



Meridian Solar Farm

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Volume 6

Environmental Statement

6.3 ES Appendix 1-1: EIA
Scoping Report

APFP Regulation 5(2)(a)

Infrastructure Planning (Applications:
Prescribed Forms and Procedure)
Regulations 2009

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Glossary of Terms

Term	Definition
Agricultural Land Classification (ALC)	The system by which agricultural land is graded on a scale of 1 to 5, with Grade 3 subdivided into 3a and 3b.
Air Quality Management Area (AQMA)	A defined area by virtue of Section 82(3) of the Environment Act 1995 ¹ , where it appears that the air quality objectives prescribed under the UK Air Quality Strategy ² will not be achieved. In these areas, a Local Authority must designate Air Quality Management Areas, within which an Action Plan can be proposed to secure improvements in air quality so that prescribed air quality objectives can be achieved.
Baseline	Environmental conditions at specific periods of time present on, or near, a Scheme, against which future changes effects from the Scheme are measured or predicted.
Battery Energy Storage System (BESS)	Battery storage system and associated infrastructure to allow for the storage, import and export of electricity to NETS.
Best and Most Versatile Quality (BMV)	Agricultural land that is defined as within ALC Grade 1, 2, or 3a.
Cable Connection	Cabling required to connect on-site substation(s), solar PV modules and solar PV supporting infrastructure located between land parcels A, B, C and D of the PV Area.
Cable Connection Corridor	Land option required for cabling between land parcels of the PV Area.
Construction Environmental Management Plan (CEMP)	A plan specific to the Scheme which ensures appropriate environmental management practices are followed during the construction phase.
Cumulative effects	The summation of effects that result from changes caused by the Scheme in conjunction with other reasonably foreseeable human induced effects. Effects can be direct and indirect and are within a specified geography across a certain time frame.
Direct impact	Spatially and temporally concurrent impacts on the environment as a result of the Scheme.
Enhancement	Beneficial effects through restoration, reconstruction or creation as a result of the Scheme.

¹ Environment Act 1995. Available at: <https://www.legislation.gov.uk/ukpga/1995/25/data.pdf>

² Department for Environment, Food and Rural Affairs (2023) Air Quality Strategy: Framework for Local Authority Delivery. Available at: https://assets.publishing.service.gov.uk/media/64e8963d63587000d1dbf9d/Air_Quality_Strategy_Web.pdf

Term	Definition
Environmental effect	The consequence of an impact on the environment.
Environmental impact	A physical or measurable change to the environment attributable to the Scheme.
Environmental Impact Assessment (EIA)	A systematic process of assessing a scheme's likely significant environmental effects undertaken in accordance with the EIA Regulations ⁴ .
Environmental Statement (ES)	A formalised statement that includes the information that is reasonably required to assess the environmental effects of the Scheme and which the Applicant can, having regard to current knowledge and methods of assessment, reasonably be required to compile, but that includes at least the information referred to in the EIA Regulations.
Flood Zone 1	Land assessed as having less than 1 in 1000 annual probability of river or sea flooding in any year.
Flood Zone 2	Land assessed as having between 1 in 100 and 1 in 1000 annual probability of river flooding or between 1 in 200 and 1 in 1000 annual probability of sea flooding in any year.
Flood Zone 3	Land assessed as having a 1 in 100 or greater annual probability of river flooding in any year or 1 in 200 or greater annual probability of sea flooding in any given year.
Grid Connection	The cabling required to connect the Site to the NETS situated within the Grid Connection Corridor exclusive of any other cabling associated with the Site.
Grid Connection Corridor	Land required for the cable connection between on-site substations and connection to NETS.
Impact	A physical or measurable change to the environment attributable to the Scheme.
Indirect effects	Effects that result indirectly from the Scheme as a consequence of the direct effects, often occurring away from the Site, or as a result of a sequence of interrelationships or a complex pathway. They may be separated by distance or time from the source of the effects.
Inverters	Device used to convert power between direct current (DC) electricity to alternating current (AC).
Magnitude	A combination of the scale, extent and duration of an effect.
Mitigation Measures	Actions proposed to avoid, prevent, reduce and where possible offset significant adverse environmental effects arising from the whole or specific elements of a scheme.
National Electricity Transmission System (NETS)	High voltage electricity transmission network across England and Wales comprising pylons, overhead lines, cables and substations that supply low voltage local distribution networks.

Term	Definition
National Planning Policy Framework (NPPF)	The framework for the Government's planning policies for England and how they are expected to be applied.
National Policy Statements (NPS)	Planning guidance for nationally significant infrastructure projects (NSIPs), including renewable electricity generation, detailing how applications will be assessed and the way impacts and mitigations will be judged.
Nationally Significant Infrastructure Project (NSIP)	Schemes of a certain classification and scale that are considered of national importance that apply to the Planning Inspectorate for development consent by virtue of the Planning Act 2008 ⁵ (as amended by the Localism Act 2011 ⁶).
On-site electric compounds	Compounds within the PV Area comprising on-site substations and control buildings.
On-site substation(s)	The infrastructure within the PV Area that transforms the voltage of electricity to be switched for transmission.
Photovoltaic (PV) Area	The land required for the Scheme excluding the Cable Connection and Grid Connection.
Pyranometers	A device that measures how much solar energy is being harvested from the sun.
Receptor	A component of the natural, created or built environment such as humans, water, air, a building, or a plant that has the potential to be affected by the Scheme.
Scheduled Monument	An ancient monument or archaeological deposits designated by the Secretary of State as a 'Scheduled Ancient Monument' and protected under the Ancient Monuments and Archaeological Areas Act 1979 ³⁴ .
Scheme	All components within the Site Boundary, including the solar PV Arrays and associated infrastructure, BESS, Grid Connection, and Cable Connection.
Scoping	An exercise undertaken to determine the topics to be addressed within the Environmental Statement.
Sensitivity	A term applied to specific receptors, combining judgements of the susceptibility of the receptor to the specific type of change or development proposed and the value related to that receptor.
Significance (effect)	A measure of the importance or gravity of the environmental effect defined by significance criteria specific to the environmental topic.
Site	The total land area required for the Scheme.
Site Boundary	The boundary encompassing all land required for the Scheme.
Solar PV arrays	A connected collection of multiple solar PV panels that form a larger complete power-generating unit.
Solar PV modules	A connected collection of multiple solar PV cells within a protective laminate.

Term	Definition
Solar PV panels	A connected collection of multiple solar PV modules that form a complete power-generating unit.
Solar PV supporting infrastructure	The components and equipment, including inverters, transformers, and switchgears, that converter the direct current (DC) electricity generated by the solar PV modules into alternating current (AC) and provide control and onward distribution of electricity across the Site.
Sustainable Drainage System (SuDS)	Sustainable management practices designed to control the rate and quality of surface water runoff into receiving waters, for example the use of swales and wetlands as buffers, as opposed to conventional drainage practices.
Switchgears	A collection of electrical disconnect fuses, switches or circuit breakers that can be used to protect, control and isolate electrical equipment and circuits.
Transformers	The electrical component that allows electricity to transmit between circuits.
Zone of Theoretical Visibility (ZTV)	The zone which represents visibility of the Scheme as determined through analysis of intervening natural and manmade terrain feature.

Abbreviations

AADT	Annual Average Daily Traffic
AC	Alternating Current
ADMS	Atmospheric Dispersion Modelling System
AIL	Abnormal Indivisible Load
ALARP	As Low as Reasonably Practicable
ALC	Agricultural Land Classification
AOD	Aerosol Optical Depth
AQMA	Air Quality Management Area
AQO	Air Quality Objective
BESS	Battery Energy Storage System
BGP	Biodiversity Gain Plan
BGS	British Geological Survey
BMV	Best and Most Versatile
BNG	Biodiversity Net Gain
BPM	Best Practicable Means
BSI	British Standards Institute
CAA	Civil Aviation Authority
CAST	Combined Aerodrome Safeguarding Team
CCC	Cambridgeshire County Council
CCTV	Closed-Circuit Television
CDM	Construction (Design and Management)
CEMP	Construction Environmental Management Plan
CIEEM	Chartered Institute of Ecology and Environmental Management
CifA	Chartered Institute for Archaeologists
CIRIA	Construction Industry Research and Information Association
CNP	Critical National Priority
COMAH	Control of Major Accident Hazards
COSHH	Control of Substances Hazardous to Health
CRTN	Calculation for Road Traffic Noise
CTMP	Construction Traffic Management Plan
DC	Direct Current
DCO	Development Consent Order
DEFRA	Department for Environment, Food and Rural Affairs
DEMP	Decommissioning Environmental Management Plan
DfT	Department for Transport
DMRB	Design Manual for Road and Bridges
DRD	Downing Renewable Developments
DTM	Digital Terrain Model
EA	Environment Agency
EcIA	Ecological Impact Assessment
ECoW	Ecological Clerk of Works
EIA	Environmental Impact Assessment
EMF	Electric and Magnetic Field
EPUK	Environmental Protection UK

ES	Environmental Statement
ESDAL	Electronic Service Delivery for Abnormal Loads
ExA	Examining Authority
FCERM	Flood and Coastal Erosion Risk Management
FRA	Flood Risk Assessment
GHG	Greenhouse Gas
GLVIA	Guidelines for Landscape and Visual Impact Assessment
GVA	Gross Value Added
HDD	Horizontal Directional Drilling
HER	Historic Environment Record
HGV	Heavy Goods Vehicle
HMMP	Habitat Management and Monitoring Plan
HRA	Habitat Regulations Assessment
HV	High Voltage
HVAC	Heating Ventilation and Air Conditioning
IAQM	Institute of Air Quality Management
ICCI	In-Combination Climate Change Assessment
IEMA	Institute of Environmental Management and Assessment
IHBC	Institute of Historic Building Conservation
IWS	Internationally Important Wildlife Sites
INNS	Invasive Non-Native Species
IOA	Institute of Acoustics
IoD	Indices of Deprivation
LAQM	Local Air Quality Management
LBAP	Local Biodiversity Action Plan
LBT	Legally Binding Target
LCA	Life Cycle Assessment
LCC	Lincolnshire County Council
LDV	Light Duty Vehicle
LEMP	Landscape and Ecological Management Plan
LGV	Light Goods Vehicle
LHA	Local Highway Authority
LiDAR	Light Detection and Ranging
LLFA	Lead Local Flood Authority
LNR	Local Nature Reserve
LOAEL	Lowest Observed Adverse Effect Level
LPA	Local Planning Authority
LSOA	Lower Super Output Area
LVIA	Landscape and Visual Impact Assessment
MAGIC	Multi-Agency Geographic Information for the Countryside
NCA	National Character Area
NETS	National Electricity Transmission System
NHS	National Health Service
NLDIDB	North Level District Internal Drainage Board
NNR	National Nature Reserve
NPPF	National Planning Policy Framework
NPPG	National Planning Practice Guidance
NPS	National Policy Statement

NPSE	Noise Policy Statement for England
NRMM	Non-Road Mobile Machinery
NSIP	Nationally Significant Infrastructure Project
NTS	Non-Technical Summary
OCN	Old County Number
OS	Ordnance Survey
PA	Planning Act
PAS	Publicly Available Specification
PCC	Peterborough City Council
PEA	Preliminary Ecological Appraisal
PEIR	Preliminary Environmental Information Report
PIA	Personal Injury Accident
PoC	Point of Connection
PPV	Peak Particle Velocity
PRF	Potential Roost Features
PRoW	Public Right of Way
PV	Photovoltaic
RCP	Relative Concentration Pathway
RFFP	Reasonably Foreseeable Future Project
RIS	Rail Industry Standard
RVAA	Residential Visual Amenity Assessment
SAC	Special Areas of Conservation
SELLP	South East Lincolnshire Local Plan
SFRA	Strategic Flood Risk Assessment
SHDC	South Holland District Council
SHIDB	South Holland Internal Drainage Board
SMP	Soil Management Plan
SOAEL	Significant Observed Adverse Effect Level
SoCC	Statement of Community Consultation
SoS	Secretary of State
SPA	Special Protection Area
SPI	Species of Principal Importance
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Drainage Systems
SWMP	Site Waste Management Plan
TA	Transport Assessment
UKCP	UK Climate Projection
WFD	Water Framework Directive
ZOI	Zone of Influence
ZTV	Zone of Theoretical Visibility

1 Introduction

1.1 Background

- 1.1.1 Meridian Solar Farm Ltd (hereafter referred to as 'the Applicant') intends to submit a Development Consent Order (DCO) application to the Secretary of State for Energy Security and Net Zero (SoS) for the proposed Meridian Solar Farm project, near Spalding, Lincolnshire (hereafter referred to as the 'Scheme'). The Scheme comprises the construction, operation (including maintenance) and decommissioning of a solar photovoltaic (PV) electricity generating facility with associated infrastructure including co-located battery storage (referred to as the 'PV Area') and an approximately 12km Grid Connection to National Grid's planned Weston Marsh substation³ east of Spalding. For the purposes of this Scoping Report the 'Site' delineates the area of land required for the Scheme development as outlined in **Figure 1.1**.
- 1.1.2 The Cable Connection Corridors are areas for potential routing to connect the separate land parcels forming the PV Area. The Grid Connection Corridors are areas for the potential grid connection between the PV Area and Weston Marsh substation with an agreement to export around 750 megawatts (MW) to the National Electricity Transmission System (NETS).
- 1.1.3 The PV Area is proposed to be located south of Spalding on land between the River Welland and Sutton St. Edmund and is approximately 1100ha in size.
- 1.1.4 The Site Boundary is outlined within **Figure 1.1**. The PV Area is denoted by a solid red line. The Site Boundary is currently a draft and as the design develops the DCO order limits will be refined to include all Scheme elements including the preferred Grid Connection Corridor and any other temporary and ancillary works as required. The PV Area comprises several land parcels denoted by the following: A, B, C and D outlined in **Figure 1.2**.
- 1.1.5 At this stage, two Grid Connection Corridor options are being considered. These are denoted by cross hatching outlined within **Figure 1.1**. Both the Grid Connection and Cable Connection Corridors will be subject to further assessment and consultation as the Scheme design progresses to determine routes for both the cable and grid connection which will be included within the DCO submission.
- 1.1.6 **Figure 1.1** shows the extent of land being considered within the Site Boundary for inclusion within the DCO application (subject to ongoing design development and consultation, including, for example, with regard to emerging access requirements) and provides a 'plan sufficient to identify land' for the purposes of Regulation 10(3)(a) of the EIA Regulations⁴. The DCO application boundaries and the proposed layout of

³ The proposed Weston Marsh substation forms part of National Grid's Grimsby to Walpole project, a proposed 440kV overhead line between Grimsby West and Walpole. A DCO application for this is currently being prepared. National Grid and the Applicant have a connection agreement in place for connection at Weston Marsh.

⁴ *The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017*. Available at: <https://www.legislation.gov.uk/ukxi/2017/572/data.pdf>

the PV Area will be finalised as the EIA develops and will be included in the Environmental Statement (ES) to accompany the DCO application.

- 1.1.7 An Environmental Impact Assessment (EIA) is being undertaken in accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended) (the 'EIA Regulations')⁴. This EIA Scoping Report presents the proposed scope, methodology and level of detail of the EIA to inform a formal request to the Planning Inspectorate for a Scoping Opinion under Regulation 10(1) of the EIA Regulations.

The Applicant

- 1.1.8 The Applicant promoting the Scheme is a subsidiary of United Kingdom-based investment manager Downing Renewable Developments LLP (DRD) founded by Downing LLP.

Figure 1.1 Scheme Location

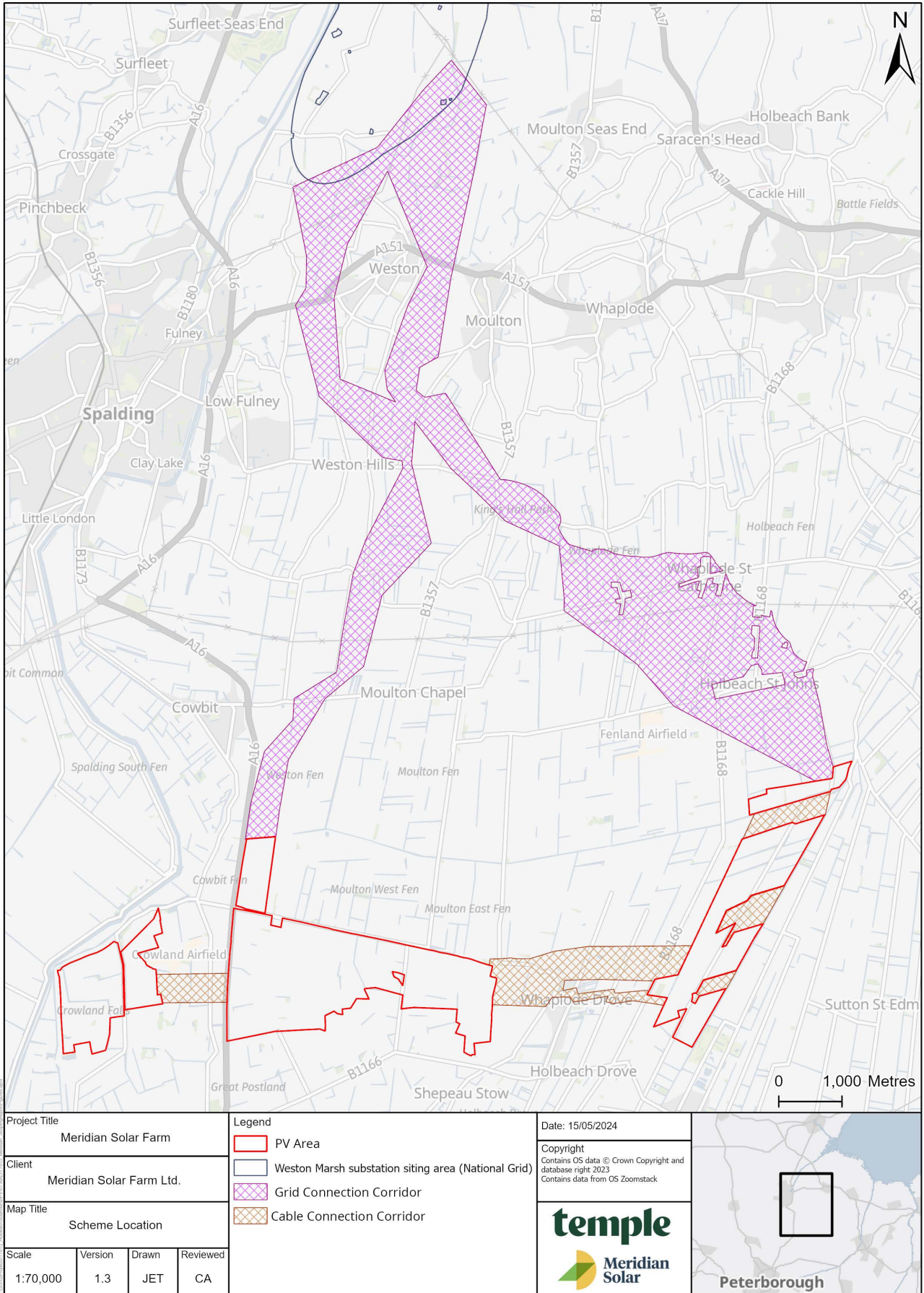
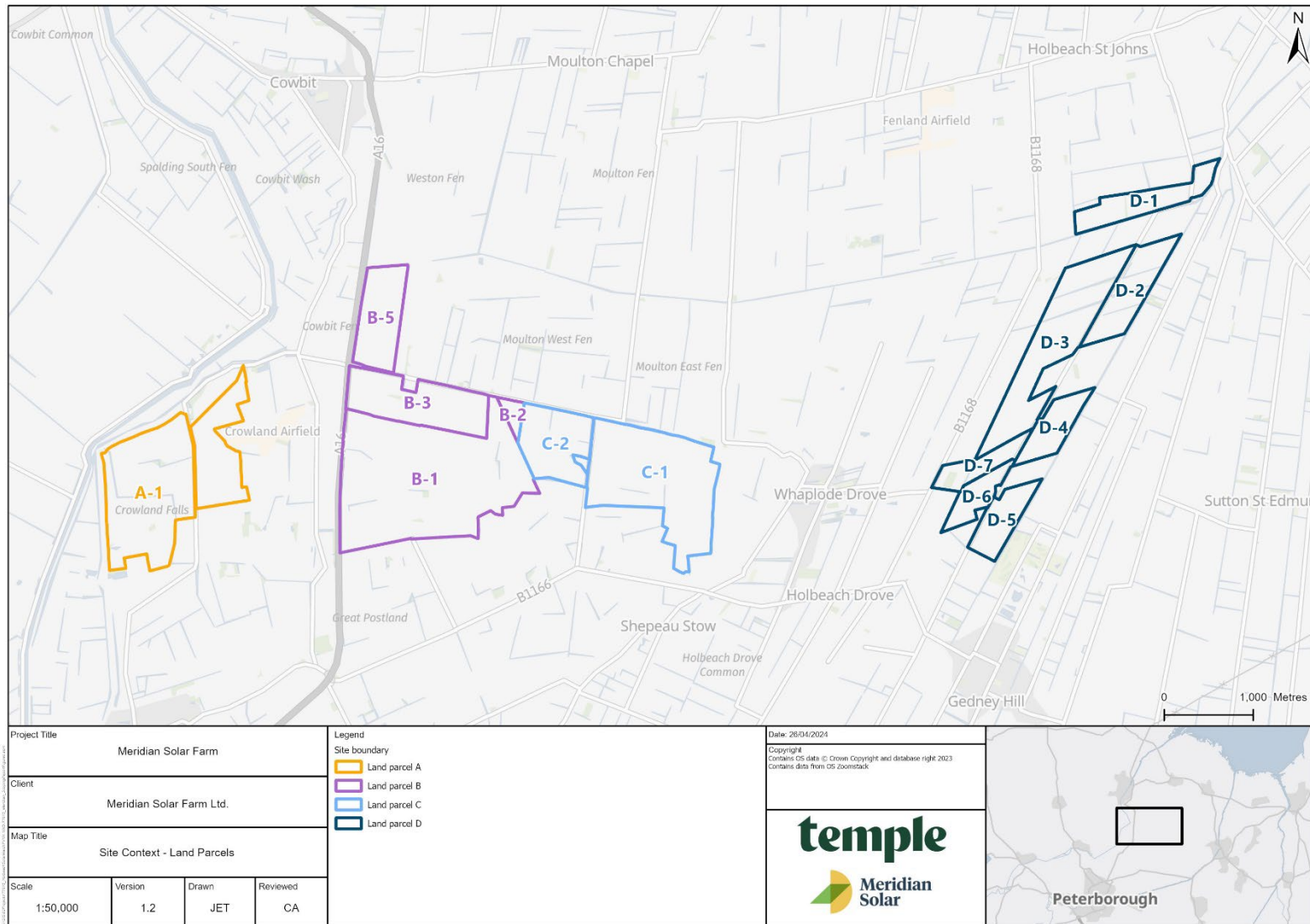


Figure 1.2 PV Area Location



1.2 Legislative context for EIA and Scoping

- 1.2.1 The Scheme falls under Sections 14(1)(a) and 15(2) of the Planning Act 2008 (PA 2008)⁵, as an onshore generating station exceeding 50MW. The Scheme therefore constitutes a Nationally Significant Infrastructure Project (NSIP) and requires a DCO application to the SoS.
- 1.2.2 The EIA requirement for NSIPs is transposed into law through the EIA Regulations. The EIA Regulations prescribe which developments are required to undergo EIA and developments relevant to the NSIP planning process under the PA 2008 are listed in either Schedule 1 or Schedule 2. Those developments listed in Schedule 1 must be subject to EIA, while developments listed in Schedule 2 must only be subject to EIA if they are considered “likely to have significant effects on the environment by virtue of factors such as its nature, size or location”. The criteria on which this judgement must be made are set out in Schedule 3 of the EIA Regulations.
- 1.2.3 The Scheme is a ‘Schedule 2 development’ under Paragraph 3(a) of Schedule 2 of the EIA Regulations⁴, as it constitutes ‘industrial installations for the production of electricity’. The Scheme may also fall under paragraph 3(b), as it may constitute ‘industrial installations for carrying gas, steam, and hot water; transmission of electrical energy by overhead cables’. Flexibility is to be given to the grid connection infrastructure associated with the ‘Grid Connection Corridor’ and ‘Cable Connection Corridor’, as this could comprise a combination of overhead lines and underground cabling. Overhead lines are considered an NSIP under Sections 14(1)(b) and 16 of the PA 2008⁵ if thresholds set out in s16 are met (voltage 132kV or greater and longer than 2km). The nature of these corridors will be confirmed as the Scheme progresses and will be consulted upon at statutory consultation, and confirmed in the application.
- 1.2.4 Considering the Scheme’s nature, size or location, there is potential for significant effects on the environment. Owing to the potential for the Scheme to meet the criteria within Schedule 3 of the EIA Regulations⁴, under Regulation 8(1)(b) of the EIA Regulations the Applicant wishes to confirm that an ES will be prepared and submitted as part of the DCO application for the Scheme.
- 1.2.5 The EIA Regulations apply to the assessment of environmental effects that are likely to arise from certain types of public and private projects.
- 1.2.6 EIA is a systematic process during which potential significant environmental effects from a Scheme are identified and assessed, and the scope for minimising these is presented to the relevant decision maker (the ‘competent authority’) in an ES accompanying a planning application.
- 1.2.7 The aim of the EIA is to provide the competent authority with the information necessary to consider potential significant environmental effects (both negative and positive), to ascertain whether these are acceptable and, where appropriate, to secure mitigation measures to minimise negative impacts prior to granting relevant consents.

⁵ Planning Act 2008. Available at: <https://www.legislation.gov.uk/ukpga/2008/29/data.pdf>

- 1.2.8 Under the Localism Act 2011⁶, the SoS will appoint an Examining Authority (ExA) from the Planning Inspectorate. The ExA will review the DCO application for the Scheme and provide a recommendation to the SoS, who will make the ultimate decision as to whether the DCO is granted or refused.
- 1.2.9 In accordance with Section 104(2) of the PA 2008⁵, the SoS is required to consider any relevant National Policy Statement (NPS), amongst other matters, when deciding whether to grant a DCO. Under the PA 2008⁵ regime, NPSs provide the policy framework from which the SoS examines and makes its decision in relation to NSIP applications. National policy is set out in relation to key types of NSIPs identified in Section 14 of the PA 2008⁵.
- 1.2.10 This Scoping Report describes the national and local planning policies relevant to the assessment of the Scheme. The purpose of a Scoping Report is not to assess the Scheme against planning policy. This will be undertaken and set out in a Planning Statement submitted as part of the DCO application. The consideration of national and local planning policy at the Scoping stage allows for the recognition of policy which could have direct influence on both the sensitivity of receptors, and the required EIA methodology. For each technical chapter, a summary of relevant national and local planning policy is provided within Section 4 of this Scoping Report.

National Policy Statements for Energy

- 1.2.11 Six NPSs have been designated in relation to energy infrastructure. The following energy related NPSs relevant to the Scheme are as follows:
- Overarching National Policy Statement for Energy (EN-1)⁷;
 - National Policy Statement for Renewable Energy Infrastructure (EN-3)⁸; and
 - National Policy Statement for Electricity Networks Infrastructure (EN-5)⁹.
- 1.2.12 In January 2024, five of the Energy NPSs were revised (EN-1 to EN-5), including the introduction of specific policies relating to solar photovoltaic (PV), battery storage and network connections. Comprising the Government's updated objectives for the development of NSIP infrastructure, these NPSs set out the need for national scale solar development, as well as providing detailed planning and policy guidance.

National Planning Policy

- 1.2.13 The SoS will also consider other important and relevant matters including National Planning Policy Framework (NPPF)¹⁰, which sets out the Government's economic,

⁶ *The Localism Act 2011*. Available at: http://www.legislation.gov.uk/ukpga/2011/20/pdfs/ukpga_20110020_en.pdf

⁷ Department for Energy Security and Net Zero (2023) *Overarching National Policy Statement for energy (EN-1)* (E03028327). London: HMSO Available at: <https://assets.publishing.service.gov.uk/media/65bbfbd709fe1000f637052/overarching-nps-for-energy-en1.pdf>

⁸ Department for Energy Security and Net Zero (2023) *National Policy Statement for Renewable Energy Infrastructure (EN-3)* (E03028327). London: HMSO Available at: <https://assets.publishing.service.gov.uk/media/65a7889996a5ec000d731aba/nps-renewable-energy-infrastructure-en3.pdf>

⁹ Department for Energy Security and Net Zero (2023) *National Policy Statement for electricity networks infrastructure (EN-5)* (E03028327). London: HMSO Available at: <https://assets.publishing.service.gov.uk/media/65a78a5496a5ec000d731abb/nps-electricity-networks-infrastructure-en5.pdf>

¹⁰ Department for Levelling Up, Housing and Communities (2023) *National Planning Policy Framework*. Available at: https://assets.publishing.service.gov.uk/media/65a11af7e8f5ec000f1f8c46/NPPF_December_2023.pdf

environmental, and social planning policies for England. The policies contained within the NPPF articulate the Government's vision of sustainable development

- 1.2.14 The NPPF should be read alongside the National Planning Practice Guidance (NPPG)¹¹, which aims to make planning guidance more accessible, and to ensure that the guidance is kept up to date.
- 1.2.15 It should be noted that the NPSs take precedence over the NPPF and NPPG where NSIPs are concerned.

Regional and Local Planning Policy

- 1.2.16 The Scheme is located within the administrative areas for Lincolnshire County Council (LCC) and South Holland District Council (SHDC). The Local Development Plans for the land in which the Scheme is proposed to be located include, but are not limited to, the following:
 - South East Lincolnshire Local Plan (SELLP)¹², adopted in 2019, covers South Holland District Council and was jointly produced with Boston Borough Council and Lincolnshire County Council;
 - South East Lincolnshire Strategic Flood Risk Assessment (SFRA)¹³;
 - Joint Lincolnshire Flood Risk and Water Management Strategy¹⁴; and
 - Lincolnshire Minerals & Waste Local Plan Core Strategy and Development Management Policies document¹⁵.

1.3 Purpose of the Scoping Report

- 1.3.1 EIA Scoping is the process of agreeing the scope of the EIA with the relevant determining authority. In the case of the Scheme, a Scoping Opinion would be sought from the relevant SoS, undertaken by the Planning Inspectorate.
- 1.3.2 The Planning Inspectorate, representing the SoS, will conduct consultations on the Scoping Report in accordance with EIA Regulations⁴. As per Regulation 10(6) of the EIA Regulations⁴, "*The Secretary of State or the relevant authority must not adopt a scoping opinion in response to a request under paragraph (1) or (2) until they have consulted the consultation bodies*". Statutory bodies subject to this consultation include the Environment Agency, Historic England and Natural England. Other relevant agencies and organisations seen to have an interest in the Scheme may also be

¹¹ Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities and Local Government (2024) *National Planning Practice Guidance*. Available at: <https://www.gov.uk/government/collections/planning-practice-guidance>

¹² South East Lincolnshire Joint Strategic Planning Committee (2019) *South East Lincolnshire Local Plan 2011-2036*. Available at: southeastlincslocalplan.org/wp-content/uploads/2019/02/Local-Plan-text-March-2019.pdf

¹³ South East Lincolnshire Joint Strategic Planning Committee (2017) *South East Lincolnshire Strategic Flood Risk Assessment*. Available at: https://www.sholland.gov.uk/media/7937/South-East-Lincolnshire-Strategic-Flood-Risk-Assessment-Report-March-2017-including-guidance-on-applying-the-Sequential-Test-for-planning-applications/pdf/SE_Lincolnshire_SFRA_2017_v6.pdf?m=1607959961710

¹⁴ Lincolnshire Flood Risk and Water Management Partnership (2019) *Joint Lincolnshire Flood Risk and Water Management Strategy 2019-2050*. Available at: <https://www.lincolnshire.gov.uk/downloads/file/2365/joint-lincolnshire-flood-risk-and-water-management-partnership-framework-draft-strategy-2019-2050-pdf>

¹⁵ Lincolnshire County Council (2016) *Lincolnshire Minerals and Waste Local Plan: Core Strategy and Development Management Policies*. Available at: <https://www.lincolnshire.gov.uk/downloads/file/2361/core-strategy-and-development-management-policies>

consulted. Feedback from these consultees will be taken into consideration when developing the Scoping Opinion.

- 1.3.3 This process determines the scope and level of detail of information to be provided in the ES. This forms an early stage in the EIA process enabling the activity of reviewing any environmental studies undertaken to date and identifying those environmental aspects that may be significantly affected/ impacted by the Scheme. This Scoping Report also sets out those environmental disciplines for which significant environmental effects are unlikely to arise as a consequence of the works and which, as a result, are proposed to be 'scoped out' of the assessment.
- 1.3.4 The Scoping Report also provides a mechanism for consulting on and agreeing the content and methodology of the subsequent EIA for the SoS to prepare a formal Scoping Opinion. The SoS and the relevant consultees are also invited to identify any sources of environmental information which may be of relevance to the EIA.
- 1.3.5 The EIA Regulations⁴ set out the requirements for an applicant who proposes to request a Scoping Opinion from the SoS. Regulation 10(3) of the EIA Regulations⁴ requires that a Scoping Report includes:
- A plan sufficient to identify the land;
 - A description of the Scheme, including its location and technical capacity;
 - An explanation of the likely significant effects of the development on the environment; and
 - Such other information or representations as the person making the request may wish to provide or make.
- 1.3.6 The Scoping Report has been prepared with consideration to the Planning Inspectorate's Advice Note Seven: Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements¹⁶.

¹⁶Planning Inspectorate (2020). *Advice Note Seven: Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements*. Available at: <https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-advice-note-seven-environmental-impact-assessment-process-preliminary-environmental-information-an>

Table 1.1 Scoping Report Contents based on Advice Note Seven

Scoping Report Contents	Location within this Scoping Report
The Scheme	
An explanation of the approach to addressing uncertainty where it remains in relation to elements of the Proposed Development e.g. design parameters.	Section 2: The Scheme
Referenced plans presented at an appropriate scale to convey clearly the information and all known features associated with the Proposed Development.	Figure 1.1 Scheme Location Figure 1.2 PV Area Location Figure 2.1 Hydrological Constraints Figure 2.2 Environmental Constraints
EIA Approach and Topic Areas	
An outline of the reasonable alternatives considered and the reasons for selecting the preferred option.	Section 3: EIA Approach and Methodology (Section 3.7 Assessment of Alternatives)
A summary table depicting each of the aspects and matters that are requested to be scoped out allowing for quick identification of issues.	Section 5: Summary of Proposed Scope
A detailed description of the aspects and matters proposed to be scoped out of further assessment with justification provided.	Section 4: Proposed Scope of the EIA and Potential Environmental Effects
Results of desktop and baseline studies where available and where relevant to the decision to scope in or out aspects or matters.	Section 4: Proposed Scope of the EIA and Potential Environmental Effects
Aspects and matters to be scoped in, the report should include details of the methods to be used to assess impacts and to determine significance of effect e.g. criteria for determining sensitivity and magnitude.	Section 4: Proposed Scope of the EIA and Potential Environmental Effects
Any avoidance or mitigation measures proposed, how they may be secured and the anticipated residual effects.	Section 4: Proposed Scope of the EIA and Potential Environmental Effects
Information Sources	
References to any guidance and best practice to be relied upon.	Section 4: Proposed Scope of the EIA and Potential Environmental Effects
Evidence of agreements reached with consultation bodies (for example the statutory nature conservation bodies or local authorities).	Section 4: Proposed Scope of the EIA and Potential Environmental Effects
An outline of the structure of the proposed ES.	Section 6: Proposed Structure of the ES

Scoping Report Structure

- 1.3.7 The Scoping Report structure will be as follows:
- Section 1: Introduces the requirement for EIA and scoping process;
 - Section 2: Describes the Scheme and Site Boundary context;
 - Section 3: Outlines the assessment methodology and approach to the EIA;
 - Section 4: Presents the proposed scope of the EIA and potential environmental effects;
 - Section 5: Summarises and concludes the report; and
 - Section 6: Presents the proposed structure of the ES.

1.4 Consultation Strategy

- 1.4.1 Effective consultation is an important requirement for development consent applications. The process is crucial to the development of a comprehensive and balanced ES. Consultation is an ongoing process. Views of the interested and affected parties serve to focus environmental studies and to identify specific issues that require further investigation.
- 1.4.2 Consultation will be undertaken with both statutory and non-statutory bodies, including those with an environmental remit, together with public consultation prior to submission of the DCO application. Formal consultation will take place in line with the relevant regulatory and legislative requirements of the NSIP planning process; however, it is proposed to continually engage with the LCC, SHDC, and key stakeholders prior to and following the submission of the DCO application, as appropriate. Relevant stakeholders are set out within each individual topic chapter.
- 1.4.3 The DCO process has several statutory requirements regarding consultation. These requirements mandate the involvement of specific stakeholder groups, the community must also be consulted as part of the pre-application process, as delineated in Sections 42, 47 and 48 of the PA 2008⁵ and Regulation 13 of the EIA Regulations⁴. Additionally, further requirements outline how the Scheme must be publicised and the creation of essential documents including the Statement of Community Consultation (SoCC), Preliminary Environmental Information Report (PEIR) and a Consultation Report. This process ensures comprehensive engagement is undertaken with transparency throughout.
- 1.4.4 The Scheme will involve a variety of stakeholders including landowners, statutory consultees, local communities, and interest groups. Each stakeholder will have independent interests and will require varying levels of consultation. To effectively consult, it is essential to understand the stakeholders' interests and tailor activities accordingly.
- 1.4.5 Information and views are being sought from a range of statutory and non-statutory bodies throughout the EIA process, and the intention is for consultees to be involved in the evolution of the design and assessment of environmental effects.

2 The Scheme

2.1 Need for the Scheme

- 2.1.1 In 2008, the UK committed to reducing greenhouse gas emissions by 80% in comparison to emissions at 1990 levels. The Climate Change Act 2008¹⁷ was passed, carbon budgets established, and a Committee on Climate Change formed. In 2019 the Government strengthened this commitment by legislating to achieving 'net zero' carbon emissions by 2050¹⁸. The Scheme has the potential to accelerate the UK's transition to Net Zero and make a significant contribution to increasing our energy security at a time of both rising energy bills and the increasing urgency to tackle the climate emergency.
- 2.1.2 Decarbonisation is a UK legal requirement and is of global significance. As noted in NPS EN-1, there is a critical national priority (CNP) for low carbon and renewable energy infrastructure, which includes solar development at a national scale. Solar developments play a crucial role in the UK's energy landscape, especially in meeting renewable energy targets outlined in key Government policies such as the NPSs. As outlined within NPS EN-3 "*Solar also has an important role in delivering the government's goals for greater energy independence. The British Energy Security Strategy states that government expects a five-fold increase in combined ground and rooftop solar deployment by 2035 (up to 70GW)*"^a. These policies provide a roadmap for sustainable energy development, emphasising the importance of renewable sources like solar power. Solar energy projects can contribute significantly to reducing carbon emissions, increasing energy security, and promoting a greener future for the UK, supporting the decarbonisation of transport and heat sectors, through electrification.
- 2.1.3 The Scheme is of critical importance for facilitating the future of efficient decarbonisation through the deployment of large-scale, technologically and geographically diverse low carbon generation schemes. This Scheme addresses all relevant aspects of existing and emerging government policy in this context.

2.2 Site Context

- 2.2.1 The Site is located to the south of Spalding and northeast of Crowland within flat, open countryside. The main land use across the Site is agricultural. The landscape features within the vicinity consist of steep man-made agricultural drainage ditches typically bordering arable field boundaries with isolated pockets of plantation.
- 2.2.2 Settlements within the surrounding area consist of small clusters of development with occasional individual properties scattered throughout. Nearby residential receptors include but are not limited to properties in Crowland, Moulton, and Gedney Hill.
- 2.2.3 The River Welland is located to the western boundary of the Site and the proposed PV Area is bisected by the South Holland Main Drain. The majority of the PV Area is

¹⁷ Climate Change Act 2008. Available at: <https://www.legislation.gov.uk/ukpga/2008/27/data.pdf>

¹⁸ The Climate Change Act 2008 (2050 Target Amendment) Order 2019. Available at: <https://www.legislation.gov.uk/uksi/2019/1056/made/data.pdf>

located within Flood Zone 3 as outlined in **Figure 2.1**, whereas the Grid Connection corridors generally lie within a combination of Flood Zones 2 and 3 with limited and localised areas falling within Flood Zone 1.

- 2.2.4 The A16 runs south to north, situated between land parcels A and B. Public Rights of Way (PRoW) and bridleways are present in the surrounding area as shown in **Figure 2.2**.
- 2.2.5 The Site sits within National Character Area 46 (NCA) The Fens, recognised by its large, low-lying, flat landscape with drainage ditches, dykes and rivers. There are no statutory landscape designations within the Site Boundary such as National Parks or National Landscapes.
- 2.2.6 The closest statutory designated site for nature conservation is Cowbit Wash Site of Special Scientific Interest (SSSI), located approximately 4km to the north west of the Site as shown in **Figure 2.2**. Two internationally designated sites are located within 15km of the Scheme, including the Nene Washes (Ramsar/Special Area of Conservation and Special Protection Area/SSSI) is located approximately 11km to the south of the Site outlined in **Figure 2.3**. There are seven non-statutory designated sites within 2km of the PV Area, which are shown on **Figure 2.4**.
- 2.2.7 The Provisional Agricultural Land Classification (ALC) Map (1:250,000 scale)¹⁴¹ shows the Site to be mainly Grade 2 quality with Grade 1 mapped in the east and north. However, it is to be noted that the Provisional maps are produced at reconnaissance level, and this is subject to review via detailed surveys being undertaken as part of the DCO application.
- 2.2.8 There are no World Heritage Sites or Registered Parks and Gardens within the Site. Three Scheduled Monuments are either within, or border, the current PV Area, a further five are located within 2.5km of the Site Boundary as shown in **Figure 2.2**.
- 2.2.9 There are 46 listed buildings within 1km of the Site Boundary, four of which are Grade I. There are two listed buildings located within the Grid Connection Corridor Options as shown in **Figures 2.5 and Figure 2.6**.
- 2.2.10 There are three conservation areas within 3km of the Site Boundary. There is one conservation area at Moulten which is located approximately 380m east of the Grid Connection Corridor. Crowland conservation area is located approximately 1.8km from the PV Area, and Spalding conservation area is located approximately 2.6km to the west of the Grid Connection Corridor.

Figure 2.1 Hydrological Constraints

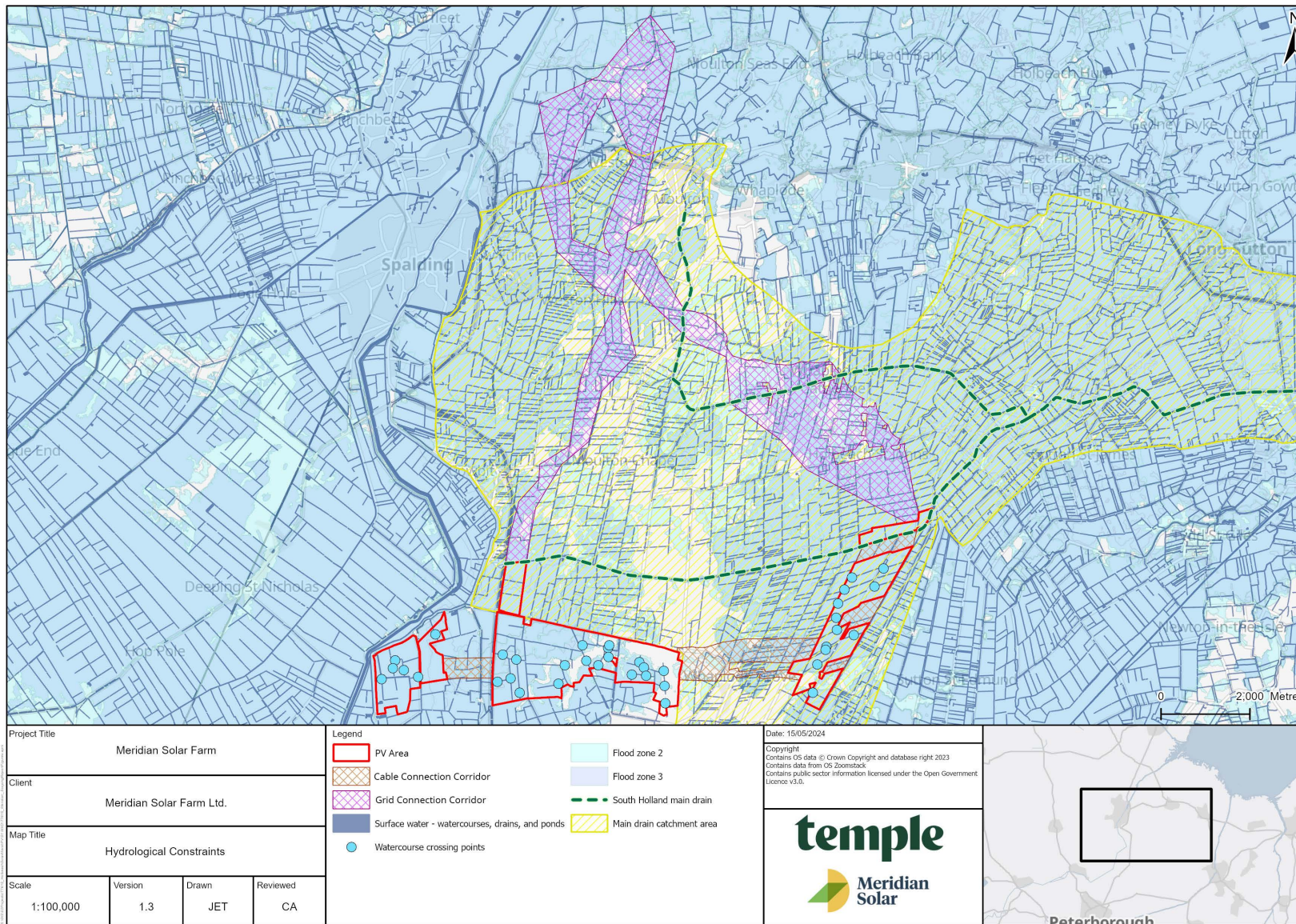


Figure 2.2 Environmental Constraints

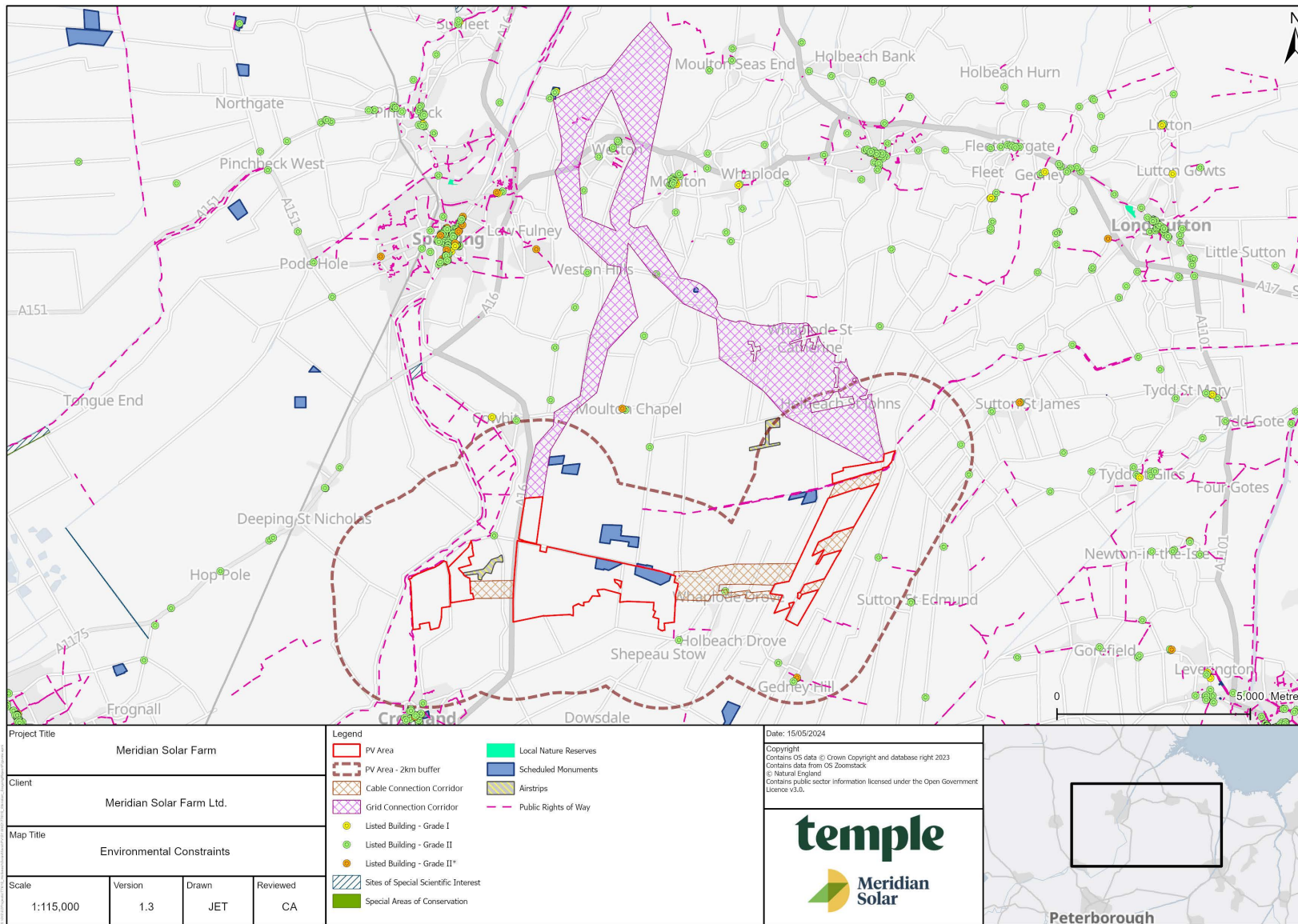


Figure 2.3 Internationally Designated Sites

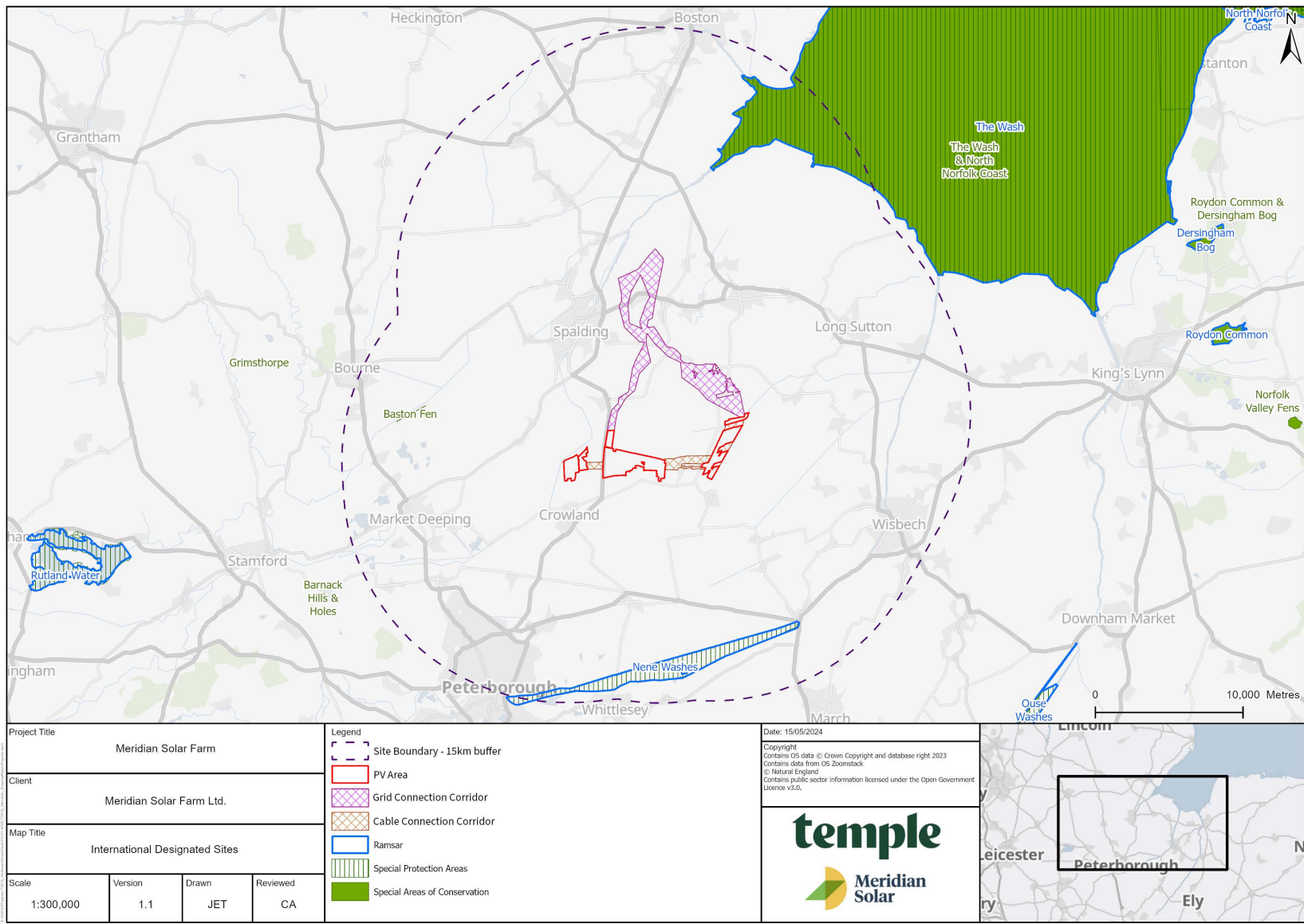


Figure 2.4 Non-Statutory Designated Sites

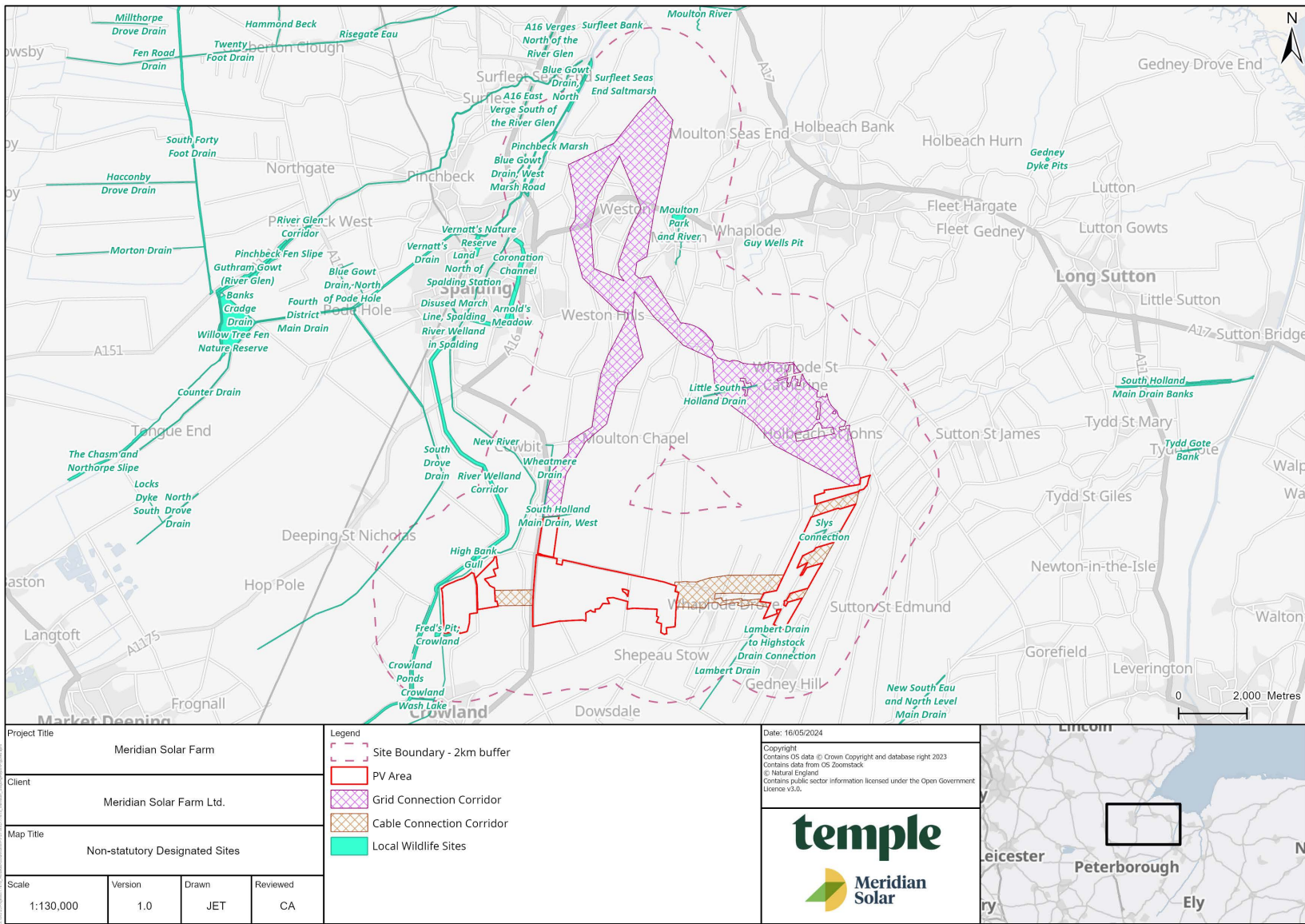


Figure 2.5 Designated Heritage Assets within 1km of the Study Area (North)

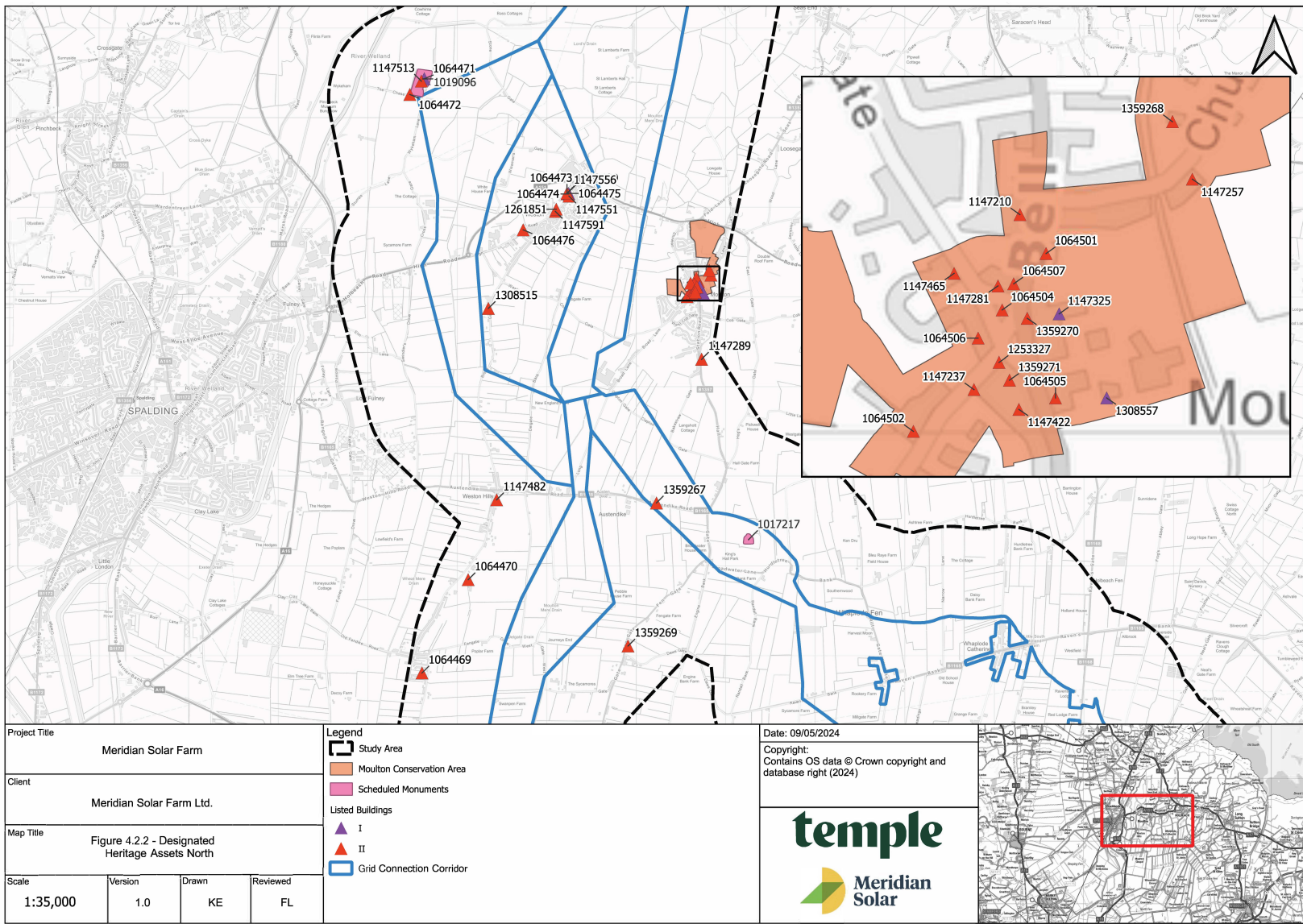
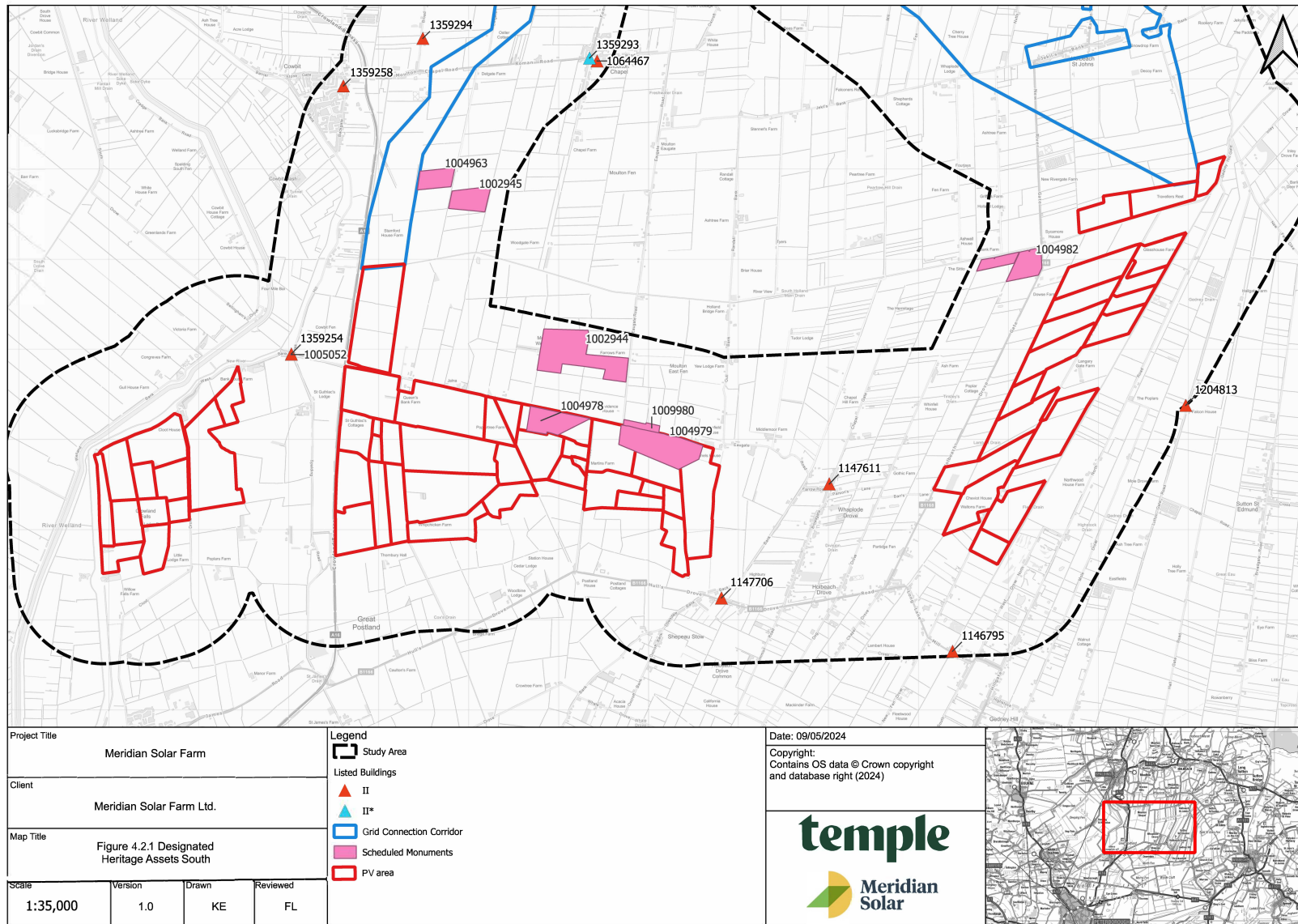


Figure 2.6 Designated Heritage Assets within 1km of the Study Area (South)



2.3 The Rochdale Envelope

- 2.3.1 The Planning Inspectorate's Advice Note 9¹⁹, 'Using the 'Rochdale Envelope'', offers guidance on the level of flexibility to be considered in an application for development consent under the PA 2008⁵. The note recognises the potential for certain aspects of the Scheme design and technical parameters to remain unfixed, requiring the EIA to evaluate possible worst-case variations to ensure comprehensive assessment of all foreseeable significant environmental effects of the Scheme.
- 2.3.2 The extent of flexibility needed will vary based on the design progress when detailed EIA work commences. It is anticipated that some aspects of the Scheme will still require design flexibility during the EIA process. Incorporating flexibility into the Scheme's design subject to the DCO application is essential to allow for alignment with environmental and technical considerations, post-consent adjustments, and technological advancements.
- 2.3.3 Technical assessments must therefore define an 'envelope' within which the works will occur. The application and EIA will be based on maximum and, if applicable, minimum parameters or deviation limits. To comply with EIA Regulations⁴, it is crucial to define these parameters as narrowly as possible to accurately identify 'likely significant effects' rather than exaggerating effects that are improbable.
- 2.3.4 The ES will explain clearly which elements of the Scheme have yet to be finalised and provide the reasons for this. Where flexibility is sought for any elements of the Scheme, the ES will set out the parameters that would apply, clearly setting out any proposed limits of deviation, ensuring an envelope that has considered the reasonable worst-case environmental effects. The flexibility will vary depending on the sensitivity of receptors and may be fixed at certain locations to prevent significant effects.
- 2.3.5 These parameters will be considered in detail by technical authors in the ES to ensure the realistic worst-case effects of the Scheme are assessed for each potential receptor.
- 2.3.6 The key elements of Advice Note 9¹⁹ in relation to the Scheme are as follows:
- The application should acknowledge the need for details of a project to evolve, within clearly defined parameters;
 - The EIA should take account of the need for evolution within those parameters, and reflect the likely significance of such a flexible project in the ES;
 - Within those defined parameters, the level of detail of the proposals should be such as to enable a sufficient assessment of the likely significant environmental effects and the identification of mitigation measures, if necessary, considering a range of possibilities: "*the assessment may conclude*

¹⁹Planning Inspectorate (2018). *Advice Note Nine: Rochdale Envelope*. Available at: <https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-advice-note-nine-rochdale-envelope>

that a particular effect may fall within a fairly wide range. In assessing the 'likely' effects, it is entirely consistent with the objectives of the Directive to adopt a 'worst case' approach. Such an approach will then feed through into the mitigation measures envisaged. It is important that these should be adequate to deal with the worst case, to optimise the effects of the development on the environment"; and

- It is for the decision maker, in granting consent, to impose conditions to ensure that the process of evolution keeps within the parameters applied for the assessment.

2.3.7 The advice outline above has been followed during the EIA scoping process for the Scheme to identify and refine the scope of environmental topics.

2.4 Description of the Scheme

2.4.1 The Scheme will comprise the construction, operation (including maintenance) and decommissioning of a solar PV electricity generating facility with associated infrastructure including co-located Battery Energy Storage System (BESS), Cable Connection to link separate land parcels forming the PV Area and a Grid Connection from the PV Area which will run approximately 12km north towards a point of connection (PoC) to the proposed Weston Marsh National Grid substation to the north of Weston as outlined in **Figure 1.1**. The Scheme has an agreement with National Grid to supply capacity of up to 750MW of electricity for export to the NETS.

2.4.2 It is to be noted that infrastructure required for the Scheme, including the solar PV and energy storage technologies, are continuously evolving. Flexibility will be maintained to ensure the latest technology is utilised at the time of construction.

2.4.3 A further detailed description of the Scheme is provided in the sections below.

Scheme Design Principles

2.4.4 A series of design principles have been developed and will be utilised to inform the design process and assist where possible with the mitigation and reduction of potential environmental effects and, where appropriate, look at wider ranging enhancements or improvements for local stakeholders.

2.4.5 Opportunities to mitigate, reduce impacts or provide enhancements will be regularly reviewed throughout the design process, using the following three key themes as guiding principles: sustainability, people, and environment.

2.4.6 The Scheme will be designed to support the transition to Net Zero and assist the UK in achieving Net Zero targets by 2050. The Scheme will be designed with flexibility to take advantage of new sustainable and efficient technologies that emerge throughout the development process. Comprehensive lifecycle analysis will be conducted to evaluate the whole-life emissions and environmental impact of the Scheme for its entire lifespan. The Applicant will, where possible, look to mitigate and reduce emissions through the Scheme by making design changes to improve performance.

2.4.7 Meaningful engagement will be carried out with communities and stakeholders. The Applicant will, where possible, work with local communities to understand how best to protect and enhance their environment and the local area.

- 2.4.8 The Applicant will look to protect and enhance the landscape and will be designed sensitively with consideration to complementing the local character, culture and supporting its ecology. The Applicant will utilise topic-based environmental studies to inform design and suitable mitigation measures.

2.5 Overview of Solar and Battery Storage Infrastructure

- 2.5.1 The PV area will require various elements of infrastructure, the principle infrastructure required for the Scheme will likely include the following, subject to further design refinement:

- Solar PV Infrastructure, including:
 - Solar PV modules; and
 - Module mounting structures.
- Solar PV Supporting Infrastructure, including:
 - Inverters;
 - Transformers; and
 - Switchgears.
- BESS Facility;
- On-site electrical compounds comprising of substation(s) and control buildings;
- On-site cabling and cabling between solar array land parcels;
- A spare parts storage building;
- Fencing and security measures;
- Temporary construction compounds, access tracks and potential minor works on local road network;
- Permanent access tracks; and
- Landscaping and biodiversity enhancements.

Solar PV Infrastructure

Solar PV Modules

- 2.5.2 Solar PV modules convert sunlight into direct current (DC) electricity. Individual panels are typically up to 2.5m in length and 1.3m wide and weigh approximately 35kg. Panels are typically formed from a series of PV cells behind two millimetres of toughened frontal glass housed in a frame built from aluminium. It is anticipated the Scheme will utilise 144-cell PV modules, however, with solar technologies evolving quickly, other options may be available at the time of procurement and construction.
- 2.5.3 Based on current technology, the generating capacity of each of the Scheme's PV panels is estimated to be in the region of 600W to 800W. Each module would be fixed into a mounting structure in groups known as 'strings'. The total number of strings of modules is anticipated to be approximately 52,000. Various factors will

help to inform the number and arrangement of modules in each string and it is likely some flexibility will be required to accommodate future potential developments in solar technology.

- 2.5.4 In this configuration, it is anticipated that panels would be tilted at an angle of in the range of 15 to 20 degrees and orientated at 180 degrees, facing south, though this is subject to further appraisal. As the Scheme design develops, the panel orientation will be determined based upon economic, environmental, and technical factors. A reasonable worst-case scenario will be assessed and presented in the ES.
- 2.5.5 The minimum height of the solar PV modules would be 2.9m and maximum would 3.5m (subject to flood modelling).

Module Mounting Structures

- 2.5.6 Each row of solar PV modules will be mounted on a rack known as a frame; supported by galvanised steel poles typically driven between 1m and 1.5m into the ground. It is anticipated that the Scheme will adopt a predominately south facing fixed module mounting configuration. If necessary, an alternative option is for the solar PV modules and associated frame to be mounted on concrete ballast so that no ground penetration is required.
- 2.5.7 Based on the design development to date, spacing between mounting rows is expected to be between 3m and 5m to allow for adequate distance to minimise inter-row shading and enable access for routine maintenance.
- 2.5.8 Solar PV modules are likely to be mounted on structures with a clearance above ground level of between a minimum of 0.5m and a maximum upper height of 1.0m. These clearance distances are indicative and subject to ongoing modelling to afford for further refinement through the consideration of factors including Site topographic and flood data.

Solar PV Supporting Infrastructure

Inverters

- 2.5.9 Inverters are required to convert the DC electricity generated by the solar PV modules into alternating current (AC) to allow for compliant electricity export to NETS. As the Scheme design is developed, it is currently expected that central inverters will be used, located at regular intervals across the PV Area, mounted on hard standing bases. It is currently anticipated that there would be approximately 140 inverters across the PV Area, each approximately 3m wide, 2.5m tall, with a depth of 1.7m.

Transformers

- 2.5.10 Transformers are required to step-up or step-down voltage of the electricity generated across the Site before it reaches on-site substation(s). These would be located at various points throughout the Site with specific voltages being confirmed through detailed design. Transformers to the specification required for the Site are typically 6m long, 2.5m wide and 3m high. As the Scheme design develops, the likely configuration of equipment will be determined based upon environmental and technical factors.

Switchgears

- 2.5.11 Switchgear equipment is required to control, protect and isolate various pieces of electrical equipment on the Site. Switchgear ensures the safe and efficient distribution of electrical power by enabling the interruption of fault currents, the disconnection of circuits for maintenance, and the protection of equipment from overloads and short circuits. Switchgear infrastructure is typically housed in buildings with approximate dimensions of up to 60m long, 15m tall, and a width of 30m, however, the configuration of equipment is subject to further refinement as the design of the Scheme progresses.

Battery Energy Storage System

- 2.5.12 The Scheme will include a co-located BESS. The BESS is designed to assist with energy management and efficiency, helping to balance supply and demand as well as support grid stability. Energy generated by the solar PV during times of low consumer demand can be stored by the BESS and exported during times of peak consumer demand. It is also intended that the BESS will be able to participate in available ancillary service markets to support with overall grid stability.
- 2.5.13 One primary component of the BESS is the battery cells which are typically assembled in containerised housings or in a cellular modular arrangement, accompanied with necessary infrastructure (transformers and inverters) to interconnect with the wider Site. Supplementary infrastructure such as spares containers and security fencing will also be installed.
- 2.5.14 A detailed design process will be undertaken for the BESS exploring several configurations; maintaining flexibility to account for the readily developing technology that could be available at the time of procurement and construction.
- 2.5.15 The BESS is typically housed within shipping container units. Each BESS unit is assumed to have storage capacity between approximately 2MW/4MWh, as storage technology advances, this per-unit capacity may increase. As such, the specific number of units required will be determined as part of the detailed design process. Each individual BESS unit is assumed to occupy approximately the same footprint as a typical shipping container, approximately 12.5m long, with a height of 2.5m and depth of 3m. Security fencing around the BESS area(s) is assumed to be weld-mesh fencing of up to 2.4m in height.
- 2.5.16 The BESS infrastructure will likely be situated within the vicinity of the on-site substation infrastructure to reduce cabling and losses though this will be confirmed through detailed design. Depending on the final on-site substation configuration, the BESS may be split and dispersed across multiple on-site substation areas.
- 2.5.17 Dependent on specific BESS technologies selected through the detailed design process, there may be a requirement for a Heating, Ventilation and Air Conditioning (HVAC) system, to ensure that the batteries operate safely and efficiently. This could be an external HVAC system to the battery units, situated adjacent or atop the container, or alternatively housed internally within the container. Specific implementation is subject to evolving technology and refinement to the design of the Scheme as it progresses.

- 2.5.18 Switchgear will be required to help control protect and isolate the BESS ensuring efficient operation and safety. The switchgear will assist with protection against overloads and faults within the BESS helping maintain stability.
- 2.5.19 As the design develops, the configuration of equipment will be determined based upon environmental and technical factors. A reasonable worst-case scenario will be assessed and presented in the ES.

On-site Substation(s)

- 2.5.20 On-site substation infrastructure will be required which will consist of electrical equipment such as but not limited to transformers, switchgear, control and metering equipment required to facilitate the export of electricity from the Site to NETS.
- 2.5.21 Some of the equipment associated with on-site substation infrastructure such as transformers, switchgear and control and metering devices may be housed within buildings with approximate dimensions of up to 15m in height, 60m in length and 30m in width. The necessary transformer infrastructure would be installed at the on-site substation(s) each with an individual footprint of up to 14.5m in width, 21.5m in length and 11m in height.
- 2.5.22 Several possible configurations are being explored for the on-site substation infrastructure. The intention of this design work is to minimise electrical losses prior to export to the NETS. The options being explored as to the number and configuration of on-site substation(s) to be installed for the Scheme include:
- A single main 400kV on-site substation;
 - Two 400kV on-site substations;
 - Three 400kV on-site substations; and
 - Three on-site substations consisting of two 132kV substations and one 400/132kV substation.
- 2.5.23 Substation configurations which would require more than one on-site substation would look to have on-site substations dispersed across multiple locations within the PV Area and serve to minimise electrical losses when transporting electricity across the different PV Areas.
- 2.5.24 At both 400kV and 132kV, it is anticipated that the required footprint for each individual on-site substation would be approximately 9000m². Further refinement is required through the iterative design process to confirm the parameters and location of on-site substation(s) as the design of the Scheme progresses, further details to be outlined within the PEIR and ES.

On-site Cabling

- 2.5.25 Low voltage on-site electrical cabling is required to connect the solar PV modules and BESS to inverters (typically via 1.5/1.8kV cables), and the inverters to the transformers on-site (typically via 0.6/1kV cables). The dimension of the trenches will vary depending on the number of ducts they contain but are typically up to 0.8m in width and up to 1.2m in depth.

- 2.5.26 Cabling between the PV Areas will be done underground where possible. Cabling from the PV modules to the inverters will be above ground secured to mounting structures.
- 2.5.27 Cabling will be required to connect the land parcels outlined within **Figure 1.1 and 1.2**. The voltage of this cabling will be confirmed following finalisation of the on-site substation(s) configuration and through more detailed design. This cabling could be underground or above ground.
- 2.5.28 Data cables will also be installed within the PV Area and Cable Connection Corridors, typically alongside electrical cables in order to allow for the monitoring during operation, such as the collection of solar PV module data from pyranometers.

Fencing and Security

- 2.5.29 Mesh fencing will enclose the operational areas of the site, approximately 1.8m in height. The BESS areas will be enclosed by weld mesh fencing up to approximately 2.4m in height. On-site substation infrastructure, such as that featured at the on-site substation(s), will be enclosed with palisade fencing, up to approximately 2.8m in height. Pole mounted internal facing closed circuit television (CCTV) cameras will be deployed regularly along the perimeter(s) of the PV Area with views along the fence line and of the internal PV Area. Additional CCTV cameras will be deployed at key locations internally. These are expected to be approximately 5m in height. The specific equipment and locations will be determined as part of the detailed design process. Non-continuous sensor triggered infrared lighting will be required and located around critical electrical infrastructure for security purposes.

PV Area Access and Access Tracks

- 2.5.30 It is anticipated that construction access will be via the A16 which is currently managed by LCC as the local highway authority. Construction access will utilise existing access to Clout Drove, Queen's Bank, Martins Road and Langary Gate Road. The exact Site access locations and access routings have yet to be confirmed following further design refinement and ongoing consultation. There is potential that highways improvement works may be required to facilitate access to the Site, further assessment will determine any requirements which will be outlined within the ES and Transport Assessment (TA).
- 2.5.31 Access tracks will be constructed across the PV Area, typically 3.5 to 5m wide, with some localised areas being wider to accommodate the turning radii of larger vehicles. These will facilitate maintenance access to key areas of infrastructure such as central solar inverters, BESS and on-site substation(s).
- 2.5.32 Details regarding operational phase transport arrangements will be further refined as the Scheme's design progresses in consultation with relevant authorities. Details will be set out in the ES .

Surface Water Drainage

- 2.5.33 While solar PV developments are not typically associated with significant flood impacts, including risk in relation to surface water drainage, some ancillary elements of the Scheme, such as the substation and transformers and electrical connections across the Cable Connection Corridors, should be considered regarding flood sensitivity as they may lead to surface water run-off and flood effects.

- 2.5.34 An outline Drainage Strategy will be developed in alignment with the impact assessment to establish how surface water from the Scheme will be managed in relation to flood risk. The Scheme drainage design will consider the results of the hydrological assessment and associated Flood Risk Assessment (FRA) which will be undertaken as part of the ES. The Drainage Strategy will be agreed prior to construction and adhered to throughout the operational phase, managing any changes to existing drainage arrangements across the Scheme.

Biodiversity and Landscaping

- 2.5.35 In keeping with the existing landscape character, landscaping may introduce advanced planting including the restoration of hedgerows as well as the additional planting of small, isolated blocks of woodland. Landscape enhancements would increase biodiversity across the Scheme and contribute to Biodiversity Net Gain (BNG).
- 2.5.36 The Scheme will include biodiversity enhancements which will focus on increasing the diversity of habitats from the current baseline. Following further refinement throughout the iterative design process landscape and biodiversity enhancement measures are to be defined.

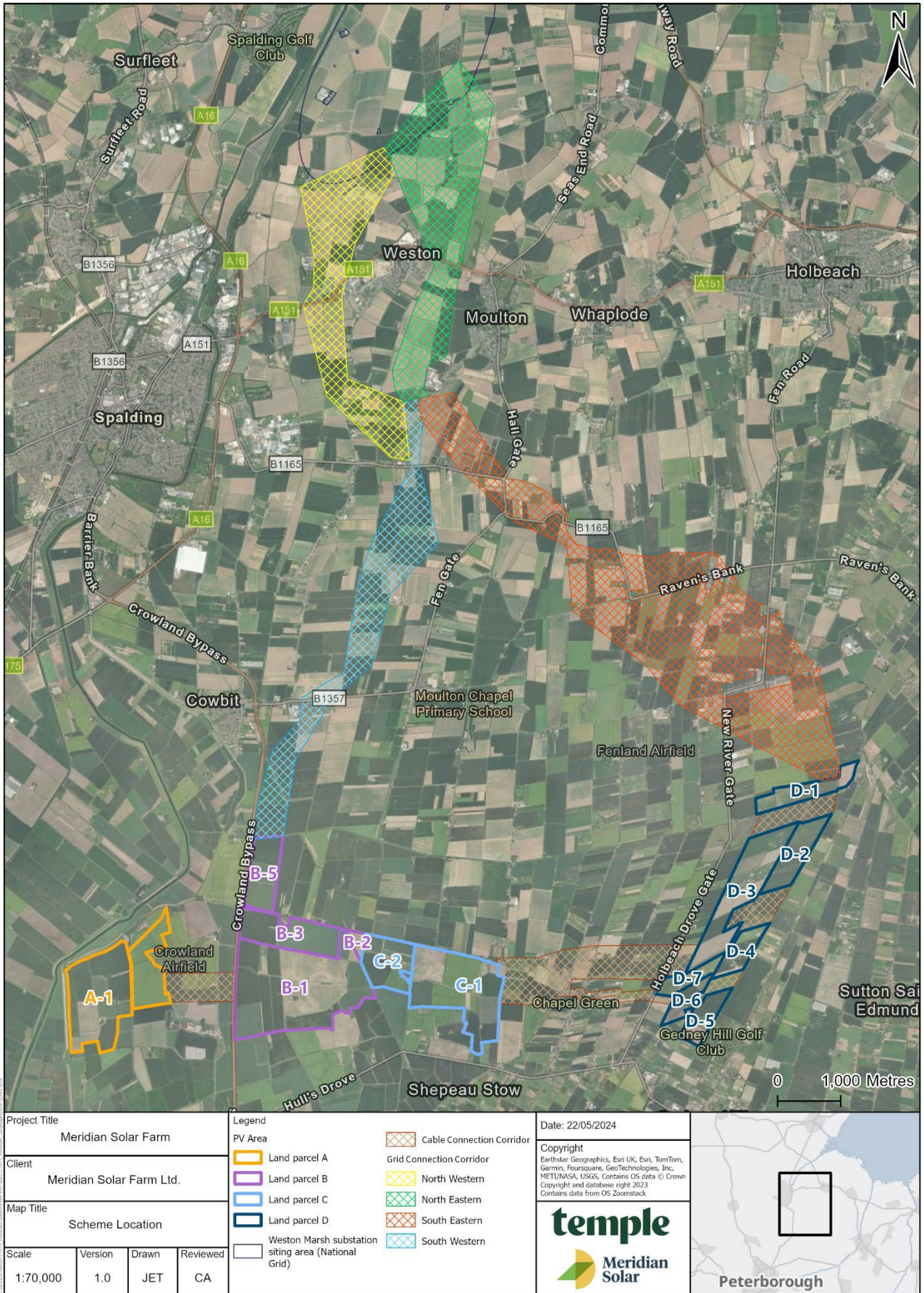
2.6 Electricity Export Connection to NETS

- 2.6.1 The electricity generated by the Scheme is currently contracted to export to Weston Marsh 400kV Substation. The connection is likely to be installed overhead, however, flexibility is required in the project parameters to provide for the potential use of underground cabling, where appropriate or required. Ongoing Grid Connection Corridor feasibility studies and options appraisals will assist in determining the routing and installation of the Grid Connection. The routing study will consider all relevant environmental legislation, policy and best practice, including the Holford Rules²⁰ and the Overarching National Policy Statement for Energy (EN-1)⁷ and EN-5⁹. The Holford Rules provide guidelines for the routing of new high voltage overhead transmission lines, providing guiding principles to apply to overhead line route design.
- 2.6.2 A defined route and understanding of the installation (including confirmation as to whether cabling will be overhead, underground, or a combination of the two) will be assessed and presented within the ES.
- 2.6.3 If the Grid Connection is overhead line, this is likely to be installed via steel lattice pylons potentially up to approximately 57m in height though this is subject to refinement as the design of the Scheme progresses.
- 2.6.4 If the Grid Connection is underground, this is likely to be installed via trenching, the specific techniques and parameters will be further refined. Underground trenching for 400kV cables will be approximately 1.5m wide and approximately 1.2m deep.

²⁰ National Grid (2010) *The Holford Rules*. Available at: <https://www.nationalgrid.com/sites/default/files/documents/13795-The%20Holford%20Rules.pdf>

- 2.6.5 Two Grid Connection Corridor options (eastern and western) have been identified, providing a location and extent for consideration to be further refined throughout the design appraisal process. The options are outlined within **Figure 1.1** and **Figure 2.7**, the corridors further defined as southern and northern corridors which have both been considered within this Scoping Report. Further assessment and consultation will be undertaken to assist with the appraisal process to determine a refined Grid Connection. The outcome of the appraisals will be to choose a preferred option which will minimise potential environmental and social impacts as far as practicable, as well as being technically feasible. This Grid Connection preferred route will be presented in the ES as part of the assessment of the Scheme. Details of the appraisal process will be provided within the ES.
- 2.6.6 The voltage for the Grid Connection would be 400kV with the connection point to be the National Grid 400kV substation at Weston Marsh, approximately 12km north of the PV Area.

Figure 2.7 Grid Connection Corridor Location



2.7 Construction

Construction Programme

- 2.7.1 Subject to development consent being granted, the earliest construction would likely commence in 2028 to supply energy to the grid from 2033. It is estimated that construction will require at least 24 months. Construction details are to be further refined and will be outlined within the ES.

Construction Activities

- 2.7.2 The types of construction activities that may be required include (not necessarily in order):

- Preparation of the Site:
 - Import construction materials, plant and equipment to the Site;
 - The establishment of a construction compound(s);
 - Upgrading of existing site tracks/access roads and construction of new tracks;
 - The upgrade or construction of crossing points (bridges / culverts) over drainage ditches; and
 - Marking out the location of the infrastructure.
- PV Area Construction:
 - Import of components to the Site;
 - Erection of module mounting structures;
 - Mounting of modules;
 - Installation of electric cabling;
 - Installation of transformer cabins;
 - Installation of battery storage units; and
 - Construction of on-site substation compound(s).
- Grid Connection and Cable Connection Installation (overhead and underground cabling):
 - The establishment of mobilisation areas and running tracks;
 - Temporary construction compounds and roadways (including those located on or near cable routes, which are yet to be determined);
 - Stripping of topsoil in sections;
 - Trenching in sections;
 - Appropriate storage and capping of soil;
 - Appropriate construction drainage with pumping where necessary;
 - Sectionalised approach of duct installation;

- Excavation and installation of jointing pits;
 - Link box installation;
 - Cable pulling;
 - Implementation of crossing methodologies for watercourses, infrastructure (including roads and rail), and sensitive habitats (e.g. horizontal directional drilling (HDD), cable bridging, etc.);
 - Clearance of vegetation and installation of fencing. Temporary stone pad would be required next to pylon locations for cranes and piling
 - Import of components to the site
 - Temporary haul routes for construction vehicles
 - Excavation of soil at pylon bases. Piling subject to the ground conditions; and
 - Erection of the pylons.
- Testing and Commissioning of Scheme infrastructure; and
 - Site Reinstatement and Habitat Creation.

2.7.3 The ES will outline proposed construction activities in greater detail, including an indicative programme for detailed phases of works.

Construction Site Access

2.7.4 The main point of vehicular access to the key highway network for the Site Boundary during the construction and decommissioning of the Scheme is anticipated to be via the A16. At this stage access is expected to be taken from the following locations for different land parcel, also outlined in **Figure 2.8**:

Land Parcel A: Clout Drove;

2.7.5 Can be accessed from the A16 via Spalding Road and Barrier Bank, James Road and Postland Road, and a number of minor roads;

Land Parcel B: Queen's Bank and Land Parcel C: Martins Road; and

2.7.6 Located east of the A16, land parcels B and C, located adjacent to each other, the A16 would be accessed via Spalding Road and Barrier Bank, and Stonegate and Backgate and a number of minor roads.

Land Parcel D: Langary Gate Road.

2.7.7 Accessed from the A16 via B1040, Moulton Chapel Road and Roman Road, and a number of minor roads.

Construction Traffic and Access

2.7.8 Further to the above, a new access track is expected to be constructed to provide construction vehicle access to the Grid Connection works at National Grid's planned Weston Marsh substation. The access track is to be defined following the refinement of the Grid Connection Corridor options, which will be defined with a single route option for the ES submission.

- 2.7.9 All construction and decommissioning access will be confirmed as the Scheme design progresses and in consultation with County Highways Authorities and National Highways where required.
- 2.7.10 Where Abnormal Indivisible Loads (AILs) are required, detailed swept path analyses will be undertaken for the constraint points along the route from the nearest strategic road network to demonstrate that components can be delivered to Site Boundary and to identify any potential road works which may be necessary. An AIL Transport Management Plan describing the route and the proposed operational management of the deliveries will be submitted in support of the DCO application.
- 2.7.11 A Traffic Management Plan will be developed and submitted alongside the ES.

Construction Environment Management

- 2.7.12 Scheme construction will be carried out in accordance with a Construction Environmental Management Plan (CEMP). A Framework CEMP will be prepared to accompany the DCO application.
- 2.7.13 The CEMP will provide a framework to manage the environmental effects of construction activities. Its objectives are to ensure that environmental mitigation commitments are met, and necessary consents and licences are obtained. This document, and the roles/responsibilities and assurance processes that are laid out within it, will be the principal mechanism by which construction phase mitigation measures from the EIA will be secured.
- 2.7.14 The CEMP will cover but not be limited to the following aspects:
- Transport and access;
 - Ecology;
 - Heritage;
 - Water environment
 - Climate change
 - Landscape and visual
 - Soils and agriculture
 - Noise and vibration;
 - Construction dust and air quality; and
 - Waste generation.

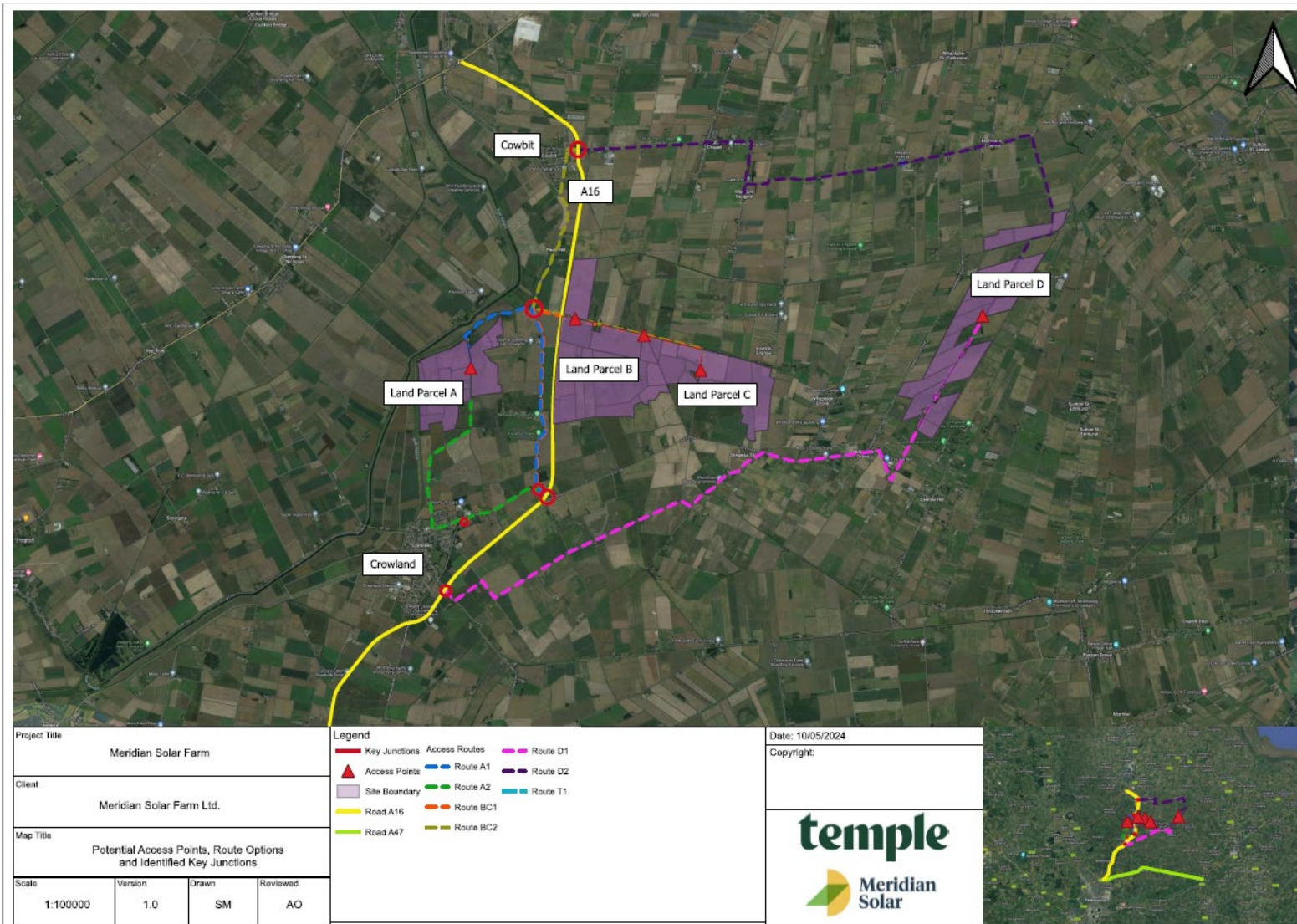
- 2.7.15 The detailed CEMP will be produced by the appointed construction contractor following grant of the DCO and will be approved by the relevant local planning authority prior to the start of construction.

Site Reinstatement and Habitat Creation and Enhancements

- 2.7.16 A plan for Site reinstatement and habitat creation will be established post the construction phase. An Outline Landscape and Ecological Management Plan (LEMP) will be included in the DCO application. The purpose of this is to outline the key measures proposed to mitigate any potential effects of the Scheme on landscape,

biodiversity and heritage features. The Outline LEMP will outline the land management and maintenance principles post-construction, providing a delivery plan for the Schemes operational life with the aim to preserve and enhance the Site biodiversity. The LEMP will be considered a live document which will be regularly refined (where required), a detailed LEMP will be further developed once the DCO has been granted.

Figure 2.8 Potential Construction Site Access Routes and Points



2.8 Operation

- 2.8.1 Activity on the Site will be minimal and would be restricted principally to vegetation management, equipment maintenance and servicing, replacement of any components that fail, periodic fence inspection, and monitoring to ensure the continued effective operation of the Scheme.

2.9 Decommissioning

- 2.9.1 The design life of the Scheme is expected to be 40 years. The Applicant will develop, construct, and operate the Scheme for the entirety of its lifecycle. It is expected that decommissioning may take up to two years.
- 2.9.2 Upon decommissioning, the above-ground physical infrastructure will be dismantled and removed, it has been assumed that any below ground infrastructure will be left in situ following decommissioning, subject to best industry practice, obligations to landowners and the relevant statutory requirements.
- 2.9.3 The Site will be returned to the relevant landowners. This will include the areas of agricultural land where the agricultural resource has been maintained (and potentially improved) during operation, and the established habitats. Post-decommissioning, the landowner may return the Site to arable use, although it could be that established habitats such as hedgerows and woodland would be retained given their potential benefits to agricultural land and the wider farming estate, this would be considered out of control for the Applicant and would not form part of the ES assessment.
- 2.9.4 An Outline Decommissioning Plan will be prepared as part of the EIA which will outline general principles to be adhered to prior to decommissioning occurring. However, as the Scheme's operational life is 40 years, it is not possible to completely identify the management routes and facilities.
- 2.9.5 All infrastructure removed from the Site will be recycled or disposed of in accordance with good practice and taking lessons learnt from similar Schemes. The Scheme will apply the waste hierarchy and where possible look to prevent, re-use or recycle waste. Any waste created through the decommissioning phase will be required to be removed from the Site and disposed of in line with lawful requirements.
- 2.9.6 The effects of decommissioning are often similar to, or to a lesser magnitude than, the construction effects and will be considered where possible in the relevant sections of the ES. It is to be noted that there can be a high degree of uncertainty regarding decommissioning as engineering approaches and technologies evolve over the operational life of the Development.

3 EIA Approach and Methodology

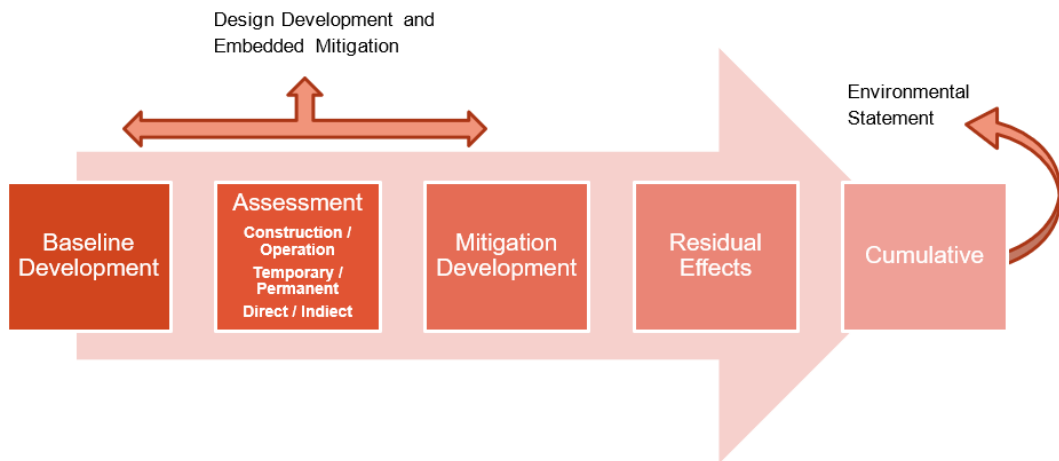
3.1 Purpose of EIA Process

3.1.1 The Applicant is adopting an environmentally and stakeholder-led Scheme design process that incorporates the results of baseline assessments iteratively to embed opportunities and mitigation early. Where practicable, environmental effects will be avoided from the outset in line with the Applicant’s aim to develop a Scheme that responds to the characteristics of the Site and surrounds.

3.2 Assessment Methodology

3.2.1 EIA is a process for identifying the likely significant environmental effects (beneficial and adverse) of proposed developments. It is considered that effective EIA is a tool to improve scheme design, as demonstrated in **Figure 3.1**. The general approach to the assessment establishes the baseline for each topic. Receptors and resources are identified, and their sensitivity classified. The potential impacts of the Scheme on these receptors and resources are assessed for the construction, operation and decommissioning phases of the Scheme, taking into account any embedded mitigation. Subsequently, additional mitigation measures are considered, as appropriate, allowing the likely significant residual and cumulative effects to be identified.

Figure 3.1 EIA Methodology Approach



The assessment methodology involves undertaking an assessment to predict the likely significant effects of the Scheme. It will identify mitigation measures, as required, through design modifications and environmental management during the project life cycle (consisting of construction, operation and decommissioning). The residual effects will then be identified following the inclusion of mitigation.

3.2.2 The assessment methodology describes the guidance used for the assessment of each environmental topic in Section 4 of this Scoping Report, together with the criteria to determine the magnitude of effects and the sensitivity of receptors. Assessment methodologies rely on sources of guidance, such as those from institute guidelines, for use in the assessments.

Spatial Scope

- 3.2.3 The spatial scope refers to the area over which the EIA will consider effects – the study area. In general, this will take into account the distance from the Scheme over which changes to the environment are likely to occur as a result of the construction or operation of the Scheme. A draft Site Boundary has been provided in **Figure 1.1**.
- 3.2.4 The study areas for the Scheme are individually defined for each environmental topic based on the geographical scope of the potential impacts on receptors/resources and the relevant topic specific criteria. Establishing them draws on the relevant guidance and professional expertise and judgement. The study area has been defined for each topic within the Section 4 of this Scoping Report and this is supported by a rationale for how this area was determined.
- 3.2.5 Where there is uncertainty in relation to design parameters, extent of limits of deviation, and/or construction and operational assumptions, the assessment will use what is considered to be a reasonable study area based on professional judgement and the knowledge of the works at the current time which is considered to reflect a reasonable worst case for assessment of potential impacts.

Temporal Scope

- 3.2.6 In general, environmental topics will address the likely significant effects anticipated to arise from the construction, operation and decommissioning phases of the Scheme as follows:
- Effects that arise as a result of construction activities, such as from the presence of construction sites, compound areas, access routes, or from associated changes in traffic movements as a result of traffic and footpath diversions. It is estimated that this phase will take approximately two years;
 - A future year will be considered for specific topics such as Landscape and Visual (i.e. 15 years after the operational assessment year) to consider aspects such as full maturation of vegetation;
 - Effects that arise as a result of operation of the Scheme, across a 40 year period, for example the introduction of new infrastructure in the landscape; and
 - Effects that arise as a result of decommissioning of the Scheme, from the presence of construction sites and associated traffic movements. It is estimated that this phase would take approximately two years. The effects of decommissioning are often similar to, or to a lesser magnitude than, the construction effects and will be considered where possible in the relevant sections of the ES.

Baseline

- 3.2.7 In order to assess the impacts on environmental receptors that would be caused by the Scheme, and to identify any potential significant effects, an understanding of the baseline is necessary. The baseline is established to be representative of the conditions likely to be in place at the point of the relevant assessment scenario.

- 3.2.8 The identification of the baseline therefore requires the description of the existing situation and then a prediction of how it is likely to evolve in the absence of the Scheme, i.e. 'future baseline scenario', based on available environmental information and scientific knowledge. This includes taking into account current conditions and using experience and professional judgment to predict what the baseline conditions might look like when accounting for natural change.
- 3.2.9 To gather a fully comprehensive, descriptive summary of the baseline, each individual topic will use appropriate data gathering methods following topic specific guidelines (where relevant). This will typically include the following:
- Desk studies: a review of previous reports and studies;
 - Appropriate site-based surveys to verify desk studies; and
 - Engaging with stakeholders both to seek to agree those methods of data collection and also to obtain any further data they may have.
- 3.2.10 The ES will detail the approach to establish the baseline and will cover:
- Sources of information;
 - Methodology (including that for modelling or surveys);
 - Consultation;
 - Any limitations (such as data availability, restricted access or seasonal variation) and assumptions; and
 - The temporal and spatial study area.

3.3 Assessment of Effects and Defining Significance

- 3.3.1 The ES will detail the likely significant effects that are predicted to result from the Scheme. The significance of an effect will generally be assessed by considering the magnitude of impact (the degree of change experienced by a receptor), against the sensitivity of the affected receptor. In some cases, technical chapters may deviate from the general approach where specific technical guidance requires a different methodology. Where this is the case, this will be clearly identified in the relevant technical chapters, as appropriate.
- 3.3.2 The following section describes how the criteria of magnitude, sensitivity and significance are interpreted and will be applied throughout the EIA, unless otherwise stated within the technical chapters.

Magnitude of Impact

- 3.3.3 An impact is a change in baseline conditions caused by the Scheme. The general criteria and definitions for magnitude of impact to describe changes arising from the construction or operation of the Scheme is shown in **Table 3.1**. Where applicable, the individual topics have set out their own specific approach to this assessment within Section 4.

Table 3.1 Magnitude of Impact and Typical Descriptions

Magnitude of Impact		Typical Description
Major	Adverse	Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features or elements
	Beneficial	Large scale or major improvement of resource quality; extensive restoration; major improvement of attribute quality.
Moderate	Adverse	Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements
	Beneficial	Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality.
Minor	Adverse	Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements.
	Beneficial	Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring
Negligible	Adverse	Very minor loss or detrimental alteration to one or more characteristics, features or elements.
	Beneficial	Very minor benefit to, or positive addition of, one or more characteristics, features or elements
No change		No loss or alteration of characteristics, features or elements; no observable impact in either direction.
Table Source: Adapted from Table 3.4N DMRB LA 104 (2020) Environmental assessment and monitoring ²¹		

Sensitivity of Receptors

- 3.3.4 A receptor is an entity that may be affected by an impact. Relevant receptors will be identified for each environmental topic and an appropriate baseline developed. The method to achieve this is usually topic-specific and will, therefore, be described in each of the topic chapters of this Scoping Report.
- 3.3.5 The value of receptors shall be reported within environmental assessments, the value (sensitivity) of receptors shall be applied.
- 3.3.6 The general criteria and definitions for sensitivity / value that will be used to describe the sensitivity of receptors to change arising from the construction, operation and decommissioning of the Scheme are shown in **Table 3.2**. Where applicable, the individual topics have set out their own specific criteria and definitions for determining sensitivity within Section 4.

Table 3.2 Environmental Value (Sensitivity) and Typical Descriptions

Value (sensitivity) of receptor / resource	Typical description
Very High	Very high importance and rarity, international scale and very limited potential for substitution.
High	High importance and rarity, national scale, and limited potential for substitution.
Medium	Medium or high importance and rarity, regional scale, limited potential for substitution.
Low	Low or medium importance and rarity, local scale.
Negligible	Very low importance and rarity, local scale.

Table Source: Adapted from Table 3.2N DMRB LA 104 (2020) Environmental assessment and monitoring²¹

Significance of Effect

3.3.7 Once the sensitivity of receptors and magnitude of impacts have been established, the overall significance of effects will be assessed using the following matrix outlined in **Table 3.3**, unless otherwise stated in relevant environmental topic.

Table 3.3 Significance Matrix

Value/ Sensitivity	Magnitude of Impact (degree of change)				
	No Change	Negligible	Minor	Moderate	Major
Very High	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Moderate or Slight
Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight

Table Source: Adapted from Table 3.8.1 DMRB LA 104 (2020) Environmental assessment and monitoring²¹

3.3.8 All effects assessed as being of moderate significance or above are considered to be significant for the purpose of this assessment. Effects of minor or negligible significance are not considered to be significant and will, therefore, not be reported as significant residual effects. Where two magnitude of impact categories are provided, evidence will be provided to support the reporting of a single option.

3.3.9 Where Table 3.3 includes two significance categories, evidence should be provided to support the reporting of a single significance category.

3.3.10 The definition of significance thresholds and criteria will also take account of:

- The duration of the impact and its frequency/likelihood;

²¹ Highways England; Transport Scotland; Welsh Government; Department for Infrastructure (Northern Ireland) (2020) *Design Manual for Roads and Bridges (DMRB): LA 104 Environmental Assessment and Monitoring*. Available at: <https://www.standardsforhighways.co.uk/tses/attachments/0f6e0b6a-d08e-4673-8691-cab564d4a60a?inline=true>

- The reversibility of the effect, and whether it is permanent or temporary;
- Whether an impact is direct or indirect (whereby direct effects are those effects where the Scheme causes an impact or change experienced by a receptor as a result of a single primary change, whereas indirect effects are those effects that are not a direct result of the Scheme but are the result of two or more stages of change resulting from a single original effect).
- Performance against any relevant environmental quality standards, where appropriate.
- Whether the effect occurs in isolation, is cumulative or interacts with other effects.

3.3.11 The duration of the effect will be assessed to be either temporary or permanent where:

- Temporary (e.g. construction and decommissioning phase); and
- Short term (<5 years during operation);
- Medium term (5 – 10 years during operation); and
- Long term (>10 years during operation).
- Permanent (e.g. once the Scheme is completed and operational and effects cannot be reversed following decommissioning).

3.3.12 The general descriptions for significance are outlined in **Table 3.4**.

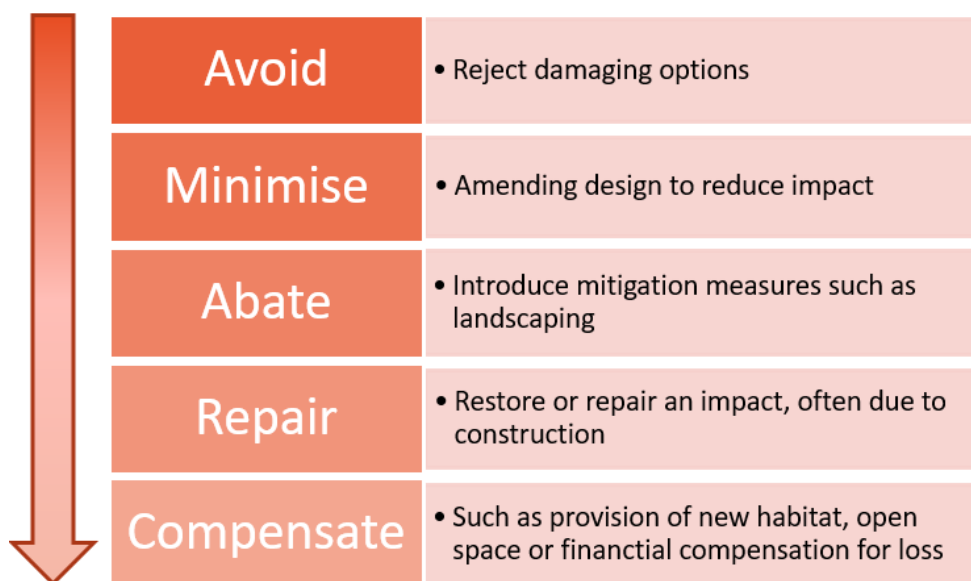
Table 3.4 Significance Categories and Typical Descriptions

Significance Category	Typical Description
Very Large	Effects at this level are material in the decision-making process.
Large	Effects at this level are likely to be material in the decision-making process.
Moderate	Effects at this level can be considered to be material decision-making factors
Slight	Effects at this level are not material in the decision-making process.
Neutral	No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

3.4 Design and Mitigation Process

3.4.1 One of the key functions of the EIA is to inform design. This Scheme design is an iterative process which takes into consideration the key significant effects on environmental receptors and the corresponding mitigation proposed. The mitigation hierarchy (**Figure 3.2**) sets out how an EIA can address the adverse effects of a development.

Figure 3.2: Mitigation Hierarchy



3.4.2 A hierarchy of actions will be employed. In the first instance, opportunities should be taken to avoid adverse effects altogether. Where avoidance is not possible (for example, due to financial, operational or societal constraints) the EIA should then seek to reduce or minimise the significance of adverse effects. Where environmental effects remain significant, compensatory measures may then be required. The Scheme will incorporate the principles of the mitigation hierarchy in the form of the following:

- **Embedded mitigation measures**, which are those measures embedded within the design to avoid affecting key environmental features. Embedded mitigation measures are underpinned by compliance with legislation, industry good practice, Best Practicable Measures (BPM) and construction environmental management procedures identified in the CEMP, which is further defined in section 2.7.13. Where there is a reliance on a specific aspect or feature of the Scheme or item of embedded design mitigation being present in identifying the likelihood and magnitude of a change or impact, this will be clearly identified;
- **Additional mitigation measures**, which are those which are required to reduce or offset likely significant adverse environmental effects of the Scheme and will be proposed where feasible within the relevant technical chapters; and
- **Enhancement measures** and their associated benefits, which are those measures that are over and above what is required to mitigate the adverse effects of the Scheme will also be detailed within each environmental topic chapter, as appropriate. These are generally not factored into the determination of residual effects, unless they have been committed to by the Scheme, in which case they will be included in the assessment.

3.5 Residual Effects

3.5.1 Effects that remain after embedded and additional mitigation measures have been implemented are referred to as residual effects. The assessment of the significance of the residual effects after mitigation has been applied is, therefore, the key outcome

of the EIA. Only residual effects are reported within the assessment of significant effects section of the environmental chapters.

3.6 Proposed Cumulative Assessment

- 3.6.1 In accordance with the EIA Regulations⁴, the EIA will also assess and report on the potential cumulative effects that could arise as a result of the Scheme. This includes the consideration of two types of cumulative effects, as follows:

In-Combination Effects

- 3.6.2 An assessment of the in-combination effects between topic areas within the Scheme will be undertaken, for example, noise and visual effects from the Scheme on the same receptor. To avoid duplication of information or assessment, interactions that are already inherent to a topic area assessment will not be considered further in the assessment of in-combination effects. For example, the Ecology assessment will include consideration of the potential interactions of effects on ecological receptors relating to Noise and Vibration effects and, therefore, this would not need to be considered further in the in-combination assessment.
- 3.6.3 Effects that are moderate adverse or beneficial and above are considered significant. However, it is acknowledged that the consideration of in-combination effects may need to consider residual effects over and including minor or slight. This is because multiple minor effects could result in a significant in-combination effect. Where only neutral or negligible residual adverse effects are identified from technical assessments it is considered that there is no potential for a significant in-combination effect. Residual effects of negligible significance are considered to be imperceptible to a receptor. Where a receptor has been identified as only experiencing one effect or where only one topic has identified effects on that receptor, there is no potential for an in-combination effect to occur.
- 3.6.4 The in-combination effect will be considered as equivalent to the 'worst case' effect already identified for a single environmental topic. Where a combination of significant effects may increase or decrease the effect on a single receptor, the residual in-combination effect will be assigned based upon the professional judgement of the relevant topic specialists and in accordance with the significance criteria set out in the relevant topic. The value (or sensitivity) of receptors will be based on the highest rating attributed by the relevant topic assessments. For example, if a receptor is high value for landscape and medium value for biodiversity, it is deemed to be high value for the purpose of the in-combination assessment.

Cumulative Effects

- 3.6.5 An assessment of the combined action of a number of different projects, in combination with the project being assessed, on a single resource/receptor. This assessment will consider the likely significant cumulative effects of the Scheme with other committed developments/schemes (Reasonably Foreseeable Future Projects (RFFPs)). The Applicant will seek to agree a list of schemes relevant to the individual topic area in advance of the assessment with the Local Authorities and other relevant statutory consultees.

3.6.6 There is no commonly accepted guidance on how to determine whether the Scheme would generate significant Inter-Scheme cumulative effects, in combination with RFFPs. The Planning Inspectorate's Advice Note 17²² is considered to represent best practice for cumulative effects assessments in relation to DCO projects, which sets out a process involving key stages.

3.6.7 In keeping with this approach, the following methodology will be employed for the EIA:

Stage 1 - Establish the Zone of Influence (ZOI) to determine the RFFPs for consideration

3.6.8 The Scheme's ZOIs for the inter-Scheme assessment will be informed by the study areas used for the topic assessment. The largest ZOI will be used to compile the long list.

3.6.9 To establish the list of 'other development', the following sources will be consulted:

- The Local Planning Authority, including consultation with the planning officer and a review of the local planning documents and portals for and planning applications;
- The Transport Assessment; and
- Large, strategic Schemes including NSIPs, Transport Works Act Orders and major planning applications. An example would be National Grid's Grimsby to Walpole proposal.

3.6.10 It is proposed to exclude small-scale planning applications, such as house extensions, or cosmetic changes to buildings; works to trees and the erection of advertisement signs and fencing as they are considered to be a development of insufficient scale, or of a type which would not result in cumulative effects with the Scheme.

Stage 2 - Develop a short list of RFFPs

3.6.11 Establishing the shortlist of 'other development' for the cumulative effects assessment by applying the threshold criteria based on temporal scope, the scale and nature of other development and any other relevant factors to assist in deciding whether to include or exclude 'other development'.

3.6.12 Minor developments i.e. less than 10 dwellings or less than 1000m² for industrial/commercial premises will not be included in the assessment unless within the Scheme boundary or permitted development associated to the Scheme, as they are considered too small to have any significant interaction with the Scheme. Applications approved over three years ago will not be considered, nor will applications for development outside of the ZOI.

3.6.13 Only RFFPs that are to be delivered over a similar timeframe of the Scheme will be considered in this assessment, which will be applications that are proposed to be delivered before or shortly after the construction of the Scheme.

²² Planning Inspectorate (2015). *Advice Note 17: cumulative effects assessment relevant to nationally significant infrastructure projects*. Available at: <https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-advice-note-seventeen-cumulative-effects-assessment-relevant-to-nationally-significant-infrastructure-projects>

- 3.6.14 As part of this stage, feedback from the Local Planning Authorities will also be considered to determine whether any other existing or emerging developments in the vicinity of the Scheme should be taken into consideration.
- 3.6.15 Advice Note 17²² adopts a tiered system, which reflects the likelihood of a development coming forward. Those in Tier 1 are considered to be the most certain to come forward and likely to have more detailed information on which to base the assessment whereas, those in Tier 3 are likely to have limited publicly available information to guide the assessment. This approach still allows projects of uncertainty to be included but it attaches less weight to their importance in the assessment. Taking this into account, each development will be allocated a tier based on the likely degree of certainty and considered accordingly in the assessment.
- 3.6.16 The following developments outlined within **Table 3.5** have already been identified for potential consideration within the EIA.

Table 3.5 Cumulative Schemes

Application ID	Address/Location	Description	Approximate Distance from the Scheme	Planning Status
H02-0875-22	Decoy Farm, Spalding Road, Crowland, Peterborough, Cambridgeshire, PE6 0LX	King Prawn Hatchery, Grow Out and Processing Facility.	500m West of Land Parcel B	Approved 05/12/22
H19-0425-23	319 Broadgate Sutton St Edmund Spalding PE12 0LH	Use of site for breeding a maximum of 14 dogs with a maximum of 6 litters per year and extension to garage to form unit for housing dogs and for storage of feed. The total extension comprises approximately 3,500 square metres in area.	2.2km East of Land Parcel D	Approved 01/08/2023
H09-0501-23	Land off, Holbeach Drove Gate, Holbeach Drove, Spalding, Lincolnshire, PE12 0PX	Comprises construction of agricultural machinery assembly facility (over 3,000 square metres), research and training facility, ground mounted solar array and associated infrastructure.	Within Site Boundary, D-7 Land Parcel	Submitted 31/05/2023 Undecided
H09-0818-23	Ashtree Farm, Little Dog Drove, Holbeach St Johns, Holbeach, Spalding, Lincolnshire, PE12 8RR	Proposed 1,000 square metre grain store.	200m West of Grid Connection Corridor	Approved 11/04/24
H23-0471-23	Bleu Raye Farm, Millgate, Whaplode, Spalding, Lincolnshire, PE12 6RY	Erection of 19 holiday lodges, reception building, facility managers accommodation & maintenance shed, 2 fishing lakes and associated hard and soft landscaping.	500m East of Grid Connection Corridor	Submitted 18/05/2023 Undecided
National Grid Electricity Transmission Grimsby to Walpole	West of Grimsby to Walpole, near Wisbech	New c140km long 400kv overhead line and 5 new substations stretching from a new substation to the west of Grimsby in the north to a new substation at Walpole near Wisbech in the south. Three further substations will be built, two to the south west of Mablethorpe and one to the north east of Spalding.	Intersects Grid Connection Corridor	Nationally Significant Infrastructure Project - Pre-application stage Submission expected Q2 2027

Stage 3 - Information Gathering

- 3.6.17 This stage involves sourcing further information relating to the shortlisted developments, in order to establish the details of their likely environmental effects to inform the cumulative effects assessment. This is likely to be primarily obtained from documentation submitted as part of planning applications or used in the appraisals for site allocations. Information gathered (where available) is likely to comprise the design of the development, its location, the expected timelines and likely environmental effects.
- 3.6.18 To mitigate the potential for cumulative effects, it is possible consultation with the corresponding applicant will be necessary as part of the design development. For example, the Applicant intends to work closely with National Grid as part of their Grimsby West to Walpole proposal to mitigate the potential for cumulative effects, in so far as possible.

Stage 4 - Assessment

- 3.6.19 The assessment will be a qualitative evaluation, using professional judgement to recognise topic methodologies to define the receptor group(s) and consider its sensitivity to the type of impacts being predicted together with their likely magnitude and duration.
- 3.6.20 This results in a judgement being formed and justified as to whether cumulative effects are predicted to be experienced by the receptor and or/ physical feature. This will also be informed by factors including value and sensitivity of the receptor affected, duration of effect, extent of effect, type of effect, frequency of effect and likely success for mitigation. The value/sensitivity of the receptor(s) and magnitude of impact will be informed by the criteria set within the individual topic chapters of this ES. Effects are considered to be significant for if moderate, large or very large. The description of significance will also account of the guidance in Advice Note 17²² to consider the capacity of environmental resources and receptors to accommodate any changes that are likely to occur.

3.7 Assessment of Alternatives

- 3.7.1 In accordance with Schedule 4, paragraph 2 of the EIA Regulations⁴, the ES will include a description of the reasonable alternatives studied by the applicant that are relevant to the Scheme, as well as an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.
- 3.7.2 The Scheme site selection evaluation process explored a range of possible alternatives for the solar PV electricity generating facility with associated infrastructure, including co-located battery storage and Grid Connection, against a set of objectives for the Scheme. The methodology and reasoning for site selection will be presented in the ES.
- 3.7.3 Similarly, the Grid Connection options appraisal results will also be presented in the ES.
- 3.7.4 Notable design and layout option for the Scheme will also be considered and presented as the design process develops.

3.8 Assumptions and Limitations

- 3.8.1 Potential impacts and their effects cannot be predicted with absolute certainty. Predictions are limited by the quality and certainty of information available, and the accuracy of predictive techniques employed. The assessments presented in the ES will, therefore, indicate the likely magnitude of impacts and significance of effects rather than providing precise predictions of effects. Where uncertainty exists, a precautionary approach assuming a reasonable worst-case impact will be adopted for the assessment.
- 3.8.2 An acknowledgement and details of any limitations or assumptions adopted for each of the topic specific assessments will be provided within each of the topic chapters of the ES. The extent to which these limitations and assumptions are likely to affect the assessment outcome (where applicable) will also be outlined.

3.9 Related Assessments

- 3.9.1 A number of other assessments and documents will be produced as part of the DCO application for the Scheme. Some of these may inform or be informed by the ES. These will be produced as standalone reports and are likely to include the following:
- Habitat Regulations Assessment (HRA) Screening Report;
 - Water Framework Directive (WFD) Assessment;
 - Flood Risk Assessment (FRA);
 - Outline Construction Environmental Management Plan (CEMP);
 - Outline Decommissioning Environmental Management Plan (DEMP);
 - Outline Construction Traffic Management Plan (CTMP);
 - BNG assessment and reporting;
 - Outline Soil Management Plan (SMP);
 - Site Waste Management Plan (SWMP);
 - Outline Landscape and Ecological Management Plan (LEMP); and
 - Statement of Statutory Nuisance.

4 Proposed Scope of the EIA and Potential Environmental Effects

4.1 Introduction

4.1.1 This section considers the potential for the Scheme to result in environmental effects on the following factors (as per the EIA Regulations 4(2)⁴):

- Climate change;
- Cultural heritage;
- Ecology and biodiversity;
- Hydrology, flood Risk and WFD;
- Agriculture and soils;
- Landscape and visual;
- Noise and vibration;
- Socio-Economics, human health and land use; and
- Traffic and access.

Other Environmental Considerations

- Air quality
- Glint and glare;
- Major accidents and disasters;
- Waste; and
- Telecommunications and utilities.

4.1.2 The following statutory and non-statutory bodies have been consulted to help inform this Scoping process:

- The Planning Inspectorate
- Lincolnshire County Council;
- South Holland District Council;
- Environment Agency;
- Natural England;
- Historic England;
- North Level District Internal Drainage Board; and
- South Holland Internal Drainage Board.

4.1.3 Details of how this engagement has informed the scope is outlined in the specific topic sections below.

4.2 Topics proposed to be ‘Scoped in’ to EIA

Climate Change

Table 4.1 Climate Change

<p>Introduction</p> <p>This table identifies the proposed scope of the EIA to assess Climate Change. This In-Combination Climate Change Impact (ICCI) Assessment considers:</p> <ul style="list-style-type: none"> • Lifecycle Greenhouse Gas (GHG) Impact Assessment - The potential effects of the Scheme on climate, in particular the magnitude of GHG emissions emitted during construction, operation and decommissioning; and • Climate Resilience - The vulnerability of the Scheme to climate change, in particular the impacts of extreme weather (caused by climate change) and adaptation to mitigate the effects of these impacts. 	
<p>Study Area</p>	<p><u>Lifecycle GHG Impact Assessment</u></p> <p>The study area for the GHG impact assessment covers all direct GHG emissions arising from activities undertaken within the Site Boundary during the construction, operation and maintenance, and decommissioning of the Scheme. It also includes indirect emissions embedded within the construction materials arising as a result of the energy used for their production, as well as emissions arising from the transportation of materials, waste and construction workers.</p> <p>The study area also includes activities that may be avoided or displaced as a result of the Scheme such as other grid electricity production activities.</p> <p><u>Climate Change Adaptation and Resilience</u></p> <p>The study area for the climate change resilience review is the land within the Site Boundary, i.e. it covers the construction, operation and decommissioning of all assets and infrastructure which constitute the Scheme.</p> <p><u>In-Combination Climate Change Impact Assessment</u></p> <p>The study area for the ICCI assessment is as defined in each environmental assessment within the ES Chapters, and includes all environmental receptors identified within the assessments undertaken by the environmental disciplines.</p>
<p>Planning Policy and Guidance</p>	<p>The following key legislation, policy and guidance will be used within the climate change assessment:</p> <p><u>Legislation</u></p> <ul style="list-style-type: none"> • Climate Change Act 2008¹⁷ as amended 2019^{18,18}; • UK Climate Change Risk Assessment 2022²³; • The Paris Agreement 2015²⁴; and • The Glasgow Climate Pact 2021²⁵. <p><u>National Planning Policy</u></p> <ul style="list-style-type: none"> • Overarching National Policy Statement for Energy (EN-1)⁷;

²³ Department for Environment, Food and Rural Affairs (2022) *UK Climate Change Risk Assessment 2022*. Available at: <https://assets.publishing.service.gov.uk/media/61e54d8f8fa8f505985ef3c7/climate-change-risk-assessment-2022.pdf>

²⁴ *Paris Agreement to the United Nations Framework Convention on Climate Change 2015*. Available at: https://unfccc.int/sites/default/files/english_paris_agreement.pdf

²⁵ *Glasgow Climate Pact 2021*. Available at: https://unfccc.int/sites/default/files/resource/cma3_auv_2_cover%20decision.pdf

	<ul style="list-style-type: none"> • National Policy Statement for Renewable Energy Infrastructure (EN-3)⁸; • National Policy Statement for Electricity Networks Infrastructure (EN-5)⁹; and • National Planning Policy Framework (NPPF)¹⁰. <p><u>Local Planning Policy</u></p> <ul style="list-style-type: none"> • South East Lincolnshire Local Plan (SELLP) 2011-2036¹²; • Lincolnshire County Council (2020) Initial Action Plan 2020-2025²⁶; • Lincolnshire County Council (2021) Green Masterplan²⁷; and • Lincolnshire County Council (2019) Carbon Management Plan²⁸. <p><u>Guidance</u></p> <ul style="list-style-type: none"> • Climate Change Planning Practice Guidance²⁹; • Institute of Environmental Management and Assessment (IEMA) (2022) Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance³⁰; • IEMA (2020) Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation³¹; and • Publicly Available Specification (PAS) 2080 (2023) Carbon Management in Buildings and Infrastructure³².
<p>Baseline Conditions</p>	<p><u>Lifecycle GHG Impact Assessment</u></p> <p>The sensitive receptor in this case will be the global atmosphere. The baseline considers GHG emissions that would be emitted or sequestered in the absence of the Scheme from within the Site Boundary. The current land use within the Site Boundary consists of predominantly agriculture; arable land, with small numbers of buildings associated with nearby villages/farms. Trees are present individually in some areas, as well as in rows and within small woodland areas. The abundance of vegetation within the Site Boundary suggests a relatively high carbon sink potential.</p> <p>Baseline agricultural GHG emissions are dependent on soil and vegetation types present, and fuel use for the operation of vehicles and machinery. There are also emissions associated with the existing road network within the Site Boundary, though this is expected to be minor based on the rural location. The existing within the Site Boundary emissions will be calculated on the basis of energy use and transport. Where there is lack of data availability, a worst-case scenario will be adopted, whereby the baseline is considered to be zero emissions, meaning that any net change in GHG emissions will be measured against zero.</p> <p><u>Climate Change Adaptation and Resilience</u></p> <p>For this aspect of assessment, a future baseline will be used. This will be using a future year of 2080, to represent a reasonable timeframe by which time UK Climate Projections (UKCP)</p>

²⁶ Lincolnshire County Council (2020) *Initial Action Plan 2020-2025*. Available at: <https://www.lincolnshire.gov.uk/green-masterplan/initial-plan-2020-2025/>

²⁷ Lincolnshire County Council (2021) *Green Masterplan*. Available at: <https://www.lincolnshire.gov.uk/green-masterplan/>

²⁸ Lincolnshire County Council (2021) *Carbon Management Plan: Final 2019*. Available at: <https://www.lincolnshire.gov.uk/downloads/file/3165/carbon-management-plan-2018-23>

²⁹ Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities and Local Government (2019) *Planning Practice Guidance: Climate Change*. Available at: <https://www.gov.uk/guidance/climate-change>

³⁰ IEMA (2022) *Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance*. 2nd edn. Available at: <https://www.iema.net/preview-document/assessing-greenhouse-gas-emissions-and-evaluating-their-significance>

³¹ IEMA (2020) *Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation*. Available at: <https://www.iema.net/downloading-document/42159>

³² Institution of Civil Engineers (ICE) (2023) *Guidance Document for PAS 2090: Practical actions and examples to accelerate the decarbonisation of buildings and infrastructure*. Available at: https://www.ice.org.uk/media/vmOnwehp/2023-03-29-pas_2080_guidance_document_april_2023.pdf

	<p>from 2018 (UKCP18)³³ under a worst-case relative concentration pathway 8.5 (RCP 8.5) will likely be observed.</p> <p>The sensitive receptor in this case will be the Scheme itself and its users, as well as considering the potential for ICCIs on sensitive receptors considered in other EIA topics.</p> <p>A 2°C increase of global mean warming is possible by 2080, meaning:</p> <p>For temperature:</p> <ul style="list-style-type: none"> • The largest warming in the UK will be in the southeast where summer temperatures may increase another 3 to 4°C; • Median warming will be at least 1 to 2°C throughout the year across the whole of the UK; • Winter cool days will warm by 1 to 1.5°C across the country, whilst temperatures on warmer winter days increase by less than 1°C; and • In summer, both hot and cool days will warm by 1.5 to 2°C across England. <p>For precipitation:</p> <ul style="list-style-type: none"> • Changes are uncertain, but suggest slightly wetter winters and drier summers, with summer drying more in the South. <p>A more detailed assessment of climate change projections will be conducted for the land within the Site Boundary as part of the ES.</p> <p><u>In-Combination Climate Change Impact Assessment</u></p> <p>The receptors for in-combination climate change impact are receptors within the surrounding environment that will be impacted by the Scheme in combination with future climatic conditions. Baseline conditions for the in-combination climate change impact assessment will be determined using the climate change projections data.</p>
<p>Assessment Methodology</p>	<p>The approach to assessing the potential impacts of the Scheme on climate will follow the 2020³¹ and 2022³⁰ IEMA Guidance documents on assessing EIAs.</p> <p>Lifecycle GHG Impact Assessment</p> <p>The baseline for the purposes of the assessment can be assumed to be zero in case of absence of site emission data. This will provide a reasonable worst-case baseline against which to establish net effects. The baseline context will be presented in terms of national carbon budgets for the UK. The ES will provide a technical appendix that quantifies the GHG emissions from the construction, operational and decommissioning phases of the Scheme.</p> <p>It is noted that Scheme will comprise the solar PV and electrical battery storage generating facility with a significant electricity generation capacity in the region of 750MW. The ES Chapter will consider the potential benefits and net-positives this will have on any significant impacts the Scheme will incur as a result of its operation, and how these will potentially offset the emissions generated during the construction and operation of the Scheme.</p> <p><u>Construction Phase</u></p> <p>The generation of GHG emissions during construction will be inevitable. Embodied GHG emissions will also be generated during the production of the solar PV modules and associated infrastructure.</p> <p>Following the receipt of the required data, in terms of all materials and quantities, the One Click Life Cycle Assessment (LCA) tool will be used to calculate the environmental effects of GHG emissions during construction. This will be in the form of tonnes of carbon dioxide</p>

³³ Meteorological Office (2024) UK Climate Projections (UKCP). Available at: <https://www.metoffice.gov.uk/research/approach/collaboration/ukcp>

equivalent (tonnes CO2e) from the embodied carbon in the construction of the Scheme. LCA is a scientific methodology used to calculate the environmental impacts, including carbon footprint, of a product, service, or process. ence of project specific data, benchmark figures will be provided. GHG emissions from constructional traffic will be estimated based upon anticipated trip generation, and assumptions for typical vehicle emissions and trip length.

Operational Phase

An inventory will be created of direct and indirect emissions associated with the operation of the Scheme. This will include any details relating to regulated and unregulated carbon emissions which may come from an Energy Strategy or benchmarks, repair/refurbishment over the lifetime of the development and any associated buildings.

Considering that the Scheme will comprise the solar PV modules and BESS, the generated renewable energy will have an overall net positive significant effect on emissions reduction during operational years of the Scheme. The net positive significant effect will be determined via comparisons to the potential emissions released from an alternative fossil-fuel generating stations (such as a combined cycle gas turbine plant).

Decommissioning Phase

Future emissions at the end of the Scheme’s design life will also be taken into account, including those associated with any decommissioning activities. This will either result from the data obtained from the One Click LCA analysis or benchmarks. Mitigation measures will be suggested, that will align with principles associated with the circular economy.

Assessment Principles

Overall, the assessment principles will involve:

- Identifying those sources of emissions that are not expected to result in a material contribution to the overall Scheme, and excluding them from further assessment; and
- For those residual GHG emissions, applying a set of robust ‘emissions factors’ (i.e. the amount of GHG resulting from a given source), to enable a like for like comparison to be made. Or using benchmarks in the absence of available data.

Using the One Click LCA tool outputs or benchmarking results, the assessment will quantify emissions from the whole life cycle of the Scheme, which will then be compared against the carbon budgets for the UK, for construction and operational phase separately, in order to compare the % share of GHG emissions that the construction of the Scheme has on the UK carbon budget, which aids the assessment of contextualise significance. As stated in the 2022 IEMA Guidance³⁰³⁰, “GHG emissions have a combined environmental effect that is approaching a scientifically defined environmental limit, as such any GHG emissions or reductions from a project might be considered to be significant”. Guidance goes on to explain that there is no single preferred method to evaluate significance, but the greater a Scheme’s carbon budget (i.e. magnitude of change), the greater its significance.

Unlike other EIA topics, sensitivity is only considered for a single receptor (i.e. the whole planet) and, therefore, it is the magnitude that drives significance. The potential significance of the Scheme’s lifecycle GHG emissions will be assessed by comparing the estimated GHG emissions from the Scheme against the reduction targets defined in the Climate Change Act 2008¹⁷ and associated five-year, legally binding carbon budgets. It is, consequently, practical to base the assessment on professional judgement on the likely significance of effects based on a set of significance criteria as outlined in the 2022 IEMA guidance³⁰³⁰.

Climate Change Adaption

For this aspect of climate change, the operational phase only will be assessed, due to the construction and decommissioning phase being short term and therefore the significant impacts of intensifying climate change would be unlikely to fully manifest in this timeframe. If construction or decommissioning activities coincide with extreme weather event(s) such as drought or storms, these would be managed through appropriate measures set out in the CEMP or DEMP, or would be addressed as required by other relevant topics, for example

	<p>potential construction related surface water flood risks related to extreme weather would be addressed within Hydrology, Flood Risk and WFD.</p> <p>The baseline for the climate change resilience assessment will be formed from documents such as the UK Climate Change Risk Assessment 2022²³, and will outline the key climatic hazards that could arise within the study area (existing and in 2080), and subsequent consequences based on the parameters of the Scheme.</p> <p>IEMA’s guidance ‘Climate Change Resilience and Adaption’ (2020)³¹ presents a methodology for the consideration of climate change resilience and adaption in the EIA process, which will be followed in the ES:</p> <ul style="list-style-type: none"> • Identify any sensitive receptors identified across all EIA topics that could be affected by climate change, and categorise them in terms of their relative sensitivity; • Apply the future climate scenario to qualitatively or quantitatively assess, using professional judgement, how each receptor is likely to be affected by the 2080s; • Consider and present the alternatives considered with respect to resilience and adaptive measures associated with the scheme’s design or management, and clearly identify those which form part of the Scheme; and • Assess whether these adopted measures are likely to be sufficient, or whether further interventions are likely to be required in the future. <p>The 2020 IEMA Guidance³¹ also introduced a new significance aspect which will be considered as part of the climate change adaption assessment. Determination of the risk level of climate hazards and thus significance of effect will be based on a combination of likelihood and consequence. The assessment is qualitative and uses expert judgement based on knowledge of similar schemes, engagement with the wider project team and a review of relevant literature. ICCIs will also be assessed, which is where consideration will be given to the likely significant environmental effects and their associated magnitude of effect, identified within the other topics being assessed as part of the ES.</p> <p>Cumulative Effects</p> <p>In line with IEMA (2022) guidance³⁰, the assessment of the Scheme’s emissions will be against particular carbon budgets, which inherently take account of other committed development. Therefore, it is not required to undertake a cumulative assessment.</p> <p>Regarding resilience and adaptation, an assessment will be undertaken regarding how the Scheme could interact with other committed developments in the local area, although it is assumed that all committed developments will account for future climate in some way.</p>
<p>Key Issues and Potential Likely Impacts</p>	<p>Construction Phase</p> <p><u>Lifecycle GHG Impact Assessment</u></p> <p>The construction of the Scheme is likely to result in carbon emissions through activities such as (but not limited to):</p> <ul style="list-style-type: none"> • Raw material extraction and manufacturing of products required to build the equipment for the Scheme. Due to the complexity of the equipment, this stage is expected to make a significant contribution to overall GHG emissions; • Transportation of materials for manufacturing; • On-site construction activity including emissions from construction compounds; • Transportation of construction materials (where these are not included in product-stage embodied GHG emissions); • Travel of construction workers; • Disposal of waste materials generated by the construction process; • Land use change; • Water use;

	<ul style="list-style-type: none"> • Operation and maintenance of scheme; • On-site decommissioning activities; • Transportation and disposal of waste material; and • Worker travel. <p>Under IEMA 2022 guidance³⁰, GHG emissions that prevent the achievement of the trajectory to net zero (following a Science Based Target) should be considered significant in EIA; therefore, the assessment will consider this and how the Scheme goes beyond 'business as usual', to determine whether it will lead to significant environmental effects.</p> <p>Operational Phase</p> <p><u>Lifecycle GHG Impact Assessment</u></p> <p>For the operational phase of the Scheme, GHG emissions will arise from regulated and unregulated energy use by the Scheme, repair/refurbishment over the lifetime of Solar Farm and associated infrastructure. These may be considered significant in accordance with the 2022 IEMA guidance³⁰, unless it can be demonstrated how the Scheme goes beyond standard practice and aligns with policy that is compliant with a net zero trajectory. This will be considered in an assessment of GHGs greenhouse gases.</p> <p><u>Climate Change Adaption and Resilience</u></p> <p>The Scheme will need to adapt and be resilient to the changing climate, as future climate conditions may cause significant effects in relation to risks from extreme weather (short and long term), temperature changes, precipitation, drought wind alterations and flooding. The Scheme will potentially be vulnerable to the following parameters:</p> <ul style="list-style-type: none"> • The Scheme may be vulnerable to extreme weather events such as storm damage to structures and assets; • Extremes in temperatures may result in heat stress of materials and structures; • The Scheme may be vulnerable to changes in precipitation, for example, land subsidence and damage to structures and drainage systems during periods of heavy rainfall; and • The Scheme may be vulnerable to changing wind patterns, for example, high winds and falling trees could damage structures and assets. <p>Decommissioning Phase</p> <p>Potential impacts are anticipated to be similar to those considered for the Construction Phase.</p>
<p>Design, Mitigation and Enhancement Measures</p>	<p><u>Lifecycle GHG Impact Assessment</u></p> <p>Measures will be presented, that will be adopted as mitigation, following the principles of the carbon management hierarchy (i.e. avoid, reduce, off-set), to show how the anticipated GHG emissions and climate resilience of the Scheme will be reduced as far as reasonably practicable.</p> <p>The CEMP will include various mitigation measures to be embedded within the Scheme to reduce the GHG impact. These will include:</p> <ul style="list-style-type: none"> • Measures to increase recyclability and reduce pollution; • Designing, constructing, and implementing the Scheme in such a way as to minimise the creation of waste and maximise the use of alternative materials with lower embodied carbon such as locally sourced products and materials with a higher recycled content; • Encouraging the use of lower carbon modes of transport by identifying and communicating local bus connections and pedestrian and cycle access routes to/from the Scheme to all construction staff, and providing appropriate facilities for the safe storage of cycles;

	<ul style="list-style-type: none"> • Liaising with construction personnel for potential to implement staff minibuses and car sharing options; • Implementing a Travel Plan to reduce the volume of construction staff and employee trips; • Switching off vehicles and plant when not in use and ensuring construction vehicles conform to current EU emissions standards; and • Conducting regular planned maintenance of the Scheme to optimise efficiency. <p>Climate Change Adaption and Resilience</p> <p>Consideration will be given to the UKCP18 climate change projections³³ and the resilience of the Scheme’s infrastructure to these, through the detailed design process and measures to mitigate effects from climate change (i.e. build resilience and adaptability) on the Scheme will be identified, and these are likely to focus on mitigation of flood risk, temperature changes and extreme weather events. These mitigation measures will be obtained via the respective ES Chapters.</p> <p>The CEMP will also include various climate change resilience mitigation measures to be embedded within the Scheme during construction, such as:</p> <ul style="list-style-type: none"> • Minimising the duration of topsoil and construction material storage within the 1 in 100-year floodplain extent (Flood Zone 3); and • The development of Health and Safety plans for construction and decommissioning activities to account for potential climate change impacts on workers, such as flooding and heatwaves. <p>Mitigation measures to encourage the use of low-carbon and more climate change resilient methods will be included within an Outline DEMP, prior to any decommissioning.</p>
<p>Consultation</p>	<p>It is not proposed to undertake targeted consultation specifically to inform the assessment of impacts for this topic, however any relevant information gathered during the non-statutory and statutory consultation events will be considered, where appropriate.</p>
<p>Assessment Assumptions and Limitations</p>	<p>Lifecycle GHG Impact Assessment</p> <p>Carbon dioxide equivalent (CO₂e) is a term describing greenhouse gases in a common unit. For any quantity and type of greenhouse gas, ‘CO₂e’ signifies the amount of CO₂ which would have the equivalent global warming impact.</p> <p>Climate Change Adaption and Resilience</p> <p>There are a number of limitations associated with the assessment of climate change adaptation and risks from more extreme weather. Climate projections used from United Kingdom Climate Projections (UKCP18)³³, under an appropriate scenario and timescale within that there will be fluctuations given the inherent uncertainties within the modelling underpinning this assessment.</p> <p>Furthermore, given the long-term nature of the assessment, a broader consideration of receptor types (rather than specific receptors identified in other topics) will be used, upon which to base consideration of how projected climatic conditions could affect these.</p> <p>All assumptions and limitations, including any exclusions, together with assumptions for choices and criteria leading to exclusion of input and output data will be documented as part of the assessment within the ES.</p>
<p>Summary of Aspects</p>	<p>Aspects scoped into EIA</p> <p><u>Lifecycle GHG Impact Assessment</u></p> <p>Construction and Decommissioning Phase Scope:</p> <ul style="list-style-type: none"> • Embedded carbon (materials required to construct the Scheme);

	<ul style="list-style-type: none"> • Emissions associated with waste disposal, construction site activities (e.g. construction plant, site offices, welfare facilities etc.), land use change, water consumption; and • Transport (emissions associated with traffic generated by the construction of the Scheme. <p>Operational Phase Scope:</p> <ul style="list-style-type: none"> • Repair, Maintenance and Refurbishment; and • Energy. <p><u>Climate Change Adaptation and Resilience</u> Operational phase climate change resilience and ICCI scoped in.</p> <p>Aspects scoped out of EIA</p> <p><u>Lifecycle GHG Impact Assessment</u></p> <p>Operational Phase Scope:</p> <ul style="list-style-type: none"> • Transport will be scoped out due to the rural nature of the Scheme and that, once operational, traffic generated by the Site is expected to be minimal and not represent a significant risk. <p><u>Climate Change Adaptation and Resilience</u></p> <p>Construction and Decommissioning Phase Scope:</p> <ul style="list-style-type: none"> • Construction and Decommissioning impacts are scoped out of this assessment due to the short-term nature of the activities associated with the construction and decommissioning period, and the impacts of climate change not being anticipated to have significant effects in such a short period of time. In addition, as outlined above, any potential impacts are likely to be mitigated via mitigation measures included in other ES Chapters and the implementation of a CEMP and DEMP.
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Cultural Heritage

Table 4.2 Cultural Heritage

<p>Introduction</p> <p>This table identifies the proposed scope of the EIA to assess Cultural Heritage. This considers:</p> <ul style="list-style-type: none"> • Physical effects on heritage assets; and • Effects upon the significance of a heritage asset due to changes in its setting. 	
<p>Study Area</p>	<p>A study area has been adopted to enable all heritage assets potentially affected by the Scheme to be identified and placed in their wider setting.</p> <p>A study area comprising a 1km buffer around the Scheme Site Boundary was established to assess the nature of the surrounding heritage sites and to place recorded sites within their context. It is considered that the extent of the study area is appropriate and proportionate to identify the likely impacts and effect of the proposed Scheme as well as to inform the historic baseline.</p> <p>A flexible approach will be taken to the identification of high importance assets on which there may be an impact upon their setting beyond the 1km study area. The zones of theoretical visibility generated for the Scheme as part of the Landscape and Visual Effects assessment will be used to identify heritage assets outside of the study area which could potentially be affected by the Scheme. This will be undertaken in inform the preparation of the ES chapter.</p>
<p>Planning Policy and Guidance</p>	<p>The assessment will be undertaken in accordance with the following relevant legislation, along with national, regional, and local plans and policies and professional guidance as detailed below:</p> <p><u>Legislation</u></p> <ul style="list-style-type: none"> • Ancient Monuments and Archaeological Areas Act 1979³⁴; • Planning (Listed Buildings and Conservation Areas) Act 1990³⁵; and • Infrastructure Planning (Decisions) Regulations 2010³⁶. <p><u>National Planning Policy</u></p> <ul style="list-style-type: none"> • Overarching National Policy Statement for Energy (EN-1)⁷; • National Policy Statement for Renewable Energy Infrastructure (EN-3)⁸; • National Policy Statement for Electricity Networks Infrastructure (EN-5)⁹; and • National Planning Policy Framework (NPPF)¹⁰. <p><u>Local Planning Policy</u></p> <ul style="list-style-type: none"> • South East Lincolnshire Local Plan (SELLP) 2011-2036¹²; and • Lincolnshire County Council (2019) Archaeology Handbook³⁷. <p><u>Guidance</u></p>

³⁴ Ancient Monument and Archaeological Areas Act 1979 (as amended). Available at: <https://www.legislation.gov.uk/ukpga/1979/46/data.pdf>

³⁵ Planning (Listed Buildings and Conservation Areas) Act 1990. Available at: <https://www.legislation.gov.uk/ukpga/1990/9/data.pdf>

³⁶ The Infrastructure Planning (Decisions) Regulations 2010. Available at: <https://www.legislation.gov.uk/ukdsi/2010/9780111490266/data.pdf>

³⁷ Lincolnshire County Council (2019) Archaeology Handbook. Available at: <https://www.lincolnshire.gov.uk/downloads/file/2204/archaeology-handbook-pdf>

	<ul style="list-style-type: none"> Chartered Institute for Archaeologists (CIfA) (2020) Standards and Guidance for Historic Environment Desk-based Assessments³⁸; Historic England (2017) Good Practice in Planning Advice Note 3: The Setting of Heritage Assets³⁹; Historic England (2019) Advice Note 12: Statements of Heritage Significance⁴⁰; Historic England (2021) Advice Note 15: Commercial Renewable Energy Development and the Historic Environment⁴¹; and IEMA, CIfA and Institute of Historic Building Conservation (IHBC) (2021) Principles of Cultural Heritage Impact Assessment in the UK⁴².
<p>Baseline Conditions</p>	<p>All designated heritage assets identified within the study area are listed in a gazetteer in Appendix A and illustrated in Figure 2.5 and Figure 2.6.</p> <p>There are no World Heritage Sites, Registered Parks and Gardens or Protected Wreck Sites in the study area.</p> <p>There are 11 Scheduled Monuments within the study area, two of which are within the PV Area and one of which is adjacent to the PV Area. All Scheduled Monuments are of high importance. These are:</p> <ul style="list-style-type: none"> Settlement W (west) of Cate's Cover Corner (1004979) is located within fields C-1-01, C-1-03 and C-1-08; Settlement NE of Whitebread Farm (1004978) is located within fields C-2-01 and C-2-03; Medieval boundary earthworks at Queen's Bank, 100m southeast of Providence House (1009980) is located adjacent to the PV Area, on the north side of the settlement W of Cate's Cove Corner (1004979); Settlement in Moulton West Fen (1002944) is located approximately 500m north of C-2; Romano-British settlement S (south) of Shell Bridge (1004982) is located approximately 300m west of D-3-01; Saint Guthlac's Cross (1005052) is located 600m east of A-1-12 and 600m west of B-3-01. The cross is additionally protected as a Grade II Listed Building; Settlement SE of Lower Delgate Farm (1002945) is located approximately 350m east of the Grid Connection Corridor; Settlement between Broadgate Farm and Lower Delgate Farm (1004963) is located adjacent to the Grid Connection Corridor; Churchyard cross, St Mary's churchyard (1013529) located approximately 375m west of the Grid Connection Corridor; King's Hall moated site, 480m east of Broadwater House Farm (1017217) is located approximately 150m east of the Grid Connection Corridor; and

³⁸ CIfA (2020) *Standard and guidance for historic environment desk-based assessment*. Available at: https://www.archaeologists.net/sites/default/files/CIfAS%26GDBA_4.pdf

³⁹ Historic England (2017) *The Setting of Heritage Assets: Historic Environment Good Practice Advice in Planning Note 3 (Second Edition)*. Available at: <https://historicengland.org.uk/images-books/publications/gpa3-setting-of-heritage-assets/heag180-gpa3-setting-heritage-assets/>

⁴⁰ Historic England (2019) *Statements of Heritage Significance: Analysing Significance in Heritage Assets Historic England Advice Note 12*. Available at: <https://historicengland.org.uk/images-books/publications/gpa2-managing-significance-in-decision-taking/gpa2/>

⁴¹ Historic England (2021) *Commercial Renewable Energy Development and the Historic Environment: Historic England Advice Note 15*. Available at: <https://historicengland.org.uk/images-books/publications/commercial-renewable-energy-development-historic-environment-advice-note-15/heag302-commercial-renewable-energy-development-historic-environment/>

⁴² IEMA, CIfA, and IHBC (2021) *Principles of Cultural Heritage Impact Assessment in the UK*. Available at: https://www.archaeologists.net/sites/default/files/j30361_iema_principlesofchia_v8.pdf

	<ul style="list-style-type: none"> • Wykeham Chapel: a moated monastic grange and retreat house (1019096) is located adjacent to the Grid Connection Corridor. <p>There is one Conservation Area within the study area at Moulton. The Grid Connection Corridor is located approximately 360m west of the Conservation Area at its closest point. The Conservation Area is of medium importance.</p> <p>There are 46 Listed Buildings within the study area (including St Guthlac's Cross mentioned above). Four are Grade I, one is Grade II* and the rest are Grade II Listed. The Listed Buildings within the study area are listed in the gazetteer in Appendix A. Grade I and II* Listed Buildings are of high importance. Grade II Listed Buildings are of medium importance.</p> <p>There are two Listed Buildings within the Site Boundary:</p> <ul style="list-style-type: none"> • Austendike Hall (1359267) is Grade II listed and located within the Grid Connection Corridor; and • The Church of St John the Baptist (1147611) is Grade II listed and located within the Cable Connection Corridors. <p>The Site lies within the fenland basin of South Lincolnshire, the largest single area of wet lowland in the United Kingdom⁴³. In this area the pre-Flandrian (c.12,000 years ago) land surface is buried beneath later Flandrian deposits. The deepest of these Flandrian deposits is a basal peat which can be found as deep as 9m below the surface, but steadily rises towards the fen edge. Marine alluvium overlies the peat, primarily consisting of clay. Silty features known as roddons cut through the clay. Roddons are the remains of former creeks and generally sit higher than the surrounding clay, which combined with their composition means that almost all settlement and saltern sites occur on the tops or sides of roddons⁴⁴.</p> <p>Within the study area there are no records of Palaeolithic, Mesolithic, Neolithic or Bronze Age heritage assets. There is a large amount of evidence in the study area relating to the Iron Age or Romano-British period. Romano-British settlements, field systems and industrial sites have been identified from cropmarks recorded on aerial photographs, pottery scatters identified from fieldwalking and past investigations. Cropmarks, potentially showing Romano-British settlements, are extensive across the study area, including within the Site. Salt-making sites containing salterns are also widespread across the study area.</p> <p>The early-medieval period is poorly represented within the study area, although there is likely to have been a continuation of use of rural settlement sites from the Romano-British period through the early-medieval period and into the medieval period, as evidenced by later pottery scatters found within Romano-British settlement sites. Further evidence of medieval activity in the area comes from medieval rural settlements and ecclesiastical sites.</p> <p>The post-medieval record is dominated by farmsteads demonstrating the change in land usage of the fens associated with wide-scale drainage and increased agricultural exploitation. Many of these farmsteads are still in use and survive as partially redeveloped buildings. 20th century modern records are very rare within the study area, represented by First and Second World War memorials.</p> <p>The significance of the non-designated heritage assets will be determined through further desk-based research and field evaluation.</p>
<p>Assessment Methodology</p>	<p>The basis for assessing impacts on the historic environment is an understanding of the heritage assets that might be affected by a proposal. The NPPF¹⁰ glossary defines a heritage asset as “A building, monument, site, place, area or landscape identified as having a degree of significance meriting consideration in planning decisions, because of its heritage interest. It includes designated heritage assets and assets identified by the Local Planning Authority (including local listing)”.</p>

⁴³ Hall, D. and Coles, J. (1994) *Fenland Survey an Essay in Landscape and Persistence*. English Heritage.

⁴⁴ Hayes, P.P. and Lane T.W. (1992) *The Fenland Project, Number 5: Lincolnshire Survey, The South-West Fens*. East Anglian Archaeology 55.

	<p>The NPPF¹⁰ and other planning policy and guidance emphasise the need to understand the cultural significance of heritage assets, including their setting, reflecting that the primary purpose is to preserve significance rather than no change.</p> <p>The process of gaining this understanding can be broken down into distinct stages:</p> <p><u>Stage 1</u> Research is undertaken leading to a preliminary factual statement that establishes the location, nature and setting of the asset.</p> <p><u>Stage 2</u> Analysis is made of what we value about the asset and the contribution made by its setting, leading to a statement of cultural significance (this is distinct from an assessment of significance of effect as outlined in Stage 6). Cultural significance is not scaled but can be expressed in terms of four key 'heritage interests' as outlined in NPPF¹⁰ Annex 2: Glossary. These interests include archaeological, architectural, artistic and historic:</p> <ul style="list-style-type: none"> • Archaeological: Where a heritage asset holds, or potentially holds, evidence of past human activity worthy of expert investigation. • Architectural: Interests in the design of a place. This can arise from conscious design or fortuitously from how the heritage asset has evolved. Architectural interest can lie in the art of science or the design, construction, craftsmanship and decoration of the building or structure (Historic England, 2019⁴⁰). • Artistic: Interest in other human creative skills which contribute to the value of the asset. This can arise of a conscious association or fortuitously from an association (e.g. depicted in a work of art or literature) (Historic England, 2019⁴⁰). • Historic: the ways in which past people, events and aspects of life can be connected through a place to the present. Heritage assets can either illustrate, or be associated with, past people and events. Heritage assets with historic interest provide a material record as well as providing meaning for communities with collective experience and an embody aspects of local and cultural identity (Historic England, 2019⁴⁰). <p><u>Stage 3</u> The attribution of importance (sometimes termed "value") is a measure of the degree to which cultural significance of the asset is sought to be protected. A judgement on importance is scaled and can be attributed in accordance with the terms set out below. As well as the criteria providing guidance, professional judgement, regional variation, and individual qualities are also considered in all cases to determine the importance of each asset. Not all the component parts of the asset may have the same importance, and this should be discussed where appropriate in the accompanying text.</p> <ul style="list-style-type: none"> • International (Very High); • National (High); • Regional (Medium); • Local (Low); • Negligible; and • Uncertain. <p><u>Stage 4</u> Having understood the cultural significance and importance of each asset, the next step is to understand the degree of the proposed change(s) as a result of the Scheme. Information on the change(s) will be used to identify what impact it would have on cultural significance of an assets at Stage 5. The details of the change will be provided in a factual statement of how a proposal would change an asset or its setting including physical, visual appearance, scale, nature and duration.</p> <p><u>Stage 5</u> Defining the Impact: An impact is any change which would increase or decrease the cultural significance of an asset. Impact is scaled, and the magnitude of impact reflects the extent to</p>
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	<p>which the cultural heritage significance of an asset is changed by a proposal. These can be positive or negative: direct or indirect: permanent or temporary; and/or cumulative. The impact may also arise at the construction, operation, maintenance or decommissioning phases of a development. The magnitude of impact should take account of mitigation measure which have been embedded within the Scheme as part of the design and optioneering process.</p> <p>A judgement of magnitude of impact can range from Major Negative to Major Positive.</p> <p><u>Stage 6</u></p> <p>The final step is determining the significance of the effect.</p> <p>The significance of effect is a conclusion regarding whether an impact matters or not, reflecting the importance of the affected heritage assets. The effect is the measure that brings together the magnitude of the impact and the heritage asset's importance. This is a critical stage of the assessment process as this determines the weight that should be given to the matter in either influencing the design of the proposal or ultimately in the test as to whether the proposal will be acceptable and permitted. The effect can be articulated through the use of a matrix which brings together the importance of an asset and the magnitude of impact on the asset's significance, the significance matrix will follow a similar criterion to that presented in Table 3.3. Where there are two options for a level of effect, it is a matter of professional judgement which should be articulated in the text description as to the level of effect appropriate.</p> <p>This assessment considers that major or moderate effects are significant in accordance with standard EIA practice and for the purposes of the EIA Regulations⁴. Decisions regarding the acceptability of a proposal will also need to be articulated within the parameters of relevant legislative or policy tests which may use their own specific language and terminology. Following the identification of an effect, additional mitigation can be used to offset, reduce or compensate for any significant adverse effects. Following mitigation, the assessment of significance of effect can be reassessed to determine the level of residual effect to an asset.</p>
<p>Baseline Development</p>	<p>The baseline study will consult the following sources as a minimum:</p> <ul style="list-style-type: none"> • The National Heritage List for England; • Lincolnshire County Council (LCC) Historic Environment Record (HER); • Historic mapping available online; • The Lincolnshire Record Office for historic mapping and other relevant records; • British Geological Survey (BGS) Geology of Britain Viewer for information on the geological conditions within the Site Boundary; • Soilscales online for information on the soil conditions within the Site Boundary; • Available borehole records; • Environment Agency LiDAR datasets; • Portable Antiquities Scheme online database for data relating to archaeological finds; • Archaeology Data Service for information on previous cultural heritage assessments and archaeological investigations; • East Midlands Historic Environment Research Framework; • Available published works and academic papers; • The results of other assessments undertaken in support of the Scheme application (e.g. Agricultural Classification Survey, Ground Investigation); and • Site visits to assess the heritage assets within the Site boundary and the immediate vicinity to record their survival, extent, condition, setting and significance. <p>The desk-based research will be supported by a programme of archaeological evaluation surveys. A geophysical survey will be undertaken within areas of the Site boundary that are suitable for survey and where land access can be obtained by way of landowner agreement.</p>

	<p>A detailed review of aerial photography and imagery, including transcriptions of potential assets, will also be produced.</p> <p>Further archaeological evaluation and detailed setting assessments will be undertaken as part of the assessment process, the scope of which will be informed by the desk-based analysis of information, the outcomes of the geophysical survey, the detailed aerial analysis and through consultation with relevant bodies. Further geoarchaeological assessment including deposit modelling may also be undertaken, informed by these earlier assessments and investigations.</p>
<p>Key Issues and Potential Likely Impacts</p>	<p>Construction Phase</p> <p>There are designated and non-designated heritage assets within the study area which may be affected by the Scheme during construction including, but not limited to, construction of the ground mounted solar PV panels, power control infrastructure and cabling, connector infrastructure, compounds and access tracks. These effects could include:</p> <ul style="list-style-type: none"> • Physical effects on heritage assets; and • Effects upon the significance of a heritage asset due to changes in its setting. <p>There is potential for previously unrecorded archaeological deposits to survive within the Scheme. These remains could potentially be impacted during construction works.</p> <p>There is potential for the physical effects on the designated and non-designated assets to be significant. The effects arising from changes in the setting of heritage assets are unlikely to be significant at construction as they will be temporary changes.</p> <p>Operational Phase</p> <p>There is potential for effects on the setting of heritage assets within the study area during the operation of the Scheme.</p> <p>Decommissioning Phase</p> <p>Decommissioning impacts are likely to be similar to any temporary impacts identified in relation to the construction phase of the Scheme. It is not anticipated that these effects would be significant.</p>
<p>Design, Mitigation and Enhancement Measures</p>	<p>Cultural Heritage technical specialists have been involved in the assessment and selection of the Grid Connection Corridors. Assessment and recommendations have been provided to the Applicant throughout the design/layout of the Scheme.</p> <p>The scope of mitigation in relation to Cultural Heritage will be informed by the desk-based analysis of information, the outcomes of the field survey, the detailed aerial imagery analysis and through consultation with relevant bodies. Mitigation measures may include but are not limited to:</p> <ul style="list-style-type: none"> • Removal of ground mounted solar PV panels from areas of significant archaeological deposits from the Scheme at the design stage; • Siting of the BESS and on-site substation in an area of the Site with reduced visibility to limit the visual intrusion into the setting of heritage assets; • Routing of the Grid Connection Corridor and siting of pylons to consider the potential impact on heritage assets; • Screening planning where appropriate; • The use of panel free buffers around designated and non-designated assets; and, • Where forms of design mitigation are not reasonably practicable, mitigation measures may include excavation and recording of archaeological remains in advance of construction activities. <p>Consideration will be given to the enhancement of heritage assets associated with the Scheme. Due to the potential complexity of the archaeological deposits, there may be opportunities to contribute to the understanding of the historic environment and the history of the area that contributes to its character. This information can be shared with the wider</p>

	community through activities such as public engagement events, publications and interpretation information made available adjacent to the Site.
Consultation	<p>Consultation will be undertaken with the following bodies as a minimum as part of the assessment process:</p> <ul style="list-style-type: none"> • The County Archaeologists for Lincolnshire; • Relevant Conservation Officers; and • Historic England. <p>Consultation will be used to discuss the previously recorded heritage assets as well as the archaeological potential of the areas within the Site Boundary. A phased approach to evaluation will be developed in consultation with the relevant authorities. Following the determination of the importance and significance of heritage assets, consultation will also be undertaken regarding mitigation measures.</p>
Assessment Assumptions and Limitations	<p>There are a number of assumptions and limitations in relation to the assessment of Cultural Heritage including:</p> <ul style="list-style-type: none"> • The assumption that all data provided by external sources are accurate; • The assumption that access to undertake both intrusive and non-intrusive archaeological evaluation will be available and that the results will be available for inclusion in the ES; and • In the event that access is not available to areas of the Scheme the available research and data along with professional judgement will be used to assess the archaeological potential of the area.
Summary of Aspects	<p>Aspects scoped into EIA</p> <p>The effects on Cultural Heritage will be considered as part of the EIA using a study area encompassing the extent of the Scheme plus a 1km buffer, with a flexible approach taken to the identification of high value assets on which there may be an impact upon setting beyond the study area. It is anticipated that there will be effects on heritage assets at all stages of the Scheme.</p> <p>Aspects scoped out of EIA</p> <p>No aspects of Cultural Heritage are scoped out of the EIA.</p>

Ecology and Biodiversity

Table 4.3 Ecology and Biodiversity

<p>Introduction</p> <p>This table identifies the proposed scope of the EIA to assess the impacts on Ecology and Biodiversity. This considers the impacts on biodiversity receptors including:</p> <ul style="list-style-type: none"> • Statutory and non-statutory nature conservation site designations; and • Priority habitats and protected/notable species within the study area. 	
<p>Study Area</p>	<p>The study area for ecological surveys comprises the Site. The study area includes a Zone of Influence (ZOI) as described below. In all cases, these are based on current industry good practice, published guidance and professional judgment:</p> <ul style="list-style-type: none"> • Internationally designated sites located within 15km, including Special Protection Areas (SPA), Ramsar sites and Special Areas of Conservation (SAC); • Nationally important statutory and non-statutory sites with 2km; • Records for protected and notable species within a 2km radius of the site Boundary; and • Habitats of Principal Importance and other notable habitats within 2km. <p>The desk study data, in combination with species and habitat specific survey guidelines and current best practice, enabled the identification of appropriate survey areas within which field surveys will be carried out. The Zone of Influence for important ecological receptors, where potential effects arising from the Scheme could occur, will be set out in this assessment.</p>
<p>Planning Policy and Guidance</p>	<p>The following key legislation, policy and guidance will be used within the ecology and biodiversity assessment:</p> <p><u>Legislation</u></p> <ul style="list-style-type: none"> • The Environment Act 2021⁴⁵; • The Conservation of Habitats and Species Regulations 2017 (as amended) (commonly referred to as the Habitats Regulations)⁴⁶; • Wildlife and Countryside Act 1981 (as amended)⁴⁷; • The Hedgerows Regulations 1997⁴⁸; • Natural Environment and Rural Communities Act 2006⁴⁹; • Protection of Badgers Act 1992⁵⁰; <p><u>National Planning Policy</u></p> <ul style="list-style-type: none"> • Overarching National Planning Statement for Energy (EN-1)⁷; • National Planning Statement for Renewable Energy Infrastructure (EN-3)⁸; • National Policy Statement for Electricity Networks Infrastructure (EN-5)⁹; • National Planning Policy Framework (NPPF)¹⁰; <p><u>Local Planning Policy</u></p>

⁴⁵ Environment Act 2021, Available at: <https://www.legislation.gov.uk/ukpga/2021/30/enacted/data.pdf>

⁴⁶ The Conservation of Habitats and Species Regulations 2017 (as amended), Available at: <https://www.legislation.gov.uk/uksi/2017/1012/made/data.pdf>

⁴⁷ Wildlife and Countryside Act 1981 (as amended), Available at: <https://www.legislation.gov.uk/ukpga/1981/69/data.pdf>

⁴⁸ The Hedgerows Regulations 1997, Available at: <https://www.legislation.gov.uk/uksi/1997/1160/made/data.pdf>

⁴⁹ Natural Environment and Rural Communities Act 2006, Available at: <https://www.legislation.gov.uk/ukpga/2006/16/data.pdf>

⁵⁰ Protection of Badgers Act 1992, Available at: <https://www.legislation.gov.uk/ukpga/1992/51/data.pdf>

	<ul style="list-style-type: none"> • South East Lincolnshire Local Plan (SELLP) 2011-2036¹². <p><u>Guidance</u></p> <ul style="list-style-type: none"> • Chartered Institute of Ecology and Environmental Management (CIEEM) (2019) Guidelines for Ecological Impact Assessment in the UK and Ireland⁵¹. <p>There are certain ecological sites that are designated for their international importance and to which special considerations attach under the Conservation of Species and Habitats Regulations 2017 ('the Habitats Regulations')⁴⁶, either through operation of law or government policy. These sites are subject to special legal protection that imposes restrictions on a 'Competent Authority' from granting consent permission or authorisations for any plan or project that may affect the conservation status and integrity of these designations. As part of the assessment of a development, it is therefore necessary to consider whether the Scheme is likely to have a significant effect on areas that have been internationally designated for nature conservation purposes (i.e. Internationally Important Wildlife Sites (IIWS)).</p> <p>The UK left the EU on 31 January 2020 under the terms set out in the European Union (Withdrawal Agreement) Act 2020 ('the Withdrawal Act')⁵². However, the most recent amendments to the Habitats Regulations – the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019⁵³ – make it clear that the need for HRA continues to apply.</p> <p>The HRA will be undertaken with reference to the general EC guidance on HRA, general guidance on HRA published by the UK government in July 2019⁵⁴ and available within Planning Inspectorate Advice Note 10⁵⁵. The information needed for the competent authority to establish whether there are any Likely Significant Effects (LSEs) from the Scheme and to assist in carrying out its Appropriate Assessment, will be provided in the HRA Report.</p>
<p>Baseline Conditions</p>	<p>Geographic Context</p> <p>The importance of ecological features is considered within a defined geographical context. It is recommended that the following frame of reference be used, or adapted to suit local circumstances:</p> <ul style="list-style-type: none"> • International; • National; • Regional; • Metropolitan, County, vice-count or other local authority-wide area; • River Basin District; • Estuarine system / Coastal cell; and • Local. <p>Therefore, considering the importance of geographical context and ecological features, a desk study was undertaken. The information provided by the desk study helps identify the</p>

⁵¹ Chartered Institute of Ecology and Environmental Management (CIEEM) (2019) *Guidelines for Ecological Impact Assessment in the UK and Ireland*. Available at: <https://cieem.net/wp-content/uploads/2018/08/ECIA-Guidelines-2018-Terrestrial-Freshwater-Coastal-and-Marine-V1.1Update.pdf>

⁵² *European Union (Withdrawal Agreement) Act 2020*. Available at: <https://www.legislation.gov.uk/ukpga/2020/1/enacted/data.pdf>

⁵³ *The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019*. Available at: <https://www.legislation.gov.uk/uksi/2019/579/made/data.pdf>

⁵⁴ Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities and Local Government (2019) *Planning Practice Guidance: Appropriate Assessment – Guidance on the use of Habitats Regulations Assessment*. Available at: <https://www.gov.uk/guidance/appropriate-assessment>

⁵⁵ Planning Inspectorate (2012) *Nationally Significant Infrastructure Projects - Advice Note Ten: Habitats Regulations Assessment relevant to nationally significant infrastructure projects*. Available at: <https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-advice-note-ten-habitats-regulations-assessment-relevant-to-nationally-significant-infrastructure-pr>

ecological baseline of the Site Boundary, providing historical evidence on species which may be impacted and an indication of other ecologically important sites which could have potential to be impacted by this Scheme.

The following data sources were reviewed to provide information on the location of internationally designated sites⁵⁶, nationally statutory designated sites, non-statutory designated sites⁵⁷, legally protected species⁵⁸, Species and Habitats of Principal Importance⁵⁹, and other notable species⁶⁰ and habitats⁶¹ that have been recorded within a 2km radius of the Site (15km for internationally statutory designated sites):

- Greater Lincolnshire Nature Partnership, the local Biological Records Centre, principally for species records and information on non-statutory sites;
- Multi-Agency Geographic Information for the Countryside (MAGIC)¹²⁰ - the Government's on-line mapping service; and
- Ordnance Survey mapping and publicly available aerial photography.

Field surveys carried out:

- Breeding Bird Survey Report (Temple, 2023);
- Wintering Bird Survey Report (Temple, 2023); and
- Preliminary Ecological Appraisal (PEA) (Temple, 2023).

Statutory Designated Sites

There are four statutory designated sites within 15km of the Site, as detailed in the table below and shown on **Figure 2.3**.

Table 4.3.1 Statuary Designated Sites within 15km of the Site

Site Name	Location in Relation to Site	Qualifying features/Description
Baston Fen SAC	Approximately 10km west	A large flowing drainage channel supporting a large community of aquatic and emergent plants, freshwater invertebrates and a variety of fish species including the spined loach.
Nene Washes Ramsar Site	Approximately 12km south	The site qualifies under Ramsar criterion 6: Bewick's swan and pintail (wintering). Populations of black-tailed godwit have been identified subsequent to

⁵⁶ **Statutory designations** include Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites (referred to collectively as National Site Network sites in England), National Nature Reserves (NNR), Sites of Special Scientific Interest (SSSI) and Local Nature Reserves (LNR).

⁵⁷ **Non-statutory sites** are designated by local authorities (e.g. Sites of Importance for Nature Conservation or Local Wildlife Sites).

⁵⁸ **Legally protected species** include those listed in Schedules 1, 5 or 8 of the Wildlife and Countryside Act 1981; Schedule 2 of the Conservation of Habitats and Species Regulations 2017 (as amended); or in the Protection of Badgers Act 1992.

⁵⁹ **Species/Habitats of Principal Importance** are those defined by Section 41 of the Natural Environment and Rural Communities Act, 2006.

⁶⁰ **Notable species** include Species of Principal Importance under the Natural Environment and Rural Communities Act 2006; Local Biodiversity Action Plan (LBAP) species; Birds of Conservation Concern (Stanbury *et al.* 2021); and/or Red Data Book/nationally notable species (JNCC, undated).

⁶¹ **Notable habitats** include Habitats of Principal Importance under the Natural Environment and Rural Communities Act, 2006; those included in an LBAP; Ancient Woodland Inventory sites; and Important Hedgerows as defined by the Hedgerow Regulations 1997.

		designation for possible future consideration as qualifying species.
Nene Washes SPA	Approximately 12km south	Article 4.1 of the EC Birds Directive by regularly supporting, in winter, an internationally important wintering population of Bewick's swan. Article 4.2 by supporting, in winter, nationally important wintering populations of wigeon, teal, gadwall and shoveler.
Nene Washes SAC	Approximately 12km south	Inland waterbodies, bogs, marshes, and fens which supports the highest density of Annex II species spined loach in the UK.

Non-Statutory Designated Sites

There are seven non-statutory designated sites within 2km of the PV Area, which are listed in the below table and shown on **Figure 2.4**.

Table 4.3.2 Non-Statutory Designated Sites within 2km of the Site

Site Name	Location in Relation to Site	Qualifying features/Description
Slys Connection Local Wildlife Site (LWS)	Within PV Area parcel D-2 and D-3	Canalised drain with rank grassland and ruderal vegetation. Contains diverse aquatic flora and abundance of invertebrates.
New River LWS	Approximately 80m to the west and north boundaries of A-1 and approximately 80m to the north boundary of B-4	A drain which forms the edge of the River Welland floodplain. Habitats along its route include rank grassland, scattered scrub, linear reedbed, native plantation and semi-improved grassland. There are steep south-facing slopes providing niches for a variety of invertebrates
River Welland Corridor LWS	Approximately 90m to the north-west corner of parcel A-1	Large river surrounded by semi-improved neutral grassland, ponds, coarse vegetation with steep south facing slopes. It contains diverse aquatic and marginal vegetation. Four-spotted moth have been recorded here which is a UKBAP priority species. Also present are grass snake, common tern and sand martin.
High Bank Gull LWS	Approximately 200m north-west from parcel A-1	A small area of woodland, neutral grassland, and open water. The pond is used for fishing but has aquatic and marginal plants present.
Lambert Drain to Highstock Drain	Approximately 450m south of parcel D-5	Steeply banked drain which contained diverse aquatic and bank vegetation. The Invasive Non-Native Species (INNS) Nuttall's waterweed is present.

Connection LWS		Supports an array on invertebrates and birds.
South Holland Main Drain, West LWS	Approximately 1km directly north from parcels B-1 and B-3	Artificial watercourse with rank grassland. It supports an abundance of aquatic vegetation but also contains the INNS Nuttall's waterweed. Two species of dragonfly and water vole are present along the watercourse.
Wheatmere Drain LWS	Approximately 1km directly north from parcel B-1	Canalised drain with rank grassland and linear reedbed. It links with South Holland Main Drain and contained diverse aquatic flora which supports birds and insects.

Site Conditions

The baseline conditions of the Site have been assessed through a combination of field surveys and desktop studies.

Habitats

The habitats on the PV Area were assessed through the UK Habitat Classification System. The habitats on the PV Area comprised arable farmland, ditches, isolated areas of plantation woodland, a small number of hedgerows and small parcels of scrub.

Species

Bats

Suitable habitat is present on the PV Area in the form of trees and buildings with bat roost suitability. During the PEA survey, at least three trees were identified as having potential roost features (PRF) and historic farm buildings within the Site also present roosting opportunities. The hedgerows, lines for trees, woodlands, and ditches all provide suitable habitat for foraging and /or commuting bats.

Great Crested Newt

No historic mitigation licences within 2km of the site Boundary and the nearest ponds lie at approximately 300m east of parcel D-5. Potential impacts cannot be discounted due to the presence of standing water in ditches throughout the Site and ponds outside, but near to the site Boundary.

Otter

An otter spraint was found 1km north of parcel B-5, on a bridge over the South Holland Main Drain West LWS. However, the remainder of the site is wide open, and the internal ditches are dry rendering the site as largely unsuitable. Three fishing lakes lie at approximately 450m south-east of parcel D-5 and may attract otters to the area via the Fleet drain that runs adjacent to the east boundaries of parcel D-5.

Birds

The PV Area provides opportunities for nesting birds, including hedgerows, watercourses, scattered trees, and arable land. This also includes Schedule 1 species. The habitat across the PV Area such as the open arable land provides opportunities for wintering birds to flock together.

The following surveys have been completed based on the design iteration:

- Wintering bird surveys were carried out from October 2022 to March 2023. The survey was designed using a landscape sampling approach, the sample areas samples chosen were associated with the typical habitats present across the Survey Area and

	<p>targeting any key habitats likely to be of particular importance to wintering birds. On six pre-defined transects using roads and public rights of way with good views across the landscape, with six visits undertaken. The survey programme was designed to provide a representative sample of the wintering bird assemblages. A total of 68 species were recorded during the surveys, including 42 notable species. Nine Schedule 1 breeding bird species were recorded, thirteen species were Birds of Conservation Concern Red-list, 23 species were Birds of Conservation Concern Amber-list and 11 Species of Principal Importance (SPI). Twelve Lincolnshire Biodiversity Action Plan⁶² species were recorded at the site during the surveys. Notable species included corn bunting, linnet, skylark, pink-footed goose and whooper swan.</p> <ul style="list-style-type: none"> • Breeding bird surveys have been completed based on the design iteration. The survey programme was designed using a landscape sampling approach to provide a representative sample of the breeding bird assemblage associated with the typical habitats present across the Site, targeting any key habitats likely to be of particular importance to breeding birds. Surveys were carried out from March – June 2023 using six pre-defined transects using roads and public rights of way with good views across the landscape. The transects covered the site to within 100m due to the nature of the landscape. Six visits to each transect were undertaken. Notable observations included skylark (95 singing males), hobby (1 pair potentially) corn bunting, linnet and yellow wagtail. <p><u>Plants</u></p> <p>The habitat across the PV Area is suitable for rare and notable plant species, however actively managed farmland will reduce likelihood of establishment.</p> <p><u>Reptiles</u></p> <p>Rough grassland margins, hedgerows, ditches and woodlands may also be suitable for grass snake and other reptiles such as common lizard and slow worm. However, these habitats are supplementary in the intensive arable agricultural landscape and not connected to any suitably sized or composed, optimal reptile habitat. Therefore, these habitats are unlikely to support reptiles other than grass snake.</p> <p><u>Water Vole</u></p> <p>The desk study revealed water vole have been recorded 420 times within the search area. 44 of these were from 2022 which comprise records from the nearby watercourses, including South Holland Main Drain which runs adjacent to parcel D-1. However, the remainder of the internal ditches on the PV Area are dry rendering the site as largely unsuitable. No ponds are present on the PV Area and the nearest ponds lie at approximately 450m south east of parcel D-5. These three ponds are fishing lakes and due to management and amenity purpose they are unlikely to support water vole.</p> <p><u>White-Clawed Crayfish</u></p> <p>There were no records returned for white-clawed crayfish from within the search area. The few watercourses holding water on the PV Area are considered to be too silted to be favourable and heavily managed which excludes rocks and deadwood in the channel that the species prefers for refuge. Therefore, habitats are regarded as sub-optimal.</p> <p><u>Invasive Plants</u></p> <p>A number of invasive non-native species were returned within the data search. Many of these are found within watercourses and can spread easily.</p> <p><u>Badger</u></p>
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⁶² Greater Lincolnshire Nature Partnership (2015) *Lincolnshire Biodiversity Action Plan*. Available at: <https://www.n-kesteven.gov.uk/sites/default/files/2023-03/NE002%20E039%20Lincolnshire%20Biodiversity%20Action%20Plan%202011%202020%20%283rd%20Edition%29.pdf>

	<p>A small number of badger records were returned within the data search with the most recent dating from 2022. The habitats on the PV Area considered suitable for badger included grasslands, ditches, woodland, scrub and hedgerows. Cumulatively these habitats provide foraging and breeding habitat. During previously conducted breeding bird surveys, a badger was seen at an outlier sett at a location approximately 1km off-site from the Site Boundary and badger faeces, mammal tracks and snuffle holes have been observed on the Site.</p> <p><u>Brown Hare</u></p> <p>There were 109 records of brown hare returned from within the search area. These date from 1977 to 2019. Wide grassland margins and cereal crops on the PV Area provide suitable habitat for breeding and foraging for brown hare and the species was frequently observed during the PEA survey visit and breeding bird surveys.</p> <p><u>Hedgehog</u></p> <p>There were 64 records of hedgehog returned from within the search area. These date from 1976 to 2023. This species is highly mobile and the site area provides suitable habitat for shelter, foraging and commuting.</p> <p><u>Terrestrial Invertebrates</u></p> <p>Four butterfly species were returned from the data search which are listed on the S41 NERC Act, and these include small heath, wall, large tortoiseshell and swallowtail. A further 19 records were of moth species with the majority of records occurring near Holbeach St Johns. There was one record of a large garden bumblebee from 2022 which is listed as a BAP species. This was recorded at Holbeach Drove.</p> <p>The grassland margins provide several grass species as larval foodplants for butterfly species including small heath and wall, and offer flowering plants such as vetch species, ragwort and knapweed for adult butterflies, moths and other pollinating insects.</p> <p><u>Aquatic Invertebrates</u></p> <p>There are several records of Northern River crangonyctid which is classed as a non-native crustacean species in the UK. Records show that this species is present within New River and South Holland Main Drain. The latter shares a short boundary with land parcel D-1. Full details of these species and the results of the surveys will be provided in the Ecology and Biodiversity Chapter of the ES. Habitat conditions assessment will also be undertaken on land within the Site boundary in order to perform a BNG assessment. The baseline information gathered from this, and other surveys, will be used to develop an appropriate strategy in line with the policies identified above.</p> <p><u>Other Considerations</u></p> <p>A new connection will be constructed to feed the power generated into the National Grid high power network between Walpole and Grimsby. This will run alongside the eastern extent of the Site. For the purposes of this scoping exercise, it is assumed that this will be constructed.</p>
<p>Assessment Methodology</p>	<p><u>Method/Guidance</u></p> <p>In accordance with the CIEEM Ecological Impact Assessment (EclA) guidelines⁶³, a ZOI, i.e. the area over which an ecological feature may be subject to effects as a result of the Scheme, was established. Following this, the ecological features which may be subject to effects arising from the Scheme were assigned a geographical scale of importance. Once the ZOI and geographical scale of importance of each ecological feature was determined, the potential impacts of the Scheme were predicted, taking into account the different stages and activities in the development process (i.e. demolition and construction, or operation). The scale of significance of the identified effects was then assessed.</p> <p><u>Determination of Baseline</u></p> <p>The following data sources have been used to determine the ecological baseline on the Site including features within the relevant zone of influence:</p>

	<ul style="list-style-type: none"> • Greater Lincolnshire Nature Partnership, the local Biological Records Centre, principally for species records and information on non-statutory sites; • MAGIC (http://www.magic.gov.uk/) - the Government’s on-line mapping service; • Ordnance Survey mapping and publicly available aerial photography; • Field surveys carried out between 2022 and 2023; • Breeding bird survey data collected during 2022 (Breeding Bird Survey Report (Temple, 2023)); • Wintering bird survey data; and • PEA (Temple, 2024) covering parcels with confirmed access based on the design iteration. <p>The ES will also be informed by further surveys and assessment, detailed below, including assessment of the elements of the Scheme not included in initial appraisal of the Site.</p> <p><u>Surveys Completed to Date</u></p> <p>The following surveys have been undertaken on the PV Area to inform the ecological baseline:</p> <ul style="list-style-type: none"> • PEA’s have been completed on parcels with confirmed access based on the design iteration. These will be updated to ensure all areas of the site have been covered and robust baseline information gathered; • Wintering bird surveys have been completed based on the current design. A survey programme was designed to provide a representative sample of the wintering bird assemblages using a landscape sampling approach. The samples chosen were associated with the typical habitats present across the PV Area and targeting any key habitats likely to be of particular importance to wintering birds. Surveys were carried out from October 2022 to March 2023 using six pre-defined transects using roads and public rights of way with good views across the landscape. Six visits to each transect were undertaken; and • Breeding bird surveys have been completed based on the current design iteration. The survey programme was designed using a landscape sampling approach to provide a representative sample of the breeding bird assemblage associated with the typical habitats present across the PV Area, targeting any key habitats likely to be of particular importance to breeding birds. Surveys were carried out from March – June 2023 using six pre-defined transects using roads and public rights of way with good views across the landscape. The transects covered the PV Area to within approximately 100m due to the nature of the landscape. Six visits to each transect were undertaken. <p>The following surveys have been undertaken within the Grid Connection Corridor to inform the ecological baseline:</p> <ul style="list-style-type: none"> • Vantage Point surveys to assess collision risk for birds with any proposed cable routes within the Grid Connection Corridor, the vantage points currently cover a vast area of land and will be narrowed down to focus on more specific areas once the preferred route is chosen. <p><u>Assessment</u></p> <p>The appraisal has been prepared with reference to best practice guidance published by CIEEM (CIEEM, 2018)⁶³ and as detailed in British Standard 42020:2013 Biodiversity - Code of</p>
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⁶³ CIEEM (2018). *Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine.* Chartered Institute of Ecology and Environmental Management, Winchester.

	<p>Practice for Biodiversity and Development (British Standards Institute (BSI), 2013)⁶⁴ and British Standard 8683:2021 Process for designing and implementing Biodiversity Net Gain. Specification.</p> <p>Only relevant species which are likely to be present within the Site will be considered. CIEEM guidance⁵¹ mentions that there is no need to “carry out detailed assessment of ecological features that are sufficiently widespread, unthreatened and resilient to project impacts and will remain viable and sustainable”. This does not disregard safeguarding biodiversity but more refers to the relevance to necessary species.</p> <p>Geographic consideration as mentioned in the baseline conditions sections will be considered during the assessment. Evidence of species populations, sizes and distributions are also key considerations during the assessment. Specific species populations within the Site and the relation to the surrounding area provides context. Plant species are assessed in terms of their intrinsic value and as habitat for protected species whose habitat is also protected. During the development of mitigation and compensation measures, due regard to protected species and their legal protection will be afforded. Considerations should be afforded towards both existing and future predicted baseline conditions whilst assessing the value of features. Therefore, a valuation of ecological features will take account of any likely changes such as trends in population sizes or distribution of species, changes to the extent of habitat, and the effects of other schemes or land use changes.</p> <p>CIEEM guidance⁶³ also mentions the necessity to only report significant residual effects which will remain after mitigation measures have been taken into account. Good practise denotes clarifying any potential significant effects without mitigation and the residual significant effects following mitigation.</p> <p>A zone of influence for protected species should be considered regarding all impacting factors on ecological receptors and the resilience of population post-development. The baseline conditions should be considered during the assessment of impacts and a description of how the baseline conditions change as a result of the project and associated activities.</p> <p>There are four internationally protected sites, Baston Fen SAC and Nene Washes RAMSAR, SAC and SPA within 15km radius of the Site which will prompt the requirement for a HRA.</p>
<p>Baseline Development</p>	<p>The follow sources of data will be used to inform the assessment:</p> <ul style="list-style-type: none"> • PEA of the Site, including a desk study covering the Site and a 2km surrounding radius (15km for statutory protected sites), data from the local environmental records centre and other sources where relevant; • Habitat condition surveys to inform BNG Assessment; <p><u>Further Surveys</u></p> <p><u>PV Area</u></p> <p>The completed PEA will confirm the requirements for further surveys to inform the ecology and biodiversity impact assessment for the PV Area, but these are anticipated to include the following:</p> <ul style="list-style-type: none"> • PEA on any areas not already covered; • Great crested newt surveys – to be completed on suitable waterbodies within 500m of the site Boundary in spring/summer 2024. Methodology - Great Crested Newt Mitigation Guidelines (English Nature, 2001⁶⁵);

⁶⁴ British Standards Institution (2013). *Biodiversity. Code of practice for planning and development: 42020*. BSI London.

⁶⁵ English Nature (2001) *Great Crested Newt Mitigation Guidelines*. Peterborough: English Nature

	<ul style="list-style-type: none"> • Bat activity surveys to be undertaken in summer 2024. Methodology – Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins, 2023⁶⁶); • Otter surveys to be undertaken on crossing points and a 200m buffer either side in spring/autumn 2024. Methodology - Monitoring the Otter <i>Lutra lutra</i> (Chanin, 2003⁶⁷); and • Water vole surveys to be undertaken on crossing points and a 50m buffer either side in spring/autumn 2024. Methodology - Water Vole Conservation Handbook (Strachan, Moorhouse and Gelling, 2011⁶⁸). <p><u>Grid Connection Corridor and Cable Connection Corridors</u></p> <p>Once the Grid Connection Corridor and Cable Connection Corridors are fully defined, a PEA will be undertaken, which will determine the scope of further surveys and will focus on avoidance in the first instance, surveys will then be conducted where avoidance is not possible. These surveys will focus on the footprint of the development such as the bases of the pylons, crossing points and access roads.</p>
<p>Key Issues and Potential Likely Impacts</p>	<p>Key Principles</p> <p><u>Potential Ecological Impacts</u></p> <p>A broad range of ecological impacts can incur on various receptors during the Scheme and should be considered. These comprise of available resources, environmental processes, ecological processes and relationships, human influenced, historical context, ecosystem properties and other environmental influences. Consideration to these aspects during the development of a Scheme should take place and can be broken down into the different phases of work.</p> <p>Construction Phase</p> <p>Direct effects such as habitat loss and species mortality could occur as a result of construction activities. Indirect effects may include habitat fragmentation, as well as disturbance of ecological features in the vicinity of the Scheme through noise, dust and light pollution. Species mortality or habitat damage could result from a pollution event, such as emissions to land or water during construction, most commonly from fuel/oil from vehicles and machinery or run-off from earthworks causing siltation watercourses.</p> <p>Operational Phase</p> <p>Effects in the operational phase could include factors such as disturbance through light and noise pollution.</p> <p>The biodiversity enhancements as part of the Scheme could result in increased diversity of plants and habitats, as well as increased nesting, roosting and feeding opportunities for a variety of species.</p> <p>Decommissioning Phase</p> <p>Potential impacts are likely to be similar to those during the construction phase. Habitats created as part of the Scheme could also be lost during this phase.</p>
<p>Design, Mitigation and Enhancement Measures</p>	<p>Construction Phase</p> <p>A Construction and Ecological Management Plan will be implemented to cover the construction phase of the Scheme. This will outline detailed measures including buffer zones</p>

⁶⁶ Collins, J. (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines. 3rd edn. London: Bat Conservation Trust.

⁶⁷ Chanin, P (2003) *Monitoring the Otter Lutra lutra*. Conserving Natura 2000 Rivers Monitoring Series No. 10, Peterborough: English Nature.

⁶⁸ Strachan, R., Moorhouse, T., and Gelling, M. (2011) *Water Vole Conservation Handbook*. 3rd edn. Warwickshire: Wildlife Conservation Research Unit.

	<p>and precautionary working methods to safeguard ecological constraints within the working area.</p> <p>The baseline ecological surveys will inform the need for any protected species licences and detailed mitigation strategies for the construction phase.</p> <p>An Ecological Clerk of Works (ECoW) to supervise works such as habitat clearance may be required – this will be informed through baseline surveys and reports and Environmental Impact Assessment.</p> <p>Operational Phase</p> <p>Baseline habitat surveys and further surveys for protected and notable species will inform the mitigation required and recommended enhancements for relevant species and habitats. Mitigation is likely to focus on the creation of grassland around the PV Area to improve carrying capacity to support ground nesting bird populations to compensate for loss and degradation of habitat.. Enhancements will focus on increasing the diversity of habitats from the current baseline and providing greater nesting, roosting and feeding opportunities for a variety of species.</p> <p>A Biodiversity Gain Plan (BGP), informed by a BNG assessment of the baseline conditions and design iteration, will demonstrate that the Scheme can deliver at least a 10% net gain in biodiversity habitat units. It will be supported by a Habitat Management and Monitoring Plan (HMMP) which will outline a detailed schedule of work that will be undertaken to support delivery of the biodiversity gain outcome.</p> <p>Decommissioning Phase</p> <p>The loss of any created habitats should be compensated through the creation of higher value habitats than the original baseline.</p> <p>Potential Mitigation and Enhancement</p> <p>Where possible and in line with the mitigation hierarchy set out in BS4202:2013⁶⁴ and current best practice, the assessment will identify avoidance, mitigation and, if necessary, compensation measures that may be required to enable the Scheme to proceed, in compliance with relevant nature conservation legislation and planning policies.</p> <p>A mitigation hierarchy for the Scheme should be applied to the highest level where possible. There are four steps of the mitigation hierarchy which must be taken throughout the lifecycle of a project (where potential for impacts on ecological receptors is present):</p> <ul style="list-style-type: none"> • Avoidance – actions taken to avoid causing impacts to the environment prior to beginning the development; • Minimisation – measures taken to reduce the duration intensity extent and/or likelihood of the unavoidable environmental impacts caused by development; • Restoration or rehabilitation – actions taken to repair environmental degradation or damage following unavoidable impacts caused by development; and • Offsets – measures taken to compensate for any adverse environmental impacts caused by developments which cannot be avoided, minimised and/or restored. <p>Biodiversity Net Gain</p> <p>Informed by a Biodiversity Net Gain (BNG) assessment of the baseline conditions and liaison with the client and design team, a Biodiversity Gain Plan (BGP) will demonstrate the level of net gain in biodiversity habitat units that the development can deliver, with a target of at least a 10%. It will be supported by a Habitat Management and Monitoring Plan (HMMP) which will outline a detailed schedule of work that will be undertaken to support delivery of the biodiversity gain outcome.</p>
<p>Consultation</p>	<p>Consultation will be undertaken with Natural England on the scope of protected species surveys. Other relevant parties will be consulted where relevant.</p>

<p>Assessment assumptions and limitations</p>	<p>Baseline ecological surveys commenced in 2022 and will continue throughout the pre-application stage to determine the baseline ecological conditions. The surveys may highlight new important ecological features with potential to be significantly affected which have not been identified (or considered not to be significant) at this stage of the assessment. The following assumptions have been made:</p> <ul style="list-style-type: none"> • The following habitats will be retained as part of the Scheme: hedgerows and trees, watercourses and mixed scrub; • Where additional features of significant ecological value are found, these will be avoided through iterative design where possible; and • The requirement to achieve a net gain in biodiversity and to mitigate impacts on ecological features may require suitable locations within the PV Area to be made available to deliver the required outcomes.
<p>Summary of Aspects</p>	<p>Aspects scoped into EIA</p> <p><u>Construction and Decommissioning Phases</u></p> <p>Direct effects such as habitat loss, species mortality and contaminated surface water in relation to construction activities. Indirect effects may include habitat fragmentation, as well as disturbance of ecological features in the vicinity of the Scheme through noise, dust and light pollution.</p> <p><u>Operational Phase</u></p> <p>Effects in the operational phase could include factors such as disturbance through collision risk, light and noise pollution.</p> <p>The biodiversity enhancements as part of the Scheme could result in increased diversity of plants and habitats.</p> <p><u>Ecology Surveys</u></p> <p>To assess the baseline of the PV Area, Grid Connection Corridor and Cable Connection Corridors (once confirmed). The scope of further surveys will be defined through PEA and high-level studies and in liaison with Natural England. Those species scoped in include:</p> <ul style="list-style-type: none"> • Birds – wintering and breeding; • Great crested newt; • Bats; and • Otter and water vole. <p>Aspects scoped out of EIA</p> <p><u>Construction and Decommissioning</u></p> <p>No habitats present are considered to be highly sensitive to dust or air pollution. The potential use of tall cranes during construction and decommissioning of overhead cables will be short term and highly localised, so highly unlikely to result in any significant effect on collision risk to birds.</p> <p><u>Operational Phase</u></p> <p>The Scheme is not anticipated to result in any hydrology or water pollution effects during operation.</p> <p><u>Ecology Surveys</u></p> <p>The following species/groups have been scoped out of the assessment due to a lack of suitable habitat, not being in the known geographical range and/or the Site not considered to be able to support important populations:</p> <ul style="list-style-type: none"> • Fish; • Aquatic invertebrates; • White clawed crayfish;

	<ul style="list-style-type: none">• Terrestrial invertebrates;• Hazel dormouse;• Red squirrel;• Pine marten;• Badger; and• Reptiles.
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Hydrology, Flood Risk and WFD

Table 4.4 Hydrology, Flood Risk and WFD

Introduction	
<p>This table identifies the proposed scope of the EIA to assess Hydrology, Hydrogeology, Flood Risk and Water Framework Directive waterbody receptors. This considers:</p> <ul style="list-style-type: none"> • Hydrology and Flood Risk – The potential effects of the Scheme on principal watercourses in the area and flood defences; • Surface Water Flood Risk – The potential effects of the Scheme on drainage patterns, surface water flows and quality; and • Water Framework Directive (WFD) – The potential effects of the Scheme on WFD waterbodies. 	
Study Area	<p>The study area has been defined to reflect the nature and extent of activities associated with the construction, operation and decommissioning of the Scheme. It extends to include the reaches of watercourse and surface water features shown in Figure 2.2, as (in the professional opinion of the assessor) these have the potential for significant interaction with the Scheme.</p>
Planning Policy and Guidance	<p>The policy, legislation and guidance relevant to the assessment of the potential effects of the Scheme on hydrology, hydrogeology, flood risk and WFD water bodies is summarised below.</p> <p><u>Legislation</u></p> <ul style="list-style-type: none"> • Control of Pollution Act 1974 (as amended) Part II: Pollution of Water⁶⁹; • Environmental Protection Act 1990⁷⁰; • Water Resources Act 1991⁷¹; • The Land Drainage Act 1991⁷² & 1994⁷³; • Environment Act 2021⁴⁵; • Protection of Groundwater against Pollution and Deterioration (2006/118/EC)⁷⁴; • The Groundwater (England and Wales) Regulations 2009⁷⁵; • Water Act 2003⁷⁶; • Water Resources (Abstraction and Impounding) Regulations 2006⁷⁷; • Environmental Permitting Regulations (England and Wales) 2010⁷⁸; • Flood and Water Management Act 2010 & Sustainable Drainage Systems: Written Statement – HCWS161⁷⁹;

⁶⁹ Control of Pollution Act 1974 (as amended), Available at: <https://www.legislation.gov.uk/ukpga/1974/40/data.pdf>

⁷⁰ Environmental Protection Act 1990, Available at: <https://www.legislation.gov.uk/ukpga/1990/43/data.pdf>

⁷¹ Water Resources Act 1991, Available at: <https://www.legislation.gov.uk/ukpga/1991/57/data.pdf>

⁷² Land Drainage Act 1991, Available at: <https://www.legislation.gov.uk/ukpga/1991/59/data.pdf>

⁷³ Land Drainage Act 1994, Available at: <https://www.legislation.gov.uk/ukpga/1994/25/data.pdf>

⁷⁴ Directive 2006/118/EC of the European Parliament and of the Council on the Protection of Groundwater against Pollution and Deterioration, Available at: <https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:372:0019:0031:EN:PDF>

⁷⁵ The Groundwater (England and Wales) Regulations 2009, Available at:

<https://www.legislation.gov.uk/ukdsi/2009/9780111480816/data.pdf>

⁷⁶ Water Act 2003, Available at: <https://www.legislation.gov.uk/ukpga/2003/37/data.pdf>

⁷⁷ Water Resources (Abstraction and Impounding) Regulations 2006, Available at:

<https://www.legislation.gov.uk/uksi/2006/641/made/data.pdf>

⁷⁸ Environmental Permitting Regulations (England and Wales) 2010, Available at:

<https://www.legislation.gov.uk/ukdsi/2010/9780111491423/data.pdf>

⁷⁹ Parliament. House of Commons. (2014) *Written Statement by the Secretary of State for Communities and Local Government (HCWS161)*. Available at: <https://www.parliament.uk/globalassets/documents/commons-vote-office/December-2014/18-December/6.-DCLG-sustainable-drainage-systems.pdf>

	<ul style="list-style-type: none"> • Waste Management (England and Wales) Regulations 2011⁸⁰; • Environmental Damage (Prevention and Remediation) (England) Regulations 2015⁸¹; • Environmental Permitting (England and Wales) Regulations 2016⁸²; • Water Environment (Water Framework Directive) (England and Wales) Regulations 2017⁸³; • The Floods and Water (Amendment etc.) (EU Exit) Regulations 2019⁸⁴; • Water Abstraction and Impounding (Exemptions) Regulations 2017⁸⁵; and • Conservation of Habitats and Species Regulations 2017⁴⁶. <p><u>National Planning Policy</u></p> <ul style="list-style-type: none"> • Overarching National Policy Statement for Energy (EN-1)⁷; • National Policy Statement for Renewable Energy Infrastructure (EN-3)⁸; • National Policy Statement for Electricity Networks Infrastructure (EN-5)⁹; • National Planning Policy Framework (NPPF)¹⁰; • National Planning Practice Guidance (PPG) on Flood Risk and Coastal Change⁸⁶; and • National Flood and Coastal Erosion Risk Management (FCERM) Strategy for England 2020⁸⁷. <p><u>Local Planning Policy</u></p> <ul style="list-style-type: none"> • South East Lincolnshire Local Plan (SELLP) 2011-2036¹²; • Lincolnshire County Council (2018) Sustainable Drainage Design and Evaluation Guide⁸⁸; and • Lincolnshire Flood Risk and Water Management Partnership: Joint Lincolnshire Flood Risk and Water Management Strategy 2019-2050¹⁴. <p><u>Guidance</u></p> <ul style="list-style-type: none"> • Environment Agency (2022) Flood Risk Assessments: climate change allowances⁸⁹; • Department for Environment, Food and Rural Affairs (2015) Non-statutory technical standards for sustainable drainage systems⁹⁰;
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⁸⁰ Waste Management (England and Wales) Regulations 2011, Available at:

<https://www.legislation.gov.uk/uksi/2011/988/made/data.pdf>

⁸¹ Environmental Damage (Prevention and Remediation) (England) Regulations 2015, Available at:

<https://www.legislation.gov.uk/uksi/2015/810/data.pdf>

⁸² Environmental Permitting (England and Wales) Regulations 2016, Available at:

<https://www.legislation.gov.uk/uksi/2016/1154/made/data.pdf>

⁸³ Water Environment (Water Framework Directive) (England and Wales) Regulations 2017, Available at:

<https://www.legislation.gov.uk/uksi/2017/407/made/data.pdf>

⁸⁴ The Floods and Water (Amendment etc.) (EU Exit) Regulations 2019, Available at:

<https://www.legislation.gov.uk/uksi/2019/9780111176283/data.pdf>

⁸⁵ Water Abstraction and Impounding (Exemptions) Regulations 2017, Available at:

<https://www.legislation.gov.uk/uksi/2017/1044/made/data.pdf>

⁸⁶ Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities and Local Government (2022) Planning Practice Guidance: Flood Risk and Coastal Change. Available at: <https://www.gov.uk/guidance/flood-risk-and-coastal-change>

⁸⁷ Environment Agency (2020) National Flood and Coastal Erosion Risk Management Strategy for England. Available at:

https://assets.publishing.service.gov.uk/media/5f6b6da6e90e076c182d508d/023_15482_Environment_agency_digitalAW_Strategy.pdf

⁸⁸ Lincolnshire County Council (2018) Sustainable Drainage: Design and Evaluation Guide, Available at:

<https://www.lincolnshire.gov.uk/downloads/file/1951/sustainable-drainage-design-and-evaluation-guide-pdf>

⁸⁹ Environment Agency (2022) Flood Risk Assessments: climate change allowances. Available at:

<https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>

⁹⁰ Department for Environment, Food and Rural Affairs (2015) Non-statutory technical standards for sustainable drainage systems,

Available at: <https://assets.publishing.service.gov.uk/media/5a815646ed915d74e6231b43/sustainable-drainage-technical-standards.pdf>

	<ul style="list-style-type: none"> • Department for Environment, Food and Rural Affairs and Environment Agency (2013) Rainfall Runoff Management for Developments⁹¹; • Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities and Local Government (2020) Planning Practice Guidance: Environmental Impact Assessment⁹²; • Department for Communities and Local Government (2001) Environmental impact assessment: guide to procedures⁹³; • Department of the Environment, Transport and the Regions and the National Assembly for Wales (2000) Environmental Impact Assessment: A Guide to Procedures⁹⁴; • Department of the Environment, Transport and the Regions (1999) Circular 2/99: Environmental Impact Assessment⁹⁵; • Environment Agency (2013) Principles and Practice for the Protection of Groundwater (GP3)⁹⁶; • Natural Resources Wales, the Northern Ireland Environment Agency, the Scottish Environment Protection Agency, Guidance for Pollution Prevention⁹⁷ series; • BS6031: 2009 Code of Practice for Earth Works (incorporating corrigendum No.1)⁹⁸; • Good Practice Guide for Handling Soils (Ministry of Agriculture, Fisheries and Food) 2000)⁹⁹; • South East Lincolnshire District Level 1 Strategic Flood Risk Assessment; • South East Lincolnshire District Level 2 Strategic Flood Risk Assessment; • South East Lincolnshire Strategic Flood Risk Assessment (March 2017)¹⁰⁰; • Report C532: Control of Water Pollution from Construction Sites – Guidance for Consultants and Contractors¹⁰¹; • Construction Sites – Guide to Good Practice¹⁰²;
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⁹¹ Department for Environment, Food and Rural Affairs and Environment Agency (2013) *Rainfall Runoff Management for Developments*. Available at: https://assets.publishing.service.gov.uk/media/602e7158d3bf7f7220fe109d/Rainfall_Runoff_Management_for_Developments_-_Revision_E.pdf

⁹² Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities and Local Government (2020) *Planning Practice Guidance: Environmental Impact Assessment*. Available at: <https://www.gov.uk/guidance/environmental-impact-assessment>

⁹³ Department for Communities and Local Government (2001) *Environmental impact assessment: guide to procedures*. Available at: <https://webarchive.nationalarchives.gov.uk/ukgwa/20120920030709/http://www.communities.gov.uk/documents/planningandbuilding/pdf/157989.pdf>

⁹⁴ Department of the Environment, Transport and the Regions and the National Assembly for Wales (2000) *Environmental Impact Assessment: A Guide to Procedures*. Thomas Telford.

⁹⁵ Department of the Environment, Transport and the Regions (1999) *Circular 2/99: Environmental Impact Assessment*. Available at: <https://assets.publishing.service.gov.uk/media/5a79d9aee5274a684690c8cb/155958.pdf>

⁹⁶ Environment Agency (2013) *Principles and Practice for the Protection of Groundwater (GP3)*. Available at: https://assets.publishing.service.gov.uk/media/5a80333e40f0b623026921a6/LIT_7660.pdf

⁹⁷ Natural Resources Wales (NRW), the Northern Ireland Environment Agency (NIEA), and the Scottish Environment Protection Agency. *Guidance for Pollution Prevention (GPP)* available at: <https://www.netregs.org.uk/environmental-topics/guidance-for-pollution-prevention-gpp-documents/>

⁹⁸ British Standards Institution (BSI) (2009) *BS 6031:2009 Code of practice for earthworks (incorporating corrigendum No.1)*. Available at: <https://www.thenbs.com/PublicationIndex/documents/details?Pub=BSI&DocId=295114>

⁹⁹ Ministry of Agriculture Fisheries and Food (2000) *Good Practice for Handling Soils (Version 04/00)* Cambridge: Farming and Rural Conservation Agency (FRCA)

¹⁰⁰ South East Lincolnshire Joint Planning Committee (2017) *South East Lincolnshire Strategic Flood Risk Assessment: March 2017*. Available at: <https://www.southeastlincolnlocalplan.org/wp-content/uploads/2018/01/SE-Lincolnshire-SFRA-2017-v6-24th-Jan-2018.pdf>

¹⁰¹ CIRIA (2001) *Control of water pollution from construction sites. Guidance for consultants and contractors (C532D)*. Available at: <https://www.ciria.org/ItemDetail?iProductCode=C532D&Category=DOWNLOAD>

¹⁰² CIRIA (2023) *Environmental good practice on site guide (C811)*. 5th edn. Available at: <https://www.ciria.org/ItemDetail?iProductCode=C811d&Category=DOWNLOAD>

	<ul style="list-style-type: none"> • Report C750: Groundwater Control – design and practice (second edition)¹⁰³; • Report C753: The SuDS Manual¹⁰⁴; • Report C624: Development and Flood Risk guidance for the construction industry¹⁰⁵; and • Due reference will also be made to UK government guidance for preventing pollution¹⁰⁶, working on or near water¹⁰⁷ and for managing water on land¹⁰⁸.
<p>Baseline Conditions</p>	<p>Hydrology and Flood Risk</p> <p>The principal watercourses in the area are the River Welland (to the west of the Scheme) and the River Nene (to the east), whilst the PV Area is bisected by the South Holland Main Drain. The River Welland and River Nene are both classified as Main Rivers and therefore fall under the jurisdiction of the Environment Agency (EA). The Site Boundary extends across areas administered by the South Holland Internal Drainage Board (SHIDB) and the North Level District Internal Drainage Board (NLDIDB). The South Holland Main Drain falls within the area administered by the SHIDB. The land is characterised by several ditches and drains, with water levels across the area are generally managed via pumping.</p> <p>The majority of the Site is currently in agricultural use and therefore comprises permeable surfaces, such that surface water run-off generally infiltrates into the ground or is routed to the various ditches/drains that bisect the site.</p> <p><u>Flood Zones</u></p> <p>The EA publishes online floodplain maps¹⁰⁹. These maps show the possible extent of fluvial flooding for a 1 in 100 year flood (1% annual probability of occurrence) and the possible extent of tidal flooding associated with a 1 in 200 year event (0.5% annual probability of occurrence), ignoring the presence of flood defences. Also shown is the possible extent of flooding arising from a 1 in 1,000 year event (0.1% probability).</p> <p>Flood Zones are defined by the EA¹¹⁰ as the following:</p> <ul style="list-style-type: none"> • Flood Zone 1: Low probability, land having a less than 0.1% annual probability of river or sea flooding. • Flood Zone 2: Medium probability, land having between a 1% and 0.1% annual probability of river flooding. • Flood Zone 3: High probability, land having a 1% or greater annual probability of river flooding. <p>Land parcels across the PV Area may be characterised by the following Flood Zones:</p> <ul style="list-style-type: none"> • A: Is entirely within Flood Zone 3;

¹⁰³ CIRIA (2016) *Groundwater control: design and practice (C750)*. 2nd edn. Available at: <https://www.ciria.org/ItemDetail?iProductCode=C750D&Category=DOWNLOAD>

¹⁰⁴ CIRIA (2015) *The SuDS Manual (C753)*. Available at: https://www.ciria.org/CIRIA/CIRIA/Item_Detail.aspx?iProductCode=C753

¹⁰⁵ CIRIA (2004) *Development and flood risk – guidance for the construction industry (C624)*. Available at: <https://www.ciria.org/ItemDetail?iProductCode=C624D&Category=DOWNLOAD>

¹⁰⁶ Department for Environment, Food and Rural Affairs and Environment Agency (2016) *Pollution prevention for businesses*. Available online at: <https://www.gov.uk/guidance/pollution-prevention-for-businesses>

¹⁰⁷ Environment Agency and Department for Environment, Food and Rural Affairs (2024) *Flood risk activities: environmental permits*. Available at: <https://www.gov.uk/guidance/flood-risk-activities-environmental-permits>

¹⁰⁸ Environment Agency (2015) *Manage water on land: guidance for land managers*. Available at: <https://www.gov.uk/guidance/manage-water-on-land-guidance-for-land-managers>

¹⁰⁹ Environment Agency (2024) *Flood Map for Planning*. Available at: <https://flood-map-for-planning.service.gov.uk>

¹¹⁰ Environment Agency (2022) *Flood Risk and Coastal Change*. Available at: <https://www.gov.uk/guidance/flood-risk-and-coastal-change#table1>

	<ul style="list-style-type: none"> • B: Is predominantly within Flood Zone 3, although a corridor within the eastern area lies within Flood Zone 1; • C: Whilst the central area lies within Flood Zone 3, a relatively large area along the northern and eastern part of this land block lies within Flood Zone 1; and • D: Lies predominantly within Flood Zone 3. <p>The Grid Connection Corridor generally lies within a combination of Flood Zones 2 and 3, with limited and localised areas falling within Flood Zone 1.</p> <p>The Cable Connection Corridors are predominantly within Flood Zone 3, with localised areas of Flood Zone 2 and 1.</p> <p><u>Surface Water Flood Risk</u></p> <p>The EA 'Flood Risk from Surface Water' Map¹¹¹, shows areas that may be susceptible to surface water flooding following an extreme rainfall event. The mapping shows that the majority of the PV Area and the Grid Connection Corridors are at a 'Very Low' risk of surface water flooding. Only isolated and localised areas are shown to be at high, medium and low risk of surface water flooding.</p> <p><u>Reservoir Flood Risk</u></p> <p>The maximum extent of flooding from reservoirs (Eyebrook Reservoir and Rutland Water) is broadly comparable to the extent of Flood Zone 3, with the exception that land parcel D is shown to be unaffected by this source of flooding.</p> <p>Soil, Geology and Hydrogeology</p> <p>The Site is covered by naturally wet, loamy and clayey Grade 1 and 2 soils. Beneath the overlying soils, the site is underlain by superficial deposits of tidal flat comprising clay and silt and bedrock units of West Walton, Ampthill Clay and Oxford Clay formations comprising mudstone and siltstone. Both superficial and bedrock units are classified as unproductive strata. There are no groundwater abstractions within 1km of the Site Boundary.</p> <p>Water Framework Directive Screening Assessment</p> <p>Four WFD waterbodies have been identified as having the potential to be impacted by the proposed works due to their hydrological connectivity to the site. The proposed works have the potential to impact their existing Ecological and Chemical status objectives, together with their Quality Elements. The four waterbodies include: the Welland - confluence Greatford Cut to tidal, the Vernatt's Drain, South Holland Main Drain and the North Level Main Drain. All waterbodies have an existing ecological status of 'Moderate'. A WFD Screening Assessment has been completed providing an overview of baseline conditions for each waterbody.</p> <p>Hydrogeological and Hydrological Receptors</p> <p>Groundwater aquifers and abstractions as potential receptors:</p> <ul style="list-style-type: none"> • Unproductive superficial aquifer – Tidal Flat deposits comprising Clay and Silt. It is therefore considered as of Negligible sensitivity and therefore scoped out of this assessment; • Unproductive bedrock aquifer – West Walton, Ampthill Clay and Oxford Clay formations comprising mudstone and siltstone. It is therefore considered as of Negligible sensitivity and therefore scoped out of this assessment; and • Groundwater abstractions – there are no groundwater abstractions within 1km of the Site Boundary. <p>Surface waterbodies, flood defences and abstractions as potential receptors:</p>
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¹¹¹ Environment Agency (2024) *Check Long Term Flood Risk*. Available at: <https://check-long-term-flood-risk.service.gov.uk/>

	<ul style="list-style-type: none"> • The following WFD waterbodies have been ‘screened in’ to the WFD screening assessment as they have the potential to be impacted by the proposed works: <ul style="list-style-type: none"> ○ River Welland – the major surface waterbody flowing north-eastwards adjacent to the western site Boundary which belongs to "Welland - conf Greatford Cut to tidal Waterbody" within the Welland Lower Operational Catchment. It has an overall 'moderate' ecological status, has 'good' fish and invertebrate status and has 'high' and 'good' status of a number of physico-chemical quality elements under the WFD's 2022 classification, therefore, the waterbody is considered as of High sensitivity; and ○ The South Holland Main Drain – an artificial waterbody flowing eastwards, parallel to the northern Site Boundary, which belongs to the "South Holland Main Drain Water Body" within the Nene Lower Operational Catchment, has a 'moderate' ecological status under the WFD's 2022 classification. It has an overall 'moderate' ecological status, with 'high' and 'good' status of a number of physico-chemical quality elements under the WFD's 2022 classification, therefore, the waterbody is considered as of High sensitivity. • Fluvial defences – the defences reducing the risk of flooding to the site consist of the Crowland and Cowbit Washes and embankment. According to the EA, they are in fair condition and provide protection against a flood event with a 1% annual probability of occurrence. The defences are categorised as Medium sensitivity; and • Surface water abstractions – there are eight licensed surface water abstractions recorded by the EA within 1km of the Site which are used for general agriculture and industrial purposes. These are therefore considered as of Low sensitivity. <p>In addition to the above receptors, the ES will consider effects upon existing development/infrastructure/third party assets/land in the vicinity and downstream of the Scheme. Land use in the vicinity of the site is generally categorised as ‘Less Vulnerable’ (in accordance with the NPPF Annex 3: Flood Risk Vulnerability Classification¹⁰). ‘Less Vulnerable’ uses are considered to be of Low sensitivity.</p>
<p>Assessment Methodology</p>	<p>The methodology for the assessment of potential impacts will follow the standard EIA methodology guided by IEMA (2016)¹¹², current government guidance, and is based on the following principles:</p> <ul style="list-style-type: none"> • The type of effect (long-term, short-term, or intermittent; positive, negative or neutral); • The probability of the effect occurring; • Receptor sensitivity; and • The magnitude (severity) of the effect. <p>The assessment methodology identifies the significance of an effect by firstly considering the sensitivity of the receptor (i.e. its importance and ability to tolerate and recover from change) and, secondly, by considering the likely magnitude of the impact (i.e. its spatial extent and duration). By combining sensitivity and magnitude, the significance of the effect is established. Where significant negative effects are identified, mitigation measures are proposed to reduce the significance. Where necessary, the assessment will be supported by a site walkover survey.</p> <p>The assessment of significance carries an intrinsic level of subjectivity and the categorisations described in the tables above provide a guide only. They may therefore be moderated based upon professional judgement and the experience of the assessor.</p>

¹¹² IEMA (2016) *Environmental Impact Assessment Guide to: Delivering Quality Development*. Available at: <https://www.iema.net/download-document/328273>

Baseline Development	<p>The assessment will be supported by the collection and interpretation of data and information requested from the EA, South Holland District Council, SHIDB and the NLDIBD. In addition, the following will be used and or referred to:</p> <ul style="list-style-type: none"> • Topography and general mapping; <ul style="list-style-type: none"> ○ Ordnance Survey (OS) Open Data, Terrain 50 DTM, LiDAR 1/2m Digital Terrain Model (DTM) (EA Open Data¹¹³), and ○ Aerial photography (Google Earth¹¹⁴ and Bing Maps¹¹⁵). • Geology and Soils; <ul style="list-style-type: none"> ○ British Geological Survey (BGS) 1:50,000 Geology Mapping¹¹⁶; ○ BGS digital geology mapping¹¹⁷ ; ○ BGS online Lexicon (BGS website)¹¹⁸; ○ 1:250,000 soils mapping (Soil Survey of England and Wales, 1983)¹¹⁹; ○ Soil Landscapes Online Viewer (DEFRA's MAGIC Map)¹²⁰; ○ Cranfield University's National Soils Resources Institute Soilsapes website¹²¹; ○ DEFRA's Magic Map¹²⁰; and ○ Coal Authority online viewer¹²². • Hydrogeology; and <ul style="list-style-type: none"> ○ Aquifer classification (DEFRA's MAGIC Map)¹²⁰; ○ Groundwater vulnerability (DEFRA's MAGIC Map)¹²⁰; and ○ Source Protection Zones (DEFRA's MAGIC Map)¹²⁰. • Hydrology and Flood Risk. <ul style="list-style-type: none"> ○ EA Flood Map for Planning¹⁰⁹; ○ EA Long Term Flood Risk Map¹¹¹; ○ EA Catchment Data Explorer¹²³; ○ South East Lincolnshire Strategic Flood Risk Assessment (2017)¹¹³; and ○ Royal HaskoningDHV, 2016 Update of South Holland Strategic Flood Risk Assessment – modelling and Mapping Note¹²⁴.
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¹¹³ Environment Agency (2024) *Open Data Products*. Available at:

<https://experience.arcgis.com/experience/753ad2ebd3554fa696885b8c366c3049/page/Open-Data/>

¹¹⁴ Google Earth 10.52 (2024) Available at: <https://earth.google.com/web/>

¹¹⁵ Bing Maps (2024) Available at: <https://www.bing.com/maps>

¹¹⁶ British Geological Survey (2024) *BGS Geology 1:50,000*. Available at: <https://www.bgs.ac.uk/datasets/bgs-geology-50k-digmappb/>

¹¹⁷ British Geological Survey (2024) *Digital British Geology Mapping*. Available at: <https://geologyviewer.bgs.ac.uk>

¹¹⁸ British Geological Survey (2024) *BGS GeoIndex Onshore Available*. at: <https://mapapps2.bgs.ac.uk/geoindex/home.html>

¹¹⁹ British Geological Survey (2024) *UK Soil Observatory (UKSO) Map Viewer*. Available at:

<https://mapapps2.bgs.ac.uk/ukso/home.html>

¹²⁰ Department for Environment, Food and Rural Affairs (2024) *Multi-Agency Geographic Information for the Countryside (MAGIC) Map*. Available at: <https://magic.defra.gov.uk/MagicMap.aspx>

¹²¹ Cranfield University (2024) *National Soils Resources Institute Soilsapes*. Available at: <http://www.landis.org.uk/soilsapes>

¹²² The Coal Authority (2024) *Coal Authority Interactive Map*. Available at: <https://mapapps2.bgs.ac.uk/coalauthority/home.html>

¹²³ Environment Agency (2024) *Catchment Data Explorer*. Available at: <https://environment.data.gov.uk/catchment-planning>

¹²⁴ Royal HaskoningDHV (2017) *2016 Update of South Holland Strategic Flood Risk Assessment – modelling and Mapping Note*.

Available at: <https://www.southeastlincslocalplan.org/wp-content/uploads/2017/03/Report-2016-Update-of-South-Holland-SFRA-Modelling-and-Mapping-Note.pdf>

<p>Key Issues and Potential Likely Impacts</p>	<p>The assessment relating to hydrology, flood risk and WFD waterbodies will consider the following potential effects:</p> <p>Construction Phase</p> <ul style="list-style-type: none"> • Potential adverse effects on drainage patterns, surface water flows and aquifer recharge; • Potential pollution of watercourses and underlying aquifers resulting from spilled hydrocarbons/petrochemicals from construction plant and the mobilisation of silts and contaminants during earthworks operations and construction of watercourse crossing points; • Potential to disturb peat deposits if foundations are piled into any underlying layer of peat; • Potential adverse effects upon the River Welland flood defences; • Potential adverse effects upon flood storage and flood flows/flood routing processes as a result of works within watercourses/drains and the floodplain; and • Potential adverse effects resulting from compaction of the ground caused by construction plant and an increase in the extent of impermeable surfaces associated with access roads and compound areas. <p>Operational Phase</p> <ul style="list-style-type: none"> • Potential adverse effects on drainage patterns, surface water flows and aquifer recharge; • Potential pollution of watercourses and underlying aquifers resulting from the flushing of silts and hydrocarbons from areas of hardstanding; and • Potential adverse effects upon flood storage and flood flows/flood routing processes as a result of buildings/infrastructure within the floodplain and new watercourse crossings. <p>Decommissioning Phase</p> <ul style="list-style-type: none"> • The decommissioning of the Scheme is considered to have similar effects upon the water environment as those during the construction phase; and • It is anticipated that any above ground works for the electrical connection will be removed and all below ground off-site cabling would be left in situ, subject to obligations to land owners, best industry practice and relevant statutory requirements. As such, the decommissioning works would be minimal, such that significant effects would be unlikely.
<p>Design, Mitigation and Enhancement Measures</p>	<p>The design for the Scheme will include measures to prevent, reduce and offset significant adverse effects upon hydrology, hydrogeology, flood risk and WFD waterbodies, the assessment of the significance of effects will include consideration of these 'embedded' mitigation measures.</p> <p>The DCO application for the Scheme will be accompanied by a Framework CEMP, the implementation of which will be secured through a DCO requirement relating to the preparation of a detailed CEMP. Details of the mitigation measures likely to be included in the CEMP are outlined below:</p> <p>Construction Phase</p> <ul style="list-style-type: none"> • A management system would be in place to adequately manage works within watercourses/drains and the floodplain; • Best practice working methods to prevent both water pollution and adverse impacts upon the surface water drainage regime;

	<ul style="list-style-type: none"> • Appropriate storage of hydrocarbons and petrochemicals in accordance with Control of Substances Hazardous to Health (COSHH) Regulations 2002¹²⁵ and Control of Pollution (Oil Storage) (England) Regulations 2001¹²⁶; • Any surface water potentially contaminated by hydrocarbons would be passed through oil interceptors prior to discharge; • Precautions would be in place to prevent silt laden run-off, arisings or chemicals entering watercourses; and • Details on construction methodologies are to be determined, it is assumed, if required to be underground, cables would be laid at a sufficient depth beneath watercourses/drains to avoid causing damage to the integrity of embankments during installation. <p>Operational Phase</p> <ul style="list-style-type: none"> • Surface Water Management infrastructure would be designed in accordance with the Construction Industry Research and Information Association (CIRIA) C753104¹⁰⁴ and guidance set out by both the Internal Drainage Boards and the Lead Local Flood Authority (LLFA), such that the surface water run-off regime replicates that existing prior to development; • Implementation of SuDS (i.e. swales); • Elevated floor levels and flood resilient construction measures. Building floor levels will be set at an appropriate freeboard above modelled flood levels; • Flood-sensitive infrastructure will be elevated above the 0.1% annual probability flood level (including climate change) defined through hydraulic modelling; and • Design of the Scheme will ensure that there are no panels within 9m of any surface water drain operated by the Internal Drainage Boards. In any event, protective provisions will be included within the DCO for the benefit of drainage authorities to govern the procedure to follow for specified works in proximity to drainage authority drainage assets. <p>Decommissioning Phase</p> <ul style="list-style-type: none"> • A management system would be in place to adequately manage works within the floodplain; • Best practice working methods to prevent both water pollution and adverse impacts upon the surface water drainage regime; • Appropriate storage of hydrocarbons and petrochemicals in accordance with Control of Substances Hazardous to Health (COSHH) Regulations 2002¹²⁵ and Control of Pollution (Oil Storage) (England) Regulations 2001¹²⁶; • Any surface water potentially contaminated by hydrocarbons would be passed through oil interceptors prior to discharge; and • Precautions would be in place to prevent silt laden run-off, arisings or chemicals entering watercourses.
<p>Consultation</p>	<p>Hydrology and Flood Risk</p> <p>The following organisations have been consulted and dialogue will continue during the assessment process:</p> <ul style="list-style-type: none"> • Environment Agency; • Lincolnshire County Council (as Lead Local Flood Authority);

¹²⁵ The Control of Substances Hazardous to Health Regulations 2002. Available at: <https://www.legislation.gov.uk/uksi/2002/2677/made/data.pdf>

¹²⁶ The Control of Pollution (Oil Storage) (England) Regulations 2001. Available at: <https://www.legislation.gov.uk/uksi/2001/2954/made/data.pdf>

	<ul style="list-style-type: none"> • South Holland Internal Drainage Board; • North Level District Internal Drainage Board; and • Welland and Deepings Internal Drainage Board. <p>The EA has advised: “We can confirm that the principal source of flooding to be considered is the River Welland, specifically breaching of the adjacent flood defences”;</p> <p>The EA has also advised: “The 2017 SFRA breach locations are considered adequate for the site. Further modelling analysis is not required, the 2017 SFRA hazard mapping can be used and is appropriate for the type of development and its location. The SFRA may be used to inform design of the Meridian Solar project and preparation of the FRA supporting the DCO submission”; and</p> <p>On this basis, and subject to reviewing the breach modelling, peak flood depth data associated with defence breaching, as set out in the SFRA (2017)¹³, will be used to define the design level for flood-sensitive infrastructure.</p> <p>Hydrogeology</p> <p>The following organisations have been consulted:</p> <ul style="list-style-type: none"> • Anglian Water; • Environment Agency; and • South Holland District Council. <p>Water Framework Directive</p> <p>The following organisations should be consulted to seek to agree (i) conclusions and recommendations arising from the WFD Screening exercise and (ii) the scope of the WFD Scoping exercise:</p> <ul style="list-style-type: none"> • Anglian Water • Environment Agency; and • South Holland District Council.
<p>Assessment Assumptions and Limitations</p>	<p>The ES will be supported by a Flood Risk Assessment which, in turn, will be based upon the results of hydraulic modelling analysis. The absence of observed/recorded data may give rise to a degree of uncertainty in modelled water levels.</p> <p>Based on a review of baseline information/mapping and identification of receptors, consideration of groundwater aquifers is scoped out of the assessment.</p> <p>It has been assumed that any above ground works for the electrical connection will be removed and all below ground off-site cabling would be left in situ.</p> <p>This WFD screening assessment has been undertaken using a desk-based approach, without a site walkover to ground truth assessment conclusions.</p> <p>Baseline waterbody catchment information is limited to data within the public domain, principally the EA Catchment Data Explorer¹²³.</p> <p>Limited design information at this early stage has required a number of assumptions to be made within this WFD Screening Assessment, as outlined within the ‘Outline of proposed designs and assumptions for WFD Screening Assessment’ above. This WFD screening assessment should be kept under review as the design process progresses, before undertaking the next stage of the WFD assessment.</p>
<p>Summary of Aspects</p>	<p>Aspects scoped into EIA</p> <ul style="list-style-type: none"> • Construction phase effects upon the surface water drainage regime; • Construction phase effects upon surface water quality; • Construction phase effects upon the River Welland flood defences; • Construction phase effects upon flood storage, flood flows and flood routing processes;

	<ul style="list-style-type: none"> • Operational phase effects upon the surface water drainage regime; • Operational phase effects upon surface water quality; • Operational phase effects upon flood storage, flood flows and flood routing processes; and • Construction and operational phase effects associated with 'watercourse crossing locations' require further assessment from a WFD perspective. Two WFD waterbodies have been 'screened in' following the WFD screening assessment. New crossings have the potential to modify the physical character of watercourses and may be locations of silt and chemical pollution, affecting waterbody WFD classification. 'Screened-in' waterbodies requiring subsequent WFD scoping assessment are: <ul style="list-style-type: none"> ○ Welland - confluence Greatford Cut to tidal; and ○ South Holland Main Drain <p>Aspects scoped out of EIA</p> <ul style="list-style-type: none"> • Groundwater aquifers – the unproductive superficial and bedrock aquifers are scoped out of the assessment; • During the operational phase, the Grid Connection and Cable Connection is not considered to give rise to impacts upon hydrology, hydrogeology, flood risk or WFD water bodies. It is therefore proposed that consideration of operational impacts associated with the Grid Connection is scoped out of the assessment; • The assessment of potential impacts associated with the decommissioning phase will be scoped out, as it is considered that decommissioning will have similar effect upon the water environment as construction. It is anticipated that any above ground works for the Grid and Cable Connection will be removed and all below ground off-site cabling would be left <i>in situ</i>. As such, the decommissioning works would be minimal, such that significant effects would be unlikely.
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Agriculture and Soils

Table 4.5 Agriculture and Soils

Introduction	
<p>This table identifies the proposed scope of the EIA to assess Agriculture and Soils. This considers:</p> <ul style="list-style-type: none"> • Soil Resources – The potential effects of the Scheme on soil resources during the construction and decommissioning phases • Agricultural Land Resources – The potential effects of the Scheme on best and most versatile agricultural land through the introduction of the solar infrastructure; and • Contaminated Land - The potential effects of the Scheme on contaminated land, in particular the risks associated with construction works, future site users and surface water. 	
Study Area	The study area comprises the PV Area, associated Cable Connection Corridors and Grid Connection Corridors that cross greenfield land.
Planning Policy and Guidance	<p>The following key legislation, policy and guidance will be used within the agriculture and soils assessment:</p> <p><u>Legislation</u></p> <ul style="list-style-type: none"> • Landfill Directive (Council Directive 1999/31/EC)¹²⁷; • The Control of Pollution (Oil Storage) (England) Regulations 2001¹²⁶; • Landfill (England and Wales) Regulations 2002^{Error! Bookmark not defined.}; • Control of Substances Hazardous to Human Health (COSHH) 2002¹²⁵; • Environmental Protection (Duty of Care) (Amendment) (England) Regulations 2003¹²⁸; • The Waste Management Licensing (England and Wales) (Amendment and Related Provisions) (No. 3) Regulations 2005¹²⁹; • Landfill (England and Wales) Regulations 2005¹³⁰; • Hazardous Waste (England and Wales) Regulations 2005¹³¹; • The Contaminated Land (England) Regulations 2006¹³²; • Protection of Groundwater against Pollution and Deterioration (2006/118/EC)¹³³; • Environmental Permitting Regulations (England and Wales) 2016⁸²; • Construction (Design and Management) (CDM) Regulations 2015¹³⁴; and

¹²⁷ Landfill Directive (1999/31/EC). Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31999L0031>

¹²⁸ The Environmental Protection (Duty of Care) (England) (Amendment) Regulations 2003. Available at:

<https://www.legislation.gov.uk/ukxi/2003/63/made/data.pdf>

¹²⁹ The Waste Management Licensing (England and Wales) (Amendment and Related Provisions) (No. 3) Regulations 2005. Available at:

<https://www.legislation.gov.uk/ukxi/2005/1728/made/data.pdf>

¹³⁰ Landfill (England and Wales) Regulations 2005. Available at: <https://www.legislation.gov.uk/ukxi/2005/1640/made/data.pdf>

¹³¹ Hazardous Waste (England and Wales) Regulations 2005. Available at:

<https://www.legislation.gov.uk/ukxi/2005/894/made/data.pdf>

¹³² The Contaminated Land (England) Regulations 2006. Available at:

<https://www.legislation.gov.uk/ukxi/2006/1380/made/data.pdf>

¹³³ Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the Protection of Groundwater

against Pollution and Deterioration. Available at: [https://eur-](https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:372:0019:0031:EN:PDF#:~:text=Groundwater%20in%20bodies%20of%20water,production%20of%20drinking%20water%2C%20in)

[lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:372:0019:0031:EN:PDF#:~:text=Groundwater%20in%20bodies%20of%20water,production%20of%20drinking%20water%2C%20in](https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:372:0019:0031:EN:PDF#:~:text=Groundwater%20in%20bodies%20of%20water,production%20of%20drinking%20water%2C%20in)

¹³⁴ Construction (Design and Management) (CDM) Regulations 2015. Available at:

<https://www.legislation.gov.uk/ukxi/2015/51/made/data.pdf>

	<ul style="list-style-type: none"> • Agriculture Act (England) Regulations 2020¹³⁵. <p><u>National Planning Policy</u></p> <ul style="list-style-type: none"> • Overarching National Policy Statement for Energy (EN-1)⁷; • National Policy Statement for Renewable Energy Infrastructure (EN-3)⁸; • National Policy Statement for Electricity Networks Infrastructure (EN-5)⁹; • National Networks National Planning Statement, for Planning Act 2008⁵; and • National Planning Policy Framework (NPPF)¹⁰. <p><u>Local Planning Policy</u></p> <ul style="list-style-type: none"> • South East Lincolnshire Local Plan (SELLP) 2011-2036¹². <p><u>Guidance</u></p> <ul style="list-style-type: none"> • BS 10175:2011+A2:2017 Investigation of potentially contaminated sites - Code of Practice¹³⁶; • BS 8485:2015+A1:2019 Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings¹³⁷; • Department for Environment, Food and Rural Affairs (2012) Environmental Protection Act 1990: Part IIA Contaminated Land Statutory Guidance¹³⁸; • Environment Agency (2023) Land Contamination: Risk Management (LCRM)¹³⁹;and • Natural England (2023), Geoconservation: Principles and practice (NE802)¹⁴⁰.
<p>Baseline Conditions</p>	<p>Agriculture and Soils</p> <p>The PV Area comprises approximately 1,000ha of agricultural land set across four land parcels, as outlined in Figure 1.2. The PV Area is level and low lying at 0 m aerosol optical depth (AOD) and in use for arable and horticultural cropping at the time of survey. The land is extensively ditch drained.</p> <p>British Geological Survey information (1:50,000 Scale)¹¹⁶ records the basal geology of the land to be mudstone of the Oxford Clay Formation, West Walton Formation and Amphill Clay Formation. Superficial deposits of Tidal Flats (clay and silt) are recorded to overlie the entire site.</p> <p>The National Soil Map¹²¹ (1:250,000 Scale) shows the soils within the Site to be predominantly within the Wallasea 2 Association. These are typically deep stoneless clayey soils that are calcareous in places with some deep calcareous silty soils. The Association is formed on level land with occasional ridges where former creeks were located. The soils within the Association vary in drainage although typically all respond well to underdrainage being only occasionally waterlogged. The remaining land within the Site is mapped as within the Wisbech Association. These soils are typically deep</p>

¹³⁵ Agriculture Act (England) Regulations 2020. Available at: <https://www.legislation.gov.uk/ukpga/2020/21/enacted/data.pdf>

¹³⁶ British Standards Institution (2017) BS 10175:2011+A2:2017: Investigation of potentially contaminated sites. Code of practice - Code of practice. Available at: <https://knowledge.bsigroup.com/products/investigation-of-potentially-contaminated-sites-code-of-practice-code-of-practice?version=standard>

¹³⁷ British Standards Institution (2019) BS 8485:2015+A1:2019: Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings. Available at: <https://knowledge.bsigroup.com/products/code-of-practice-for-the-design-of-protective-measures-for-methane-and-carbon-dioxide-ground-gases-for-new-buildings?version=standard>

¹³⁸ Department for Environment, Food and Rural Affairs (2012) Environmental Protection Act 1990: Part IIA Contaminated Land Statutory Guidance. Available at: <https://assets.publishing.service.gov.uk/media/5a757dfa40f0b6360e47489d/pb13735cont-land-guidance.pdf>

¹³⁹ Environment Agency (2023) Land Contamination Risk Management (LCRM). Available at: <https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm>

¹⁴⁰ Natural England (2023) Geoconservation: Principles and practice (NE802). Available at: <https://publications.naturalengland.org.uk/publication/6152405931261952>

stoneless calcareous coarse silty soils. The soils are waterlogged for long periods where land has not been drained although where efficient ditch drainage is in place they are permeable and well-drained.

The Provisional Agricultural Land Classification (ALC) Map (1:250,000 scale)¹²⁰ shows the Site to be mainly Grade 2 quality with Grade 1 mapped in the east and north. However, the Provisional maps are produced at reconnaissance level and are not intended to be used for planning decisions and so more detailed survey is required. Part of the PV Area has already been surveyed in detail to Post-1988 MAFF ALC Guidelines (Natural England reference: ALCC05791)¹⁴¹. This land was found to be mainly of Subgrade 3a quality (approximately 122ha), with smaller areas of Grade 2 (approximately 31.1ha) and Grade 1 (approximately 4.6ha).

Using the available information, the geology and soil associations mapped over the Site are likely to give land of 'best and most versatile' agricultural quality. The initial findings of the reconnaissance survey have shown the land to be mainly of Subgrade 3a quality with areas of Grade 1, 2 and Subgrade 3b. The land is primarily limited by wetness and workability constraints.

Contaminated Land

A full contaminated land baseline has been completed for the Site. Review of historical mapping indicates that the Site and the local area have a history of predominantly agricultural land use with only limited urban development from the mid-19th Century onwards. Within the Site Boundary, the following historic features were identified:

- Residential properties, roads, bridges and footpaths;
- railway line and embankments; and
- pumping stations.

Potential sources of contamination at the Site and surrounding areas are associated with the following activities:

- Made Ground within the site, associated with a limited historic development extent within the site footprint; and
- Historical industrial works (including pumping stations and railway lines) and associated Made Ground within the site.

The environmental receptors that may be present within the Site Boundary and their associated sensitivity are as follows:

- Human receptors including future site users and workers involved in site development; High sensitivity;
- Surface water features including River Welland, South Holland Main Drain and surface water abstractions; Medium sensitivity; and
- Groundwater is scoped out due to presence of negligible sensitivity, unproductive superficial and bedrock strata.

Geodiversity

Cowbit Wash SSSI is a geological SSSI designated for sequence of alternating marine clastic and freshwater peat layers which have been used for pollen, diatom, particle-size and radiocarbon analyses to understand changes to the fens during the Flandrian period from approximately 5900BC onwards. It is dependent on a high water table to preserve the peat record.

Cowbit Wash was identified in the baseline however it is 3.6km to the west of the Site Boundary and separated by a series of deep agricultural drains and elevated roads. For this reason, no

¹⁴¹ Department for Environment Food and Rural Affairs (2016) *Agricultural Land Classification detailed Post 1988 survey* ALCC05791. Available at: <https://environment.data.gov.uk/dataset/5ade7e89-1959-4a91-9485-eba44788c1f2>

	<p>potential impact linkage is identified that could change the water environment on-site and therefore Cowbit Wash SSSI is excluded as a receptor.</p>																											
<p>Assessment Methodology</p>	<p>The assessment is designed to consider the effect of the Scheme on two sensitive receptors: soil resources and agricultural land quality (namely best and most versatile land).</p> <p>The impact of the Scheme to agricultural land and soil resources will be assessed using significance and magnitude criteria developed by Land Research Associates. The assessment will be carried out at three stages of the Scheme: construction phase, operational phase, and decommissioning phase. The criteria are set out in the tables below.</p> <p>For the purposes of this assessment, thresholds for the magnitude of impact adopted in this assessment set out below and within Table 4.5.1 are based on a threshold of the permanent change of 20ha of best and most versatile (BMV) agricultural land within Article 18(1), paragraph (y) of the Table to the Town and Country Planning (Development Management Procedure) Order 2015. These thresholds are recommended as the area of BMV land change that triggers a requirement to consult with Natural England, implying that this is also the point at which the change is no longer considered to be 'not significant'. Therefore, for the purposes of this assessment:</p> <ul style="list-style-type: none"> • A total permanent loss/gain of BMV land which exceeds 20ha is considered significant; • A loss of BMV which is either temporary and reversible after construction, or which falls below the 20ha threshold, is considered as being not significant; and • A loss of non-BMV land is considered as being not significant. <p>Table 4.5.1: Magnitude of Receptors</p> <table border="1"> <thead> <tr> <th>Receptors</th> <th>Large</th> <th>Moderate</th> <th>Small</th> <th>Negligible</th> </tr> </thead> <tbody> <tr> <td>Agricultural Land</td> <td>Loss of >80ha of best and most versatile land</td> <td>Loss of 20-80ha of best and most versatile land</td> <td>Loss of 5-20ha of best and most versatile land</td> <td>Loss of <5ha of best and most versatile land</td> </tr> <tr> <td>Soil Resources</td> <td>Loss of >80% of topsoil resources and insufficient topsoil protected for on-site uses. Subsoil compaction of >10% of Site</td> <td>Loss or irreversible damage to 50-80% of topsoil resources. Compaction of 5-10% of subsoils</td> <td>Loss or irreversible damage to <50% of topsoil resources. Compaction of <5% of subsoils</td> <td>Only minor disturbance of soils within the Site.</td> </tr> </tbody> </table> <p>Table 4.5.2: Sensitivity of Receptors</p> <table border="1"> <thead> <tr> <th>Receptors</th> <th>High</th> <th>Medium</th> <th>Low</th> </tr> </thead> <tbody> <tr> <td>Agricultural Land</td> <td>Grades 1 & 2</td> <td>Subgrade 3a</td> <td>Subgrade 3b and grades 3 & 4</td> </tr> <tr> <td>Soil resources</td> <td>Permeable coarse loamy and medium loamy soils, or other soils capable of supporting valuable habitats</td> <td>Fine textured or sandy topsoil not capable of supporting valuable habitats Mixed permeable and slowly permeable subsoils.</td> <td>Damaged or contaminated soils Slowly permeable subsoils</td> </tr> </tbody> </table>	Receptors	Large	Moderate	Small	Negligible	Agricultural Land	Loss of >80ha of best and most versatile land	Loss of 20-80ha of best and most versatile land	Loss of 5-20ha of best and most versatile land	Loss of <5ha of best and most versatile land	Soil Resources	Loss of >80% of topsoil resources and insufficient topsoil protected for on-site uses. Subsoil compaction of >10% of Site	Loss or irreversible damage to 50-80% of topsoil resources. Compaction of 5-10% of subsoils	Loss or irreversible damage to <50% of topsoil resources. Compaction of <5% of subsoils	Only minor disturbance of soils within the Site.	Receptors	High	Medium	Low	Agricultural Land	Grades 1 & 2	Subgrade 3a	Subgrade 3b and grades 3 & 4	Soil resources	Permeable coarse loamy and medium loamy soils, or other soils capable of supporting valuable habitats	Fine textured or sandy topsoil not capable of supporting valuable habitats Mixed permeable and slowly permeable subsoils.	Damaged or contaminated soils Slowly permeable subsoils
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	<p>The significance of any adverse impact will be assessed as either ‘major’ (i.e. significant), ‘moderate’, ‘minor’ or ‘negligible’ according to the magnitude of the impact of the Scheme and the sensitivity of the receptor, and either ‘temporary’ or ‘permanent’.</p>
<p>Baseline Development</p>	<p>Agriculture and Soils</p> <p>Soil resources and agricultural land quality will be reviewed by means of a desk study of published and unpublished soil maps and reports and more accurately assessed by a survey across the Site boundary (described below).</p> <p>An initial Reconnaissance ALC survey has been conducted at selected intersections of a 100m grid, giving an average density of approximately one observation per 4 to 5 hectares. Locations will be selected using topography of the land and results from the desk study. This density of survey is below that recommended by Natural England for planning applications and is intended to give provisional grades only. This will enable the identification of higher-grade land and the information can be fed into the early stages of Scheme design.</p> <p>Following the initial Reconnaissance a more detailed survey, with pre-determined observations located at alternate intersects of a 100m grid (giving a density of one observation per two hectares), will be carried out. Infill of survey points on grid intersects will be undertaken where variation occurs (different soil types resulting in a change in land quality) to confirm the position of land grade boundaries and identify soil and land types.</p> <p>The field survey will be informed by a desk study carried out using the following sources:</p> <ul style="list-style-type: none"> • 1:50,000 scale British Geological Survey mapping¹¹⁶; • 1:250,000 National Soil Mapping¹¹⁷; and • Defra MAGIC mapping¹²⁰. <p>Once the Grid Connection route and proposed method (overhead or underground) have been defined, a survey scope will be determined and agreed with Natural England, surveys will be concentrated on the footprint of the pylons/cabling crossing points and access roads.</p> <p>Contaminated Land</p> <p>A contaminated land baseline has been completed which has consulted the following sources as a minimum:</p> <ul style="list-style-type: none"> • National Library of Scotland Historic Maps¹⁴²; • Mineral Resource Maps in England (Lincolnshire South)¹⁴³; • Category 1 & 2 Environmental Pollution Incidents (The Rivers Trust)¹⁴⁴; and • Historic Landfill Sites¹⁴⁵.
<p>Key Issues and Potential Likely Impacts</p>	<p>Construction and Decommissioning Phase</p> <ul style="list-style-type: none"> • There is the potential for soil resources to be damaged by machinery during the installation of the solar PV modules if carried out when the soil is in a plastic state. This would lead to reduced drainage capabilities and restricted rooting for vegetation. This is a potentially significant effect due to the large scale of the Scheme; • There is the potential for encountering contaminated Made Ground across the Site, although the likelihood of encountering widespread contamination is low

¹⁴² National Library of Scotland (2024) *National Library of Scotland Historic Maps*. Available at: <https://maps.nls.uk/>

¹⁴³ Natural Environment Research Council (2023) *Lincolnshire: mineral resource information in support of national, regional and local planning*. Available at: <https://nora.nerc.ac.uk/id/eprint/535617/>

¹⁴⁴ The Rivers Trust (2021) *Category 1 & 2 Environmental Pollution Incidents (Catchment Based Approach Data Hub)*. Available at: <https://data.catchmentbasedapproach.org/datasets/16ce1e1cd121405f8cd746b6652b0a06/explore>

¹⁴⁵ The Rivers Trust (2019) *Historic Landfill Sites (Catchment Based Approach Data Hub)*. Available at: <https://data.catchmentbasedapproach.org/datasets/historic-landfill-sites/explore>

	<p>based upon historic mapping data. The main risk is to site construction workers who may undertake earthworks in areas of potentially contaminated Made Ground as part of the development works. Contamination may pose a short-term (acute) or long-term (chronic) risk to workers during construction and maintenance. However, potential risks can be mitigated through adoption of good working practices on-site as part of wider site management during construction. The risk to construction workers and future site users relating to contaminated land is assessed as being Moderate / Low; and</p> <ul style="list-style-type: none"> • There is the possibility that any earthworks in potentially contaminated Made Ground could expose contaminated soils and introduce a new pathway to surface waters. This should be considered during the design of any proposed works. The control of sediment run off during any proposed works should also be considered to be protective of surface waters. The risk to surface water relating to contaminated land is assessed as being Moderate / Low. <p>Operational Phase</p> <ul style="list-style-type: none"> • Due to the presence of infrastructure across the Site, the land will likely only be suitable for low density grazing/grassland only. The Scheme could result in the temporary loss of the arable use of the agricultural land of BMV or lower quality land on the Site during the Scheme’s operational life (40 years); and • No impacts on contaminated land are anticipated during operation.
<p>Design, Mitigation and Enhancement Measures</p>	<p>A Site-specific Soil Management Plan will be written by a qualified soil scientist. The report should include means of soil protection from compaction damage; remedial measures to remove damage; depth and method of soil stripping during cable laying; soil handling advice and timings. This will mitigate the potential effects of the construction and decommissioning phase of the Scheme to negligible.</p> <p>The solar PV module layout, rows and width of field margins should be designed to accommodate machinery and equipment that will be required to top/harrow and seed grass to allow improved grassland management to be carried out on the site. The depth of buried cables and protection/positioning of above ground cabling should also be considered where agricultural machinery and livestock will be operating. Cables should be buried deep enough to avoid risk of disturbance from farm practices and care should also be taken when considering the position of cables to avoid damage to land drains.</p> <p>While the presence of widespread or significant contamination is unlikely it is recommended that measures to deal with any unexpected contamination that may be encountered during future site development are contained within a dedicated CEMP for the site.</p>
<p>Consultation</p>	<p>Ongoing consultation has started with Natural England to discuss works completed to date and to seek to agree the proposed survey methodology.</p>
<p>Assessment Assumptions and Limitations</p>	<p>The reconnaissance survey provides an indication of the likely distribution of grades and so can only inform the baseline until the more detailed survey is undertaken for the ES Chapter.</p> <p>Reference is made to Provisional ALC Map (1:250,000 scale)¹²⁰ though it should be noted these maps are produced at reconnaissance level and are not intended to be used for planning decisions and so more detailed survey are required.</p> <p>The contaminated land assessment has been completed utilising desk-based data. A detailed site walkover to identify potential visual evidence of contamination has not been undertaken.</p> <p>The presence of contamination within the underlying Made Ground has not been verified by a Phase 2 ground investigations. This includes on-site and off-site sources, such as nearby pumping station, infilled historical pits and landfills.</p> <p>Ground conditions within the area of proposed works, including geological profile and groundwater characteristics have been inferred from available mapping and local borehole records.</p>

	<p>Assessment of historical landfills is based on desk based review of recorded sites. There is the potential for unrecorded or unlicensed landfills to be present within or near to the study area.</p>
<p>Summary of Aspects</p>	<p>Aspects scoped into the EIA</p> <ul style="list-style-type: none"> • Agricultural land resources: Best and most versatile agricultural land (i.e. Grades 1, 2 and 3a on MAFF's 1988 Agricultural Land Classification (ALC) system) is considered to be a limited national resource, is given special consideration in national policy, and can be considered to be of higher sensitivity than land in Grades 3b, 4 and 5. The loss of lower quality land is considered of lower importance under the planning system of England. <p>Aspects scoped out of the EIA</p> <ul style="list-style-type: none"> • Soil resources within the PV Area, Grid Connection Corridor and Cable Connection Corridors. Soil is complicated as it is a multi-functional resource, able to support crops, habitat areas, mitigate flood risk etc. However, the main requirement in regard to solar PV sites is that the soil is capable of supporting its prior land-use at the end of a Scheme's lifetime, typically arable farming. The production and adherence to a site-specific Soil Management Plan will ensure soil resources are protected and the effect of the Scheme is negligible; • Geodiversity – No potential impact linkage is identified that could change the water environment on-site and therefore Cowbit Wash SSSI is scoped out of the assessment; and • Contaminated Land – A contaminated land assessment has been completed. Limited issues related to contaminated land could be controlled if encountered at the construction phase. As a result, this can be controlled outside of the EIA process and so receptors that could be affected by contaminated land issues have been scoped out of this assessment.

Landscape and Visual

Table 4.6 Landscape and Visual

Introduction	
<p>This table identifies the proposed scope of the EIA to assess Landscape and Visual effects. This considers:</p> <ul style="list-style-type: none"> Landscape and Visual Amenity – The potential effects of the Scheme on landscape features, character, views and visual amenity during construction, operational and decommissioning phases. 	
Study Area	<p>The preliminary Landscape and Visual Impact Assessment (LVIA) study area and draft Zone of Theoretical Visibility (ZTV) (Figure 4.6.1) extends up to 5km from the Site Boundary to cover the nearest settlements. These include:</p> <ul style="list-style-type: none"> Crowland; Spalding; Moulton; Holbeach Drove; Whaplode Drove; and Deeping St Nicholas. <p>In accordance with Guidelines for Landscape and Visual Impact Assessment; 3rd edition (GLVIA3)¹⁴⁶, the landscape study area is used to identify the areas of the surrounding landscape that the Scheme may influence. The ZTV also helps form the basis of the visual study area, identifying areas from which the Scheme may be visible, and the groups of people/individuals that may be significantly affected by the changes to their views.</p> <p>GLVIA3¹⁴⁶ sets out that at the scoping stage, the study area is defined in a preliminary way and will be modified as detailed analysis is undertaken.</p> <p>The LVIA study area will be reviewed throughout the design process and fieldwork studies. The study area will also be consulted on with the Local Planning Authorities (LPAs) and the final study area will be within the ES.</p>
Planning Policy, and Guidance	<p><u>National Planning Policy</u></p> <ul style="list-style-type: none"> Overarching National Policy Statement for Energy (EN-1)⁷; National Policy Statement for Renewable Energy Infrastructure (EN-3)⁸; National Policy Statement for Electricity Networks Infrastructure (EN-5)⁹; and National Planning Policy Framework (NPPF)¹⁰. <p><u>Local Planning Policy</u></p> <ul style="list-style-type: none"> South East Lincolnshire Local Plan (SELLP) 2011-2036¹²; South Holland Local Plan (adopted July 2006)¹⁴⁷; and Lincolnshire County Council Green Masterplan²⁷.
Baseline Conditions	<p>The Site sits solely within National Character Area 46 (NCA) The Fens, recognised by its large, low-lying, flat landscape with drainage ditches, dykes and rivers. The views within this landscape consist of large, open views with huge skies meeting the horizon.</p>

¹⁴⁶ Landscape Institute and IEMA (2013) *Guidelines for Landscape and Visual Impact Assessment (GLVIA3)*. 3rd edn. London: Routledge

¹⁴⁷ South Holland District Council (2006) *South Holland Local Plan*. Available at: <https://www.viking-link.com/media/1198/cd25-south-holland-district-local-plan-july-2006-extracts-only.pdf>

	<p>The Site is not located within any National Parks, or National Landscapes or any other landscape designations. Whilst evaluating the study area, there are some Conservation Areas that fall within 5km of the Site Boundary:</p> <ul style="list-style-type: none"> • Moulton Conservation Area: Approximately 380m east of the Grid Connection Corridor; • Crowland Conservation Area: Approximately 1800m from the PV Area; and • Spalding Conservation Area: Approximately 2600m to the west of the Grid Connection Corridor. <p>The main land use across the study area is agriculture, large scale arable fields that form a part of the long-range views within the area. Vegetation is minimal with small groups of woodland scattered within the view. Field boundaries within the Site Boundary are mainly defined by the large drainage ditches.</p> <p>The River Welland is located to the western boundary of the Site. The River Welland continues north into Spalding but does not impact the grid connection corridors.</p> <p>Settlements within the study area consist of small clusters of development with occasional individual properties scattered throughout. The largest settlements nearest to the Scheme are Crowland to the southwest, Spalding to the northwest and Moulton to the northeast. Smaller settlements within the study area include Holbeach St Johns, Holbeach Drove and Whaplode Drove.</p> <p>The A16 (Crowland Bypass), A151 (High Road/Spalding Road) and the A17 (Washway Road) are the main vehicular routes within the study area. The A16 runs south to north, intersecting the Site on the east and west. The A151 runs east to west from Holbeach, joining the A16 near Spalding. One Grid Connection Corridor option passes over the A151. The A17 is in the northeast of the study area, bypassing Holbeach.</p> <p>Other infrastructure within the study area includes telecommunications poles, carrying overhead wires and overhead powerlines carried by pylons dominantly in the north.</p> <p>Public Rights of Way (PRoW) and Bridleways are present within the study area, providing views across the surrounding landscape for walkers and riders. The PRoW can be accessed from roads and tracks bordering the PV Area, but no PRoW leads directly into the PV Area.</p> <p>Within the study area, there are some statutory designations which include Cowbit Wash SSSI and Vernatts LNR. The SSSI does not appear to have public access and is designated for its geological interest. However, from desktop studies and the preliminary run of the ZTV, the SSSI could potentially have views of the Grid Connection Corridor from the A1175 or Barrier Bank. The designated LNR would potentially have no view of the Scheme or grid connection corridors due to being surrounded by other development in Spalding.</p> <p>Within the study area, several listed buildings and scheduled monuments will be considered when evaluating the landscape value. This will be considered within the LVIA assessment.</p> <p>Site visits were conducted in November 2023 and February 2024, to gather baseline data and understand the characteristics of this landscape, key views and visual amenity.</p> <p>During the site visits, potential receptors have been identified. These will be clarified with the LPA to ensure all receptors have been considered for viewpoint photography within the ES. The receptors below have been identified to be within the Study Area from desktop studies or been identified within our preliminary ZTV:</p>
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Table 4.6.1 Visual Receptors	
Visual Receptor Type	Visual Receptor or Receptor Group
Residents	Residents of Holbeach St Johns, Holbeach Drove, Whaplode Drove, Moulton Chapel. Whaplode St Catherine, Weston Hills, Moulton, Weston. Any identified residential properties located along rural lanes throughout the study area.
Recreational Users	Users of PRow within and at the Site Boundary, and representative assessment of views from number of PRow across the study area to the north, south, east and west of the PV Area.

The fieldwork undertaken during November 2023 and February 2024 provided a preliminary indication of what potential visual impacts the Scheme may have on the receptors listed above. The combination of the flat landscape, minimal vegetation and the vegetation that was present not being in leaf, gave an indication the Scheme may be visible from a wide area with many visual receptors.

Assessment Methodology

The assessment of landscape and visual effects will be prepared within reference to the GLVIA3¹⁴⁶, published by the Landscape Institute and IEMA in 2013.

The assessment will involve the following key stages:

- Baseline review of published documents such as landscape character assessment, planning policy and relevant supporting evidence-base documents, and Ordnance Survey mapping and online aerial photographs;
- Fieldwork to verify the landscape and visual baseline and to identify receptors. The receptors will be discussed with the LPA for agreement;
- Assessment of sensitivity, considering receptor value and susceptibility;
- Assessment of magnitude of change; and
- Combine sensitivity with magnitude of effect to assess significance of the effect for the landscape and visual receptors identified in bullet 2.

The process is supported using viewpoints and associated photographs to illustrate and evaluate the Scheme’s effects at key sites. The assessment of effects will not be confined to receptors located at these key viewpoints alone.

Professional Judgement

GLVIA3¹⁴⁶ recognises that professional judgement is an important concept within LVIA. The assessment will rely on qualitative judgements that are based on reasoned and informed justification.

Assessment of Construction and Decommissioning Effects

The construction and decommissioning phase would be of fixed duration, and are expected to proceed in a phased process, so that not all receptors would be affected at the same time. Therefore, some viewpoints may see completed development whilst others will have construction or decommissioning activities at the same point in time.

Assessment of Residential Receptors

The assessment of visual effects on residential receptors relates to how the Scheme will affect their visual amenity. It is not a detailed Residential Visual Amenity Assessment (RVAA, Landscape Institute Technical Guidance Note 2/19¹⁴⁸).

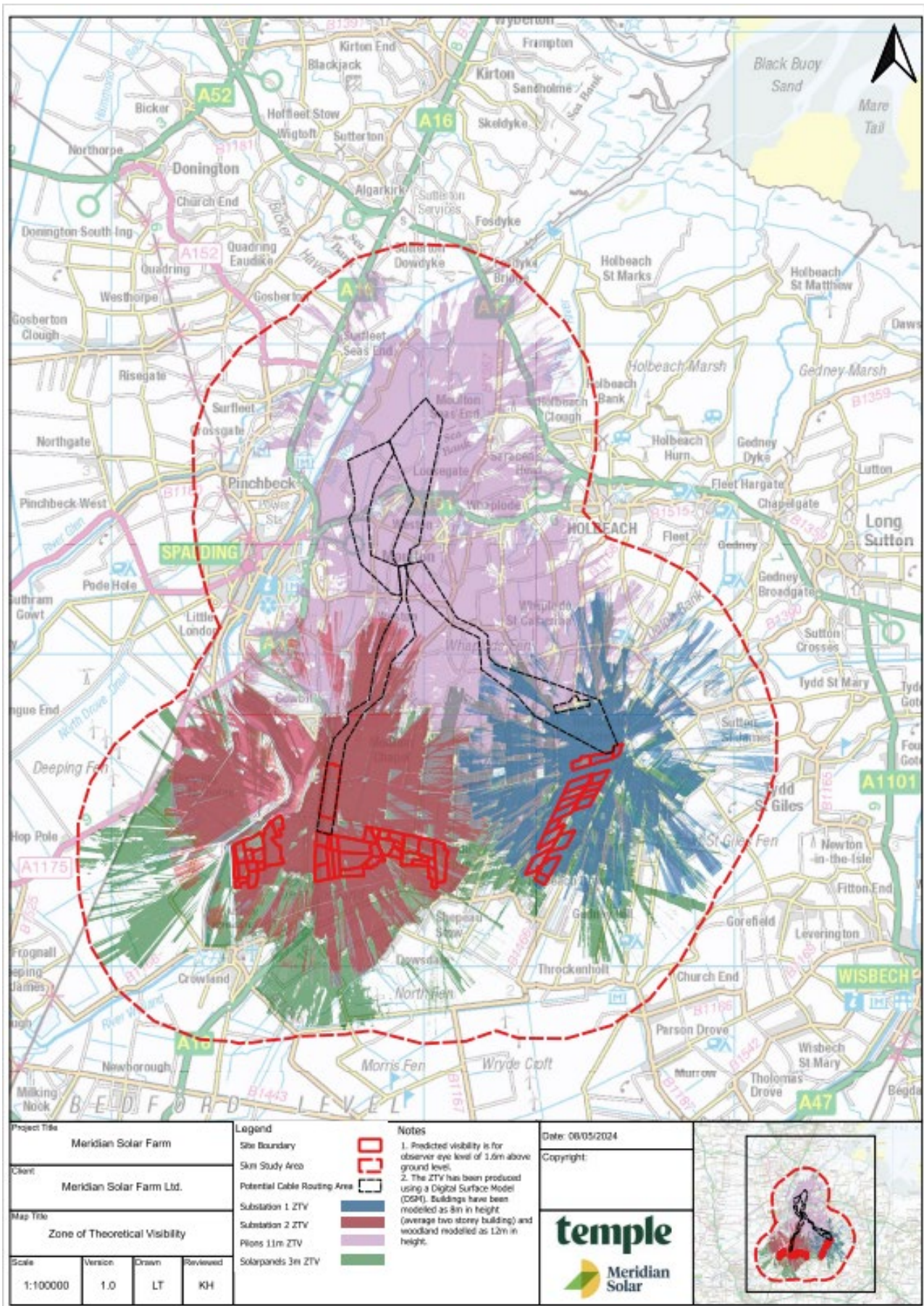
¹⁴⁸ Landscape Institute (2019) *Residential Visual Amenity Assessment (RVAA): Technical Guidance Note 2/19*. Available at: <https://www-landscapeinstitute-org/2019/03/tgn-02-2019-rvaa.pdf>

	<p>At this stage we are not proposing to undertake a detailed Residential Visual Amenity Assessment in accordance with the Landscape Institute Technical Guidance Note¹⁴⁸, but this position will be reviewed once the preliminary LVIA results are available. Therefore, if after year 15 i.e. after the establishment of proposed mitigation planting, if residential receptors are to still have significant adverse effects, a Residential Visual Amenity Threshold (RVAT) will be undertaken.</p> <p>Visual amenity is the visual quality of a site or area as experienced by residents, workers and visitors.</p> <p>The following information is described in the assessment:</p> <ul style="list-style-type: none"> • Description of location (receptor); • Description of nature of existing view and likely change during development lifespan; • Description of magnitude of change and sensitivity of visual receptors; and • Summary of the significance of the potential impact. <p>The significance of landscape and visual effects will be determined through the determination of the sensitivity of receptors and the magnitude of impact, following a similar matrix set out in Table 3.3.</p>
<p>Baseline Development</p>	<p>The development of the baseline will be supported by the following as a minimum:</p> <ul style="list-style-type: none"> • Baseline Site Visits conducted in November 2023 and February 2024 have been undertaken to gather preliminary information on the Scheme and Grid connection options. <p>Desktop studies of the National, Regional and Local Landscape Character documents, also any national and local plans, strategies and evidence-base that is applicable to the area;</p> <ul style="list-style-type: none"> • Freely available geographical information data; and • Viewpoint photography. <p>Viewpoints</p> <p>A viewpoint is a location from where a view of the Scheme may be seen. A number of viewpoints will be chosen to support the assessment of landscape and visual effects and illustrate effects at key locations.</p> <p>Baseline surveys were conducted in November 2023 and February 2024. Viewpoint photography will be conducted at two different times of the year, September – March for ‘winter’ photos when most vegetation is not in leaf; and April-August for ‘summer’ photos, when most vegetation is in leaf.</p> <p>Viewpoints will be carefully selected to be either:</p> <ul style="list-style-type: none"> • Representative viewpoints – represent the experience of different types of visual receptors. For example, a represent view from several residential properties in a similar geographical location, with similar existing views. • Specific viewpoints – important key viewpoints within the landscape. This may include views out from historic areas, views that include historic features, or views from routes valued for their scenic amenity; and • Illustrative viewpoints – chosen specifically to demonstrate a particular effect or issue. <p>Viewpoints will be initially selected from locations where the Scheme is likely to be visible and is predicted to result in significant effects on the view and the receptors. This is informed by a review of Ordnance Survey maps and online aerial photography, fieldwork observations, discussions with LPAs and information on relevant issues such as access, landscape character and popular vantage points.</p> <p>A range of views and visual receptors will be represented through the choice of viewpoints. Factors that will be considered when selecting the final viewpoints to be used for the assessment include:</p>

	<ul style="list-style-type: none"> • Landscape character type (separate and combinations of type); • Visual composition, for example focused or panoramic views, simple or complex landscape pattern, vistas or glimpses; • Distance from the Scheme (short, medium and long-range views); • Aspect and elevation; • Viewer type; • Activities of the receptors, for example those at home, work, travelling in various modes or carrying out recreation; and • Modes of movement, for example those moving through the landscape or stationary.
<p>Key Issues and Potential Likely Impacts</p>	<p>Construction Phase</p> <ul style="list-style-type: none"> • The Scheme has the potential to cause temporary significant landscape and visual effects during the construction phase. This will be due to the alterations to the landform e.g. widening of roads and changes to the ditches in this location. There is also the impact of the removal of some of the small areas of vegetation if it is impacted by the road widening or access to the Site. • The Scheme has the potential to cause temporary significant visual effects during construction. This would be due to the potential changes of the views, with plant, moving vehicles, and lighting, compounds, storage areas and temporary access tracks, in comparison to open fields and farming activities. <p>Operational Phase</p> <ul style="list-style-type: none"> • The Scheme has the potential to result in significant adverse landscape and visual affects during operation (assessed at year 1 and 15). The presence of solar PV modules, structures and the Grid Connection and Cable Connection would change the land use and character. • Visual effects also have the potential to be significant due to the changes in views, in comparison to long distance views of fields and farming activity. Some mitigation planting would have matured by year 15, potentially shortening some of the long-distance views whilst also screening the development. However, planting could also create a positive change to landscape character. <p>Decommissioning</p> <ul style="list-style-type: none"> • The Scheme would potentially result in significant adverse effects, similar to the construction phase. This would be temporary and due to the machinery and associated activity to remove the panels and associated infrastructures.
<p>Design, Mitigation and Enhancement Measures</p>	<p>The design and layout of the Scheme, notably the assessment and selection of the Grid Connection Corridors, has been informed by recommendations from landscape and visual technical specialists .</p> <p>Mitigation</p> <p>It is expected that mitigation is likely to comprise the following:</p> <ul style="list-style-type: none"> • Advanced planting – proposed planting to take place before the Scheme is constructed. Vegetation will be more mature and has potential to be ready in place to mitigate views of the Scheme before its operational phase; • Seek to avoid or minimise any removal of any vegetation that is present in the landscape; • Restoration of hedgerows to provide visual screening; • Additional planting of small isolated woodland blocks, mimicking the current character within the landscape; • Proposed fencing to be of appropriate height and style to minimise its visual prominence; and • Assuming no lighting will be used at the perimeter fence, only in emergency situations. Minimising the landscape and visual effects caused by lighting.

	<p>Potential Enhancement</p> <ul style="list-style-type: none"> • Opportunities to manage the receiving landscape include potential to enhance the core wetland complexes and increase their connectivity by enhancing the main rivers, waterways and their associated riparian habitats and improve recreational access opportunities within the Fens.
<p>Consultation</p>	<p>The following consultees will be approached to seek to agree appropriate viewpoints to be assessed within the LVIA which will form a part of the Environmental Statement (this process has commenced):</p> <ul style="list-style-type: none"> • Lincolnshire County Council; and • South Holland District Council. <p>The Applicant is also liaising with National Grid regarding potential cumulative effects with their proposed Grimsby to Walpole Scheme.</p>
<p>Assessment assumptions and limitations</p>	<ul style="list-style-type: none"> • A Residential Visual Amenity Assessment is not proposed to be completed within the LVIA process, requirements to complete a RVAA will be reviewed following preliminary LVIA results; • All fieldwork will be undertaken from publicly accessible locations. Professional judgement will be used to assess residents' views, aided by aerial photography and field observations; • Agreement will be sought on viewpoints through consultation with South Holland District Council and Lincolnshire County Council; • Uncertainties at this stage include the layout, siting and heights of the solar PV modules, on-site substation(s), and associated structures. The receptors will be reviewed accordingly in relation to the height of the panels, informed by ZTVs; • No lighting assessment will be undertaken under the Landscape and Visual topic, as it is considered lighting during construction and decommissioning to be temporary; • The assessment and the prediction of effects during the lifespan of the Scheme are based on the available background information and supplied drawings of the proposal and involve a degree of informed professional judgement; and • The assessment will not include taking views from inside private property, professional judgement and additional information listed above will determine the assessment from public accessible locations.
<p>Summary of Aspects</p>	<p>Aspects scoped into EIA</p> <ul style="list-style-type: none"> • Assessment of likely effects on landscape features, character, views and visual amenity during construction, operation, and decommissioning. This covers the Scheme, including the solar array and associated infrastructure and the Grid Connection. <p>Aspects scoped out of EIA</p> <ul style="list-style-type: none"> • No aspects of landscape and visual topic to be scoped out.

Figure 4.6.1 Draft Zone of Theoretical Visibility



Noise and Vibration

Table 4.7 Noise and Vibration

<p>Introduction</p> <p>This table identifies the proposed scope of the EIA to assess Noise and Vibration. This considers:</p> <ul style="list-style-type: none"> • Noise – The potential effects of the Scheme during construction and decommissioning phases associated with likely work activities. Operational noise effects during operation of the Scheme will also be considered with the introduction of new infrastructure across the Site Boundary. • Vibration – The potential effects of the Scheme during construction and decommissioning phases associated with likely work activities. 	
<p>Study Area</p>	<p>The study area for the assessment of direct noise and vibration impacts includes noise and vibration sensitive receptors within 300m of the Scheme and is outlined in Figure 4.7.1. The study area shown is approximate and may be expanded in areas where construction or operational noise levels are predicted to exceed the thresholds for significant effects defined by relevant guidance.</p> <p>The nearest sensitive receptors and proposed assessment locations and their locations relative to the Scheme are identified in Figure 4.7.2. These were identified by OS address point data through a desktop analysis.</p> <p>28 baseline assessment locations near the Scheme have been identified, 11 of which are for the Grid Connection Corridor options. The Grid Connection will be refined to a single route following further assessment and appraisal. This is not intended to be an exhaustive list of assessment locations. Following a scoping process and consultation with key stakeholders, including South Holland District Council Environmental Health Officer, a finalised list of assessment locations will be selected. It should be noted that because the cabling installation work is transient (typically less than a month at a single location), there is the possibility of scoping it out after the consultation phase.</p>
<p>Planning Policy and Guidance</p>	<p><u>Legislation</u></p> <ul style="list-style-type: none"> • Control of Pollution Act (1974)¹⁴⁹; and • Environmental Protection Act (1990)⁷⁰. <p><u>National Planning Policy</u></p> <ul style="list-style-type: none"> • Overarching National Policy Statement (NPS) for Energy (EN-1)⁷; • National Policy Statement for Renewable Energy Infrastructure (EN-3)⁸; • National Policy Statement for Electricity Networks Infrastructure (EN-5)⁹; • National Planning Policy Framework (NPPF)¹⁰; and • The Noise Policy Statement for England (NPSE) (2010)¹⁵⁰ sets out the long-term vision of the government’s noise policy. <p><u>Local Planning Policy</u></p> <ul style="list-style-type: none"> • South East Lincolnshire Local Plan (SELLP) 2011-2036¹². <p><u>Guidance</u></p>

¹⁴⁹ Control of Pollution Act 1974. Available at: https://www.legislation.gov.uk/ukpga/1974/40/pdfs/ukpga_19740040_en.pdf

¹⁵⁰ Department for Environment, Food and Rural Affairs (2010) *Noise Policy Statement for England (NPSE)*. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69533/pb13750-noise-policy.pdf

	<ul style="list-style-type: none"> • Planning Practice Guidance: Noise¹⁵¹ provides guidelines that are designed to assist with the implementation of the noise requirements set out in the NPPF¹⁰; • British Standard 7445-2:1991¹⁵²; • British Standard 8233:2014¹⁵³; • British Standard 6472-1:2008¹⁵⁴; • British Standard 5228: 2009+A1:2014¹⁵⁵; • British Standard 7385-2:1993¹⁵⁶; • British Standard 4142:2014+A1:2019¹⁵⁷; • Department of Transport/Welsh Office Memorandum 'Calculation of Road Traffic Noise' (Department of Transport, 1988)¹⁵⁸; • The Highways Agency 'Design Manual for Road and Bridges LA 111 - Noise and vibration' (DMRB, 2020)¹⁵⁹; • The World Health Organisation Guidelines for Community Noise (1999)¹⁶⁰; and • BS ISO 9613-2:2024¹⁶¹ IEMA and Institute of Acoustics (IOA) guidelines for noise impact assessment¹⁶²,
<p>Baseline Conditions</p>	<p>The present land use within the Site Boundary is primarily agricultural. It includes arable farming, residential and local wildlife sites. There are individual and clusters of residential properties located within and adjacent to the Site Boundary. Fenland and Crowland Airfields and East of England Shooting Ground are also located adjacent to the Site.</p> <p>The dominant sources of sound in the area are considered to be road traffic on the surrounding major roads (primarily associated with A16 and A151) and air traffic (primarily associated with Fenland and Crowland Airfields) when present.</p>

¹⁵¹ MHCLG (2014) Planning Practice Guidance: Noise. Available at: <https://www.gov.uk/guidance/noise--2>

¹⁵² British Standards Institute (1991) BS 7445-2:1991 *Description and measurement of environmental noise - Guide to the acquisition of data pertinent to land use*. Available at: <https://knowledge.bsigroup.com/products/description-and-measurement-of-environmental-noise-guide-to-the-acquisition-of-data-pertinent-to-land-use?version=standard>

¹⁵³ British Standards Institute (2014) BS 8233:2014 *Guidance on sound insulation and noise reduction for buildings*. Available at: <https://knowledge.bsigroup.com/products/guidance-on-sound-insulation-and-noise-reduction-for-buildings?version=standard>

¹⁵⁴ British Standards Institute (2008) BS 6472-1:2008 *Guide to evaluation of human exposure to vibration in buildings - Vibration sources other than blasting*. Available at: <https://knowledge.bsigroup.com/products/guide-to-evaluation-of-human-exposure-to-vibration-in-buildings-vibration-sources-other-than-blasting?version=standard>

¹⁵⁵ British Standards Institute (2009) BS 5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites - Noise*. Available at: <https://knowledge.bsigroup.com/products/code-of-practice-for-noise-and-vibration-control-on-construction-and-open-sites-noise?version=standard>

¹⁵⁶ British Standards Institute (1993) BS 7385-2:1993 *Evaluation and measurement for vibration in buildings - Guide to damage levels from groundborne vibration*. Available at: <https://knowledge.bsigroup.com/products/evaluation-and-measurement-for-vibration-in-buildings-guide-to-damage-levels-from-groundborne-vibration?version=standard>

¹⁵⁷ British Standards Institute (2019) BS 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound*. Available at: <https://knowledge.bsigroup.com/products/methods-for-rating-and-assessing-industrial-and-commercial-sound?version=standard>

¹⁵⁸ Department of Transport and Welsh Office (1998) *Calculation of Road Traffic Noise*. Available at: <https://www.noisemap.ltd.uk/wp-content/uploads/2020/06/CRTN.pdf>

¹⁵⁹ Highways England; Transport Scotland; Welsh Government; Department for Infrastructure (Northern Ireland) (2020) *Design Manual for Roads and Bridges (DMRB): LA 111 Noise and Vibration*. Available at: <https://www.standardsforhighways.co.uk/tses/attachments/cc8cfcf7-c235-4052-8d32-d5398796b364>

¹⁶⁰ World Health Organisation (1999) *Guidelines for Community Noise*. Available at: <https://iris.who.int/bitstream/handle/10665/66217/a68672.pdf?sequence=1&isAllowed=y>

¹⁶¹ British Standards Institute (2024) BS ISO 9613-2:2024 *Acoustics. Attenuation of sound during propagation outdoors - Engineering method for the prediction of sound pressure levels outdoors*. Available at: <https://knowledge.bsigroup.com/products/acoustics-attenuation-of-sound-during-propagation-outdoors-engineering-method-for-the-prediction-of-sound-pressure-levels-outdoors?version=standard>

¹⁶² IEMA and Institute of Acoustics (2014) *Guidelines for Environmental Noise Impact Assessment*. Available at: <https://www.iema.net/download-document/236678>

Assessment Methodology	<p><u>Baseline Noise Survey</u></p> <p>A baseline environmental noise survey exercise will be carried out post-scoping comprising short term attended measurements at locations to establish existing baseline noise conditions. The measurement locations will be representative of noise sensitive receptors surrounding the Scheme which have the potential to be impacted by noise from the construction, operation and/or decommissioning of the Scheme. The scope and methodology will be defined in consultation with the Environmental Health Officers of South Holland District Council and Lincolnshire County Council, where possible, agreed prior to commencement of surveys.</p> <p>Weather conditions will also be noted for the duration of the noise surveys so any periods of adverse weather conditions could be identified and omitted from noise data.</p> <p><u>Vibration Assessment</u></p> <p>The vibration assessment methodology is based on assessing impacts due to exceedance of fixed thresholds. The vibration baseline is therefore assumed to be negligible at receptors. There may be noticeable vibration at some receptors e.g. close to roads or railway lines; in these cases, the assumption is that there is no existing vibration to present a worst case in terms of potential impacts.</p> <p><u>Significance of Effect</u></p> <p>In accordance with NPSE, a SOAEL (Significant Observed Adverse Effect Level) and a LOAEL (Lowest Observed Adverse Effect Level) has been set for each type of noise or vibration source for residential receptors to be assessed. For non-residential receptors, further specific effect threshold levels have been set where required, outlined in Table 4.7.1.</p> <p>Table 4.7.1 Potential Significance of Adverse Effect Related to National Noise Policy (NPSE)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #92d050;"> <th style="text-align: center;">Magnitude of Change</th> <th style="text-align: center;">Potential of Effect</th> <th style="text-align: center;">Significance</th> <th style="text-align: center;">Adverse noise effect related to NPSE effect level (for residential receptors)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">High</td> <td style="text-align: center;">Major (Significant)</td> <td style="text-align: center;">adverse</td> <td style="text-align: center;">Adverse noise effect exceeding an unacceptable adverse effect level</td> </tr> <tr> <td style="text-align: center;">Moderate</td> <td style="text-align: center;">Moderate (Significant)</td> <td style="text-align: center;">adverse</td> <td style="text-align: center;">Adverse noise effect exceeding SOAEL</td> </tr> <tr> <td style="text-align: center;">Low</td> <td style="text-align: center;">Minor</td> <td style="text-align: center;">adverse</td> <td style="text-align: center;">Adverse noise effect exceeding LOAEL, but below SOAEL</td> </tr> <tr> <td style="text-align: center;">Very Low</td> <td style="text-align: center;">Negligible</td> <td></td> <td style="text-align: center;">Noise effect exceeding NOEL but below LOAEL</td> </tr> <tr> <td style="text-align: center;">None</td> <td style="text-align: center;">None</td> <td></td> <td style="text-align: center;">No change from baseline</td> </tr> </tbody> </table> <p>All potential noise and vibration effects during the construction and decommissioning phases will be temporary and all potential noise effects during operation will be reversible long-term.</p> <p><u>Construction and Decommissioning</u></p> <p>Noise and vibration levels associated with construction and decommissioning works will be using the data and procedures given in BS 5228:2009+A1:2014¹⁵⁵ Part 1: Noise and Part 2: Vibration.</p> <p>Construction and decommissioning noise effects will be assessed through comparison of predicted noise levels with the assessment threshold levels set out below:</p> <ul style="list-style-type: none"> • The SOAEL for residential receptors can vary depending on the baseline noise environment characterised by the existing ambient noise level as well as other factors such as the type of noise sources present; and 	Magnitude of Change	Potential of Effect	Significance	Adverse noise effect related to NPSE effect level (for residential receptors)	High	Major (Significant)	adverse	Adverse noise effect exceeding an unacceptable adverse effect level	Moderate	Moderate (Significant)	adverse	Adverse noise effect exceeding SOAEL	Low	Minor	adverse	Adverse noise effect exceeding LOAEL, but below SOAEL	Very Low	Negligible		Noise effect exceeding NOEL but below LOAEL	None	None		No change from baseline
Magnitude of Change	Potential of Effect	Significance	Adverse noise effect related to NPSE effect level (for residential receptors)																						
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None	None		No change from baseline																						

	<ul style="list-style-type: none"> The SOAEL has the threshold value. These criteria are based on the “ABC method” criteria in BS 5228:2009+A1:2014¹⁵⁵ Part 1; this method categorises the location into A, B or C categories based on the baseline noise level and the threshold value varies depending on the category. The LOAEL is set as the ambient noise level. The unacceptable adverse effect level is set as 10dB above the SOAEL threshold value. <p>For all non-residential receptors, noise levels generated by site activities will be deemed to be significant if the total noise (pre-construction ambient plus site noise) exceeds the pre-construction ambient noise by 5 dB or more, subject to lower cut-off values of 65dB, 55dB and 45dB $L_{Aeq,T}$ from site noise alone, for the daytime, evening and night-time periods, respectively; and a duration of one month or more.</p> <p>Construction and decommissioning vibration effects will be assessed through comparison of predicted vibration levels with the assessment threshold levels set out in BS 5228:2009+A1:2014¹⁵⁵ Part 2 to assess the effect of perceptible vibration on people (residential and non-residential) and in BS 7385:1993¹⁵⁶ Part 2 to assess the effect of vibration on buildings.</p> <p>The assessment will follow guidance of vibration levels from BS 5228:2009+A1:2014¹⁵⁵ Part 2. The vibration levels are in terms of Peak Particle Velocity (PPV) at the receptor. The 0.3mm/s level is considered to be the LOAEL and the 1mm/s level to be the SOAEL with 10mm/s as the unacceptable adverse effect level.</p> <p>BS 7385:1993¹⁵⁶ Part 2 will be utilised for transient vibration guide values for cosmetic damage. The levels given represent guide values for the onset of cosmetic damage in buildings.</p> <p>The temporary changes in road traffic noise levels along the local road network due to construction traffic will be assessed in accordance with the Calculation for Road Traffic Noise (CRTN). For roads with less than 1000 vehicles per 18 hours, the methodology set out in the Noise Advisory Council measurement and prediction guide will be used.</p> <p>The potential change in noise level as a result of temporary changes in road traffic noise levels along the local road network due to construction traffic will be evaluated in accordance with the Design Manual for Roads and Bridges (DMRB)¹⁵⁹ short term traffic noise effect criteria.</p> <p>Using the scale as set out in the table above, the SOAEL is considered to be equivalent to a 3dB change and the LOAEL a 1 dB change. The effect criteria apply to the total road traffic noise change at receptors.</p> <p><u>Operation</u></p> <p>Predictions of operational plant sound levels will be undertaken using the computer modelling software CadnaA which implements the calculation procedures following BS ISO 9613-2:2024¹⁶¹ ‘Attenuation of sound during propagation outdoors’ guidance. Sound level data for operational noise-producing plant will be based on manufacturer level data for proposed plant selections and similar rated plant. The likely operational plant and activities to be assessed will include inverters, transformers, switchgears and cooling units.</p> <p>Operational noise effects will be assessed following guidance from BS 4142:2014+A1:2019¹⁵⁷ which states that typically the greater the difference between the rating level and the background noise level, the greater the magnitude of the impact:</p> <ul style="list-style-type: none"> A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context; A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context; and The lower the rating level is, relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.
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	<p>Table 4.7.2 gives an indication of how the BS 4142:2014+A1:2019¹⁵⁷ assessment may align with the national noise policy effect levels; however, the actual impact will depend on the context the new noise source is introduced into.</p> <p>Table 4.7.2 Operational Noise Assessment Criteria Effect Level</p> <table border="1"> <thead> <tr> <th>Difference between Rating Level and Background Level</th> <th>BS 4142 Rating</th> <th>NPSE effect level</th> </tr> </thead> <tbody> <tr> <td>- 10dB*</td> <td>N/A*</td> <td>NOEL</td> </tr> <tr> <td>0dB</td> <td>Indication of the specific sound source having a low impact depending on the context.</td> <td>LOAEL</td> </tr> <tr> <td>+ 10dB</td> <td>Likely to be an indication of a significant adverse impact depending on the context.</td> <td>SOAEL</td> </tr> </tbody> </table> <p>* The difference between rating level and background level of -10 dB was removed from BS 4142:2014+A1:2019¹⁵⁷ revision; however, this rating level can still be used as an indication of NOEL.</p>	Difference between Rating Level and Background Level	BS 4142 Rating	NPSE effect level	- 10dB*	N/A*	NOEL	0dB	Indication of the specific sound source having a low impact depending on the context.	LOAEL	+ 10dB	Likely to be an indication of a significant adverse impact depending on the context.	SOAEL
Difference between Rating Level and Background Level	BS 4142 Rating	NPSE effect level											
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+ 10dB	Likely to be an indication of a significant adverse impact depending on the context.	SOAEL											
<p>Key Issues and Potential Likely Impacts</p>	<p>The key environmental constraints for noise and vibration are nearby noise sensitive residential and non-residential receptors which will require mitigation to be adopted to minimise noise impact during construction and operation of the Scheme.</p> <p>Note that, the assessment of noise effects on ecological receptors is outside of the scope of this chapter. These effects will be assessed in the Ecology and Biodiversity Chapter of the ES, as appropriate.</p> <p>Construction and Decommissioning</p> <ul style="list-style-type: none"> The potential (temporary) noise and vibration effects during the construction and decommissioning phases are likely to include works activities associated with Site preparation, plant installation, substation construction, cable laying, and construction-related vehicle movements within the Site Boundary including along access routes. <p>Operation</p> <ul style="list-style-type: none"> The potential (reversible long-term) noise effects during operation of the Scheme are likely to include noise from inverters, transformers, switchgears, and associated battery storage plant (e.g. cooling units, transformers), the on-site substation (e.g. transformers), and any associated vehicle movements. There are no vibration sources to be introduced as part of the Scheme, so there will be no operational vibration effects. It is proposed that operational vibration be scoped out from further assessment. The assessment of operational road traffic is proposed to be scoped out due to low vehicle numbers operating on-site. 												
<p>Design, Mitigation and Enhancement Measures</p>	<p>Measures to control noise and vibration as defined in Annex B and in Section 8 of BS 5228:2009+A1:2014¹⁵⁵ Part 1 and Part 2 will be adopted where reasonably practicable. These measures represent 'Best Practicable Means' (BPM) (as defined by section 72 of the Control of Pollution Act 1974¹⁴⁹) to manage noise and vibration emissions from construction activities. Examples of BPM that may be implemented during construction works are presented below:</p> <ul style="list-style-type: none"> Avoiding unnecessary revving of engines and switching off equipment when not required; Keeping internal haul routes well maintained and avoiding steep gradients; Using rubber linings in, for example, chutes and dumpers to reduce impact noise; Minimising drop heights of materials; Start up plant and vehicles sequentially rather than all together. Locating plant as far from noise sensitive receptors as practicable; 												

	<ul style="list-style-type: none"> • Working within designated daytime working hours; • Use of broadband audible reversing warnings which have minimal impact; • Selection of quieter equipment or working methods where practicable; • Keeping plant, equipment and other noise control measures well maintained; and • Use of enclosures or screening where practicable. <p>Embedded measures relevant to the construction phase will be described within a Framework Construction Environmental Management Plan.</p> <p>At this stage no specific noise mitigation measures have been included for the operational plant. As the plant design progresses, specifying plant and machinery with low noise emissions, will help to reduce noise emissions.</p> <p>Embedded measures relevant to the decommissioning phase will be outlined within a Framework Decommissioning Environmental Management Plan.</p>
Consultation	<p>Liaison will occur with key stakeholders including the relevant Local Authority Environmental Health Officers from South Holland District Council and Lincolnshire County Council. This will include discussing and seeking to agree our approach in advance for baseline surveys, proposed locations and assessment to confirm our methodology.</p>
Assessment assumptions and limitations	<ul style="list-style-type: none"> • Predictions of construction noise will be based on the anticipated programme and construction methods and will be predicted following guidance from BS 5228:2009+A1:2014¹⁵⁵ Part 1. The construction works are assumed to be undertaken in standard core working hours and use best practicable means to minimise noise and vibration impact. Predictions of sound levels have an associated degree of uncertainty; • Predictions of operational plant and activities sound levels will be undertaken following guidance to BS ISO 9613-2:2024¹⁶¹ which are based on an assumption of moderate downwind propagation, and hence could be considered as a worst-case calculation. However, the standard also indicates an estimated accuracy of $\pm 3\text{dB(A)}$ in predicted levels; • There can be a high level of uncertainty regarding decommissioning as engineering approaches and technologies evolve over the operational life of the Scheme, and assumptions will therefore be made, where appropriate. Noise effects during the decommissioning phase of the Scheme are assumed to be similar or less than noise effects during the construction phase. The noise assessment presented for the construction phase will therefore be considered representative (or an overestimate) of the decommissioning phase. As such a separate assessment for noise from the decommissioning phase is not proposed; and • Any measurement of existing baseline sound levels will be subject to a degree of uncertainty. Environmental sound levels vary between days, weeks, and throughout the year due to variations in source levels and conditions, meteorological effects on sound propagation and other factors. Hence, any measurement survey can only provide a sample of the ambient levels. Every effort will be made to ensure that measurements are undertaken in such a way as to provide a representative sample of conditions, such as avoiding periods of adverse weather conditions. However, a small degree of uncertainty will always remain in the values taken from such a measurement survey.
Summary of Aspects	<p>Aspects scoped into EIA</p> <ul style="list-style-type: none"> • Baseline noise monitoring will be undertaken at locations representative of surrounding noise-sensitive receptors; • An assessment of construction and decommissioning plant noise and vibration will be undertaken; • An assessment of operational plant noise and vibration will be undertaken; and • An assessment of road traffic noise during the construction phase of the Scheme will be undertaken.

	<p>Aspects scoped out of EIA</p> <p><u>Ground-borne vibration from the operation of the Scheme</u></p> <ul style="list-style-type: none">• No major vibration sources are envisaged to be introduced as part of the operation of the Scheme and as such there will be no associated vibration effects. It is proposed that ground-borne vibration is scoped out of any further assessment. <p><u>Operational noise effects associated with the Cable Connections (within the Cable Connection Corridors and Grid Connection Corridors)</u></p> <ul style="list-style-type: none">• It is not anticipated that the cabling associated with the Cable Connection and Grid Connection will produce any significant operational noise emissions. It is proposed that operational noise effects associated with the cabling are scoped out of any further assessment. <p><u>Operational road traffic noise</u></p> <ul style="list-style-type: none">• Element proposed to be scoped out due to low vehicle numbers operating on the Site. <p><u>Road traffic noise during the decommissioning phase</u></p> <ul style="list-style-type: none">• The assessment of road traffic noise as a result of the decommissioning phase is proposed to be scoped out due to uncertainties in relation to future traffic flows and transport infrastructure.
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Figure 4.7.1 Potential Noise Receptors

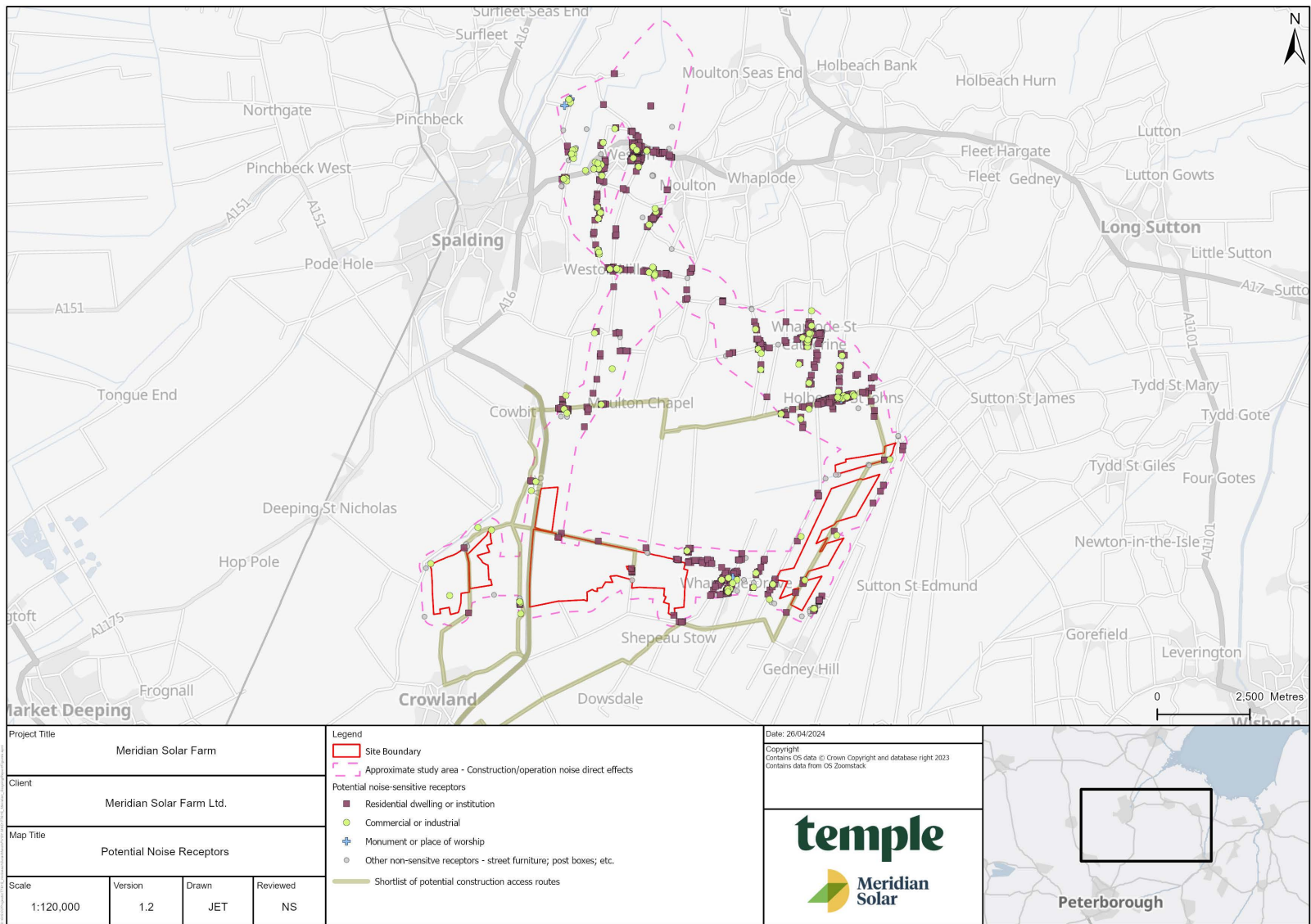
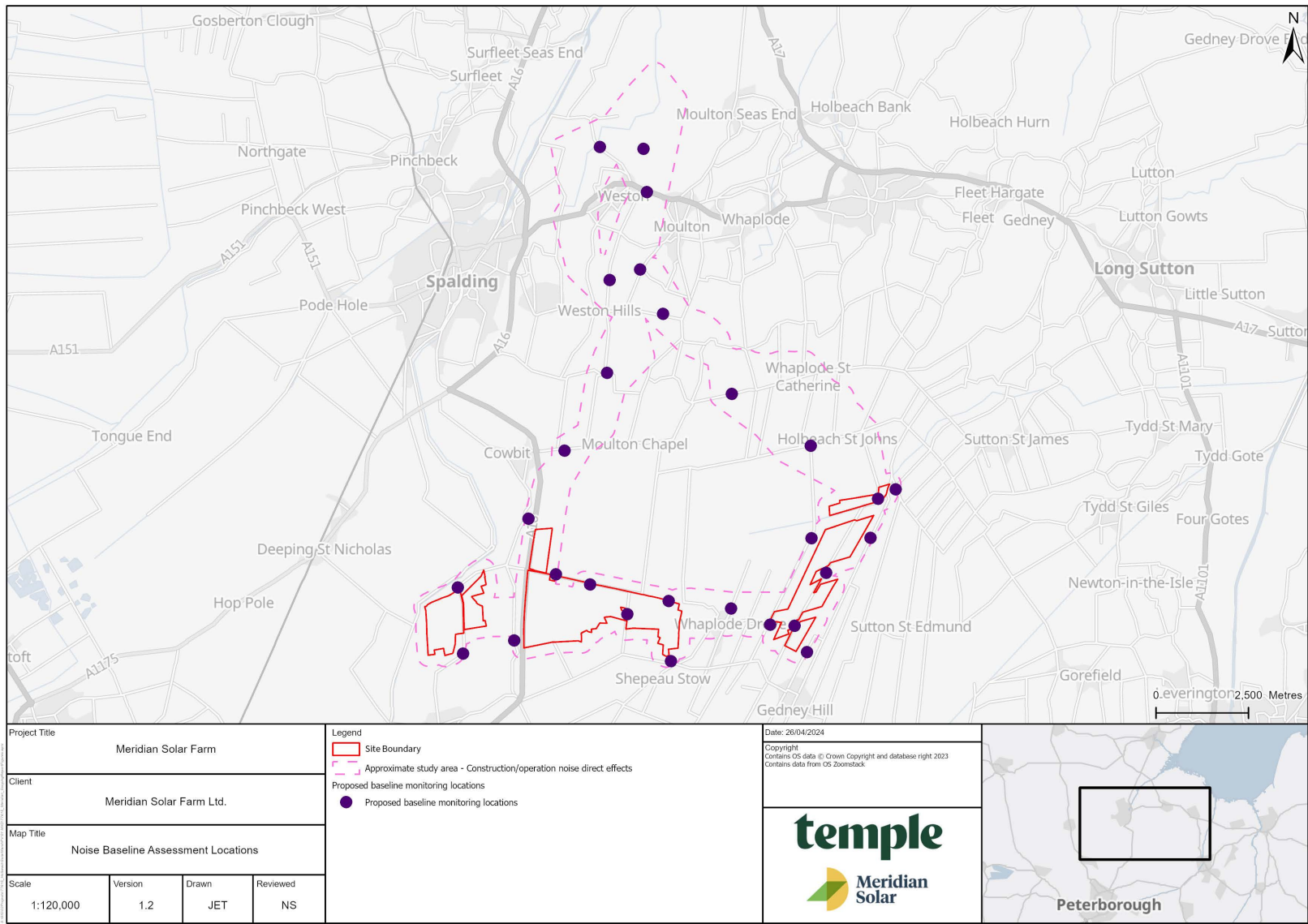


Figure 4.7.2 Proposed Noise Assessment Locations



Socio-Economics, Human Health and Land Use

Table 4.8 Socio-Economics, Human Health and Land Use

<p>Introduction</p> <p>This table identifies the proposed scope of the EIA to assess Socio-Economics, Human Health and Land Use. This considers:</p> <ul style="list-style-type: none"> • Socio-Economics – The potential effects of the Scheme on sensitive socio-economic receptors, and existing and future land use receptors (recreational facilities (including PRoW), and community facilities). • Human Health – The potential effects of the Scheme on all human health receptors in the study area. Those who will experience changes in health as a result of the Scheme (i.e. sensitive receptors) include the general population, construction workers and operational / maintenance workers. • Land Use - The potential effects of the Scheme on likely changes to accessibility and severance for private property and housing, community land and assets, development land and businesses and agricultural land holdings. 	
<p>Study Area</p>	<p><u>Socio-Economics and Human Health</u></p> <p>The Scheme is located within the administrative area of South Holland District Council and Lincolnshire County Council. The Scheme is located across the following wards:</p> <ul style="list-style-type: none"> • Crowland and Deeping St Nicholas; • Whaplode and Holbeach St Johns; • Fleet; • Spalding St Paul’s; and • Moulton, Weston and Cowbit. <p>Impacts on potentially sensitive socio-economic and health receptors will be assessed against various geographical impact areas in respect of the varying nature and type of socio-economic receptors. The study area will primarily focus on the wards and district the Scheme is located within. It is important to note, that the study area may differ based on the nature and type of receptors being assessed and will be set out in the ES.</p> <p><u>Land-Use</u></p> <p>Regarding potential impacts on land-use a study area of a 500m buffer area will be applied to the Scheme, including the construction footprint (i.e. compounds and temporary land take). The buffer has been informed by guidance and criteria set out in the Design Manual for Roads and Bridges (DMRB) LA 112 ‘Population and Human Health’¹⁶³. Although this guidance has been prepared to inform road infrastructure Schemes, this method has been determined as suitable for use in providing a consistent, robust approach across infrastructure Scheme. The study area will be extended to include the whole farm holding when establishing the effect of the project and land-take on specific holdings. Impacts to agricultural land are considered separately in Table 4.5.</p>
<p>Planning Policy and Guidance</p>	<p>There is limited specific legislation relevant for the assessment of socio-economics, human health or land use. The ES will refer to relevant national, regional and local planning policy as detailed below:</p> <p><u>Legislation and Regulation</u></p> <ul style="list-style-type: none"> • Health and Social Care Act 2012¹⁶⁴;

¹⁶³ Highways England; Transport Scotland; Welsh Government; Department for Infrastructure (Northern Ireland) (2020) *Design Manual for Roads and Bridges (DMRB): LA 112 Population and Human Health*. Available at: <https://www.standardsforhighways.co.uk/tses/attachments/1e13d6ac-755e-4d60-9735-f976bf64580a>

¹⁶⁴ *Health and Social Care Act 2012*. Available at: <https://www.legislation.gov.uk/ukpga/2012/7/enacted/data.pdf>

	<ul style="list-style-type: none"> • Care Act 2014¹⁶⁵; and • Equality Act 2010¹⁶⁶. <p><u>National Planning Policy</u></p> <ul style="list-style-type: none"> • Overarching National Policy Statement for Energy (EN-1)⁷; • National Policy Statement for Renewable Energy Infrastructure (EN-3)⁸; • National Policy Statement for Electricity Networks Infrastructure (EN-5)⁹; • National Planning Policy Framework (NPPF)¹⁰; • The Growth Plan¹⁶⁷; • National Planning Practice Guidance (NPPG)¹¹; and • Spatial Planning for Health - Public Health England. An evidence resource for designing healthier places¹⁶⁸. <p><u>National Guidance</u></p> <ul style="list-style-type: none"> • Fair Society, Healthy Lives: The Marmot Review¹⁶⁹. <p><u>Local Planning Policy</u></p> <ul style="list-style-type: none"> • South East Lincolnshire Local Plan¹²; and • South Holland Climate Change Strategy¹⁷⁰ <p><u>Other Guidance</u></p> <ul style="list-style-type: none"> • National Highways, Design Manual for Roads and Bridges (DMRB), LA 112, Population and Human Health¹⁶³; • Effective Scoping of Human Health in Environmental Impact Assessment¹⁷¹; and • Determining Significance for Human Health in Environmental Impact Assessment¹⁷².
<p>Baseline Conditions</p>	<p><u>Socio-Economics and Health</u></p> <p>According to the most recent population statistics, the population of South Holland was around 95,100 in 2021, a 7% increase from 2011¹⁷³. In South Holland the average median age is 46 years, a higher average than England (40 years). In terms of age groups, the highest proportion of the population were aged 16-64 (59.2%) with 14% of people in South Holland aged 55-64, whilst those aged between 35 and 49 years fell by 6% between 2011 and 2021. South Holland is the sixth least densely populated of the East Midlands' 35 Local Authority administrative areas.</p>

¹⁶⁵ Care Act 2014. Available at: <https://www.legislation.gov.uk/ukpga/2014/23/enacted/data.pdf>

¹⁶⁶ Equality Act 2010. Available at: <https://www.legislation.gov.uk/ukpga/2010/15/data.pdf>

¹⁶⁷ Chancellor of the Exchequer (2022) *The Growth Plan 2022* London: The Stationary Office (CP743). Available at: https://assets.publishing.service.gov.uk/media/632d2c24e90e0711d5d5959e/HMT_Autumn_Statement_2022_PRINT.pdf

¹⁶⁸ Public Health England (2017) *Spatial Planning for Health: An evidence resource for planning and designing healthier places*. Available at: https://assets.publishing.service.gov.uk/media/5b59b090e5274a3ff828c70c/spatial_planning_for_health.pdf

¹⁶⁹ Institute of Health Equity (2012) *Fair Society, Healthy Lives: The Marmot Review*. Available at: <https://www.instituteofhealthequity.org/resources-reports/fair-society-healthy-lives-the-marmot-review/fair-society-healthy-lives-full-report-pdf.pdf>

¹⁷⁰ South and East Lincolnshire Councils Partnership (2022) *South Holland Climate Change Strategy*. Available at: https://www.sholland.gov.uk/media/20590/Climate-Change-Strategy-March-2022/pdf/Climate_Change_Strategy_March_22.pdf

¹⁷¹ IEMA (2022) *Institute of Environmental Management and Assessment (IEMA) Guide to: Effective Scoping of Human Health in Environmental Impact Assessment*. Available at: <https://www.iema.net/download-document/256909>

¹⁷² IEMA (2022) *Institute of Environmental Management and Assessment (IEMA) Guide to: Determining Significance for Human Health in Environmental Impact Assessment*. Available at: <https://www.iema.net/download-document/256912>

¹⁷³ Office for National Statistics (2022) *Population change in South Holland: Census 2021*. Available at: <https://www.ons.gov.uk/visualisations/censuspopulationchange/E07000140/>

In 2021, 44% of residents, aged 16 years and over in South Holland highest level of education is level 1,2 or 3 qualifications. Followed by 25% of residents having no qualifications and 20% of residents having level 4 qualifications or above.

The English Indices of Deprivation (IoD) measures relative deprivation in England. It is based on seven distinct domains of deprivation – income, employment, health deprivation and disability, education and skills training, crime, barriers to housing and services and living environment, which are combined and weighted to form the overall index.

There are 49 Lower Super Output Areas (LSOAs) within South Holland. According to the 2019 IoD¹⁷⁴, 1 LSOA within the study ward was ranked amongst the 20% of the most income deprived areas in the whole of England, while 2 were amongst the 20% least income deprived. The remaining 46 LSOAs (within the Study ward) were ranked in between with 9 LSOAs located on the 6th decile.

Residents in the study area are much more likely to be homeowners with 40% of households in South Holland are owned outright and 20% owned with a mortgage, loan or shared ownership¹⁷⁷.

Table 4.8.1 below shows the latest available figures for the size of the economy in each impact area as measured by Gross Value Added (GVA) and employment.

Table 4.8.1 Gross Value Added and Employment

Impact Area	GVA (£ million) ¹⁷⁵	Employment (2021 data) ¹⁷³
Crowland and Deeping St Nicholas	£153.92	5,546
Whaplode and Holbeach St Johns	£132.96	3,737
Moulten, Weston and Cowbit ¹⁷⁶	£396.68	6,049
South Holland ¹⁷⁷	£4,634.61	78,998
England	£3,510,531.50	46,006,957

Indicators deemed relevant to likely human health impacts of the Scheme have been identified from 2021 Census data¹⁷⁸. They are shown in **Table 4.8.2** with some of these statistics summarised in the below text:

¹⁷⁴ Ministry of Housing, Communities and Local Government (2019) *The English Indices of Deprivation 2019 (IoD2019)*. Available at: https://assets.publishing.service.gov.uk/media/5d8e26f6ed915d5570c6cc55/IoD2019_Statistical_Release.pdf

¹⁷⁵ Adjusted to 2023 prices using HM Treasury (2024) *GDP Deflator at market prices, and money GDP March 2024 (Budget 2024)*. Available at: <https://www.gov.uk/government/statistics/gdp-deflators-at-market-prices-and-money-gdp-march-2024-budget-2024>

¹⁷⁶ ONS (2024). UK gross value added (GVA) and productivity estimates for other geographies. Available at: <https://www.ons.gov.uk/economy/grossvalueaddedgva/datasets/ukgvaandproductivityestimatesforothergeographies>

¹⁷⁷ ONS (2024). Regional economic activity by gross value added (balanced), UK: 1998 to 2017. Available at: <https://www.ons.gov.uk/economy/grossvalueaddedgva/bulletins/regionalgrossvalueaddedbalanceduk/1998to2017>

¹⁷⁸ Office for National Statistics (2022) *Life expectancy (LE) and healthy life expectancy (HLE) by Census Wards, England and Wales*. Available at: <https://www.ons.gov.uk/visualisations/dvc479/map/index.html>

Table 4.8.2 Life Expectancy

Indicator	Crowland and Deeping St Nicholas	Whaplode and Holbeach St Johns	Moulton, Weston and Cowbit	South Holland	England
Life expectancy (Male)	79.8	77.8	81.7	78.9	79.3
Life expectancy (Female)	85.4	83.0	83.1	82.7	83.2

In South Holland, 17% of people reported being disabled under the Equality Act.

In South Holland 56.3% of people are employed, which is higher than the Region (55.1%) with 27.4% of residents retired.

In regard to employment, 5% of residents in South Holland work in crop or animal production, hunting or related service activities. However, a greater percentage of people (11%) who are employed work in retail trade, of motor vehicles and motorcycles closely followed by 9% of people employed to work in the manufacturing of food products and construction of buildings, civil engineering or specialised construction activities.

South Holland's population has increased 7.8% which is at a higher rate than England (6.6%), however, the population is considered to be ageing¹⁷³. The majority of residents aged 16 and over are employed, followed by those retired. The majority of residents are likely to own a property and have level 1,2 or 3 qualifications.

Land Use

Within the study area, the land use is mostly utilised for agricultural purposes, characterised by large-scale regular arable fields across several land-holdings. Further detail regarding the agricultural and soils baseline is outlined in **Table 4.5**.

Further detail regarding farm businesses will be investigated via interview as appropriate and reported in the ES.

Assessment Methodology

There is currently no statutory guidance on the methodology for undertaking assessments of socio-economic, human health and land use effects. The assessment follows best practice methodology.

Socio-Economics

The impact on potentially sensitive socio-economic receptors, and existing and future land use receptors (recreational facilities (including PRow), and community facilities) will consider those within the study area as determined by the nature of impact and type of the receptor being assessed. Assessments will be undertaken in the context of national, local planning and other relevant policy or guidance. In addition to the baseline data, the assessment of effects will be underpinned by forecasts / estimates for both the construction and operational phases. The economic and regeneration effects of the Scheme will be included within the assessment.

The socio-economic assessment will also explore the scope for mitigation and enhancement measures to maximise the potential for adding value to the local economy and community.

Sensitivity of Receptor

Sensitivity is generally assessed by reference to a number of characteristics of the receptor, including: their existing state in relation to the dimension being assessed (are they already disadvantaged); their ability to absorb, avoid or mitigate the effect; and level of policy priority. The criteria used for determining sensitivity is provided in **Table 4.8.3**.

Table 4.8.3 Methodology for Determining Sensitivity

Sensitivity Receptor	Description
High	Receptor is identified as a policy priority. Evidence of significant socio-economic challenges and vulnerabilities, comparative to other areas. The receptor / resource has little ability to absorb change.
Medium	Some evidence of socio-economic challenges and vulnerabilities, compared with other areas. The receptor / resource has moderate capacity to absorb change.
Low	Receptor is not identified as a policy priority. Evidence that the receptor is resilient and faces no particular challenges.

Magnitude of Impact

The magnitude of the impact varies between the different impacts being considered. Generally, it will depend on factors such as the duration of the impact and the nature of the detriment caused (e.g., permanent or reversible). The criteria for determining impact magnitude are presented in **Table 4.8.4**.

Table 4.8.4 Methodology for Determining Impact Magnitude

Magnitude of Impact	Criteria for Assessing Impact
Major	Total loss or major / substantial alteration to key elements. Features of the baseline (pre-development) conditions such that the post-development character/composition/attributes will be fundamentally changed.
Moderate	Loss or alteration to one or more key elements/features of the baseline conditions such that post-development character / composition / attributes of the baseline will be materially changed.
Minor	A minor shift away from baseline conditions. Change arising from the loss / alteration will be discernible / detectable but not material. The underlying character / composition / attributes of the baseline condition will be similar to the pre-development circumstances / situation.
Negligible	Very little change from baseline conditions. Change barely distinguishable, approximating to a 'no change' situation.

Determining Significance

The significance of effects will adopt a matrix approach with greater magnitudes of impact on more sensitive receptors resulting in a greater significance of effects. The significance of the effects is a product of the significance of effect (**Table 4.8.3**) and magnitude of impact (**Table 4.8.4**) outlined above. Significance can be amended where suitable mitigation and enhancement measures are secured, and if accompanied by an appropriate explanation of how these measures are reasonably likely to alter significance.

Human Health

The assessment will consider all human health receptors in surrounding areas with the potential to be impacted by the Scheme. Those who will experience changes in health as a result of the Scheme (i.e. sensitive receptors) include the general population, construction workers and operational / maintenance workers.

A high-level electromagnetic field assessment will be conducted to calculate the recommended clearance distances from nearby places of residence for the substation, Grid and Cable connection routes with respect to potential effects on human health.

The scope of this assessment is based on the guidance ‘Effective Scoping of Human Health in Environmental Impact Assessment’¹⁷¹ and ‘Determining Significance for Human Health in Environmental Impact Assessment’¹⁷², both published by IEMA in November 2022. Both cover the consideration of health as a topic within EIA and outline a significance framework based on receptor sensitivity and impact magnitude, which can be scaled up or down depending on the size and nature of the scheme being assessed.

Sensitivity of Receptor

Sensitivity is generally assessed by reference to several characteristics of the receptor, including, but not limited to, their existing state in relation to the dimension being assessed (are they already disadvantaged); their ability to absorb, avoid or mitigate the effect; and level of policy priority (as shown in **Table 4.8.5**).

Table 4.8.5 Criteria for Relative Receptor Sensitivity

Sensitivity	Criteria
High	High levels of deprivation (including pockets of deprivation); reliance on resources shared (between the population and the project); existing wide inequalities between the most and least healthy; a community whose outlook is predominantly anxiety or concern; people who are prevented from undertaking daily activities; dependants; people with very poor health status; and/or people with a very low capacity to adapt.
Medium	Moderate levels of deprivation; few alternatives to shared resources; existing widening inequalities between the most and least healthy; a community whose outlook is predominantly uncertain with some concern; people who are highly limited from undertaking daily activities; people providing or requiring a lot of care; people with poor health status; and/or people with a limited capacity to adapt.
Low	Low levels of deprivation; many alternatives to shared resources; existing narrowing inequalities between the most and least healthy; a community whose outlook is predominantly ambivalence with some concern; people who are slightly limited from undertaking daily activities; people providing or requiring some care; people with fair health status; and/or people with a high capacity to adapt.
Negligible	Very low levels of deprivation; no shared resources; existing narrow inequalities between the most and least healthy; a community whose outlook is predominantly supportive with some concern; people who are not limited from undertaking daily activities; people who are independent (not a carer or dependant); people with good health status; and/or people with a very high capacity to adapt.

Magnitude of Impacts

Impact magnitude will be determined by an assessment of baseline data, project specifications, supporting documents and the findings of other ES chapters, as well as informed by professional judgement, with relatively large changes to or within the Study

Area having a higher magnitude of impact. The relative impact magnitude will be assigned in accordance with the criteria in **Table 4.8.6**.

Table 4.8.6 Criteria for Relative Magnitude of Impact

Magnitude	Criteria
High	High exposure or scale; long-term duration; continuous frequency; severity predominantly related to mortality or changes in morbidity (physical or mental health) for very severe illness/injury outcomes; majority of population affected; permanent change; substantial service quality implications.
Medium	Low exposure or medium scale; medium-term duration; frequent events; severity predominantly related to moderate changes in morbidity or major change in quality-of-life; large minority of population affected; gradual reversal; small service quality implications.
Low	Very low exposure or small scale; short-term duration; occasional events; severity predominantly related to minor change in morbidity or moderate change in quality-of-life; small minority of population affected; rapid reversal; slight service quality implications.
Negligible	Negligible exposure or scale; very short-term duration; one-off frequency; severity predominantly relates to a minor change in quality-of-life; very few people affected; immediate reversal once activity complete; no service quality implication.

Determining Significance

The significance of effects is based on the intersection of sensitivity and magnitude judgments outlined within the tables above, with greater magnitudes of impact on more sensitive receptors resulting in a greater significance of effects. Major to moderate ratings is generally classed as significant and moderate/minor to negligible ratings are generally classed as non-significant.

Land Use

Following DMRB guidance¹⁶³, the assessment will report on the likely changes to accessibility and severance for private property and housing, community land and assets, development land and businesses and agricultural land holdings. A desk based study will determine the baseline, a survey utilising a questionnaire will also be carried out.

Agricultural landowners and occupiers will be requested to provide information on the size of the farm holding, including any land rented as well as owned to establish the impact that land taken temporarily and permanently is likely to have on the farm business.

Further requirements for surveys/consultation will be identified as necessary at latter phases.

Land use impacts will be assessed against the significance and magnitude criteria set out by DMRB within LA112 (Population and Human Health)¹⁶³ Table 3.11 and Table 3.12.

The significance of effect shall be derived by combining the assigned value (sensitivity) of receptors with the magnitude of change arising from a project, in accordance with the criteria outlined in **Section 3.3** of this Scoping Report. The significance of the effect shall be determined for each element of the land and accessibility sub topic (e.g. private property and housing, development land and businesses etc) affected by the Scheme.

Baseline development

Socio-Economics

	<p>The baseline for the socio-economic conditions of the local area will be established from a number of sources, including: the 2021 Census¹⁷⁹, which provides the most comprehensive data source for information on social and housing conditions at a local level; annual population surveys for economic data; lists of the community facilities that serve the study area published by SHDC, LCC, the National Health Service (NHS) and by other organisations.</p> <p>Impacts on social and economic determinants and facilities are assessed by various geographical impact areas, depending on the likely geographical extent of an impact. These reference areas will be compared with socio-economic information for the District, Lincolnshire and for East Midlands region as a whole.</p> <p><u>Human Health</u></p> <p>A profile of the local community, including demographic data, health and wellbeing needs and assets, and information on vulnerable groups has been prepared to enable an assessment of health and wellbeing themes that aligns with the Study Area’s priorities and needs. Wherever possible, the baseline year used in this assessment is 2023, the latest year for which at least some of the baseline information is available. Where information for the year 2023 is not available, the assessment refers to the latest available information. Where data for the Study Area is unavailable (particularly for some health data), data for the next smallest geographic area, often SHDC, has been used to supplement the evidence base.</p> <p><u>Land Use</u></p> <p>A profile of the local land use will be determined through the development of a desk-based baseline and the use of a questionnaire posed to surrounding landowners. The changes in land use will be considered and informed by the Agricultural Land Classification studies that have been undertaken, further discussed in Table 4.5.</p>
<p>Key Issues and Potential Likely Impacts</p>	<p>The construction, operation and decommissioning of the Scheme has the potential to result in significant effects on agriculture, health and socio-economics. The following key potential impact pathways will be assessed as part of the EIA:</p> <p><u>Socio-economics – Construction and Decommissioning Phase</u></p> <ul style="list-style-type: none"> • Direct and indirect creation of jobs and other impacts on employment markets and associated GVA resulting from the construction of the Scheme; • Direct and indirect loss of jobs or business viability/earnings due to the temporary displacement of businesses / agricultural land; and • Indirect loss of jobs and consequential changes to employment markets, due to a reduction in spending associated with the displacement of businesses and jobs by the Scheme. <p><u>Socio-economics – Operation Phase</u></p> <ul style="list-style-type: none"> • Direct and indirect creation of jobs and other impacts on employment markets / and increased spending resulting from the operation of the Scheme; and • Direct and indirect loss of jobs, and consequential changes to employment, due to the permanent displacement of businesses, notably agriculture. <p><u>Health – Construction and Decommissioning Phase</u></p> <ul style="list-style-type: none"> • Impact on local Public Rights of Way; • Potential construction amenity impacts; • Impact of the Scheme on accessibility to open space and on active travel;

¹⁷⁹ Office for National Statistics (2024) *Census Data 2021*. Available at: <https://www.ons.gov.uk/search?topics=9731,6646,3845,9497,4262,4128,7755,4994,6885,9724,7367&filter=datasets>

	<ul style="list-style-type: none"> • Potential changes to social infrastructure accessibility; • Potential impacts of noise and air pollution as a result of impact of increased traffic levels or new diversionary routes; and • Potential impact on mental or physical health as result of construction works. <p><u>Health – Operation Phase</u></p> <ul style="list-style-type: none"> • Impact on local Public Rights of Way; • Potential impacts on the health of existing residents as a result of environmental change, e.g. access to active travel opportunities; • Impact of the Scheme on accessibility to open space and on active travel; • Impact of the Scheme on access to employment and training, particularly for local residents; • Potential impact on community cohesion (e.g. access to social infrastructure) as a result of severance; and • Potential impacts resulting from exposure to electric and magnetic fields (EMFs). <p><u>Land Use - Construction and Decommissioning Phase</u></p> <ul style="list-style-type: none"> • Displacement of existing land-uses either directly or indirectly for incompatible adjacent uses; and • Effects of construction on private property and housing, community land and assets, development land and businesses and agricultural land holdings may include: <ul style="list-style-type: none"> ○ Loss or alteration to characteristics, features, or elements; ○ Introduction of severance or change in access; and ○ Change in attributes, quality or vulnerability. <p><u>Land Use - Operation phase</u></p> <ul style="list-style-type: none"> • Effects on the operation of farm business and agri-environment schemes.
<p>Design, Mitigation and Enhancement Measures</p>	<p>The Scheme may generate a range of socio-economic, human health and land-use effects, some of which would be temporary, whilst others would be permanent. Mitigation measures will be considered and embedded into the Scheme where possible and developed as the design is refined.</p> <p>Examples of mitigation and enhancement may include measures to enhance local skills and employment, access to PRow and open spaces. Where possible, embedded mitigation will also be included within relevant topic chapters such as air quality and noise and vibration to minimise any health related impacts.</p>
<p>Consultation</p>	<p>It is not proposed to undertake targeted consultation specifically to inform the assessment of impacts for this topic, however any relevant information gathered during the non-statutory and statutory consultation events will be considered, where appropriate.</p>
<p>Assessment Assumptions and Limitations</p>	<p>The Human Health Impact Assessment is based on professional judgment and considers both the adverse and the beneficial impacts that the Scheme will have on the surrounding receptors. It provides an indication of human health and well-being effects on people and the local community.</p> <p>The identification of receptors that could be subject to likely significant effects has been informed by the initial baseline analysis, as well as consideration of evidence on socio economic effects associated with the construction and operation of similar developments.</p> <p>In the absence of a detailed construction programme at the ES stage, all temporary effects during construction and decommissioning will be assessed as occurring simultaneously and for a programme of approximately 24 to 36 months. Whilst a phased construction may be possible, the approach taken to assuming a 24-to-36-month programme ensures that the</p>

	<p>likely 'worst-case' is assessed, which may result in the overestimation of predicted health effects. Should the construction phase be extended or delivered in phases the predicted effects would be the same or less than those outlined in this chapter. Similarly, should parts of the Scheme be decommissioned in advance of the main decommissioning phase the predicted effects would be the same or less than those outlined in this ES chapter; the assessment of a 24 to 36-month decommissioning period would therefore represents a worst case.</p> <p>Despite the data limitations described above, the data used is the best available at the time of assessment, and where required professional judgement and reasonable assumptions have been applied. Overall, the approach adopted is standard and common to all such assessments and therefore deemed appropriate.</p> <p>Other limitations and assumptions relate to the baseline data and benchmarks used for the assessment. The baseline data is dependent on the currency and coverage of what is available at the time of production.</p>
<p>Summary of Aspects</p>	<p>Aspects scoped into EIA</p> <p>The assessment will consider the provision of temporary employment during construction and decommissioning including gross value added, creation of long-term employment opportunities during the operational phase.</p> <p>Consideration of any existing uses on-site. Change of land use including displacement of agricultural land and impacts on recreation, open space (including PRoW), community facilities, existing business viability and agri-environment schemes.</p> <p>Human health, including, EMFs, air quality, noise impacts and amenity aspects, active travel opportunities, employment/ training opportunities and social cohesion will be included within the assessment.</p> <p>Aspects scoped out of EIA</p> <p>Considering the location of the Scheme the following components of socio-economics have been scoped out, access to:</p> <ul style="list-style-type: none"> • Housing; • Education; • Childcare; • Open and play space; • Healthcare; • Community and leisure facilities; and • Tourism and recreation. <p>No aspects of human health and land use topic are proposed to be scoped out.</p>

Traffic and Access

Table 4.9 Traffic and Access

<p>Introduction</p> <p>This table identifies the proposed scope of the EIA to assess potential effects from the Scheme on transport and access. This Considers:</p> <ul style="list-style-type: none"> Transport and Access – The potential effects of the Scheme on severance, driver delay, pedestrian delay, Non-Motorised User Amenity, fear and intimidation and road safety, road safety audit and large loads. 	
<p>Study Area</p>	<p>Based on the desktop study completed to date, the main point of vehicular access to the key highway network for the Scheme is anticipated to be via the A16, which is managed by local highways authority. The A16 runs in a north-south direction to the east of land parcel A and to the west of land parcels B, C and D. At this stage, subject to confirmation as Scheme details are developed, access is expected to be taken from the following locations for different land parcels:</p> <ul style="list-style-type: none"> Land Parcel A: Cloot Drove; Land Parcel B: Queen’s Bank; Land Parcel C: Martins Road; and Land Parcel D: Langary Gate Road. <p>The potential access route options for the Scheme are identified as below and outlined in Figure 2.8:</p> <p><u>Land Parcel A</u></p> <p>Land Parcel A can be accessed from the A16 via Spalding Road and Barrier Bank, and James Road and Postland Road, and several minor roads.</p> <p><u>Land Parcels B & C</u></p> <p>Land Parcels B and C are adjacent to each other to the east of the A16. The A16 can be accessed from Land Parcels B and C via Spalding Road and Barrier Bank, and Stonegate and Backgate, and several minor roads.</p> <p><u>Land Parcel D</u></p> <p>Land Parcel D can be accessed from the A16 via B1040 and Moulton Chapel Road and Roman Road, and a number of minor roads.</p> <p>Further detail on proposed accesses and route options to the Scheme will be included within the ES and the Transport Assessment (TA).</p> <p>Due to the nature of the Scheme, consideration will need to be given to a number of locations within the surrounding highway network which could potentially be impacted depending on the identified access route options. The exact Site access locations and access routings have yet to be confirmed. Within the PV Area, key junctions likely to require consideration include:</p> <ul style="list-style-type: none"> A16 junction with Stonegate and Moulton Chapel Road (B1357) (north of land parcels A and B) Barrier Bank junction with Queen’s Bank and Wash Bank (east of land parcel A) A16 junction with James Road (southeast of land parcel A) James Road junction with Spalding Road (southeast of land parcel A) James Road junction with Postland Road (B1166) (south of land parcel A) A16 junction with B1040 (south of land parcel A) <p>The locations of potential access points, route options, and identified key junctions as mentioned above can be seen in Figure 2.8.</p>

	<p>The extent of the study area for assessment in terms of highway impact will be subject to discussion, and agreement will be sought, with relevant Local Highway Authorities and National Highways (as necessary).</p> <p>A new access is expected to be constructed to provide construction vehicle access to the Grid Connection Corridor, the location of this will subject to further assessment on access requirements and will be completed as the Grid Connection Corridor is refined as part of the Scheme design process.</p>
<p>Planning Policy and Guidance</p>	<p><u>National Planning Policy</u></p> <ul style="list-style-type: none"> • Overarching National Policy Statement for Energy (EN-1)⁷; • National Policy Statement for Renewable Energy Infrastructure (EN-3)⁸; • National Policy Statement for Electricity Networks Infrastructure (EN-5)⁹; and • National Planning Policy Framework (NPPF)¹⁰. <p><u>National Guidance</u></p> <ul style="list-style-type: none"> • National Planning Practice Guidance¹¹. <p><u>Local Planning Policy</u></p> <ul style="list-style-type: none"> • South East Lincolnshire Local Plan (SELLP) 2011-2036¹². <p><u>Guidance</u></p> <ul style="list-style-type: none"> • Institute of Environmental Management and Assessment (IEMA) Guidelines for the Environmental Assessment of Traffic and Movement ¹⁸⁰.
<p>Baseline Conditions</p>	<p><u>Existing Local Highway Network</u></p> <p>The existing local highway network in the vicinity of the Scheme is described below:</p> <p>The A16 is managed by the Local Highway Authority, it is a major access road in the local highway network to the Site, which runs along in a north south direction to the east of land parcel A and to the west of land parcel B. It is generally a single carriageway and is subject to a varying speed limit of 50mph and 60mph.</p> <p><u>In the vicinity of Land Parcel A</u></p> <p>Spalding Road and Barrier Bank are both single carriageways. Both roads are subject to a speed limit of 50mph. It is noted that Barrier Bank is subject to a heavy goods vehicle (HGV) restriction (except for access).</p> <p>James Road and Postland Road are single carriageways. James Road is subject to a speed limit of 50mph and without any footway. Postland is subject to a speed limit of 30mph and with footways to both sides. Postland Road is a mainly residential area with many residential properties located on both sides.</p> <p>Other minor roads, such as Wash Bank and Cloot Drove, which run through, alongside or in the vicinity of land parcel A. The roads are not adequate for passing of two HGVs and it may therefore be necessary to utilise the grass verges to create some passing places to facilitate the passing of two HGVs.</p> <p><u>In the vicinity of Land Parcels B and C</u></p> <p>Spalding Road and Barrier Bank have been described under land parcel A. While Stonegate and Backgate are both single carriageways, subject to a speed limit of 30mph. Both</p>

¹⁸⁰ IEMA (2023) *Institute of Environmental Management and Assessment (IEMA) Guidelines: Environmental Assessment of Traffic and Movement*. Available at: <https://s3.eu-west-2.amazonaws.com/iema.net/documents/IEMA-REPORT-Environmental-Assessment-of-Traffic-and-Movement-Rev07.pdf>

	<p>Stonegate and Backgate are residential areas with many residential properties located on both sides.</p> <p>Other minor roads, such as Queen’s Bank and Martins Road, run through, alongside or in the vicinity of land parcels B and C. They are single track road and are not adequate for the passing of two HGVs and it may therefore be necessary to utilise the grass verges to create some passing places to facilitate the passing of two HGVs.</p> <p><u>In the vicinity of Land Parcel D</u></p> <p>The B1040 is a single carriageway and is subject to an HGV restriction (except for loading). Moulton Chapel Road is a single carriageway. Roman Road is single carriageway route.</p> <p>Other minor roads, such as Green Drove, Sheppard’s Drove and Cox’s Drove, and Langary Gate Road which run through, alongside or in the vicinity of land parcel D are single track roads. The roads are not adequate for passing of two HGVs and it may therefore be necessary to utilise the grass verges to create some passing places to facilitate the passing of two HGVs.</p> <p>Existing Walking Facilities</p> <p>Due to the location of the Scheme in rural Lincolnshire, limited footways are present alongside the carriageways in the Study Area. There are a number of PRow passing through the Scheme. There are no PRow passing through the PV Area though there are several or running adjacent as follows, also outlined in Figure 2.2:</p> <p><u>Land Parcel A</u></p> <ul style="list-style-type: none"> • PRow Crow7/1, footpath, west of Wash Bank and Clout Drove; runs along the west and north section of land parcel A. <p><u>Land Parcels B & C</u></p> <ul style="list-style-type: none"> • PRow Crow12/1, footpath, east of Martins Road; runs through land parcel C. • PRow Whap/1/1, footpath, east of Martins Road and land parcel C. <p><u>Land Parcel D</u></p> <ul style="list-style-type: none"> • PRow GedH4/1 & GedH/1/1, footpath, east of Langary Gate Road and land parcel D. <p>Existing Cycling Facilities</p> <p>There are no formal on or off-road cycling facilities within the immediate vicinity of the Scheme; however, the roads surrounding the Scheme are generally lightly trafficked and therefore would not deter cyclists. Further detail on the provision of cycle routes and facilities will be detailed within the ES.</p> <p>Existing Equestrian Facilities</p> <p>There are several PRowS designated as Bridleways passing through the PV Area or running adjacent to the PV Area boundary. These are as follows. In addition, some of the surrounding roads are generally lightly trafficked and therefore would not necessarily deter equestrians.</p> <p><u>Land Parcel A</u></p> <ul style="list-style-type: none"> • PRow DeeN/5/1, bridleway, runs along Wash Bank and north section of land parcel A. • PRow Crow17/2, bridleway, west of Wash Bank and Clout Drove; runs along the west and north section of land parcel W. <p><u>Land Parcels B and C</u></p> <ul style="list-style-type: none"> • PRow Crow11/1, bridleway, east of Martins Road; runs along north section of land parcel C. <p><u>Land Parcel D</u></p>
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	<ul style="list-style-type: none"> • PRoW Moul/7/1, Whap/6/2, Whap/7/3, Holb/14/1, Holb/14/3, Holb/15/3, Flee/8/1, Flee/8/2, bridleways, run along the South Holland Main Drain and north section of land parcel D. <p>Bus</p> <p>At present, there are no public transport services or bus stops located on the A16. The nearest served bus stops are located on Barrier Bank, Moulton Chapel Road and Farrow Road in the vicinity of the Scheme. The following bus routes serve these bus stops:</p> <ul style="list-style-type: none"> • Barrier Bank – Bus service 37 – Spalding to Peterborough - Three services in the AM peak, three services in the PM peak and otherwise bi-hourly service during the inter-peak. • Moulton Chapel Road and Farrow Road – Bus service 43 – Spalding to Sutton St James - One service in the AM peak and one PM service. • Farrow Road – Bus service S137S – Spalding to Sutton St Edmund - One service in the AM peak and one service in the PM peak. <p>Rail</p> <p>Spalding Station is located approximately 3.6km to the west of the Site Boundary and is managed by East Midlands Rail, running services between Peterborough and Doncaster. The only passenger services calling at the station during a weekday are three services in the AM peak and three services in the PM peak and otherwise hourly service during the inter-peak.</p>
<p>Assessment Methodology</p>	<p>To determine the impact of the Scheme, a number of scenarios will be assessed. The scenarios considered appropriate for assessment are:</p> <ul style="list-style-type: none"> • Baseline (2024) – AM, PM and Daily; and • Peak Construction Year (2028) With and Without Development – AM, PM and Daily. <p>The peak construction year of 2028 is considered appropriate at this stage as it corresponds with the anticipated peak construction year for the purpose of the EIA.</p> <p>For the purposes of the EIA, the decommissioning assessment year is considered to be 2073 (40 years from opening). This year will not be considered in the TA in terms of the highway impact assessment or any junction assessments as it is considered too far into the future to be able to accurately predict traffic flows or junction forms.</p> <p>A TA Scoping Report will be formally presented to LCC as statutory consultees in order to seek to agree the scope of the TA. It is possible that some junction capacity analysis will be required, and this will be discussed and agreement sought with LCC, where necessary.</p> <p>The assessment would be undertaken in accordance with the IEMA Environmental Assessment of Traffic and Movement (2023)¹⁸⁰. The following key effects will be considered in the assessment:</p> <ul style="list-style-type: none"> • Severance; • Driver Delay; • Pedestrian Delay; • Non-Motorised User Amenity; • Fear and Intimidation; • Road Safety; • Road Safety Audit; and • Large Loads. <p>The IEMA guidance note¹⁸⁰ sets out two rules to be used as a screening process to identify the appropriate extent of the assessment area and likelihood of impacts. These are:</p> <ul style="list-style-type: none"> • Rule 1 – Include highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%); and

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

Where the predicted increase in traffic flow is lower than these thresholds outlined above, then the impact is considered insignificant and as such, no further assessments are required.

Where construction traffic flows meet, or exceed these thresholds outlined above, the significance of traffic and transport effects (including any cumulative development) will be determined by assessing the sensitivity of receptors against the magnitude of change to categorise significance as Major, Moderate, Minor or Negligible. The key effects that are considered are noted above. It is not anticipated that a formal TA will be required as these are not generally considered necessary for temporary construction works. A reduced scope TA is therefore proposed and will be submitted in support of the DCO application.

Where Abnormal Indivisible Loads (AILs) are required, detailed swept path analyses will be undertaken for the main constraint points along the route from the nearest strategic road network to demonstrate that components can be delivered to the Scheme and to identify any potential road works which may be necessary. An AIL Transport Management Plan describing routes and the proposed operational management of the deliveries will be submitted in support of the DCO application.

Cumulative assessment of traffic effects from nearby Schemes that are of a significant scale (and where traffic flows are publicly available) and have been determined will be undertaken. Schemes that are in pre-application, or that do not have a planning determination, will not be included in cumulative reviews.

Sensitivity of Receptors

The sensitivity of the receptors is summarised in **Table 4.9.1**.

Table 4.9.1 Sensitivity of receptors

Sensitivity of Receptor	Criteria for Road Users	Criteria for Residents or Locations
High	Where the road is a minor rural road, not constructed to accommodate frequent use by HGVs. Includes roads with traffic control signals, waiting and loading restrictions, traffic calming measures.	Where a location is a large rural settlement containing a high number of community and public services and facilities.
Medium	Where the road is a local A or B class road, capable of regular use by HGV traffic. Includes roads where there is some traffic calming or traffic management measures.	Where a location is an intermediate sized rural settlement, containing some community or public facilities and services.
Low	Where the road is Trunk or A-class, constructed to accommodate significant HGV composition. Includes roads with little or no traffic calming or traffic management measures	Where a location is a small rural settlement, few community or public facilities or services.
Negligible	Where roads have no adjacent settlements. Includes new strategic trunk roads that would be little affected by additional traffic and suitable for Abnormal Loads and new strategic trunk road junctions capable of accommodating Abnormal Loads	Where a location includes individual dwellings or scattered settlements with no facilities.

	<p><u>Magnitude of Impacts</u></p> <p>The IEMA guidance¹⁸⁰ outlines how effects and levels of magnitude should be determined. In accordance with the IEMA guidance¹⁸⁰ the following categories will be considered:</p> <ul style="list-style-type: none"> • Severance; • Driver Delay; • Pedestrian Delay; • Non-Motorised User Amenity; • Fear and Intimidation; • Road Safety; • Road Safety Audits; and • Large Loads <p><u>Determining Significance</u></p> <ul style="list-style-type: none"> • In order to determine the significance of an effect, the sensitivity of receptors and magnitude of impacts outlined above will be considered. The assessment will determine significance utilising a similar approach to the matrix outlined in Table 3.3. • Effects would be considered of significance where they are assessed to be large or moderate. Where an effect could be one of Large/Moderate or Moderate/Slight, professional judgement would be used to determine which option should be applicable
<p>Baseline Development</p>	<p>To inform the assessment of the Scheme, information from a number of sources will be collected. The sources which will be used are set out below:</p> <ul style="list-style-type: none"> • Local travel and network information from various sources including LCC, and local rail and bus operators; • Personal Injury Accident (PIA) data from LCC; • Traffic Surveys (new and existing data); • OS and/or Architectural Base Mapping to ascertain an accurate geographical representation of the areas in the vicinity of the Scheme; • Highway boundary information from LCC; and • Mode share data from the 2021 Census¹⁷⁹. <p>Peak hour traffic flows will be identified from historic data held by LCC. In addition, traffic counts will be undertaken, if considered necessary at locations in the vicinity of the Scheme to determine the baseline traffic conditions of the surrounding highway network. The Applicant will seek to agree the extent of the traffic data and scope for any traffic surveys that may be required with the appropriate Local Highway Authorities.</p>
<p>Key Issues and Potential Likely Impacts</p>	<p>The nature of the Scheme is such that the greatest impact is likely to occur during the construction and decommissioning phases and this will be the focus of the assessment of transport effects presented in the ES.</p> <p>The main considerations and potential effects as a result of the Scheme during the construction and decommissioning phases are:</p> <ul style="list-style-type: none"> • Increase in HGV movements; • AILs; • Travel to and from site by construction employees; • Increase in delay to vehicles, pedestrians, cyclists and equestrians due to increase in HGV movements; and • Change in route connections and amenity for pedestrians, cyclists and equestrians due to the Scheme.

	<p>Although the Scheme is located close to a number of small villages and/or settlements including Crowland, Cowbit, Moulton Chapel, Holbeach St Johns and Whaplode Drove, there is not expected to be a significant proportion of visitors (given the nature of the Scheme) during the construction, operational or decommissioning phases.</p> <p>Consideration will also be given to those users of local facilities which could be impacted by the Scheme.</p>
<p>Design, Mitigation and Enhancement Measures</p>	<p>The design of suitable access arrangements will give full consideration given to the road safety of all road users. Standard additional mitigation measures will include:</p> <ul style="list-style-type: none"> • Production of an Outline CTMP; • A Travel Plan providing for staff sustainable access; and • A Framework Abnormal Load Transport Management Plan. <p>All mitigation measures will only be relevant to the construction and decommissioning phase of the Scheme.</p> <p>Potential mitigation measures, which could be implemented during the construction phase, could include the following:</p> <ul style="list-style-type: none"> • Upgrading of routes where they are considered necessary to cater for the additional or larger vehicles; • Positioning of suitably qualified banksmen at the Site access points, to allow all vehicle arrivals and departures to be safely controlled during the construction period; • Providing road signs and/or markings to increase awareness of the Site access points during the construction phase and undertaking vegetation clearance where appropriate in the vicinity of the Site access points; • Encouraging local construction staff to car share, to reduce single occupancy car trips, by promoting the benefits of car sharing such as reduced fuel costs and by providing dedicated parking spaces for those car sharing nearer to the compound; • Implementing a shuttlebus service to transfer non-local staff to/from local worker accommodation, to reduce vehicle trips on the surrounding highway network; • Implementing a Delivery Management System to control the bookings of HGV deliveries from the start of the construction period i.e. to regulate the arrival times of HGVs via timed delivery slots, as well as to monitor compliance of HGV routing; and • Maintaining access to PRoW during the construction phase, or otherwise providing temporary diversion routes if required.
<p>Consultation</p>	<p>The TA Scoping Report will be formally presented to LCC as the Local Highway Authority (LHA) for the local road network in order to seek to agree the scope of the TA. Peterborough City Council (PCC) and Cambridgeshire County Council (CCC) may also be consulted as appropriate subject to the confirmation of the access route options at later stage. In addition, National Highways may need to be engaged as their closest route is the A47 which intersects the A16 to the south of the Scheme (approximately 8km).</p> <p>Consultation on the route(s) for AIL access will be undertaken with the statutory structure and road agencies via the Department for Transport (DfT) Electronic Service Delivery for Abnormal Loads (ESDAL) system.</p>
<p>Assessment Assumptions and Limitations</p>	<p>At this stage the exact extent of the study area cannot be confirmed in terms of traffic and transport as detailed discussions have not yet taken place with the respective Highway Authorities. The area proposed as part of this Scoping Report is determined by our understanding of the road network and where the likely impacts will be; however, it is anticipated that this will be formally agreed with respective Highway Authorities and National Highways where necessary. Any additional assessment scope demanded will be assessed as part of both the TA and the ES.</p>

	<p>As an assumption, at this stage it is anticipated that, as a worst case during the peak construction period, there could be up to 60 HGV deliveries per day. In addition, there will be Light Goods Vehicle (LGV) deliveries and vehicle movements associated with construction worker arrivals and departures. Construction worker numbers are anticipated to peak at around 400 staff per day; traffic forecasts associated with the above will be provided in the ES and TA.</p>
<p>Summary of Aspects</p>	<p>Aspects scoped into EIA</p> <p>The effects on transport and access will be considered as part of the EIA using the study area mentioned above. Construction traffic will include staff and material deliveries to and from the Scheme. During the construction phase, a peak of construction traffic will be generated. The assessment will quantify the level of construction traffic and the potential impact with regard to the effects noted below:</p> <ul style="list-style-type: none"> • Severance; • Driver delay; • Pedestrian delay; • Non-motorised user amenity; • Fear & intimidation; • Road safety; • Road Safety Audits; and • Large loads. <p>Aspects scoped out of EIA</p> <p>During the operational phase, it is anticipated that the Scheme will be manned by a nominal amount of people across the Site (three permanent staff per day), predominantly undertaking maintenance tasks. In addition, there is expected to be approximately 10 to 20 visitors per week (equating to 2 to 4 visitors per day) for deliveries, and replacement of any components that fail. Staff vehicles and those used for maintenance will primarily be four wheeled drive vehicles and vans, with HGVs rarely accessing the site during this phase. Therefore, due to the low level of trips likely to be generated within the network peak hours (with up to seven arrivals and seven departures expected daily), the traffic associated with this phase will be insufficient to trigger the 30% threshold for assessment (taken from the IEMA Guidelines¹⁸⁰) and as such, it is proposed that this phase can be scoped out of further assessment. Further detail of the operational phase transport arrangements will be set out in the ES and TA to support this approach.</p> <p>The decommissioning phase would result in fewer traffic movements than the construction phase as elements such as the improved junction and some access tracks may be retained for future agricultural and/or land uses. Given that the decommissioning phase is assumed to be 40 years on from the commencement of operation for the purposes of the EIA, it would be impossible to ascertain the future baseline with any degree of certainty. As such, it is proposed to scope out the decommissioning phase from further assessment.</p>

Other Environmental Considerations

Air Quality

Table 4.9 Air Quality

<p>Introduction</p> <p>This table identifies the proposed scope of the EIA to assess potential effects from the Scheme on air quality receptors. This considers:</p> <ul style="list-style-type: none"> Fugitive Dust Emissions – The potential effects of the Scheme during construction and decommissioning activities may generate fugitive dust emissions which may give rise to annoyance due to the soiling of surfaces. Ambient Air Quality – Emissions from traffic and plant generated and used in connection with the proposed construction and decommissioning activities may also affect ambient air quality at and around the Site. 	
<p>Study Area</p>	<p>The Site is located in an agricultural setting, with sparsely populated residential properties. The closest sensitive receptors for the construction dust and operational assessment are farms, villages and hamlets located on the Site Boundary or within several hundred metres of the Site Boundary. The study area would include representative receptor locations within 250 m of the Site Boundary and within 50 m of the route(s) used by construction vehicles on the public highway, up to 250 m from the Site access points.</p> <p>The study area is informed by Institute of Air Quality Management and Local Air Quality Management Technical Guidance and their proximity to works associated with the Scheme. Sensitive receptors located at a greater distance from the Site are not likely to be adversely affected and are therefore not included in the assessment.</p>
<p>Planning Policy and Guidance</p>	<p>The following key legislation, policy and guidance will be used within the air quality assessment:</p> <p><u>Legislation</u></p> <ul style="list-style-type: none"> Air Quality (England) Regulations 2000 (as amended)¹⁸¹; The Environment Act 2021⁴⁵; Air Quality Standards Regulations 2010 (as amended)¹⁸²; The Environment Targets (Fine Particulate Matter) (England) Regulations 2023¹⁸³; <p><u>National Planning Policy</u></p> <ul style="list-style-type: none"> Overarching National Policy Statement for Energy (EN-1)⁷; National Policy Statement for Renewable Energy Infrastructure (EN-3)⁸; National Policy Statement for Electricity Networks Infrastructure (EN-5)⁹; National Planning Policy Framework (NPPF)¹⁰; and The Environmental Improvement Plan 2023¹⁸⁴ <p><u>Local Planning Policy</u></p> <ul style="list-style-type: none"> South East Lincolnshire Local Plan (SELLP) 2011-2036¹².

¹⁸¹ The Air Quality (England) Regulations 2000. Available at: <https://www.legislation.gov.uk/ukxi/2000/928/made/data.pdf>

¹⁸² Air Quality Standards Regulations 2010. Available at: <https://www.legislation.gov.uk/ukxi/2010/1001/made/data.pdf>

¹⁸³ The Environment Targets (Fine Particulate Matter) (England) Regulations 2023. Available at: <https://www.legislation.gov.uk/ukxi/2023/96/made/data.pdf>

¹⁸⁴ Department for Environment, Food and Rural Affairs (2023) Environmental Improvement Plan 2023. Available at: <https://assets.publishing.service.gov.uk/media/64a6d9c1c531eb000c64ffa/environmental-improvement-plan-2023.pdf>

	<p><u>Guidance</u></p> <ul style="list-style-type: none"> • Guidance on the Assessment of Dust from Demolition and Construction (Institute of Air Quality Management, 2024)¹⁸⁵ ('the IAQM 2024 guidance'); • Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) screening criteria, found in the Land-Use Planning & Development Control: Planning for Air Quality guidance (2017)¹⁸⁶ ('the EPUK-IAQM guidance'); • British Standard 6069-2:1994¹⁸⁷; and • Local Air Quality Management Technical Guidance ('TG22')¹⁸⁸. 																																																																		
<p>Baseline Conditions</p>	<p>There are currently no Air Quality Management Areas (AQMAs) within the SHDC administrative boundary.</p> <p>In order to oversee air pollutant levels within the district, SHDC has an established monitoring network consisting of two automatic analysis and 15 non-automatic (passive) samplers. The nearest monitoring site to the site boundary is SH1 which is approximately 2km south of the Site, located in Crowland. The available nearby monitoring data indicates that the study area is likely to be below the annual mean Air Quality Objectives (AQOs) for NO₂ and PM₁₀.</p> <p>Monitoring from the district for NO₂, PM₁₀ and PM_{2.5} are presented in Table 4.9.1.</p> <p>Table 4.9.1 Annual mean NO₂ and PM₁₀ concentrations monitored by SHDC (µg/m³) during 2019-2022</p> <table border="1"> <thead> <tr> <th>Site Name</th> <th>Pollutant</th> <th>Annual Air Quality Objective</th> <th>2019</th> <th>2020</th> <th>2021</th> <th>2022</th> </tr> </thead> <tbody> <tr> <td rowspan="2">CM1</td> <td>NO₂</td> <td rowspan="10">40</td> <td>9.3</td> <td>8.5</td> <td>8.7</td> <td>8.9</td> </tr> <tr> <td>PM₁₀</td> <td>13.7</td> <td>10.9</td> <td>9</td> <td>11.5</td> </tr> <tr> <td rowspan="2">CM2</td> <td>NO₂</td> <td>9.3</td> <td>7.7</td> <td>7.4</td> <td>7.8</td> </tr> <tr> <td>PM₁₀</td> <td>14.2</td> <td>12.9</td> <td>12.6</td> <td>14.5</td> </tr> <tr> <td>SH1</td> <td rowspan="8">NO₂</td> <td>10.3</td> <td>8.9</td> <td>8.8</td> <td>9.7</td> </tr> <tr> <td>SH2a, SH2b, SH2c</td> <td>32.1</td> <td>27.6</td> <td>29.8</td> <td>32.2</td> </tr> <tr> <td>SH3</td> <td>11.0</td> <td>9.4</td> <td>9.7</td> <td>10.7</td> </tr> <tr> <td>SH4</td> <td>10.1</td> <td>8.9</td> <td>8.7</td> <td>9.6</td> </tr> <tr> <td>SH5</td> <td>12.8</td> <td>11.0</td> <td>11.6</td> <td>12.1</td> </tr> <tr> <td>SH6</td> <td>27.9</td> <td>20.9</td> <td>23.8</td> <td>27.6</td> </tr> <tr> <td>SH7</td> <td>26.4</td> <td>20.0</td> <td>19.5</td> <td>21.6</td> </tr> </tbody> </table>	Site Name	Pollutant	Annual Air Quality Objective	2019	2020	2021	2022	CM1	NO ₂	40	9.3	8.5	8.7	8.9	PM ₁₀	13.7	10.9	9	11.5	CM2	NO ₂	9.3	7.7	7.4	7.8	PM ₁₀	14.2	12.9	12.6	14.5	SH1	NO ₂	10.3	8.9	8.8	9.7	SH2a, SH2b, SH2c	32.1	27.6	29.8	32.2	SH3	11.0	9.4	9.7	10.7	SH4	10.1	8.9	8.7	9.6	SH5	12.8	11.0	11.6	12.1	SH6	27.9	20.9	23.8	27.6	SH7	26.4	20.0	19.5	21.6
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¹⁸⁵ Institute of Air Quality Management (2024) *Guidance on the Assessment of Dust from Demolition and Construction*. Available at: <https://iaqm.co.uk/wp-content/uploads/2013/02/Construction-Dust-Guidance-Jan-2024.pdf>

¹⁸⁶ Environmental Protection UK and Institute of Air Quality Management (2017) *Land-Use Planning & Development Control: Planning for Air Quality*. Available at: <https://www.iaqm.co.uk/text/guidance/air-quality-planning-guidance.pdf>

¹⁸⁷ British Standards Institute (1994) *BS 6069-2 Characterization of air quality - Glossary*. Available at: <https://knowledge.bsigroup.com/products/characterization-of-air-quality-glossary?version=standard>

¹⁸⁸ Department for Environment, Food and Rural Affairs (2022) *Local Air Quality Management: Technical Guidance (TG22)*. Available at: <https://iaqm.defra.gov.uk/wp-content/uploads/2022/08/LAQM-TG22-August-22-v1.0.pdf>

SH8a, SH8b, SH8c			9.6	8.1	7.3	7.9
SH11			15.5	12.7	14.3	14.4
SH13			25.7	21.9	24.0	25.9
SH19 (former SH14)			16.3	13.4	14.5	14.5
SH15			22.3	17.6	19.9	19.6
SH16			17.0	12.1	13.4	13.6
SH17			20.3	18.7	19.0	22.2
SH18			19.8	16.7	17.3	18.7

Data available from the United Kingdom Air Information Resource (UK-AIR) website operated by Defra¹⁸⁹ has been used to establish estimated annual average background concentrations of NO₂, PM₁₀ and PM_{2.5} across the study area on a 1km² grid basis.

Table 4.9.2 presents estimated annual average background NO₂, PM₁₀ and PM_{2.5} concentrations for the grid square containing the Site, centred around (530500, 313500) for the years 2022-2024.

The estimated background concentrations are well below the relevant AQOs for NO₂, PM₁₀ and PM_{2.5}.

As background concentrations are predicted to fall with time, background concentrations in future years would not be expected to exceed their respective AQOs.

Table 4.9.2: Estimated Background Annual Average NO₂, PM₁₀ and PM_{2.5} Concentrations at the Site

Assessment Year	Estimated Annual Average Pollutant Concentrations Derived from the Local Air Quality Management (LAQM) Support Website		
	Annual Average NO ₂ (µg/m ³)	Annual Average PM ₁₀ (µg/m ³)	Annual Average PM _{2.5} (µg/m ³)
2022	6.2	15.9	8.8
2023	6.1	15.7	8.7
2024	5.9	15.6	8.6
Air Quality Objective	40	40	20

Sensitive Receptors

There are several sensitive receptors within the study area which may be affected by the Scheme during the construction, including:

- Occupants of nearby dwellings, hotel, offices and shops in proximity to roads carrying traffic travelling to and from the Site whilst construction activities are ongoing. These are farms, villages and hamlets located inside the Site or within several hundred metres of the Site boundary. This includes on Cloot Drove, Welland Bank, Queen’s Bank,

¹⁸⁹ Department for Environment, Food and Rural Affairs (2024) UK AIR: Air Information Resource. Available at: <https://uk-air.defra.gov.uk/>

	<p>Martins Road near to Crowland, and Hull's Drove, West Drove North, North Road, Langary Gate Road near to Whaplode Drove;</p> <ul style="list-style-type: none"> • Areas where members of the public may be exposed for one hour or longer in proximity to roads carrying traffic travelling to and from the Site, whilst construction activities are ongoing; and • Users of nearby buildings or amenity space, which may experience a loss of amenity due to dust soiling, or whose health may be affected, as a result fugitive dust and pollutants such as NO2 and PM10 generated by construction related activities or non-road mobile machinery (NRMM). <p>A search of Defra's MAGIC maps website England¹²⁰ indicates that there are no designated SACs, SPAs, Ramsar Sites, SSSIs, National or Local Nature Reserves or Ancient Woodland within 200m of the Site.</p>
<p>Assessment Methodology</p>	<p><u>Determination of the Baseline</u></p> <p>The air quality assessment will review publicly available sources of data to characterise baseline ambient air quality at and around the Site, including air quality monitoring undertaken by SHDC and neighbouring Local Authorities and the Defra background maps.</p> <p>Prediction Methodology</p> <p><u>Construction Phase:</u></p> <p>A qualitative dust risk assessment for the construction phase of the Scheme will be undertaken, in line with the Control of Dust and Emissions during Construction and Demolition (2024) Institute of Air Quality Management technical guidance¹⁸⁵. This will provide an assessment of the likely impacts of dust from the various stages of construction at selected representative receptor locations within 250m of the Site boundary and within 50 m of the route(s) used by construction vehicles on the public highway, and up to 250 m from the Site access points. These receptor locations will include, as appropriate, receptors at nearby committed and consented development.</p> <p>Construction traffic data for the Scheme will be screened against the Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) screening criteria, found in the Land-Use Planning & Development Control: Planning for Air Quality guidance (2017)¹⁸⁶ ('the EPUK-IAQM guidance'), which suggests a detailed air quality assessment is required when:</p> <ul style="list-style-type: none"> • The change in light duty vehicle (LDV) flows is greater than 500 annual average daily traffic (AADT) outside of an AQMA; or the change in heavy duty vehicle (HDV) flows is greater than 100 AADT outside of an AQMA. <p>Where in any given year during which construction activities take place, one or both of these thresholds are exceeded, it is proposed to quantify the effects that this additional traffic may have on air quality using the Atmospheric Dispersion Modelling System (ADMS) Roads 5 dispersion modelling software. The study area will be determined by the locations breaching the screening criteria and the availability of traffic data.</p> <p>Where one or more of the EPUK-IAQM guidance¹⁸⁶ screening criteria are exceeded (in relation to construction vehicle movements) and where construction may take place for at least one year, it is also proposed to model the impact of vehicle movements on air quality for the following three scenarios:</p> <ul style="list-style-type: none"> • 'Base case' (verification) scenario (year to be confirmed, but likely to be 2022; • 'Peak construction year without development', for the year during which the largest volume of construction traffic attributable to the Scheme will be generated, inclusive of future baseline and traffic from nearby committed and consented developments (if data are available) but without the development Scheme in place; or • 'Peak construction year with development': the year during which the largest volume of construction traffic attributable to the Scheme will be generated, inclusive of

	<p>future baseline, traffic from nearby committed and consented developments (if data are available) and Scheme traffic.</p> <p>Where the effects of construction traffic on air quality can be screened out, a qualitative assessment detailing findings from the screening exercise will be undertaken. Should the screening exercise indicate that the construction traffic numbers would not exceed criteria the impact from construction of the Scheme would be determined as not significant.</p> <p>Should it be determined that the effects of construction traffic on air quality cannot be screened out, potential road traffic effects will be considered at representative locations where people might experience a change in local air quality in the vicinity of roads where the Scheme is expected to introduce potentially significant volumes of additional traffic, during the construction phase (when reviewed against the EPUK-IAQM guidance¹⁸⁶ screening criteria), for which traffic data are made available.</p> <p>Emission factors from the Defra Emissions Factors Toolkit¹⁹⁰ (current at the time) will be used in the assessment. We propose using emissions factors appropriate to the years being assessed.</p> <p>The assessment will include model verification against local monitoring data at a reasonably representative selection of local monitoring locations, including monitoring locations referenced in the 'Local Air Quality Management Technical Guidance 2022' (Defra, 2022) ('TG22')¹⁸⁸. The changes in concentration between comparable 'without development' and 'with development' scenarios for annual mean NO₂, PM₁₀ and PM_{2.5} will be undertaken with reference to the AQOs and legally binding target (LBT) value for annual mean PM_{2.5}. The impact magnitude will be assessed with reference to the descriptors provided in the EPUK-IAQM guidance¹⁸⁶. Professional judgement will be exercised to determine the overall significance of effects, based on the impact magnitudes assigned and the number of additional receptors which are exposed to concentrations exceeding an AQO where they were not predicted to without the development in place.</p> <p>The overall significance of predicted changes in local air quality on human receptors, including background pollutant concentrations, has been established through the consideration of the following factors (IAQM 2017 guidance (IAQM Land-Use Planning & Development Control: Planning for Air Quality, January 2017)¹⁸⁶):</p> <ul style="list-style-type: none"> • The existing and future air quality in the absence of the Proposed Development; • Duration (temporary or long term); • Reversibility (reversible or permanent); • The extent of current and future population exposure to the effects; and • The influence and validity of any assumptions adopted when undertaking the prediction of effects. <p>Should there be a need to complete dispersion modelling then the future year with peak construction and future year without-construction can be compared against impact descriptors for individual receptors(see Table 4.9.3, informed by IAQM 2017 guidance¹⁸⁶ below). Should there be several receptors that have moderate to substantial impact then the effect would be overall significant. However, should there be only slight or negligible impacts then the effect would not be significant.</p>
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¹⁹⁰ Department for Environment, Food and Rural Affairs (2024) *Emissions Factors Toolkit (EFT)*. Available at: <https://laqm.defra.gov.uk/air-quality/air-quality-assessment/emissions-factors-toolkit/>

Table 4.9.3 Impact Descriptors for Individual Receptors

Long Term Average Concentration at Receptor in Assessment Year	% Change in Concentration Relative to Air Quality Assessment Level (AQAL)			
	1	2-5	6-10	>10
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Moderate
95-102% of AQAL	Slight	Moderate	Moderate	Substantial
103-109% of AQAL	Moderate	Moderate	Substantial	Substantial
119% or more of AQAL	Moderate	Substantial	Substantial	Substantial

Operational Phase
Road Traffic Emissions
 When the Scheme becomes operational, it is understood that operating the solar PV modules would require minimal staff and therefore minimal operating vehicle movements. There would be approximately 7 HGV and 7 LDV vehicle movements daily during the operational phase of the development. This is below the EPUK-IAQM guidance¹⁸⁶ for the need for detailed dispersion modelling. Therefore, the operational emissions associated with road traffic emissions would not be assessed further.¹⁸⁶

Key Issues and Potential Likely Impacts

Construction and Decommissioning Phase
 During the construction phase associated activities have the potential to generate fugitive dust emissions which may give rise to annoyance due to the soiling of surfaces. Emissions of this nature can also pose a risk of human health effects due to the increase in exposure to PM₁₀ concentrations.
 The effects generated through the decommissioning phase are anticipated to be similar or to a lesser degree to those generated during the construction phase.
 Emissions from traffic and plant generated and used in connection with the proposed construction activities may also affect ambient air quality at and around the Site.
Operational Phase
 The development would not exceed EPUK-IAQM guidance¹⁸⁶ screening criteria. Therefore, no specific qualitative assessment of operational phase emissions would be undertaken as no key issues or significant impacts would be likely.

Design, Mitigation and Enhancement Measures

Following the findings of the assessment, high-level recommendations will be provided, if appropriate, for mitigation of the potential impacts that the Scheme may have on local air quality. The air quality ES chapter will also include a construction dust mitigation section. Mitigation measures proposed will be outlined within the CEMP and DEMP.

Consultation

Consultation with the Environmental Health Officer for SHDC would be undertaken to seek to reach agreement on assessment methodology and environmental baseline This consultation would include discussion of the construction air quality assessment.

Assessment assumptions and limitations

All assumptions and limitations, including any exclusions, together with assumptions for choices and criteria leading to exclusion of input and output data will be documented as part of the assessment.

Summary of Aspects

Aspects scoped into EIA
 It is proposed that an Air Quality ES Chapter is considered as part of the EIA for the Scheme.

	<p>It is proposed that a standalone Air Quality Assessment be undertaken to assess the potential impacts of the Scheme, and will include the following sections:</p> <ul style="list-style-type: none">• Qualitative Construction Dust Risk Assessment; and• Qualitative Construction Phase Assessment of Road Traffic Emissions. <p>The effects generated through the decommissioning phase are anticipated to be similar or to a lesser degree to those generated during the construction phase. The qualitative construction dust risk assessment will inform effects anticipated for the decommissioning phase.</p> <p>Aspects scoped out of EIA</p> <p>Based on the nature of the works for the operational phase we would not complete a quantitative dispersion modelling assessment.</p> <p>The Assessment of road traffic during the decommissioning phase is proposed to be scoped out due to the uncertainties in relation to future traffic flows and transport infrastructure.</p>
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Glint and Glare

Table 4.10 Glint and Glare

<p>Introduction</p> <p>This table identifies the proposed scope of the EIA to assess potential effects from the Scheme on Glint and Glare receptors. This considers:</p> <ul style="list-style-type: none"> • Glint and Glare – The potential effects of the Scheme on light sensitive receptors (Dwellings, users of nearby roads and PRoW and Airfields) with a view of the Scheme during operation. • Light-sensitive receptors with view of a the Scheme that have potential to experience solar PV panel glare. 	
<p>Study Area</p>	<p>Study areas derived from best practice guidelines and recommendations (as referenced below) will be applied to identify light-sensitive receptors potentially affected by the solar PV panels within the PV Area:</p> <ul style="list-style-type: none"> • Residential dwellings inside, or within 1km of the PV Area; • National and Regional roads inside, or within 1km of the PV Area; • Rail infrastructure (sections of railway line and identified railway signals) inside, or within 500m of the PV Area; and • Aviation inside, or within 5-10km of the PV Area.
<p>Planning Policy and Guidance</p>	<p>The key planning policy and guidance that will be considered when carrying out this assessment is:</p> <p><u>National Planning Policy</u></p> <ul style="list-style-type: none"> • Overarching National Policy Statement for Energy (EN-1)⁷; • National Policy Statement for Renewable Energy Infrastructure (EN-3)⁸; • National Policy Statement for Electricity Networks Infrastructure (EN-5)⁹; • National Planning Policy Framework (NPPF)¹⁰; and • The National Planning Practice Guidance for ‘Renewable and Low Carbon Energy’¹¹. <p><u>Local Planning Policy</u></p> <ul style="list-style-type: none"> • South East Lincolnshire Local Plan (SELLP) 2011-2036¹². <p><u>Guidance</u></p> <ul style="list-style-type: none"> • The UK Highway Code¹⁹¹ which states that a road user should be aware of particular hazards such as glare from the sun; • Network Rail Guidance¹⁹² based on Rail Industry Standard (RIS) RIS-0737-CCS which sets out guidelines which detail reflections and glare, visibility of signals, and train drivers’ field of vision; • The Interim Civil Aviation Authority (CAA) – Solar PV Systems sets out recommendations on where glint and glare assessments are necessary as part of the relevant planning application. Beyond these recommendations, no specific methodology or frame of reference are defined for assessing the impact of glint and glare on aviation infrastructure;

¹⁹¹ Department for Transport (2023) *The Highway Code*. Available at: <https://www.gov.uk/guidance/the-highway-code>

¹⁹² Network Rail and Rail Safety and Standards Board (2016) *RIS-0737-CCS Iss 1*:

Rail Industry Standard for Signal Sighting Assessment Requirements. Available at: <https://www.rssb.co.uk/standards-catalogue/CatalogueItem/RIS-0737-CCS-Iss-1>

	<ul style="list-style-type: none"> • Combined Aerodrome Safeguarding Team (CAST) Aerodrome Safeguarding Guidance Note¹⁹³ which aims to provide safeguarding advice in relation to solar photovoltaic developments; and • US Federal Aviation Administration Policy¹⁹⁴ which sets out best practice for measuring ocular impact, and the appropriate methodology for glint and glare assessments.
<p>Baseline Conditions</p>	<p>It should be noted that there are no other solar developments greater than 50MW located within 1km of the PV Area. As such, the main source of irradiance will be the sun. Impacts that coincide with direct sunlight appear less prominent than those that do not as the sun is a far more significant source of light than reflecting panels. Road users are already aware of safety implications when driving in bright sunlight. Dwellings will experience the most noticeable source of irradiance at sunset and sunrise. Receptors that will be included within the modelling assessment are:</p> <ul style="list-style-type: none"> • Dwellings within 1km of the Site; • Road Infrastructure within 1km of the Site Boundary, namely Crowland Bypass (A16) and Hull's Drove (B1166); and • Aviation Infrastructure within 5km of the Site Boundary, namely Fenland Airfield and Crowland Airstrip.
<p>Assessment Methodology</p>	<p>The significance of potential glint and glare effects is determined by two variables:</p> <ul style="list-style-type: none"> • The sensitivity of the receptor; and • The magnitude of change. <p>In general, light-sensitive receptors with view of a solar PV development have potential to experience solar PV panel glare. While no technical distance limits/thresholds are reported within which glare is possible for such receptors, the potential or significance of a reflection decreases with distance due to an observer's decreasing field of vision capability with increasing distance, as well as possible obstructions such as shielding caused by terrain and vegetation.</p> <p>Industry guidance states that a 1km study area is considered appropriate for assessing glint and glare effects on local dwellings and road users. A study area of 500m is commonly used for railway operations and infrastructure. Updated CAA guidance states that 5km is the screening distance of choice although aerodromes could be considered out to 10km. Only in exceptional circumstances may assessments of aerodromes be required beyond 10km.</p> <p>An initial judgement may be made based on review of aerial mapping or photography. Where it is clear no line of sight is possible, receptors are excluded from further assessment. Where line of sight is possible, a more detailed assessment is undertaken using modelling software to determine if glare is geometrically possible.</p> <p>The following methodology for glint and glare assessment is derived from good practice considerations whilst incorporating relevant guidance undertaken for this assessment:</p> <ul style="list-style-type: none"> • Light-sensitive receptors will be identified in their respective study areas surrounding the PV Area; • The visibility of the panels from the identified receptors will be considered. If the panels are not visible from the receptor, then no glare can occur;

¹⁹³ Combined Aerodrome Safeguarding Team (CAST) (2024) *CAST Aerodrome Safeguarding Guidance Note*. Available at: <https://www.caa.co.uk/media/f51mg4hs/cast-advice-note-5-renewable-energy-developments-renewable-energy-apr-24.pdf>

¹⁹⁴ US Federal Aviation Administration and US Department of Transportation (2021) *Federal Aviation Administration Policy: Review of Solar Energy System Projects on Federally-Obligated Airports*. Available at: <https://www.federalregister.gov/documents/2021/05/11/2021-09862/federal-aviation-administration-policy-review-of-solar-energy-system-projects-on-federally-obligated>

	<ul style="list-style-type: none"> • Solar PV panel glare from the Scheme towards the identified receptors will be considered by undertaking geometric modelling calculations; • Where solar glare is predicted, factors such as duration, time of day and, for aviation receptors, the glare intensity will be considered to determine the magnitude of impact; • Mitigating factors will also be considered e.g. glare coinciding with direct sunlight to determine the magnitude of impact; and • Determination will be made whether a significant impact is likely. <p>The significance of the impact on the receptor is correlated against the magnitude of the change on that receptor to determine whether the overall significance of the effect on the receptor will be Negligible, Minor Adverse, Moderate Adverse, or Major Adverse as outlined in Section 3 of this Scoping Report. Detail on the significance methodology will be included within the technical chapter of the ES.</p>
<p>Baseline development</p>	<p>A detailed receptor review will be conducted to identify light-sensitive receptors within the study areas defined above. These will be conducted using both Google Earth satellite imagery¹¹⁴ and Google Street View. The review will also investigate the potential impact from glare at identified receptors through analysis of topography and/or obstructions.</p>
<p>Key Issues and Potential Likely Impacts</p>	<p>Construction and Decommissioning Phases</p> <p>As not all panels will be installed during the construction or decommissioning phases, it is considered that the length of glare and possible intensity of glare will be less than or equal to the operational phase. The worst-case scenario for glint and glare effects is therefore the operational phase.</p> <p>Operational Phase</p> <p>The following potential effects on receptors during the operational phase have been identified for consideration:</p> <p><u>Dwellings</u></p> <p>330 Residential dwellings were identified within the 1km screening distance of the PV Area. Where dwellings are identified with a potential line of sight to solar PV arrays, technical modelling will be undertaken.</p> <p><u>Roads</u></p> <p>Major National, National and Regional roads are predicted to have higher level of traffic compared to local roads and have higher sensitivity.</p> <p>Road users along Crowland Bypass (A16) and Hull’s Drove (B1166) have a potential line of sight towards the proposed arrays such that these roads will require technical modelling. Therefore, these roads are taken forward for technical modelling.</p> <p>In accordance with industry guidance, technical modelling is not recommended for local roads, where traffic densities are likely to be relatively low. Any solar reflections from the Scheme that are experienced by a road user along a local road would be considered ‘Low/Minor’ impact magnitude.</p> <p>Given the ‘Low’ sensitivity of local road users and the maximum corresponding ‘Low/Minor’ impact magnitude, it is not considered possible to have a significant glint and glare impact upon local road users. Technical modelling is not proposed for local road users on this basis.</p> <p><u>Aviation</u></p> <p>Aviation receptors were identified within the screening distances of the PV Area.</p> <p>Fenland Airfield and Crowland Airstrip were identified within 5km and as such will require technical modelling.</p> <p><u>Rail Infrastructure</u></p>

	<p>No rail infrastructure was identified within the screening distance of the PV Area. Assessment of railway infrastructure is scoped out on this basis.</p> <p><u>PRoWs</u></p> <p>Given the 'Low' sensitivity of PRoW users and the maximum corresponding 'Low/Minor' impact magnitude, it is not considered possible to have significant glint and glare impacts upon PRoW users. Technical modelling is not proposed for PRoW users on this basis.</p> <p>There are no indirect effects during operation from glint and glare.</p>
Design, Mitigation and Enhancement Measures	<p>Where glare impacts are predicted toward ground-based receptors (Air Traffic Control Tower, residential dwellings, and road infrastructure), appropriate mitigation may include the installation of screening around the site perimeter to obstruct line of sight to solar PV panels.</p> <p>Where 'Moderate Adverse' effects are predicted toward aerodrome approach paths, mitigation may be requested by the relevant safeguarding authority. Due to the aerial nature of the receptor, mitigation for approach paths may require significant alteration of the PV Area's characteristics. The most recent Civil Aviation Authority guidance does not provide clarity with regards to how to interpret glint and glare assessment results. It is recommended that each aerodrome authority review their own risk assessments and make a judgement as to what the results will mean within their own aerodrome.</p>
Consultation	<p>Consultation is being undertaken with the Safeguarding Teams at Crowland Airfield and Fenland Airfield regarding the potential impacts on the aerodromes. Further requirements for consultation will be identified as necessary during each subsequent assessment phase.</p>
Assessment Assumptions and Limitations	<p>Uncertainties at this stage are the layout as well as the siting and heights of the solar PV panels across the PV Area.</p> <p>Professional judgement will be used to assess views of ground-based receptors, aided by aerial photography and street view photography as well as ZTVs and site photography prepared by the wider team.</p> <p>Agreement on receptors will be sought through consultation with the Safeguarding Teams at Crowland Airfield and Fenland Airfield.</p> <p>As not all panels will be installed during the construction or decommissioning phases, it is considered that the length of glare and possible intensity of glare will be less than or equal to the operational phase. The worst-case scenario for glint and glare effects is therefore the operational phase.</p>
Summary of Aspects	<p>Aspects scoped into EIA</p> <p>The effect of the Scheme on light-sensitive receptors during the operational phase will be considered as part of the EIA using study areas derived from best practice guidelines and recommendations. In particular, the potential impacts on nearby residential dwellings, the A16, the B1166, Fenland Airfield and Crowland Airfield.</p> <p>Aspects scoped out of EIA</p> <p>No rail infrastructure has been identified within the 500m screening distance from the PV Area. Additionally, it is considered that there will be no significant impact on nearby local roads or PRoWs. Furthermore, it was identified that the worst-case scenario for glint and glare effects is during the operational phase. Therefore, it is proposed that the effect on rail infrastructure, local roads, and PRoWs can be scoped out of the EIA, as well as the construction and decommissioning phases of the Scheme.</p>

Major Accidents and Disasters

Table 4.11 Major Accidents and Disasters

<p>Introduction</p> <p>This table identifies the proposed scope of the EIA to assess potential effects from the Scheme relating to Major Accidents and Disasters. This considers:</p> <ul style="list-style-type: none"> • The potential effects of the Scheme on the environment deriving from its vulnerability to risks of relevant major accidents and/or disasters; • The Potential effects of the Scheme interacting with any sources of external hazards; and • The potential effects of an external major accident and/or disaster and risk of the Schemes existence on an environmental receptor. 	
<p>Study Area</p>	<p>The baseline for this assessment, against which potential major accidents and disasters will be considered will consist of any land uses or activities within the Site boundary together with any area occupied during the period of construction or operation. Consideration will also be given to external features beyond the Site boundary but likely to have potential interaction with the Scheme.</p>
<p>Planning Policy and Guidance</p>	<p>The following key planning policy and guidance in relation to major accidents and disasters will be considered within the assessment:</p> <p><u>Legislation</u></p> <ul style="list-style-type: none"> • The Control of Major Accident Hazards Regulations 2015¹⁹⁵; and • Under Schedule 3 of the EIA Regulations⁴, the risks of major accidents and natural disasters relevant to the Scheme needs to be considered., with the following requirements set out: <ul style="list-style-type: none"> ◦ <i>A description of the expected significant adverse effects of the development on the environment deriving from the vulnerability of the development to risks of major accidents and/or disasters which are relevant to the project concerned...Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies.</i> <p><u>National Planning Policy</u></p> <ul style="list-style-type: none"> • Overarching National Policy Statement for Energy (EN-1)⁷. <p><u>Guidance</u></p> <ul style="list-style-type: none"> • IEMA (2020) Major Accidents and Disasters in EIA: An IEMA Primer¹⁹⁶.
<p>Baseline Conditions</p>	<p>The Site is largely located across agricultural land with few receptors, houses are mainly sited along roadsides in small clusters. North of the Grid Connection Options are larger towns including Weston, Moulton. Spalding is located west of the Grid Connection Corridor options.</p> <p>The River Welland is located to the west of the Site, with a large proportion of the Scheme located within Flood Zone 3 (High probability of flooding).</p> <p>The A16 is located to the west of the Scheme and breaks up the western parcels of the PV Area.</p> <p>Two airfields are located within proximity to the Scheme. Crowland airfield has four approach paths and is located approximately 500m between land parcels A and B. Fenland airfield also has four aircraft approach paths and is located approximately 4km north of land parcel D.</p>

¹⁹⁵ The Control of Major Accident Hazards Regulations 2015. Available at: <https://www.legislation.gov.uk/uksi/2015/483/made/data.pdf>

¹⁹⁶ IEMA (2020) Major Accidents and Disasters in EIA: An IEMA Primer. Available at: <https://www.iema.net/resources/reading-room/2020/09/28/major-accidents-and-disasters-in-eia-an-iema-primer>

	<p>The nearest receptors to be considered as part of Major Hazards and Accidents topic include:</p> <ul style="list-style-type: none"> • Human Receptors including nearby residents and users of the PRoW; • Future human receptors including construction, operational and decommissioning workers; • Adjacent Property & Infrastructure including, surrounding airfields, public right of way and other material assets; and • Environmental Components, including ecological, land, soil.
<p>Assessment Methodology</p>	<p>There is currently no recognised standard methodology for assessing significant environmental effects associated with the vulnerability of a development to a major accident or disaster event. However, the following methodology has been adopted based on the 2020 guidance published by the IEMA¹⁹⁶ and reference can also be made to previous assessments that have been undertaken for similar Schemes.</p> <p>IEMA guidance¹⁹⁶ defines an Accident and Disaster to be:</p> <p><i>“Accident: Events that threaten immediate or delayed serious environmental effects to human health, welfare and/or the environment and require the use of resources beyond those of the client or its appointed representatives to manage. Whilst malicious intent is not accidental, the outcome (e.g. train derailment) may be the same and therefore many mitigation measures will apply to both deliberate and accidental event.</i></p> <p><i>Disaster: May be a natural hazard (e.g. earthquake) or a man-made/external hazard (e.g. act of terrorism) with the potential to cause an event or situation that meets the definition of a major accident.”</i></p> <p>The purpose of this is to assess the vulnerability of the Scheme to those hazards that have the potential to cause a major event, and which could then generate a significant adverse effect on the environment. A precautionary yet proportionate approach will be adopted within the ES. This will comprise a risk assessment specific to the Site, focusing on un-planned, yet plausible events caused by both natural (for example a flood) and man-made events (for example arson) which could arise.</p> <p>The following three categories have been determined based on practices completed by similar projects:</p> <ul style="list-style-type: none"> • Events that could not realistically occur, due to the nature of the Scheme or its location; • Events that could realistically occur, but for which the Scheme, and associated receptors, are no more vulnerable than any other development; and • Events that could occur, and to which the Scheme is particularly vulnerable, or which the Scheme has a particular capacity to exacerbate. <p>The approach to assessing the potential impacts of the Scheme on Major Accidents and Disasters will follow the 2020 IEMA Guidance document¹⁹⁶ on assessing EIAs.</p> <p>Screening: The initial identification to whether the Scheme is vulnerable to a major accident and/or disaster also considering the potential for the Scheme to lead to a significant effect.</p> <p>Baseline: A desk-based review of likelihood, vulnerability and significance of the event occurring.</p>

	<p>The baseline for Major Accidents or Disasters will be established from a number of sources including the National Risk Register¹⁹⁷ and Lincolnshire's local community risk profile¹⁹⁸. The top risks to Lincolnshire include road traffic collisions, health and wellbeing, flooding and severe weather and pandemic.</p> <p>Other sources of data may be gathered from but not limited to the Health and Safety Executive, Environment Agency and Control of Major Accident Hazards (COMAH).</p> <p>An aviation obstruction assessment will be completed as part of the ES, this will assess the Scheme with respect to the relevant aviation infrastructure in proximity to the Scheme, notably Fenland airfield, and establish the maximum height to which the Scheme can be built. The assessment will identify any potential constraints, any potential impacts to aviation will also be discussed within this chapter.</p> <p>Assessment: A qualitative assessment of potential risk events will be carried out using professional judgement. The assessment will be informed by technical studies such as the aviation safeguarding assessment and in consultation with EIA topic specialists and the Scheme designers.</p> <p>Where possible, embedded mitigation will be demonstrated for individual events to provide a thorough proportionate approach, demonstrating management of risks to be As Low as Reasonably Practicable (ALARP).</p>
<p>Key Issues and Potential Likely Impacts</p>	<p>Not all events will be relevant to the Scheme, for example volcanic eruptions, and will, therefore, be automatically scoped out from the assessment. An overview of major accidents of disasters that will be further considered across all phases of the Scheme include but are not limited to:</p> <ul style="list-style-type: none"> • Flooding and severe weather; • Fire/Explosion including risks associated with Scheme infrastructure such as BESS; • Road traffic accidents; • Aircraft disasters; and • Utilities failures.
<p>Design, Mitigation and Enhancement Measures</p>	<p>The management framework for the Scheme would be defined by several mechanisms, including applicable UK regulations and guidance applicable to construction activities.</p> <p>The Applicant's role in ensuring a safety facility is to set the terms of reference for construction contractor and operational companies to perform within statutory compliance and commitment to common industry good practice is considered as an appropriate minimum operational standard, informed by the following guidance and policy:</p> <ul style="list-style-type: none"> • Health and Safety at Work Act 1974¹⁹⁹; • Construction (Design and Management) (CDM) Regulations 2015¹³⁴; • National Planning Policy Framework 2023¹⁰; • Electricity at Work Regulations 1989²⁰⁰;

¹⁹⁷ Cabinet Office (2023) *National Risk Register*. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1175834/2023_NATIONAL_RISK_REGISTER_NRR.pdf

¹⁹⁸ Lincolnshire County Council and Lincolnshire Fire and Rescue (2020) *Understanding Risk in Lincolnshire 2020-2024: Lincolnshire Fire & Rescue Community Risk Profile*. Available at: <https://www.lincolnshire.gov.uk/downloads/file/4817/lfr-community-risk-profile>

¹⁹⁹ *Health and Safety at Work etc. Act 1974*. Available at: <https://www.legislation.gov.uk/ukpga/1974/37/data.pdf>

²⁰⁰ *The Electricity at Work Regulations 1989*. Available at: <https://www.legislation.gov.uk/uksi/1989/635/made/data.pdf>

	<ul style="list-style-type: none"> • EU Regulation No. 402/2013 on common safety method on risk evaluation and assessment (CSM-RA) (as amended by regulation EU 2015/1136)²⁰¹; and • The Planning (Hazardous Substances) Regulations 2015²⁰². <p>These would serve to control and/or minimise the impacts and/or vulnerability of the Scheme and identified risks including those arising from major accidents and natural disasters.</p> <p>In addition to appropriate design, the Scheme would be subjected to an adequate maintenance and inspection program designed to ensure that the integrity of the facility is maintained during operation.</p>
Consultation	<p>Where the need for consultation is identified in regard to a specific event and/or receptor, for example utilities, consultation would be undertaken accordingly.</p> <p>Consultation will be undertaken with the Safeguarding Teams at the surrounding Airfields respectively regarding the potential impacts on the aerodromes. Further requirements for consultation will be identified as necessary during each subsequent assessment phase.</p>
Assessment assumptions and limitations	<p>Potential impacts and their effects cannot be predicted with absolute certainty. Predictions are limited by the quality and certainty of information available, and the accuracy of predictive techniques employed. The assessment presented in the ES will, therefore, indicate the likely impacts rather than providing precise predictions of effects. Where uncertainty exists, a precautionary approach assuming a reasonable worst-case impact will be adopted for the assessment.</p> <p>The design of the Scheme will be guided by other industry standards and codes, many of which are mandatory. These require infrastructure and systems to be designed so that risks to people and the environment are either eliminated or reduced to levels that are ALARP and this is considered sufficient.</p> <p>The design, construction, operation and decommissioning will take into account standard good practices.</p> <p>The construction phase will be managed through the implementation of the CEMP and the decommissioning phase will be managed through the implementation of the DEMP which will be assumed to be followed.</p> <p>The assessment will be based on available information, sufficient assumptions will be outlined within the ES if there are absences of information at the time of assessment.</p>
Summary of Aspects	<p>Aspects scoped into EIA</p> <p>Considering the nature, scale and location of the Scheme, the ES will include a Major Accidents or Disasters chapter, this will outline the potential risks associated with the Scheme and how they could be mitigated.</p> <p>The effect of the Scheme on surrounding aerodromes during the operational phase will be considered as part of the EIA.</p> <p>At this stage we consider the risks to be low, based on a significant body of experience of UK Solar farm operation. However, the ES will consider these risks more thoroughly and present more detailed justification. Where appropriate this assessment will also feed into the design of the Scheme.</p>

²⁰¹ Commission Implementing Regulation (EU) 2015/1136 amending Implementing Regulation (EU) No 402/2013 on the common safety method for risk evaluation and assessment. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32015R1136&from=GA>

²⁰² The Planning (Hazardous Substances) Regulations 2015. Available at: <https://www.legislation.gov.uk/uksi/2015/627/made/data.pdf>

4.3 Topics proposed to be ‘Scoped Out’ of the EIA

Table 4.12 Topics proposed to be ‘Scoped Out’ of the EIA.

Topics Scoped Out	Reason
Telecommunications and Utilities	<p>During the construction and decommissioning phases, the Scheme has the potential to effect existing utilities infrastructure. A desk study will be carried out to identify existing constraints within the Site Boundary, and consultation will be undertaken with relevant telecommunications and utilities providers including water, gas and electricity as appropriate. Information gathered will inform Scheme design and appropriate safety measures will be implemented to ensure any existing infrastructure is protected and potential impacts are avoided. As such, a separate assessment will not be undertaken in the ES.</p>
Waste	<p>During construction no demolition works will be carried out within the Site Boundary, and as a result it is not intended for large quantities of material to be removed from the Site. Potential streams of construction waste and estimated volumes will be outlined within the ES.</p> <p>Based on historic mapping data there is potential for encountering contaminated Made Ground within the Site Boundary, although the likelihood of encountering widespread contamination is low.</p> <p>The Scheme will follow the waste hierarchy and where possible the Scheme will look to prevent, re-use, recycle or recover waste. If this is not viable then the waste will be disposed of in adherence to agreed procedures ensuring any potential impacts are mitigated. In the event that contaminated soils are identified procedures will be in place and ensuring no cross-contamination with ‘clean’ materials.</p> <p>During construction, waste is likely to arise from the following activities:</p> <ul style="list-style-type: none"> • General waste associated with welfare facilities; • Waste from the maintenance of construction vehicles including chemicals (fuels and oils); • Packaging waste from incoming materials (paper and cardboard); • Waste associated with supporting infrastructure such as the construction of fencing, access roads and other supporting infrastructure; and • Water associated with cleaning activities. <p>It is proposed that any construction associated waste will be managed via best practice under a Site Waste Management Plan (SWMP), included within the CEMP, in accordance with The Definition of Waste: Development Industry Code of Practice guidance developed by CL:AIRE²⁰³. The SWMP will be produced prior to construction commencing and will describe how materials will be managed and stored efficiently and disposed of legally during the construction phase. It will also outline the aims, objectives and on-going management responsibilities, including management and storage practices, to be implemented during the construction phase, and will set targets for the reduction, diversion from landfill and reuse of waste.</p> <p>During operation, there will be limited waste produced in relation to the Scheme, it is assumed waste will arise from general maintenance activities only including the replacement of components (e.g. batteries and panels). An analysis of waste streams will be described within the ES alongside any potential mitigation measures.</p>

²⁰³ Contaminated Land: Applications in Real Environments (CL:AIRE) (2011) *The Definition of Waste: Development Industry Code of Practice. Version 2.* Available at: <https://www.clare.co.uk/component/phocadownload/category/8-initiatives?download=212:definition-of-waste-development-industry-code-of-practice>

	<p>As outlined in Section 2 the decommissioning phase will consist of the removal of Site infrastructure, decommissioning will follow best practice measures and where possible infrastructure will be recycled.</p> <p>Any waste created through the construction and decommissioning phases will be required to be removed from the Site and disposed of in line with lawful requirements.</p> <p>An Outline Decommissioning Plan will be prepared as part of the EIA which will outline general principles to be adhered to prior to decommissioning occurring. However, as the Scheme's operational life is 40 years, it is not possible to completely identify the management routes and facilities.</p> <p>The ES will outline any measures which will be implemented to minimise waste.</p> <p>Considering the above, it is considered that no significant waste impacts are expected during any phase of the Scheme and so has been scoped out of the EIA.</p>
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5 Summary of Proposed Scope

Table 5.1 Proposed Scope of the ES

Topic	Construction	Operation	Decommissioning
Climate Change	<p>Scoped In</p> <p><u>Lifecycle GHG Impact Assessment</u></p> <p>The construction of the Scheme is likely to result in carbon emissions through various construction related activities. The assessment will consider embedded carbon, and emissions associated with construction site activities, waste disposal and transport.</p> <p>Scoped Out</p> <p><u>Climate Change Adaptation and Resilience</u></p> <p>Due to the short-term nature of the construction period, and the impacts of climate change not being anticipated to have significant effects in such a short period of time. In addition, as outlined above, any potential impacts are likely to be mitigated via mitigation measures included in other ES Chapters and the implementation of a CEMP.</p> <p>Transport emissions associated with traffic generated by the construction of the Scheme will be scoped out due to the rural nature of the Site.</p>	<p>Scoped In</p> <p><u>Lifecycle GHG Impact Assessment</u></p> <p>For the operational phase of the Scheme, GHG emissions will arise from regulated and unregulated energy use of the Scheme, repair/refurbishment over the lifetime of Solar Farm and associated infrastructure. GHG emission calculations will account for offset through the production of cleaner renewable energy compared to the grid average.</p> <p><u>Climate Change Adaptation and Resilience</u></p> <p>The Scheme will need to adapt and be resilient to the changing climate, as future climate conditions may cause significant effects in relation to risks from extreme weather (short and long term), temperature changes, precipitation, drought wind alterations and flooding.</p> <p>Scoped Out</p> <p><u>Lifecycle GHG Impact Assessment</u></p> <p>Once operational, traffic generated by the Site is expected to be minimal and so associated impacts such as GHG emissions do not represent a significant risk and is therefore scoped out.</p>	<p>Scoped In</p> <p><u>Lifecycle GHG Impact Assessment</u></p> <p>The decommissioning of the Scheme is likely to result in carbon emissions through various activities. The assessment will consider embedded carbon, emissions associated with decommissioning site activities, waste disposal and transport.</p> <p>Scoped Out</p> <p><u>Climate Change Adaptation and Resilience</u></p> <p>Due to the nature of the Scheme and the short-term nature of the potential significant effects, the impacts relating to the decommissioning/end-of-life phase are also scoped out of this assessment.</p>
Cultural Heritage	<p>Scoped In</p> <p>The effects on Cultural Heritage (including built heritage, setting and archaeology) will be considered as part of the EIA using a study area encompassing the extent of the Scheme in addition to a 1km buffer. A flexible approach will be taken to the identification of high value assets on</p>		

Topic	Construction	Operation	Decommissioning
	which there may be an impact upon setting beyond the study area. It is anticipated that there is potential for effects on heritage assets at all stages of the Scheme.		
Ecology and Biodiversity	<p>Scoped In</p> <p>Direct effects such as habitat loss, species mortality and contaminated surface water in relation to construction activities. Indirect effects may include habitat fragmentation, as well as disturbance of ecological features in the vicinity of the Scheme through noise, dust and light pollution.</p> <p>Ecology Surveys – To assess the baseline of the PV Area and Grid Connection and Cable Connection routes (once confirmed). Scope of further surveys defined through PPEA and high-level studies and in liaison with Natural England. Those species scoped in include:</p> <ul style="list-style-type: none"> • Birds – wintering and breeding; • Great crested newt; • Bats; and • Otter and water vole. <p>Liaison with Natural England will take place in relation to the Habitat Regulations Assessment for Nene Washes and Baston Fen.</p> <p>Scoped Out</p> <p>The following species/groups have been scoped out of the assessment due to a lack of suitable habitat, not being in the known geographical range and/or the site not considered to be able to support important populations:</p> <ul style="list-style-type: none"> • Fish; 	<p>Scoped In</p> <p>Effects in the operational phase could include factors such as disturbance through light and noise pollution.</p> <p>The biodiversity enhancements as part of the Scheme could result in increased diversity of plants and habitats.</p> <p>Scoped Out</p> <p>No habitats present are considered to be highly sensitive to dust or air pollution.</p> <p>The potential use of tall cranes during construction and decommissioning of overhead cables will be short term and highly localised, so highly unlikely to result in any significant effect on collision risk to birds.</p> <p>The Scheme is not anticipated to result in any hydrology or water pollution effects during operation.</p>	<p>Scoped In</p> <p>Direct effects such as habitat loss, species mortality and contaminated surface water in relation to construction activities. Indirect effects may include habitat fragmentation, as well as disturbance of ecological features in the vicinity of the Scheme through noise, dust and light pollution.</p> <p>Scoped Out</p> <p>No habitats present are considered to be highly sensitive to dust or air pollution.</p> <p>The potential use of tall cranes during construction and decommissioning of overhead cables will be short term and highly localised, so highly unlikely to result in any significant effect on collision risk to birds.</p>

Topic	Construction	Operation	Decommissioning
	<ul style="list-style-type: none"> • Aquatic invertebrates; • White clawed crayfish; • Terrestrial invertebrates; • Hazel dormouse; • Red squirrel; • Pine marten; • Badger; and • Reptiles. 		
Hydrology, Flood Risk and WFD	<p>Scoped In</p> <p>Effects upon the surface water drainage regime, water quality and upon flood storage, flood flows and routing processes.</p> <p>Effect upon the River Welland and flood defences will be considered as well as effects associated with watercourses crossing locations in relation to WFD waterbodies.</p> <p>The ES will be supported by a Flood Risk Assessment which, in turn, will be based upon the results of hydraulic modelling analysis. Relevant organisations have been and will be consulted through the process.</p> <p>Scoped Out</p> <p>Groundwater aquifers – the unproductive superficial and bedrock aquifers are scoped out of the assessment</p>	<p>Scoped In</p> <p>Effects upon surface water drainage regime, water quality, water crossing points, and upon flood storage, flood flows and routing processes.</p> <p>Scoped Out</p> <p>Groundwater aquifers – the unproductive superficial and bedrock aquifers are scoped out of the assessment.</p> <p>During the operational phase, the Grid Connection is not considered to give rise to impacts upon hydrology, hydrogeology, flood risk or WFD water bodies. It is therefore proposed that consideration of operational impacts associated with the Grid Connection is scoped out of the assessment.</p>	<p>Scoped Out</p> <p>At the end of its operational life, the decommissioning of the Scheme is considered to have similar effects upon the water environment as those during the construction phase.</p> <p>At the end of its operational life, it is anticipated that any above ground works for the electrical connection will be removed and all below ground off-site cabling would be left <i>in situ</i>. As such, the decommissioning works would be minimal, such that significant effects would be unlikely.</p>
Agriculture and Soils	<p>Scoped In</p> <p>Effects upon agricultural land resources, including assessment of agricultural land classification. Best and most versatile agricultural land (i.e. Grades 1, 2 and 3a on MAFFs 1988 Agricultural Land Classification (ALC) system) is considered to be a limited national resource and is given special</p>		

Topic	Construction	Operation	Decommissioning
	<p>consideration in national policy, and can be considered to be of higher sensitivity than land in Grades 3b, 4 and 5. The loss of lower quality land is considered of lower importance under the planning system of England.</p> <p>Scoped Out</p> <p>Soil resources within the PV Area, Cable Connection and Grid Connection Corridors (unless covered inherently in the ALC assessment). Soil is complicated as it is a multi-functional resource, able to support crops, habitat areas, mitigate flood risk etc. However, the main requirement in regard to solar PV sites is that the soil is capable of supporting its prior land-use at the end of a Scheme’s lifetime, typically arable farming. The production and adherence to a site-specific Soil Management Plan will ensure soil resources are protected and the effect of the Scheme is negligible.</p> <p>Geodiversity – No potential impact linkage is identified that could change the water environment on-site and therefore Cowbit Wash SSSI is scoped out of the assessment; and</p> <p>Contaminated Land – Limited issues related to contaminated land could be controlled if encountered at the construction phase. As a result, this can be controlled outside of the EIA process and so receptors that could be affected by contaminated land issues have been scoped out of this assessment.</p>		
Landscape and Visual	<p>Scoped In</p> <p>Assessment of likely effects on landscape features, character, views and visual amenity during construction, operation, and decommissioning.</p>		
Noise and Vibration	<p>Scoped In</p> <p>Baseline noise monitoring will be undertaken at locations representative of surrounding noise-sensitive receptors.</p> <p>An assessment of construction road traffic noise and plant noise and vibration associated with the Scheme will be undertaken.</p>	<p>Scoped In</p> <p>An assessment of operational plant noise and vibration will be undertaken.</p> <p>Scoped Out</p> <p>No major vibration sources are envisaged to be introduced as part of the operation of the Scheme and as such there will be no associated vibration effects. It is proposed that ground-borne vibration is scoped out of any further assessment.</p> <p>It is not anticipated that the cabling associated with the Cable Connection and Grid Connection will produce any significant operational noise emissions. It is proposed that operational noise effects associated with the</p>	<p>Scoped In</p> <p>An assessment of construction and decommissioning plant noise and vibration will be undertaken.</p> <p>Scoped Out</p> <p>The assessment of road traffic noise as a result of the decommissioning phase is proposed to be scoped out due to uncertainties in relation to future traffic flows and transport infrastructure.</p>

Topic	Construction	Operation	Decommissioning
		<p>cabling are scoped out of any further assessment.</p> <p>Due to low vehicle numbers operating on-site, operational road traffic noise is scoped out.</p>	
<p>Socio-Economics, Human Health and Land Use</p>	<p>Scoped In</p> <p>The assessment will consider the provision of temporary employment during construction and decommissioning including gross value added, creation of long-term employment opportunities during the operational phase.</p> <p>Consideration of any existing uses on-site. Change of land use including displacement of agricultural land and impacts on recreation, open space (including PRow) and community facilities.</p> <p>Human health, including the access to healthcare, air quality and noise impacts, active travel, employment and training and social cohesion will be included within the assessment.</p> <p>Scoped Out</p> <p>Considering the location of the Scheme the following components of socio-economics have been scoped out, access to:</p> <ul style="list-style-type: none"> • Housing; • Education; • Childcare; • Open and play space; • Healthcare; • Community and leisure facilities; and • Tourism and recreation. <p>No aspects of the human health and land use topics are proposed to be scoped out</p>		
<p>Traffic and Access</p>	<p>Scoped In</p> <p>Construction traffic will include staff and material deliveries to and from the Scheme. During the construction phase, a peak of construction traffic will be generated. The assessment will quantify</p>	<p>Scoped Out</p> <p>Due to the low level of trips likely to be generated within the network peak hours, the traffic associated with this phase will be insufficient to trigger the 30% threshold for assessment (in line with IEMA Guidance¹⁸⁰) and as such, it is proposed that this phase can be</p>	<p>Scoped Out</p> <p>The decommissioning phase would result in fewer traffic movements than the construction phase as elements such as the improved junction and some access tracks may be retained for future agricultural and/or land uses. Given that the decommissioning</p>

Topic	Construction	Operation	Decommissioning
	<p>the level of construction traffic and the potential impact with regard to the effects noted below:</p> <ul style="list-style-type: none"> • Severance; • Driver delay; • Pedestrian delay; • Non-motorised user amenity; • Fear & intimidation; • Road safety; • Road Safety Audits; and • Large loads. 	<p>scoped out of further assessment. Further detail of the operational phase transport arrangements will be set out in the ES and TA to support this approach.</p>	<p>phase is assumed to be 40 years on from the commencement of operation for the purposes of the EIA, there would be too many uncertainties to ascertain the future baseline with any degree of assurance. As such, it is proposed to scope out the decommissioning phase from further assessment.</p>
Air Quality	<p>Scoped In</p> <p>It is proposed that a standalone Air Quality Assessment be undertaken to assess the potential impacts of the Scheme, and will include the following sections:</p> <ul style="list-style-type: none"> • Qualitative Construction Dust Risk Assessment; and • Qualitative Construction Phase Assessment of Road Traffic Emissions. 	<p>Scoped Out</p> <p>Based on the nature of the works for the operational phase we would not complete a quantitative dispersion modelling assessment.</p>	<p>Scoped In</p> <p>It is proposed that a standalone Air Quality Assessment be undertaken to assess the potential impacts of the Scheme. It is anticipated that effects associated with the decommissioning phase would be of a similar or lesser degree than those associated with construction. The qualitative construction dust risk assessment will inform effects associated with decommissioning and appropriate mitigation.</p> <p>Scoped Out</p> <p>The assessment of road traffic emissions during the decommissioning phase proposed to be scoped out due to uncertainties in relation to future traffic flows and transport infrastructure.</p>

Topic	Construction	Operation	Decommissioning
Glint and Glare	<p>Scoped Out</p> <p>As not all panels will be installed during the construction phase, it is considered that the length of glare and possible intensity of glare will be less than or equal to the operational phase.</p>	<p>Scoped In</p> <p>The effect of the Scheme on light-sensitive receptors during the operational phase will be considered as part of the EIA using study areas derived from best practice guidelines and recommendations. In particular, the potential impacts on nearby residential dwellings, the A16, the B1166, Fenland Airfield and Crowland Airfield.</p>	<p>Scoped Out</p> <p>As panels will be progressively removed during the decommissioning phases, it is considered that the length of glare and possible intensity of glare will be less than or equal to the operational phase.</p>
Major Accidents and Disasters	<p>Scoped In</p> <p>Considering the nature, scale and location of the Scheme, the ES will include a Major Accidents or Disasters chapter, this will outline the potential risks associated with the Scheme and how they could be mitigated. This will include, amongst others, as assessment of the effects of the Scheme on surrounding airfields during the operational phase. A risk-based approach will be taken.</p>		
Waste	<p>Scoped Out</p> <p>A description of the potential streams of construction, operation and decommissioning waste and estimated volumes will be outlined within the ES, and works will be carried out in adherence to the CEMP, SWMP and ODEMP</p>		
Telecommunications and Utilities	<p>Scoped Out</p> <p>A desk based study will be carried out alongside any relevant consultation to identify any existing infrastructure constraints, information obtained will be utilised to inform Scheme design to ensure potential impacts are avoided.</p>		

6 Proposed Structure of the ES

6.1.1 The ES will comprise the following documents:

- Non-Technical Summary (NTS) - this document will provide a concise summary of the Scheme, alternative designs that were considered, significant environmental effects and mitigation measures in plain English;
- ES Volume I: ES Main Text - this will contain the main body of the ES, compliant with the EIA Regulations and with the proposed chapter headings as set out below;
- ES Volume II: ES Figures - a complete set of figures will be provided for reference which support the assessments in ES Volume I; and
- ES Volume III: Technical Appendices - these will provide supplementary details of the environmental studies conducted during the EIA where appropriate, including relevant data tables, figures and photographs.

6.1.2 Taking into consideration the proposed scope, as summarised in **Table 5.1**, it is currently envisaged that the ES Volume II: Main Text will be structured with the chapter headings as set out below:

- Chapter 1: Introduction
- Chapter 2: Scheme Location and Site
- Chapter 3: Scheme Description
- Chapter 4: Alternatives and Design Evolution
- Chapter 5: EIA Methodology
- Chapter 6: Climate Change
- Chapter 7: Cultural Heritage
- Chapter 8: Ecology and Biodiversity
- Chapter 9: Hydrology, Flood Risk and WFD
- Chapter 10: Agriculture and Soils
- Chapter 11: Landscape and Visual
- Chapter 12: Noise and Vibration
- Chapter 13: Socio-Economics, Human Health and Land Use
- Chapter 14: Traffic and Access
- Chapter 15: *Other Environmental Considerations*
 - Air Quality
 - Glint and Glare
 - Major Accidents and Disasters
- Chapter 16: Cumulative Effects
- Chapter 17: Summary of Residual Effects

Appendix A Gazetteer of Known Heritage Assets

List Entry	Name	Type	NGR	Description
1004978	Settlement NE of Whitebread Farm	Scheduled Monument	TF 29002 14178	Possible Romano-British settlement comprising of a small group of ditched enclosures visible on aerial photographs. (HER Number: MLI22032).
1004979	Settlement W of Cate's Cove Corner	Scheduled Monument	TF 30140 13908	A group of irregular Romano-British settlements and industrial sites associated with droves. Pottery indicates the main occupation to be late 2nd-early 3rd century. (MLI20005).
1002944	Settlement In Moulton West Fen	Scheduled Monument	TF 29272 15013	Briefly occupied Romano-British settlement comprising of ditched enclosures, a watercourse and droves form at least twenty-four separate domestic and salt making sites including four red hills (a Roman coastal site producing salt by boiling seawater). (MLI20014).
1004982	Romano-British Settlement S of Shell Bridge	Scheduled Monument	TF 34177 15940	Romano-British settlement. Excavations from 1935 onwards by J Mossop yielded pottery dating to approximately AD100-300 (Event ID: ELI191). Droves, fields and small enclosures are present on APs. Excavations by Boston Archaeology Group in 1960 uncovered a possible hut site producing pottery and querns in the NW part of the field as well as clay lined troughs and handbricks (Event ID: ELI651). In 1961, an excavation for the Ministry of Works on a saltern site in the centre of the same field (Event ID: ELI127, Event ID: ELI4155). Kesteven College of Education investigated the SE drove way and two enclosures. The earliest feature was the enclosure S of the droveway containing late 2nd-early 3rd century pottery while a C14 date from the upper fill gave a date of 397-562 cal. AD. (MLI20016).
1002945	Settlement SE of Lower Delgate Farm	Scheduled Monument	TF 28015 16659	This record has been generated from an "old county number" (OCN) scheduling record. Likely cropmarks noted from aerial images.
1005052 1359254	St Guthlac's Cross	Scheduled Monument and Grade II Listed Building	TF 26033 14940	Partially extant 19th century farmstead comprising of regular courtyard with multiple yards and farmhouse detached from the main working complex. There has been a partial loss (less than 50%) of traditional buildings. Isolated location. Large modern sheds are located on the site. (MLI123855).
1004963	Settlement between Broadgate Farm and Lower Delgate Farm	Scheduled Monument	TF 27643 16891	This record has been generated from an "old county number" (OCN) scheduling record. Likely cropmarks noted from aerial images.
1009980	Medieval Boundary Earthworks at Queen's Bank, 100M Southeast of Providence House	Scheduled Monument	TF 29926 14147	The monument includes medieval earthwork banks and ditches which are the remains of part of the northern boundary of the monastic lands of Crowland Abbey (located 7km to the southwest), located on the boundary between the parishes of Crowland to the south and Moulton to the north. The earthworks comprised originally three parallel east-west banks approximately 30m

List Entry	Name	Type	NGR	Description
				- 35m apart and flanked by ditches. The middle bank survives under pasture for approximately 395m. The ditches along either side of the bank have become infilled but are visible. The southern of the three banks lies under the bridleway on Queen's Bank, and the ditch to the north of it is occupied by a modern dyke. The line of the northern bank to the east is recorded on older OS maps, and the ditches associated with it will survive as buried features. The earthworks extended originally for a distance of at least 5.5km, from Brotherhouse Bar eastwards to Aswick Grange.
1013529	Churchyard cross, St Mary's churchyard	Scheduled Monument	TF 29229 25150	The monument includes the remains of a Grade II Listed standing stone cross located in the churchyard of St Mary's Church, Weston, to the southwest of the south porch. The cross is medieval in origin with modern additions. The monument includes the base, comprising a plinth and a socket stone, the shaft, knop, and head.
1017217	King's Hall moated site, 480m east of Broadwater House Farm	Scheduled Monument	TF 31257 21303	The monument includes a medieval moated site known as King's Hall, thought to have been the residence of the de Moulton family. In 1086 there were two land holdings at Moulton belonging to Ivo Taillebois and Guy de Craon. By the early 13th century much of the land at Moulton had passed to Thomas de Moulton as tenant of Guy de Craon. It is believed that the moated site was established during the late 12th century on land reclaimed from the fen. In 1216 reference is made to the 'castle of Moulton' and subsequent references include one to repairs made in 1461. By the 1530s, parts of the building were still standing but after the 18th century was no longer visible above ground.
1019096	Wykeham Chapel: a moated monastic grange and retreat house	Scheduled Monument	TF 27600 26386	A monastic grange was a farm owned and run by a monastic community and independent of the secular manorial system of communal agriculture and servile labour. The first monastic granges appeared in the 12th century, but they continued to be constructed and used until the Dissolution. The moated monastic grange, retreat house and chapel survive well as a series of standing, earthwork and buried remains. Its specific function as a monastic grange and retreat house, together with the unusual survival of the chapel, makes this a particularly rare example of its kind.
9709	Moulton	Conservation Area		Conservation Area in Moulton village centre. No appraisal available.
1064467	Windmill	Grade II	TF 29432 18198	Tower mill. 1865, with 20th century extension. Red brick. Flat roof topped with funnel. 5 storeys. No machinery survives internally.
1064469	Church of St John the Evangelist	Grade II	TF 27609 19808	Chapel of Ease. 1888 with 1896 and 20th century additions. Red brick with stock brick dressings, some ashlar dressings. Slate roofs

List Entry	Name	Type	NGR	Description
				with stone coped gables with tumbling and kneelers; small gabled ventilator openings, stack to south and cross finials. Nave with south aisle, north transept and tower with lantern, chancel.
1064470	The Poplars Farmhouse	Grade II	TF 28125 20848	Farmhouse. c.1800. Red brick, painted stucco dressings. Hipped slate roof with overhanging eaves and 4 stacks to rear. 2 storeys, 3 bay front with central doorway with modillioned open pediment, ionic columns, plain fanlight and panelled door.
1064471	The Wykeham Chapel of St Nicholas	Grade I	TF 27635 26433	Private chapel, now ruin. 1311 with late 18th and late 19th century additions. Limestone ashlar, some red brick patching. Nave and chancel in one. Moulded plinth and string course regularly placed 4 stage buttresses with southwest polygonal stair turret with slit lights. West front with large, pointed window with slender nook shafts and hood mould, now blocked with brick. Built for Prior Hatfield of Spalding as a private chapel for his country house. Scheduled as Ancient Monument No. 45.
1064472	Gate Piers to Chapel Farmhouse	Grade II	TF 27473 26257	Pair of gatepiers. c.1700. Limestone ashlar. A pair of rectangular piers, each with moulded plinth, rusticated pier, moulded coping and wrought iron finials.
1064473	Cross 9 Metres South of South Aisle	Grade II	TF 29229 25149	Cross. 14th century with 20th century alterations. Limestone ashlar. Octagonal base with chamfered top, alternating sides with remnants of large, broached stops, 2 opposite sides with recessed rectangular wedges. Surmounted by tapering rectangular shaft with deeply chamfered corners and broached stops. 19th century crenelated capital with tapering cross above with crenelated gable.
1064474	Row of 7 Gravestones 1-6 Metres to South of Church	Grade II	TF 29247 25148	Row of 7 gravestones. Late 18th and early 19th century in date. Limestone ashlar.
1064475	Church of St Mary	Grade I	TF 29248 25153	Parish church. 1170, mid-14th century, restored by G. G. Scott in 1858- 67, and J. L. Pearson in 1885-6. Limestone ashlar and rubble, some red brick patching. Lead roofs of 1885, with stone coped gables with cross finials and stone corbel tables. Nave with west tower, north and south aisles with south porch, clerestory, north and south transepts and chancel. Late 15th century 3 stage west tower with moulded plinth and string course, and 4 stage angle buttresses, the second stage with ornate gablets, and north-east polygonal stair turret with 3 slit lights and parapet. pulpit. Drum font of c.1200 with semi-circular shafts with moulded capitals supporting it, and 8 sides of drum articulated by 8 attached shafts. Section of ornate 17th century panelling to north-west of nave. Monuments Ashlar and marble ornaments as well as 18th and 19th century gravestones.

List Entry	Name	Type	NGR	Description
1064476	Milestone	Grade II	TF 28739 24747	Milestone. Mid-19th century. Painted stone. Rectangular with slightly chamfered corners and top. Approximately 0.75 metres high. Inscribed: to right' Holbeach 5 miles. Weston'. To left: 'Spalding 3 miles. Weston.'
1064501	Manor House	Grade II	TF 30697 24173	House. Early 19th century. Red brick. Slate roof with wooden eaves and gable stacks. 2 storeys, 3 bay fronts with central doorway with semi-circular head, ornate fanlight and partially glazed panelled door.
1064502	Hazeldean House	Grade II	TF 30570 24003	House. 18th century. Colourwashed rendered brick. Plain tiled roof with wooden eaves and gable stacks. 2 storeys, 3 bay front with plinth and painted raised quoins.
1064504	Hand Pump	Grade I	TF 30655 24119	Hand pump. 18th and late 19th century. Painted wood, lead, cast iron. Tall wooden box, lead spout, long cast iron handle.
1064505	20, High Street	Grade II	TF 30706 24035	Millhouse with bakehouse, now house. Early 18th century, with mid-18th, mid-19th, 20th century alterations. Red brick. Slate roof with ashlar coped gables, moulded wooden eaves cornice, with projecting gable stack to right, single gable stack to left. Mid-18th century main house of 2 storeys with attic, 3 bay front with plinth, first floor band and a band above the first floor windows.
1064506	Harrox House	Grade II	TF 30632 24092	House. Late 18th century. Colourwashed and rendered brick, some painted ashlar. Slate roof with ashlar coped gables, dentillated wooden eaves cornice and gable stacks. 2 storeys, 3 bay front with painted ashlar quoins and central doorway with open doric porch with fluted columns and entablature; partially glazed door.
1064507	10, High Street	Grade II	TF 30666 24144	House. c.1825. Brown brick with painted stucco dressings. Hipped slate roof with single ridge stack and single stack to rear. 2 storeys, 2 bays.
1147210	2, Bell Lane	Grade II	TF 30672 24210	House. 1702, with late 19th and 20th century alterations. Rendered brick. Concrete tiled roof with rendered gable stacks. 2 storeys, 5 bay front with remnants of 19th century quoins and high 18th century plinth. Central doorway, plain doorcase and plank door. Plaque above inscribed: 'JB 1702'.
1147237	Harrington House	Grade II	TF 30628 24043	House. Late 18th to mid-19th century. Red brick. Slate roof with ashlar coped gables, dentillated wooden eaves cornice and gable stacks. 2 storeys and attic, 3 bay front with central doorway with moulded doorcase and cornice.
1147257	The Goddards	Grade II	TF 30837 24244	House, now 3 dwellings. c.1800. Red brick. Concrete tiled roof with stone coped gables and hidden behind ashlar coped parapet; gable stacks. 2 and a half storeys, 3 bay fronts with central doorway with open Doric porch with fluted columns and open pediment.
1147281	Brooklyn House With Attached Stables	Grade II	TF 30651 24142	House with attached stable block. c.1825. Red brick with painted stucco dressings. Concrete tiled roof with stone coped gables,

List Entry	Name	Type	NGR	Description
				wooden cornice, gable stacks, that to the right truncated. 2 storeys and attic, 2 bay front with first and second floor broad stucco bands.
1147289	Clifden House Farmhouse	Grade II	TF 30732 23305	House. c.1800. Red brick. Slate roof with partially tumbled gables, moulded and dentillation wooden eaves and gable stacks. 2 storeys, 3 bay front. Ashlar plaque on right hand return wall with coat of arms. Large late 19th century addition to rear.
1147325	Church of All Saints	Grade II	TF 30710 24115	Parish church. c.1180, c.1200 with mid-14th, late 15th and 1777 additions. Restored in 1867. Limestone ashlar, some red brick. Lead and slate roofs with stone coped gables with eastern cross finial. West tower with spire, nave with north and south aisles, south porch and clerestorey, chancel with north organ chamber. 4 stage mid-14th century tower partially remodelled in the late 15th century. Font of 1719 by William Tudd. Several marble monuments as well as 18th and 19th century gravestones.
1147422	The Swan Public House	Grade II	TF 30671 24024	Inn, now public house. Late 18th century, early to late 19th and 20th century alterations. Colourwashed, rendered red brick. Slate roof over 4 bays to the right, pantile roof over 4 bays to the left, with a raised ridge defining the two sections.
1147465	2, Shivean Gate	Grade II	TF 30609 24154	House. Early 19th century with 20th century additions. Red brick. Slate roof with gable stacks. 2 storey, 3 bay front with first floor band.
1147482	Beech House (Snowdrop House on OS Map)	Grade II	TF 28443 21739	Farmhouse. Late 18th century, with mid-19th century additions. Red brick with painted stucco dressings. Concrete tiled roof with brick coped gables and parapet, 2 gable stacks. 2 storeys, 3 bay front with central doorway with open pediment, fanlight, slender columnar doorcase.
1147513	Chapel Farmhouse	Grade I	TF 27602 26406	Farmhouse. Late 17th century to mid-18th century in date. Red brick with some limestone ashlar dressings. 20th century concrete tiled roof with rendered, coped, and tumbled gables; 2 projecting gable stacks on main south front, each with 3 tall shafts. 2 storeys and garret, 7 bay south front with outer blind bays beyond single projecting stacks.
1147551	Lychgate	Grade II	TF 29251 25124	Lychgate War Memorial. c.1918. Red brick and wood. Gabled thatched roof. Parallel brick walls with low double wooden gates attached on inner sides; and surmounted by wooden frame with open cusped traceried panels, with bands of foliate and castellated decoration. 4 centred archways to north and south above, with gable apex with open cusped tracery, and north side with niche containing figure of soldier.
1147556	Tomb Chest Approximately 3 Metres South of Church	Grade II	TF 29230 25158	Tomb chest. 1629. Limestone ashlar. Stone to east inscribed: 'Here lyeth the Body of Willyam Welles Deseased the 22 of October An. Dom. 1629' Parallel stone set to form a

List Entry	Name	Type	NGR	Description
				rectangular chest with overhanging chamfered slab placed on top.
1147591	Barn to South of Oakleigh House	Grade II	TF 29099 24953	Barn. Mid-18th century with mid-19th and 20th century alterations. Red brick. Corrugated iron, steeply pitched roof with coped and tumbled south gable and coped and patched tumbling to north gable. Single storey and garret, 3 bay west front with doorway to left with broken down, partially blocked door. 2 shuttered openings to left. South gable end with rectangular shuttered opening to left, blocked opening above with small shuttered opening above that. Oakleigh House is not included in this list.
1253327	K6 Telephone Kiosk at the Junction of Broad Lane and High Street	Grade II	TF 30652 24069	Telephone kiosk, Type K6. Designed 1935 by Sir Giles Gilbert Scott. Made by various contractors. Cast iron. Square kiosk with domed roof. Unperforated crowns to top panels and margin glazing to windows and doors.
1261851	Oakleigh House	Grade II	TF 29109 24978	Farmhouse. Early 18th and early 19th century. Red brick, partly rendered, with slate, pantile and 20th century concrete tile roofs. 4 gable stacks. L-plan. Front range, to street, 2 storeys, 3 bays, with central doorway with painted surround. Rear wing now rendered. 3 bay, single storey plus attics. To the left a single storey extension with a plank door and a casement window both with segment heads. Northeast room on ground floor has early 18th century dado panelling. Rear wing has stick baluster staircase.
1308515	Broadgate House Farmhouse	Grade II	TF 28350 23872	Farmhouse. Early 18th century in date, refronted c.1800, with mid-19th century alterations. Red brick, some colourwashed render. Slate roof with stone coped gables and 2 gable stacks, that to the left projecting and with flat band. Z storeys with attic, 3 bay front with chamfered plinth.
1308557	Windmill	Grade II	TF 30755 24035	Tower mill. c.1822, by Robert King, 1895, 1928. Brown brick. Corrugated iron shallow pointed roof of 1928, with finial, and dentillated brick eaves. 8 storeys plus basement, a total of 80 feet in height to the curb. 18 feet, 9 inches in diameter at ground level; 12 feet in diameter at curb. 3 round basement openings, one each to the south-east, south-west and north-west. 2 pairs of French stones remain in place on the fourth floor, one inscribed: 'WJ & T Child. Maker. Hull. 1853'. The wind shaft no longer exists but the tail bearing housing remains. This is the tallest windmill in the country (not including the tallest complete windmill, including the cap, at Sutton in Norfolk). Source: Dolman, p.23. Buildings at entrance to road now demolished.
1359258	Mill	Grade II	TF 26611 17921	COWBIT BACKGATE TF 21 NE (west side) 13/1 Mill II Tower mill. Early C19. Red brick. Tapering tower mill with corbelled out top. 4 stages. Ground floor doorway now contains

List Entry	Name	Type	NGR	Description
				2 light window. To upper stages 2 four light pivot windows and one blocked opening all with brick segmental heads. Interior not available for inspection.
1359267	Austendike Hall	Grade II	TF 30228 21704	House. Mid-18th century with 19th century alterations. Red brick with some render and some ashlar dressings. Slate roof with broken dentillated eaves, tumbled gables, single ridge and 2 gable stacks. 2 storeys with attic, 4 bay front with ashlar quoins.
1359268	The Old Vicarage	Grade I	TF 30818 24299	Vicarage, now house. Late 18th century in date. Red brick. Hipped slate roof with 2 lateral stacks. 2 storeys and attic, 4 bay front.
1359269	Barn to Rear of Holly Cottage	Grade II	TF 29910 20110	Barn. Early 18th century with late 19th alterations. Red brick. Pantile roof with brick coped partly tumbled gables. L-plan. Single storey, 2 bay south front with doorway with plank door. Smaller plank door to right. Projecting range to right with large plank door with wooden lintel, in west side.
1359270	Lychgate	Grade II	TF 30679 24111	Lychgate. 1897. Limestone ashlar, wood. Hipped, bell canted, plain tile roof with ornate ridge tiles with finial. Low parallel stone walls with chamfered tops, support wooden frame with lower straight braces and low, panelled openwork gates. Upper curved braces, those to the west inscribed with memorial to Queen Victoria's Jubilee and the date, 1897.
1359271	Bayfield	Grade II	TF 30662 24052	House. Mid-18th century, refronted in 1805 with later 19th century alterations. Red brick. Hipped slate roof with large stack to rear. 2 and a half storeys, 3 bay front with ashlar plinth, first floor band and second floor sill band. Single central bay projects slightly and is topped with a pediment with datestone inscribed '1805'.
1359293	Chapel of St James	Grade II*	TF 29348 18231	Chapel of Ease. 1722, by William Sands Senior, of Spalding; with 1886 additions. Red brick with limestone ashlar dressings. Octagonal slate roof over nave with lead, pyramidal finial; slate polygonal chancel roof. Moulded brick eaves. Octagonal nave of 1722 with polygonal chancel and north vestry of 1886 attached to east. Ashlar dressed plinth. Large scrolled cartouche above with palms and inscribed: " P A 52 DEO PFSS ECCLESIAE ANGLICANAE EVI REE REST IfD ASH MDCCXXII". To the east, on the north side is a vestry of 1886, with a west doorway with ashlar lintel and plank door.
1359294	Elm Tree Farmhouse	Grade II	TF 27495 18450	Farmhouse. c.1800. Red brick. Plain tiled roof with brick coped gables and gable stacks. 2 storeys, 3 bay front.
1146795	Gedney Hill Mill	Grade II Listed Building	TF 33383 11652	Tower mill built in c.1824, since converted into a house and all machinery has been removed. (HER Number: MLI22284).
1147611	Church of St John the Baptist	Grade II Listed Building	TF 32012 13507	Church, built in 1821 on or very near the site of its medieval wooden church predecessor. Altered 1907-8. Foundation deposits relating to the construction of the 1821 church were

List Entry	Name	Type	NGR	Description
				revealed in January 2007, during the Watching Brief was conducted by Archaeological Project Services during groundworks for new drainage and the construction of a new porch. An early 20th century foundation trench relating to the previous porch was also seen. No earlier features were encountered, although fragments of human bone were noted in the surrounding graveyard soil. (Event ID: ELI8013) (HER Number MLI22184).
1147706	Windmill	Grade II Listed Building	TF 30814 12243	Tower mill. Late 18th century. Tarrred red brick. Missing cap, no roof, dogtooth eaves. 4 storeys. West side with segmental headed doorway with plank double doors. Upper floors collapsed with the machinery (which can be partly seen through ground floor openings) including a pair of stones, buried beneath rubble and wood. Originally had a clasp arm great spur wheel.
1204813	Yarwood House	Grade II Listed Building	TF 35975 14378	Cottage dating from the late 17th century and altered in the early 18th century. Red brick. Corrugated iron roofs. Single ridge and right gable stacks. Brick coped and tumbled gables. (HER Number MLI94516).

