supervise and report on the delivery of the mitigation methods and controls outlined in the Management Plans. The Environmental Clerks of Works will monitor that the works proceed in accordance with relevant environmental DCO requirements and adhere to the required good practice and mitigation measures. The Environmental Clerks of Works will be supported as necessary by appropriate specialists, including ecologists and arboriculturists, soils and land drainage experts.
 - iii. GG04: Construction workers will undergo training to increase their awareness of environmental issues as applicable to their role on the Project. Topics will include where appropriate:
 - pollution prevention and pollution incident response;
 - dust management and control measures;
 - location and protection of sensitive environmental sites and features;
 - adherence to protected environmental areas around sensitive features;
 - working hours and noise and vibration reduction measures;
 - working with potentially contaminated materials;
 - waste management and storage;
 - flood risk response actions;

- agreed traffic routes, access points, etc.;
 - soil management; and
 - drainage management.
- iv. GG06: A Construction Environmental Management Plan (CEMP), a Landscape and Ecological Management Plan (LEMP), a Materials and Waste Management Plan (MWMP), a Construction Traffic Management Plan (CTMP), Emergency Action Plan, Public Rights of Way Management Plan (PRoWMP), Overarching Written Scheme of Investigation (WSI), Biodiversity Management Plan, Noise and Vibration Management Plan, Pollution Prevention Plan, Foundation Works Risk Assessment, Carbon efficiency Plan, Dust Management Plan (DMP), DrMP along with a Soil Management Plan (SMP) will be produced prior to construction. These are collectively referred to as 'the environmental control Plans.'
 - v. GG07: The CEMP will set out site specific measures and construction methodologies to avoid or reduce potential effects of the Project on the environment during construction. The contractor(s) shall undertake regular site inspections to check conformance to the Management Plans.
 - vi. GG10: The name and contact details for the Project will be displayed at the entrance to all compounds. This will include an emergency number.
 - vii. GG11: Any activity carried out or equipment located within a construction compound that may produce a noticeable nuisance, including but not limited to dust, noise, vibration and lighting, will be located away from sensitive receptors such as residential properties or ecological sites where practicable.
 - viii. GG13: Vehicles will be correctly maintained and operated in accordance with manufacturer's recommendations and in a responsible manner. All plant and vehicles will be required to switch off their engines when not in use and when it is safe to do so. Electric, or other low carbon plant and equipment should be used where available and where practicable
 - ix. GG14: Materials and equipment will not be moved or handled unnecessarily. When loading and unloading materials from vehicles, including excavated materials, drop heights will be limited.
 - x. GG18: Wheel washing facilities will be provided at each main compound, where appropriate. Road sweepers will be deployed on public roads where necessary to prevent excessive dust or mud deposits.
 - xi. GG19: Earthworks and stockpiled soil will be managed as per the SMP.
 - xii. GG20: Bonfires and the burning of waste material will be prohibited.

12.6.4 The control and management measures included within the Preliminary CoCP specific to Air Quality include:

- i. AQ01: Dust management measures will be set out in the Dust Management Plan (DMP) as part of the CEMP. This will be specific to particular phases of the Project. The DMP, will include, but not be limited to the following:
 - Communications to include display of the name and contact details of person(s) accountable for Air Quality and dust issues on the site boundary.
 - Daily on-site and off-site inspections will be undertaken by the Contractor(s), where receptors are nearby, to monitor dust. This should include regular dust

soiling checks of surfaces such as street furniture, cars and windowsills within 100 m of the site boundary, with cleaning to be provided if necessary. The frequency of site inspections will be increased by the person accountable for Air Quality and dust issues on-site when activities with a high potential to produce dust are being carried out, during prolonged dry or windy conditions or in response to complaints or an incident resulting in dust emissions. Inspection results will be recorded, and an inspection log made available to the local authority upon request.

- Site management will document all dust and Air Quality complaints, identify causes and take measures to reduce emissions in a timely manner, and record the measures taken.
 - Preparation and management of the site ensuring that machinery and dust causing activities are located as far as possible away from receptors, screens/barriers are erected around dusty activities/materials and are at least as high as any stockpiles, use wet methods to keep site fencing, barriers and scaffolding clean, remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on-site where they must be covered, seeded, or fence stockpiles used to prevent wind whipping.
 - Monitoring and inspections to include evolving evaluation of Project phases as required and practicable.
 - Construction operations will only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, for example, suitable local exhaust ventilation systems. Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate. Use enclosed chutes and conveyors and covered skips. Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate. Ensure equipment is readily available on-site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
- ii. AQ03: During construction, bulk cement and other fine powder materials are to be delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery. Sand and other aggregates are to be stored in bunding areas and not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate control measures to reduce dust are in place. For smaller supplies of fine powder materials, bags are to be sealed after use and stored appropriately. Scabbing (roughening of concrete surfaces) will be avoided if possible.
- iii. AQ04: The contractor is to inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
- iv. AQ05: To minimise the impact from trackout, on-site activities will:
- Impose and signpost a maximum speed limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures, subject to the approval of the nominated undertaker and in agreement with the local authority, where appropriate).

- Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.
 - Avoid dry sweeping of large areas.
 - Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
 - Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
 - Record all inspections of haul routes and any subsequent action in the site log book.
 - Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
 - Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).
 - Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
 - Access gates to be located at least 10 m from receptors where possible.
- v. AQ06: Dust pollution from earthworks activities will be limited through the use of the following measures, as appropriate:
- Topsoil will be stripped as close as reasonably practicable to the period of excavation or other earthworks activities to avoid risks associated with run-off or dust generation.
 - Hessian, mulches, or tackifiers will be used where it is not possible to re-vegetate or cover with topsoil as soon as practicable.
 - Materials will be compacted after deposition, with the exception of topsoil and subsoil on land to be restored for agriculture, forestry, landscaping and wildlife habitats.
 - Cover will only be removed in small areas during work and not all at once.
 - Soil spreading, seeding, planting or sealing of completed earthworks will be undertaken as soon as reasonably practicable following completion of the earthworks.
- vi. AQ07: Operating vehicle/machinery will follow the below:
- Construction vehicles will be required to meet Euro VI emissions standards which reduce NO_x and PM₁₀ emissions.
 - All NRMM with an engine power rating of 37 kW to 560 kW will be required to meet Euro Stage IV standards as a minimum.
 - Avoid the use of diesel or petrol-powered generators and use mains electricity or battery powered equipment where practicable to limit emissions from plant and NRMM.
 - Low and zero emission vehicles will be used where possible for site use.

- Produce a Construction Logistics Plan to manage the sustainability of goods and materials.
- Implement a Construction Workforce Travel plan to support and encourage sustainable travel.
- Ensure all vehicles switch off engines when stationary - no idling vehicles.
- All vehicles, plant and NRMM will be regularly inspected, serviced and maintained.

Additional Mitigation Measures

- 12.6.5 Additional mitigation measures are those required to reduce likely significant adverse environmental effects which may still occur despite the inclusion of the embedded design and control measures described above.
- 12.6.6 Additional mitigation measures are not anticipated to be required in relation to Air Quality effects. However, this will remain under review during the completion of further assessment and development of the ES.
- 12.6.7 It is however noted that additional environmental mitigation which has been proposed to reduce effects upon visual amenity and ecology and biodiversity may also reduce impacts upon air quality as follows:
- Screening vegetation which, while primarily included to limit visual intrusion (for landscaping purposes), may further reduce potential Air Quality impacts by filtering dust and air pollutants emitted by construction site activities; and,
 - Woodland replacement and tree planting on the boundary of the draft Order Limits which, while primarily included to encourage nature conservation / biodiversity and landscape integration, may reduce potential Air Quality impacts by filtering dust and air pollutants emitted by construction and operation site activities.
- 12.6.8 No additional mitigation measures specifically relating to Air Quality effects have been assumed within the Preliminary Assessment of Effects reported in the following section.

12.7 Preliminary Assessment of Effects

- 12.7.1 The following section presents the findings of the preliminary assessment of effects upon the relevant air quality receptors identified within the Section 1 Study Area, as a result of construction, maintenance and/or operational activities within Section 1.
- 12.7.2 The preliminary assessment of effects reported below takes into account the Design and Control mitigation measures previously described.
- 12.7.3 For a summary of the likely significant effects please refer to **PEI Report Volume 2 Part B Section 1 Chapter 13 Summary**. A supplementary summary of all non-significant effects is also included within this Section in **Table 12.10**, based upon the assessment scope detailed in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
- 12.7.4 It is noted that this is an ongoing assessment and is subject to change due to the ongoing design development of the Project. This is particularly relevant to the further

assessment of the likely air quality effects of changes in traffic flow due to the Project. A full assessment will be included within the ES submitted with the DCO application.

Likely Significant Effects

Construction

Construction Dust

- 12.7.5 The preliminary assessment presented indicates that no significant effects are likely due to construction dust and PM₁₀. Further rationale is provided in the following sections in relation to non-significant effects.

Construction Traffic Emissions

- 12.7.6 The methodology followed for predicting the construction traffic flows is given in **PEI Report Part B Volume 2 Section 1 Chapter 9 Traffic and Movement**. Construction traffic flows (in terms of LGVs and HGVs) have been provided for the current year of 2024 and 2031, which is anticipated to be the busiest period of vehicle movements.
- 12.7.7 Initial screening of the projected construction traffic flows against the EPUK/IAQM change criteria (for human sensitive receptors) and the IAQM criteria (for ecological sensitive receptors) has been undertaken. The road links where the criteria are exceeded within the NELC local authority area are shown on **PEI Report Volume 2 Part B Section 1 Figure 12.2 Preliminary Affected Road Network and Local Authority Monitoring Locations** and presented in **Table 12.5**.
- 12.7.8 Based on the initial screening, changes in traffic flows on 12 road links are expected to exceed the EPUK/IAQM criteria for human sensitive receptors. Given these links are located outside an AQMA, the relevant criteria are:
- i. a change in LDV flows of more than 500 AADT; and/or
 - ii. a change in HDV flows of more than 100 AADT.
- 12.7.9 The initial screening has also identified road links which exceed the IAQM screening criteria for ecological sensitive receptors. The relevant criteria are:
- i. a change in total traffic flows greater than or equal to equal to 1000 AADT; and/or
 - ii. a change in HDV flows greater than or equal to 200 AADT.

Table 12.5 Road links exceeding the relevant Assessment Criteria – Construction Traffic

Road Link ID	Road Name	2024 Baseline		2031 Baseline		2031 Construction		
		AADT (total vehicles/day)	HGV (vehicles/day)	AADT (total vehicles/day)	HGV (vehicles/day)	Change in AADT Flows (total vehicles/day)	Change in LGV Flows (vehicles/day)	Change in HGV Flows (vehicles/day)
CR1	A180	26194	3197	27875	3403	852	119	734
CR2	A180	34885	2786	37125	2964	328	106	222
CR21-3	A1173	8146	402	8778	433	524	12	512
CR20-2	A18	14956	647	15916	688	560	48	512
CR18-2	A18	5682	566	6047	603	510	26	484
CR18-1	A18	3621	466	3854	496	506	22	484
CR20-1	A18	13946	664	14842	706	524	12	512
CR21-1	A1173	4782	422	5089	449	524	12	512
CR21-2	A1173	3363	354	3579	377	524	12	512
LK1	A1136	8507	224	9053	238	333	111	222
LK2	A1136 Great Coates Road	0	0	0	0	363	141	222
LK3	Aylesby Road - C149	2337	192	2487	204	465	243	222

Note: All traffic data presented in the table has been rounded to the nearest whole number.

- 12.7.10 Human and ecological sensitive receptors adjacent to road links where the projected changes in traffic flows due to construction of the Project do not exceed the EPUK/IAQM and IAQM criteria have been screened out of any further assessment and therefore significant effects at these locations are considered unlikely.
- 12.7.11 Finalised traffic projections produced in support of the ES will, however, be rescreened to confirm that changes in traffic flows due to construction of the Project exceed the relevant criteria. Where this is the case, a detailed assessment involving dispersion modelling will be undertaken and reported in the ES, based upon the methodology summarised in section 12.5 and detailed within **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
- 12.7.12 It is noted that vehicle movements during construction of the Project will vary throughout the construction programme, with relatively short peaks in LGV and HGV movements, associated with workforce travel and the import/export of construction materials respectively. It is assumed that any peak in HGV movements will be short in duration.
- 12.7.13 Notwithstanding this, at receptors within 200 m of those road links identified in **Table 12.5**, significant effects due to changes in air quality cannot be ruled out at this stage, in the absence of dispersion modelling results.

Operation and Maintenance

- 12.7.14 It is currently predicted that the operational and maintenance traffic flows will fall below the EPUK/IAQM change criteria (for human sensitive receptors) and the IAQM criteria (for ecological sensitive receptors). However, screening against both the EPUK/IAQM and IAQM screening criteria will be undertaken at the ES Stage.

Likely Non-Significant Effects

Construction Dust Assessment

- 12.7.15 **PEI Report Volume 2 Part B Section 1 Figure 12.1 Construction Dust Study Area** shows the construction dust Study Area. The construction of the 400 kV overhead line would generally follow the sequence outlined in **PEI Report Volume 2 Part B Section 1 Chapter 1 Overview of the Section and Description of the Project**.
- 12.7.16 Construction activities associated with the proposed New Grimsby West Substation and the overhead lines that have the potential to generate and/or re-suspend dust and PM₁₀ include:
- site surveys and preparation;
 - enabling works, including localised utility works;
 - establishment of temporary access/egress to the Site and haul roads;
 - establishment of construction compounds;
 - earthworks, including the groundworks (soil stripping and excavation for pylon and substation foundations);
 - materials handling, storage, stockpiling and disposal;

- vii. movement of vehicles and construction traffic within the draft Order Limits;
- viii. exhaust emissions from site plant and NRMM, especially when used at the extremes of their capacity and during mechanical breakdown;
- ix. construction of foundations and substation aprons;
- x. construction of buildings and areas of hardstanding alongside fabrication processes;
- xi. pylon assembly;
- xii. establishment of scaffolding and crossing protection;
- xiii. conductor stringing;
- xiv. demobilisation of construction compounds and temporary accesses; and
- xv. site reinstatement.

- 12.7.17 The majority of the dust releases during construction are likely to occur in the 'working week' during which construction activities are undertaken. However, for some potential release sources (e.g. exposed soil or stockpiles), in the absence of dust control mitigation measures, dust generation has the potential to occur 24 hours per day, 7 days per week, until such works are complete and areas reinstated.
- 12.7.18 The construction dust assessment methodology adopts a worst-case approach and treats all receptors within the Section 1 Study Area consistently. There will however be considerable variation to the magnitude of dust emissions throughout the construction phase dependant on specific construction activities being undertaken at any one time. This includes, for example, variation in the number of vehicles throughout the construction programme, which will affect the track out dust emissions.
- 12.7.19 Therefore, the risk of impacts to local amenity will vary throughout construction and be greater during certain periods (e.g. during the peak of earthwork activities). Several receptors within the Section 1 Study Area will also be influenced by construction activities for shorter periods than others. For example, a sensitive receptor location in proximity to a pylon location is likely to experience impacts for a shorter period than a receptor in proximity to a construction compound site or the new Grimsby West Substation site. This is due to the greater scale and duration of construction activities associated with substation construction and the compound, relative to the activities required for the erection of pylons. This assessment will be refined further as more detail is available in the ES submitted with the DCO application.

Assessment of Potential Dust Emission Magnitude

- 12.7.20 The IAQM assessment methodology has been used to determine the potential dust emission magnitude for the following four different dust and PM₁₀ sources: demolition; earthworks; construction; and trackout. The findings of the assessment are presented below.

Demolition

- 12.7.21 Demolition works within the Section 1 Study Area assessed within the PEI Report are limited to localised enabling works to existing electricity supply infrastructure crossed

by the overhead line route. Specifically, this is anticipated to include the removal of existing third-party poles and pylons over short sections of existing line to be replaced by underground cable, to facilitate the new overhead line. As previously noted, the decommissioning (demolition) of the existing Grimsby West Substation has not been assessed at this stage.

- 12.7.22 Based upon precautionary assumptions, the total volume of assumed works is more than 75,000 m³ and is therefore defined as large.

Earthworks

- 12.7.23 The main earthworks that will be undertaken are localised preparation for haul roads, substation and pylon foundation construction and landscaping. The soil type is slowly permeable seasonally waterlogged fine loamy soils and similar soils with only slight waterlogging. More information on each soil type is given within **PEI Volume 2 Section 2 Chapter 8 Agriculture and Soils**.

- 12.7.24 The total area within the draft Order Limits falls within the IAQM range for large sites (over 110,000 m²). Therefore, the potential dust emission magnitude is judged to be large for earthwork activities given the scale of the site and the soil types present.

Construction

- 12.7.25 The total volume of buildings⁶ (substation buildings, pylons and construction compounds) to be constructed on the Site will be above 75,000 m³ with potentially dusty construction materials being used. Therefore, the potential dust emission magnitude is judged to be large for construction activities.

Trackout

- 12.7.26 There are over 50 HDV outward movements in any one day, travelling over potentially dusty surface material. It is considered that the potential dust emission magnitude of is large for trackout.

Dust Emission Magnitude Summary

- 12.7.27 **Table 12.6** provides a summary of the potential dust emission magnitude determined for each construction activity considered.

Table 12.6 Potential Dust Emission Magnitude

Activity	Dust Emission Magnitude
Demolition	Large
Earthworks	Large
Construction	Large
Trackout	Large

⁶ For the purposes of the assessment, pylons have been defined as buildings. The Building Act 1984 defines the word “building” as “any permanent or temporary building, and, unless the context otherwise requires, it includes any other structure or erection of whatever kind or nature (whether permanent or temporary)”.

Assessment of Sensitivity of the Study Area

- 12.7.28 The prevailing wind direction is from the south. Therefore, receptors located to the north of the draft Order Limits (specifically the Great Coates urban area within the Section 1 Study Area) are more likely to be affected by dust and particulate matter emitted and re-suspended during the construction phase.
- 12.7.29 There are no identified ecological receptors within the Section 1 Study Area.
- 12.7.30 Under low wind speed conditions, it is likely that the majority of dust would be deposited in the area immediately surrounding the source. This area mainly comprises arable land, the receptor counts are outlined in **Table 12.7**. There are also human sensitive receptors including Church View Care Home along the Aylesby Road construction route within 250 m of the Site that may be sensitive to trackout. Background PM₁₀ levels are predicted to be well below the annual mean objective (see **Table 12.3**).

Table 12.7 Count of human sensitive receptors within defined distances

Section Number	Distance from draft Order Limits				
	0-20 m	0-50 m	0-100 m	0-200 m	0-250 m
1	7	48	128	289	374

- 12.7.31 Taking the above number and sensitivity of receptors into account and following the IAQM assessment methodology, the sensitivity of the area to changes in dust and PM₁₀ has been derived for each of the construction activities considered. The results are shown in **Table 12.8**.

Table 12.8 Sensitivity of the Section 1 Study Area

Potential Impact	Sensitivity of the Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Medium	Medium	Medium	Medium
Human Health	Low	Low	Low	Low

Assessment of Dust Risk to Define Site-Specific Mitigation

- 12.7.32 The predicted dust emission magnitude has been combined with the defined sensitivity of the area to determine the risk of impacts during the construction phase, prior to mitigation. **Table 12.9** below provides a summary of the risk of dust impacts for the Project. The risk category identified for each construction activity has been used to determine the level of mitigation required.

Table 12.9 Summary Dust Risk Table

Potential Impact	Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	High	Medium	Medium	Medium
Human Health	Medium	Low	Low	Low

- 12.7.33 Control measures relevant to dust impacts during construction are set out within the Preliminary CoCP and summarised in section 12.6. Based upon the identified risk, an appropriate suite of dust management measures will be specified within the DMP to be included in the CEMP, which will be adhered to during construction (Preliminary CoCP measure AQ01). Based upon the application of the DMP and the further management measures included within Preliminary CoCP, it is not considered likely that there would be significant effects associated with dust generated during construction.

Construction Traffic Emissions

- 12.7.34 Where projected changes in vehicle movements due to construction are below the EPUK/IAQM thresholds and IAQM thresholds, changes in air quality at relevant receptor locations are unlikely to be significant. However, the change in HGV vehicle trips will be rescreened and assessed as per the EPUK/IAQM guidance (Ref 8) and IAQM guidance (Ref 9) and the outcomes reported within the ES.

Operation and Maintenance

- 12.7.35 The operational traffic flows of the Grimsby West substation are anticipated to comprise vehicles associated with routine visits and fault maintenance. It is anticipated that there will be two visits per month by two people. With regards to operational visits for the overhead line, based upon existing precedent and current estimates, typical routine maintenance vehicle movements would comprise up to one vehicle per permanent pylon, per year (i.e. one arrival and departure respectively). The movement itself could comprise a LGV access via the permanent access route. Less than 10 new pylons are proposed within the Section 1 draft Order Limits therefore less than one vehicle per month are anticipated to access the Section 1 draft Order Limits.
- 12.7.36 The projected vehicle movements during operation and maintenance of the Project are below both the EPUK/IAQM and IAQM screening criteria. Therefore, no likely significant effects are expected upon air quality during operation of the Project.
- 12.7.37 This will be confirmed within the ES following re-screening of any updated operational traffic volumes against the screening criteria.

Summary

- 12.7.38 For completeness, **Table 12.10** summarises the findings of the preliminary assessment with respect to those impacts that are not predicted to result in significant Air Quality effects.

Table 12.10 Preliminary summary of non-significant Air Quality effects – Section 1

Receptor	Impact	Sensitivity/ Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
Construction					
Human Health Receptors sensitive to construction dust impacts	Without mitigation, there may be adverse impacts to human health owing to construction dust impacts.	There are less than 10 receptors within 20 m of the draft Order Limits, therefore according to the IAQM guidance, the receptor sensitivity is low.	Negligible	Not Significant	With the appropriate mitigation in place as described in the chapter and as will be secured through the CoCP, construction dust impacts are not considered significant.
Receptors sensitive to amenity loss from construction dust	Without mitigation, there may be adverse impacts to receptors sensitive to amenity loss within 250 m of the draft Order Limits.	There are less than 10 receptors within 20 m of the draft Order Limits, therefore according to the IAQM guidance, the receptor sensitivity is medium.	Negligible	Not Significant	With the appropriate mitigation in place as described in the chapter and as will be secured through the CoCP, construction dust impacts are not considered significant.
Operation					
Human Health Receptors sensitive to changes in air quality	Changes in pollutant concentrations due to operation/maintenance vehicle emissions associated with the Project.	No road links have been identified which exceed the relevant criteria.	Negligible	Not significant	Projected changes in traffic flow during operation and maintenance of the Project are low and are not predicted to exceed the relevant assessment criteria. Therefore, changes in pollutants concentrations due to operational/maintenance traffic are not predicted to be significant.
Ecological Receptors sensitive to changes in air quality					

12.8 Monitoring

- 12.8.1 As part of the CoCP, a CEMP will be prepared which will include dust management measures as outlined above. Control Mitigation Measure AQ01 includes for daily on-site and off-site visual inspections which will be undertaken by the Contractor(s) to monitor dust levels. These inspection findings will be recorded in the site log.
- 12.8.2 The proposed Control Mitigation Measures are anticipated to minimise the impacts such as that no significant effect would be expected. Consequently, no Air Quality monitoring beyond on-site and off-site visual inspections will be required during the construction and operational phases of the Project.

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13. Summary

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13. Summary for Section 1 New Grimsby West Substation

13.1 Introduction

- 13.1.1
- This chapter summarises the findings of the preliminary assessment of likely significant environmental effects arising from the construction, operation and maintenance of the Project within the New Grimsby West Substation Section (Section 1). The full preliminary assessments, including the rationale as to why an effect is considered to be significant or not significant can be found in **PEI Report Volume 2 Part B Section 1 Chapter 2 to 12**.
- 13.1.2
- The significant effects summarised in **Table 13.2** and **Table 13.3** take into account the design and embedded mitigation measures and control mitigation measures described within Chapter 2-12. Where additional mitigation measures have been determined, these are taken into account, however it is noted that the identification and design of additional mitigation measures is ongoing. As such, likely significant effects identified in **Table 13.2** and **Table 13.3** are based upon confirmed additional mitigation measures only.
- 13.1.3
- Baseline data is also still being collected, surveys are still being undertaken, and the design of the Project will be refined prior to the Development Consent Order (DCO) application being submitted. As such, a confidence rating has been introduced in the summary tables below which provides a rating of high, moderate or low confidence in the prediction of the significance of effects. Definitions of the confidence ratings are provided in **Table 13.1**.
- 13.1.4
- As the design evolves mitigation measures and environmental assessments will be further developed and reported within the Environmental Statement (ES) submitted with the DCO application.

Table 13.1 Confidence level definitions

Confidence Level	Definition
High Confidence	<div><p>A high level of confidence in the prediction of significant effects can be justified through:</p><ul style="list-style-type: none">• The consideration of, and routeing and/or siting of the Project away from, designated features and high sensitivity receptors;• Complete baseline data to inform the prediction;• Mitigation measures are fully defined and/or the application of mitigation measures has proven to be effective in similar projects; and• A thorough understanding of Project activities.</div>

Confidence Level	Definition
Moderate Confidence	<p>A moderate level of confidence in the prediction of significance of effects can be justified through:</p> <ul style="list-style-type: none"> • Particular surveys or assessments are incomplete at this stage, but it is possible to extrapolate results; • Mitigation measures will continue to be developed up to the submission of the application for consent; and • A general understanding of the Project activities being undertaken, and the associated impacts based on other Projects, while more detailed information will be provided later.
Low Confidence	<p>A low level of confidence in the prediction of significance of effects can be justified through:</p> <ul style="list-style-type: none"> • Only limited baseline data is available at this stage; • Input assessments (e.g. modelling outputs) are unavailable or limited, to the extent it isn't possible to confidently identify the effect and its significance. • Exact project activities are unknown; • Mitigation measures remain in the early stages of development; and • Where this is the case, a precautionary, worst-case approach is taken.

Table 13.2 Summary of significant effects during the construction phase – Section 1

Description of receptor and potential impact	Key embedded and control measures	Proposed additional mitigation measures	Preliminary likely significant effects	Confidence rating (high/moderate/low)
Landscape				
The Landscape Character Type (LCT) of LCT 3: Wooded Open Farmland would be directly impacted by construction activities associated with the new Grimsby West Substation and connecting overhead line, including the establishment and presence of construction compounds and haul roads, resulting in changes in the character and perception of the landscape.	<p>The New Grimsby West Substation and associated works have been located close to areas of existing vegetation to screen views of the substation and the location of access tracks, bellmouths and the overhead line alignment refined to minimise loss of mature vegetation.</p> <p>Construction impacts would be managed through the measures outlined within the Preliminary Code of Construction Practice (CoCP).</p>	Areas of supplementary woodland planting and tree planting on field boundaries around the New Grimsby West Substation to provide visual screening.	Adverse effect	High
Visual				
The community of Aylesby Parish would be impacted by the construction activities associated with the new Grimsby West Substation, pylons GL3 and GL4, modification of the existing 4KG 400 kV overhead lines and new overhead line within Section 2, including the establishment and presence of construction compounds and haul roads,	The New Grimsby West Substation and associated works have been located close to areas of existing vegetation to screen views of the substation and the location of access tracks, bellmouths and the overhead line alignment refined to minimise loss of mature vegetation.	Areas of supplementary woodland planting and tree planting on field boundaries around the New Grimsby West Substation to provide visual screening.	Adverse effect	High

Description of receptor and potential impact	Key embedded and control measures	Proposed additional mitigation measures	Preliminary likely significant effects	Confidence rating (high/moderate/low)
resulting in changes to views from receptor locations.	Construction impacts would be managed through the measures outlined within the Preliminary CoCP.			

Ecology and Biodiversity

Designated Sites

<p>Birds species which are qualifying features of the following European Designated Sites may be impacted by construction activities within functionally linked land, resulting in temporary displacement and/or habitat degradation. These are:</p> <ul style="list-style-type: none"> • The Humber Estuary Special Protection Area (SPA) and Ramsar Site; • The Greater Wash SPA. 	<p>The positioning of the pylons and associated haul roads (temporary access routes) has sought to avoid or reduce direct and indirect impacts on notable species and habitats, including woodland and trees.</p> <p>Construction impacts would be managed through the measures outlined within the Preliminary CoCP.</p>	<p>The assessment does not take into account additional mitigation measures which are in the early stages of development and are yet to be confirmed. These measures will be informed by ongoing survey and assessment and are likely to include the creation of replacement habitats where required to avoid significant effects.</p>	<p>Significant adverse effects cannot be excluded at this stage</p>	<p>Low – further assessment is required once surveys are completed and data assessed. The potential for Likely Significant Effect (LSE) upon these European designated sites will be assessed within the Report to Inform the Habitat Regulations Assessment, informed by discussions with Natural England and other statutory bodies.</p>
<p>The Humber Estuary Special Area of Conservation (SAC) and Ramsar site may be indirectly impacted by construction activities within or adjacent watercourses which are hydrologically linked, potentially resulting in changes in water quantity, level and flow, and/or impacts upon migratory fish which are qualifying</p>	<p>The positioning of the substation, pylons and haul roads has sought to avoid or reduce direct and indirect impacts on high value aquatic habitats.</p> <p>Where new culverts are unavoidable, these would either be arch culverts, leaving the natural bed undisturbed, or as far as reasonably practicable,</p>		<p>Significant adverse effects cannot be excluded at this stage</p>	

Description of receptor and potential impact	Key embedded and control measures	Proposed additional mitigation measures	Preliminary likely significant effects	Confidence rating (high/moderate/low)
features, including river and sea lamprey.	they would be installed with the invert set below the natural bed level for a semi-natural bed to establish. Construction impacts would be managed through the measures outlined within the Preliminary CoCP.			
The bird assemblage and lamprey species which are features of the Humber Estuary Site of Special Scientific Interest (SSSI) may be impacted by construction activities within functionally linked land (including hydrologically linked watercourses), resulting in disturbance and/or habitat degradation.	The positioning of pylons and access routes to avoid or reduce direct and indirect impacts on notable species and habitats, including woodland and trees and high value aquatic habitats. Construction impacts would be managed through the measures outlined within the Preliminary CoCP.	The assessment does not take into account additional mitigation measures which are in the early stages of development and are yet to be confirmed. These measures will be informed by ongoing survey and assessment and are likely to include the creation of replacement habitats where required to avoid significant effects.	Significant adverse effects cannot be excluded at this stage.	Low - potential impacts upon the bird assemblage and lamprey species will be assessed once all baseline surveys are complete.
Habitats				
Terrestrial habitats, including Maud Hole Covert and Wyber's Wood, would be impacted by construction activities associated with the new	The positioning of the substation pylons and access routes to avoid or reduce direct and indirect impacts on notable	The assessment does not take into account additional mitigation measures which are in the early stages of	Significant adverse effects cannot be excluded at this stage.	Low - Survey works are ongoing and will inform further assessment of impacts and effects

Description of receptor and potential impact	Key embedded and control measures	Proposed additional mitigation measures	Preliminary likely significant effects	Confidence rating (high/moderate/low)
Grimsby West Substation and connecting overhead lines, including the establishment and presence of construction compounds and haul roads, resulting in potential loss, damage or fragmentation of woodland, hedgerows and scrub.	species and habitats, including woodland and trees. Construction impacts would be managed through the measures outlined within the Preliminary CoCP.	development and are yet to be confirmed. These measures will be informed by ongoing survey and assessment and are likely to include the creation of replacement terrestrial habitats and Skylark mitigation areas, where required to avoid significant effects.		and the design of any required mitigation measures.
Aquatic habitats would be directly impacted by construction activities associated with new Grimsby West Substation and overhead line connections, including watercourse crossings and diversions, resulting in permanent or temporary loss or damage to watercourses and ditch habitats.	The positioning of the substation, pylons and access routes has sought to avoid high value aquatic habitats. Where new culverts are unavoidable, these would either be arch culverts, leaving the natural bed undisturbed, or as far as reasonably practicable, they would be installed with the invert set below the natural bed level for a semi-natural bed to establish. Construction impacts would be managed through the measures outlined within the Preliminary CoCP.	The assessment does not take into account additional mitigation measures which are in the early stages of development and are yet to be confirmed. These measures will be informed by ongoing survey and assessment and are likely to include the creation of replacement ditch habitats, where required to avoid significant effects.	Significant adverse effects cannot be excluded at this stage.	Low - survey works are ongoing and will inform further assessment of impacts and effects and the design of any required mitigation measures.

Description of receptor and potential impact	Key embedded and control measures	Proposed additional mitigation measures	Preliminary likely significant effects	Confidence rating (high/moderate/low)
Protected and Notable Species				
<p>The following species may be impacted by construction activities resulting in: loss, damage or fragmentation of suitable habitats; disturbance; and/or death/injury:</p> <ul style="list-style-type: none"> • Terrestrial Invertebrates • Great Crested Newts • Reptiles • Wintering and breeding birds • Badgers • Bats • Otters • Water Vole 	<p>The positioning of pylons and access routes to avoid or reduce direct and indirect impacts on notable habitats, including woodland, ponds and hedgerows.</p> <p>Construction impacts will be managed through the measures outlined within the Preliminary CoCP.</p>	<p>The assessment does not take into account additional mitigation measures which are in the early stages of development and are yet to be confirmed. These measures will be informed by ongoing survey and assessment and are likely to include the creation of replacement habitats and Skylark mitigation areas, where required to avoid significant effects.</p>	<p>Significant adverse effects cannot be excluded at this stage</p>	<p>Low - survey works are ongoing and will inform further assessment of impacts and effects and the design of any required mitigation measures.</p>
Historic Environment				
Designated Assets				
<p>Two moated sites at Healing Hall scheduled monument (NHLE 1010947) would be temporarily impacted by the construction activities associated with the new Grimsby West Substation and connecting overhead line, including the presence of temporary pylons and</p>	<p>The Section 1 design has been developed to avoid physical impacts to the two moated sites at Healing Hall scheduled monument, by locating the proposed substation approximately 330m to the south of the monument.</p>	<p>No additional mitigation measures have been identified for this preliminary assessment.</p>	<p>Moderate adverse effect</p>	<p>High</p>

Description of receptor and potential impact	Key embedded and control measures	Proposed additional mitigation measures	Preliminary likely significant effects	Confidence rating (high/moderate/low)
movement of construction traffic, resulting in temporary changes to the setting of the scheduled monument.	<p>Temporary impacts on the setting of heritage assets may be lessened or avoided through consideration of the detailed design of individual pylons, access roads, construction compounds and temporary structures. This will be assessed fully within the historic environment chapter of the ES submitted with the DCO application.</p> <p>Construction impacts would be managed through the measures outlined within the Preliminary CoCP.</p>			

Water Environment and Flood Risk

No likely significant effects are predicted during the construction phase of the Project, based upon the preliminary assessment.

Geology and Hydrogeology

No likely significant effects are predicted during the construction phase of the Project, based upon the preliminary assessment.

Agriculture and Soils

Agricultural Land Classification

57.6 ha of agricultural land (assumed to be BMV land) would be temporarily impacted by construction activities, including establishment and presence of haul roads and temporary compounds, resulting	The Project has been designed to minimise the extent of land take required to construct, maintain and operate the proposed assets and position infrastructure (such as pylons and haul roads) as close as is	No additional mitigation measures have been identified for this preliminary assessment.	Moderate adverse effect	High
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Description of receptor and potential impact	Key embedded and control measures	Proposed additional mitigation measures	Preliminary likely significant effects	Confidence rating (high/moderate/low)
in temporary loss of agricultural land.	practicable to field boundaries to minimise impacts to agricultural operations.			
28.7 ha of agricultural land (assumed to be BMV land) would be permanently impacted by the construction of operational infrastructure including the new Grimsby West Substation and associated accesses and pylon foundations, resulting in the permanent loss of agricultural land.	Construction impacts would be managed through the measures outlined within the Preliminary CoCP.		Major adverse effect	High
Soil Function				
Soils within the draft order limits would be temporarily impacted by construction activities including topsoil/subsoil stripping and storage, resulting in temporary effects on soil quality and ecosystem services.	Where practicable, all surplus soil resources would be re-used within the Project where, depending on the proposed land use, some soil ecosystem services would be retained, restored or potentially enhanced.	No additional mitigation measures have been identified for this preliminary assessment.	Major - Moderate adverse effects	High
28.7 ha of soils would be permanently impacted by the construction of operational infrastructure, including the new Grimsby West Substation and associated accesses and pylon foundations, resulting in loss of soil quality and ecosystem services.	Construction would be managed through the measures outlined within the Preliminary CoCP.		Major adverse effect	Moderate – the magnitude of impacts may be reduced if it is practicable to beneficially re-use the soil resources.

Description of receptor and potential impact	Key embedded and control measures	Proposed additional mitigation measures	Preliminary likely significant effects	Confidence rating (high/moderate/low)
Traffic and Movement				
Users of Highway Links				
Drivers (all vehicles including HGVs and Emergency Services) may be impacted where projected increases in traffic flows exceed the relevant Institute of Environmental Management and Assessment thresholds. Where this is the case, change in traffic flow may result in severance, changes in journey time, driver delay and highway safety effects.	Identified construction traffic routes are based upon classified roads as far as practicable. Haul roads would be used to reduce construction traffic movements on local roads. Construction impacts would be managed through the measures outlined within the Preliminary CoCP.	No additional mitigation measures have been identified for this preliminary assessment.	Significant adverse effects cannot be excluded at this stage	Moderate - baseline data for some of the identified construction traffic routes is not currently available. Detailed assessment of severance, delay, highway safety and fear and intimidation, has yet been undertaken to determine the magnitude of impacts upon identified road links.
Bus passengers may be impacted on those routes where projected increases in traffic flows exceed the relevant Institute of Environmental Management and Assessment thresholds, potentially resulting in delay due to congestion.			Significant adverse effects cannot be excluded at this stage	
Pedestrians and cyclists may be impacted on those routes where projected increases in traffic flows exceed the relevant Institute of Environmental Management and Assessment thresholds, potentially resulting in severance, delay, increased journey time, decline in amenity,			Significant adverse effects cannot be excluded at this stage	

Description of receptor and potential impact	Key embedded and control measures	Proposed additional mitigation measures	Preliminary likely significant effects	Confidence rating (high/moderate/low)
additional fear and intimidation and safety effects.				
All users of the public highways which would be Primary Access Routes between Immingham and Grimsby Docks and the new Grimsby West Substation may be impacted by the movement of Abnormal Indivisible Loads, resulting in severance, delay or increased journey time, due to potential road closures and/or diversions.	Routing and timing of Abnormal Indivisible Loads and hazardous loads would be informed by engagement with the Local Highway Authorities to minimise potential disruption as far as reasonably practicable.	No additional mitigation measures have been identified for this preliminary assessment.	Significant adverse effects cannot be excluded at this stage	Low - the requirements and routeing of Abnormal Indivisible Loads are still being determined and therefore detail to inform the assessment is not available at this stage. Planned routes will be confirmed based upon further engagement with the relevant local highway authorities.
All users of the public highways which would be Primary Access Routes between Immingham and/or Grimsby Docks and the new Grimsby West Substation may be impacted by the movement of hazardous loads, resulting in additional fear and intimidation and safety effects.			Significant adverse effects cannot be excluded at this stage	
Noise and Vibration				
No likely significant effects are predicted during the construction phase of the Project, based upon the preliminary assessment.				

Description of receptor and potential impact	Key embedded and control measures	Proposed additional mitigation measures	Preliminary likely significant effects	Confidence rating (high/moderate/low)
Socioeconomics, Recreation and Tourism				
Aura Solar Farm (Grimsby Solar Farm) could be directly impacted by the construction of pylons and overhead line within Section 1, potentially resulting in both temporary and permanent loss of land during construction.	Impacts on the operation of this receptor may be lessened or avoided through consideration of the detailed design of individual pylons, haul roads and temporary structures. This will be assessed fully within the ES submitted with the DCO application. Construction would be managed through the measures outlined within the Preliminary CoCP.	No additional mitigation measures have been identified for this preliminary assessment.	Adverse effect	Moderate – National Grid will continue to engage with the Promotor of this project to inform a full assessment of likely impacts and effects, which will be reported within the ES.
Air Quality				
Human sensitive receptors (including residential properties, schools, care homes and hospitals) which are within 200m of road links projected to experience increases in traffic flow which are above the Environmental Protection UK/Institute of Air Quality Management and Assessment thresholds, could be exposed to increased pollutant concentrations during the construction phase.	Maximising separation between sensitive receptors and the proposed temporary and permanent access roads as far as reasonably practicable. Construction impacts would be managed through the measures outlined within the Preliminary CoCP.	No additional mitigation measures have been identified for this preliminary assessment.	Significant adverse effects cannot be excluded at this stage	Low - dispersion modelling will be undertaken for the ES and will inform further assessment of impacts and effects and the design of any required mitigation measures.

Description of receptor and potential impact	Key embedded and control measures	Proposed additional mitigation measures	Preliminary likely significant effects	Confidence rating (high/moderate/low)
Ecological sensitive receptors which are within 200m of road links projected to experience increases in traffic flow which are above the Environmental Protection UK/Institute of Air Quality Management and Assessment thresholds, could be exposed to increased pollutant concentrations during the construction phase.			Significant adverse effects cannot be excluded at this stage	

Table 13.3 Summary of significant effects during the operation and maintenance phase – Section 1

Description of receptor and potential impact	Key embedded and control measures	Proposed additional mitigation measures	Preliminary likely significant effects	Confidence rating (high/moderate/low)
Landscape				
The Landscape Character Type (LCT) of LCT 3: Wooded Open Farmland would be directly impacted by the presence of the new Grimsby West Substation, permanent access road and pylons GL3 and GL4, resulting in changes in the character and perception of the landscape.	The new Grimsby West Substation has been located close to areas of existing vegetation to provide screening of views of the substation.	Areas of supplementary woodland planting and tree planting on field boundaries around the new Grimsby West Substation to provide visual screening.	Adverse effect	High
Visual				
The community of Aylesby Parish would be impacted by the presence of the new Grimsby West Substation and pylons in Section 1, resulting in changes to views from receptor locations.	The new Grimsby West Substation has been located close to areas of existing vegetation to provide screening of views of the substation.	Areas of supplementary woodland planting and tree planting on field boundaries around the new Walpole B Substation to provide visual screening.	Adverse effect	High
Ecology and Biodiversity				
Designated Sites				
Bird species which are features of the following designated sites may be impacted by the presence of	The new Grimsby West Substation, pylons and permanent access routes have been positioned to avoid or reduce direct and indirect	The assessment does not take into account Additional Mitigation Measures which are in the early stages of development and are	Significant adverse effects cannot be excluded at this stage	Low – further assessment is required once surveys are completed and data assessed. The potential for LSE upon these

<p>the overhead line, resulting in collision mortality:</p> <ul style="list-style-type: none"> • The Humber Estuary SPA • The Humber Estuary Ramsar • The Humber Estuary SSSI 	<p>impacts on notable habitats, as far as reasonably practicable.</p>	<p>yet to be confirmed. These measures will be informed by ongoing survey and assessment and are likely to include the use of bird diverters to reduce collision risk.</p>		<p>European designated sites will be assessed within the Report to Inform the Habitat Regulations Assessment, informed by discussions with Natural England and other statutory bodies.</p>
<p>The following European Designated Sites may be impacted by the permanent diversion of existing drainage ditches and new operational drainage indirectly resulting in changes in flow regimes, including the volume of water supplied, water depth and water flow rates which may lead to indirect impacts these sites:</p> <ul style="list-style-type: none"> • Humber Estuary SAC • Humber Estuary Ramsar 	<p>The positioning of the substation, pylons and access routes has sought to avoid high value aquatic habitats, including main rivers and Water Framework Directive waterbodies.</p> <p>New substation surface water drainage systems will provide attenuation of runoff from impermeable surfaces to greenfield rates and incorporate appropriate pollution prevention measures, incorporating the use of Sustainable Urban Drainage Systems (SuDS) as far as practicable.</p>	<p>No additional mitigation measures have been identified for this preliminary assessment.</p>	<p>Significant adverse effects cannot be excluded at this stage</p>	

Protected and Notable Species

<p>Wintering and breeding birds may be impacted by the presence of overhead line resulting in collision mortality.</p>	<p>The new Grimsby West Substation, pylons and permanent access routes have been positioned to avoid or reduce direct and indirect impacts on notable species and</p>	<p>The assessment does not take into account Additional Mitigation Measures which are in the early stages of development and are yet to be confirmed.</p>	<p>Significant adverse effects cannot be excluded at this stage.</p>	<p>Low - survey works are ongoing and will inform further assessment of impacts and effects and the design of any required mitigation measures.</p>
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habitats, as far as reasonably practicable.

These measures will be informed by ongoing survey and assessment and are likely to include the use of bird diverters to reduce collision risk.

Historic Environment

No likely significant effects are predicted as a result of the operation and maintenance of the Project, based upon the preliminary assessment.

Water Environment and Flood Risk

No likely significant effects are predicted as a result of the operation and maintenance of the Project, based upon the preliminary assessment.

Geology and Hydrogeology

No likely significant effects are predicted as a result of the operation and maintenance of the Project, based upon the preliminary assessment

Agriculture and Soils

No likely significant effects are predicted as a result of the operation and maintenance of the Project, based upon the preliminary assessment.

Traffic and Movement

No likely significant effects are predicted as a result of the operation and maintenance of the Project, based upon the preliminary assessment.

Noise and Vibration

No likely significant effects are predicted as a result of the operation and maintenance of the Project, based upon the preliminary assessment.

Socioeconomics, Recreation and Tourism

No likely significant effects are predicted as a result of the operation and maintenance of the Project, based upon the preliminary assessment.

Air Quality

No likely significant effects are predicted as a result of the operation and maintenance of the Project, based upon the preliminary assessment.

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